

HSM110XC AT **Commands Manual**

Short-Range Products

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About the Document

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1 Introduction

This document outlines general and BLE-related AT commands supported by Quectel HSM110XC module.

1.1. Definitions

- **<CR>** Carriage return character.
- **<LF>** Line feed character.
- **<...>** Parameter name. Angle brackets do not appear on the command line.
- **[...]** Optional parameter of a command or an optional part of TA information response. Square brackets do not appear on the command line. When an optional parameter is not given in a command, the new value equals its previous value or the default settings, unless otherwise specified.
- **Underline** Default setting of a parameter.

1.2. AT Command Syntax

All command lines must start with **AT** or **at** and end with **<CR>**. Information responses and result codes always start and end with a carriage return character and a line feed character: **<CR><LF><response><CR><LF>**. In tables presenting commands and responses throughout this document, only the commands and responses are presented, and **<CR>** and **<LF>** are deliberately omitted.

AT commands implemented by the module can be separated into three categories syntactically: “**Basic**” and “**Extended**”, as listed below:

- **Basic Command**

These AT commands have the format of **AT<x><n>**, or **AT&<x><n>**, where **<x>** is the command, and **<n>** is/are the argument(s) for that command. An example of this is **ATE<n>**, which tells the DCE (Data Circuit-terminating Equipment) whether received characters should be echoed back to the DTE (Data Terminal Equipment) according to the value of **<n>**. **<n>** is optional and a default will be used if it is omitted.

- **Extended Command**

Extended commands can be executed in several modes, as shown in the following table.

Table 1: Types of AT Commands

Command Type	Syntax	Description
Test Command	AT+<cmd>=?	Test the existence of the corresponding command and return information about the type, value, or range of its parameter.
Read Command	AT+<cmd>?	Check the current parameter value of the corresponding command.
Write Command	AT+<cmd>=<p1>[,<p2>[,<p3>[...]]]	Set user-definable parameter value.
Execution Command	AT+<cmd>	Return a specific information parameter or perform a specific action.

Multiple commands can be placed on a single line using a semi-colon (;) between commands. In such cases, only the first command should have **AT** prefix. Commands can be in upper or lower case.

Spaces should be ignored when you enter AT commands, except in the following cases:

- Within quoted strings, where spaces are preserved;
- Within an unquoted string or numeric parameter;
- Within an IP address;
- Within the AT command name up to and including a **=**, **?** or **=?**.

On input, at least a carriage return is required. A newline character is ignored so it is permissible to use carriage return/line feed pairs on the input.

If no command is entered after the **AT** token, **OK** will be returned. If an invalid command is entered, **ERROR** will be returned.

Optional parameters, unless explicitly stated, need to be provided up to the last parameter being entered.

1.3. AT Command Responses

When the AT command processor has finished processing a line, it will output **OK**, **ERROR** or **+CME ERROR: <err>** to indicate that it is ready to accept a new command. Solicited information responses are sent before the final **OK**, **ERROR** or **+CME ERROR: <err>**.

Responses will be in the format of:

```
<CR><LF>+CMD1: <parameters><CR><LF>  
<CR><LF>OK<CR><LF>
```

Or

```
<CR><LF><parameters><CR><LF>  
<CR><LF>OK<CR><LF>
```

1.4. Declaration of AT Command Examples

The AT command examples in this document are provided to help you learn about the use of the AT commands introduced herein. The examples, however, should not be taken as Quectel's recommendations or suggestions about how to design a program flow or what status to set the module into. Sometimes multiple examples may be provided for one AT command. However, this does not mean that there is a correlation among these examples, or that they should be executed in a given sequence. The URLs, domain names, IP addresses, usernames/accounts, and passwords (if any) in the AT command examples are provided for illustrative and explanatory purposes only, and they should be modified to reflect your actual usage and specific needs.

2 AT Command Description

2.1. Description of General AT Commands

2.1.1. AT+QRST Reboot Module

The command reboots the module.

AT+QRST Reboot Module	
Execution Command AT+QRST	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

2.1.2. ATI Display MT Identification Information

The command displays the MT identification information.

ATI Display MT Identification Information	
Execution Command ATI	Response Quectel <objectID> Revision: <revision> OK
Maximum Response Time	300 ms
Characteristics	-

Parameter

<objectID>	String type without double quotation marks. Identifier of device type.
<revision>	String type without double quotation marks. Identification text of MT firmware version.

2.1.3. AT+QVERSION Get Firmware Version

The command gets firmware version of the module.

AT+QVERSION Get Firmware Version	
Execution Command AT+QVERSION	Response +QVERSION: <version> OK If there is any error: ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<version>	String type without double quotation marks. Firmware version number.
------------------------	--

2.1.4. AT+QECHO Enable/Disable Echo Function

The command enables or disables echo function.

AT+QECHO Enable/Disable Echo Function	
Write Command AT+QECHO=<enable>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration is not saved.

Parameter

<enable>	Integer type. Enable/disable echo function.
<u>0</u>	Disable
1	Enable

2.1.5. AT+QSETBAUD Set Baud Rate

The command sets serial port baud rate and writes the baud rate to Flash.

AT+QSETBAUD Set Baud Rate	
Write Command AT+QSETBAUD=<baud_rate>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration is saved automatically.

Parameter

<baud_rate>	Integer type. Serial port baud rate. The values of the baud rate are 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800 and 921600. Default value: 115200. Unit: bps.
--------------------------	--

2.1.6. AT+QTXPOWER Set TX Power

The command sets TX power and writes the TX power configuration to Flash.

AT+QTXPOWER Set TX Power	
Read Command AT+QTXPOWER?	Response +QTXPOWER: <TX_power> OK If there is any error: ERROR
Write Command AT+QTXPOWER=<TX_power>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect after the module is rebooted. The configuration is saved automatically.

Parameter

<TX_power> Integer type. TX power. Range: -47–8. Default value: 0. Unit: dBm.

2.1.7. AT+QCFGRI Configure RI Pin Feature

The command enables or disables RI pin, configures the latency of URC output after the RI pin level changes and sets the duration of the RI pin low-level state.

AT+QCFGRI Configure RI Pin Feature

Write Command AT+QCFGRI=<RI_enable>[,<URC_delay>[,<RI_hold>]]	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations are not saved.

Parameter

<RI_enable> Integer type. Enable or disable RI pin. The module's RI pin is GPIO_24. See [document \[1\]](#) for details.

0 Disable
1 Enable

<URC_delay> Integer type. Latency of URC output after the RI pin level changes. This parameter is valid only when **<RI_enable>** is 1. Range: 10–50. Default value: 20. Unit: ms.

<RI_hold> Integer type. Duration of the RI pin low-level state. This parameter is valid only when **<RI_enable>** is 1. Range: 10–50. Default value: 20. Unit: ms.

NOTE

The RI pin level is high by default. After the RI pin is enabled through **AT+QCFGRI=1,20,20**, it switches to a low level for 20 ms. And then the URC is output.

2.2. Description of BLE-Related AT Commands

2.2.1. AT+QBLEINIT Initialize BLE Functionality

The command initializes BLE functionality. You only need to execute the command once to initialize BLE functionality after the module is booted.

AT+QBLEINIT Initialize BLE Functionality	
Read Command AT+QBLEINIT?	Response +QBLEINIT: <role> OK If there is any error: ERROR
Write Command AT+QBLEINIT=<role>[,<auto_adv>]	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations are not saved.

Parameter

<role>	Integer type. Module role when initializing BLE functionality. 1 Central device. 2 Peripheral device. Advertising starts automatically by default after BLE disconnection. To disable this feature, execute AT+QBLEINIT=2,0 during BLE functionality initialization. 4 Multi-role device. Up to two central devices and five peripheral devices can be connected to the module simultaneously.
<auto_adv>	Integer type. Whether advertising starts automatically after BLE disconnection when the module is operating as a peripheral device or a multi-role device. 0 Do not start advertising <u>1</u> Start advertising

2.2.2. AT+QBLEADDR Query BLE Device Address

The command queries BLE device address.

AT+QBLEADDR Query BLE Device Address	
Read Command AT+QBLEADDR?	Response +QBLEADDR: <BLE_addr> OK If there is any error: ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<BLE_addr> String type. BLE device address represented as a 48-bit hexadecimal string, e.g., "90395E8A70D1".

2.2.3. AT+QBLENAME Set BLE Device Name

The command sets the BLE device name.

AT+QBLENAME Set BLE Device Name	
Read Command AT+QBLENAME?	Response +QBLENAME: <BLE_name> OK If there is any error: ERROR
Write Command AT+QBLENAME=<BLE_name>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration is saved automatically.

Parameter

<BLE_name>	String type. BLE device name. Maximum length: 25 bytes. Default value: "HSM110XC".
-------------------------	--

2.2.4. AT+QBLEADVPARAM Configure BLE Advertising Parameters

The command configures BLE advertising parameters when the module is operating as a peripheral device or a multi-role device.

AT+QBLEADVPARAM Configure BLE Advertising Parameters	
Read Command AT+QBLEADVPARAM?	Response +QBLEADVPARAM: <adv_int_min>,<adv_int_max> OK If there is any error: ERROR
Write Command AT+QBLEADVPARAM=<adv_int_min>,<adv_int_max>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations are not saved.

Parameter

<adv_int_min>	Integer type. Minimum advertising interval for undirected and low duty cycle directed advertising. Range: 32–16384 (Time range: 20 ms–10.24 s). Default value: 160 (100 ms). Unit: timeslot (1 timeslot = 0.625 ms).
<adv_int_max>	Integer type. Maximum advertising interval for undirected advertising and low duty cycle directed advertising. Range: 32–16384 (Time range: 20 ms–10.24 s). Default value: 160 (100 ms). Unit: timeslot (1 timeslot = 0.625 ms).

NOTE

BLE advertising parameters configured by **AT+QBLEADVPARAM** can only take effect after BLE advertising is restarted.

2.2.5. AT+QBLEADVDATA Set BLE Advertising Data

The command sets BLE advertising data when the module is operating as a peripheral device or a multi-role device.

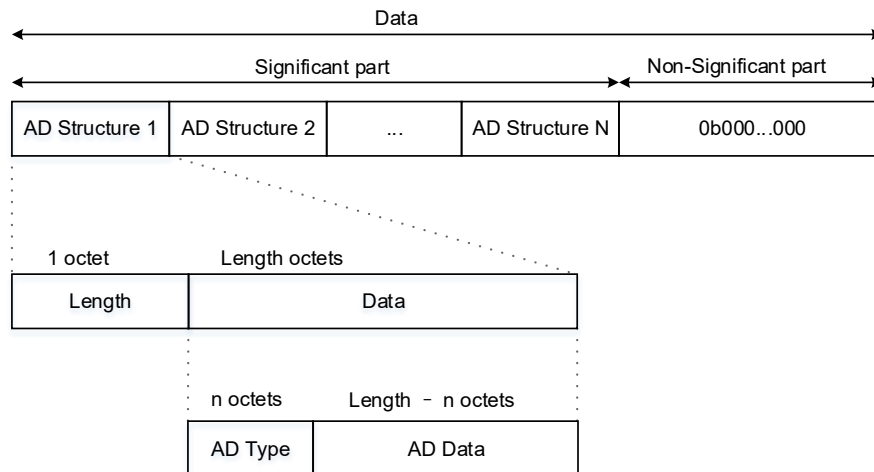


Figure 1: BLE Advertising Format

AT+QBLEADVDATA Set BLE Advertising Data	
Write Command AT+QBLEADVDATA=<adv_data>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration is not saved.

Parameter

<adv_data>	Hexadecimal string type. Advertising data (AD). It consists of multiple AD Structure fields and should comply with the data format in Figure 1 . The fields included are as follows:
Length	Length of AD Structure. It includes AD Type and AD Data, but excludes the Length field itself (1 byte). Maximum value: 0x1E (30 bytes).
AD Type	Advertising data type, such as TX Power Level (0x0A), Local Name (0x09), Le Role (0x1C) and Service UUIDs (0x16). After the peer scans the advertisement, it determines the meaning of the advertising data based on the AD Type.
AD Data	Advertising data in big-endian byte order.

NOTE

For details of AD types, please see *Core Specification 5.2* (<https://www.bluetooth.com/specifications/specs/core-specification/>).

2.2.6. AT+QBLESRDATA Set BLE Scan Response Data

The command sets BLE scan response data when the module is operating as a peripheral device or a multi-role device.

AT+QBLESRDATA Set BLE Scan Response Data

Write Command AT+QBLESRDATA=<sr_data>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration is not saved.

Parameter

<sr_data> Hexadecimal string type. Scan response data, in same format as **<adv_data>**. For more details about **<adv_data>**, please see **Chapter 2.2.5**.

2.2.7. AT+QBLEBEACONDATA Set Advertising Data in Beacon Mode

The command sets advertising data in beacon mode when the module is operating as a peripheral device or a multi-role device.

AT+QBLEBEACONDATA Set Advertising Data in Beacon Mode

Write Command AT+QBLEBEACONDATA=<beacon_data>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration is not saved.

Parameter

<beacon_data> String type. Advertising data in beacon mode.

NOTE

For details of advertising data in beacon mode, please see *Core Specification 5.2* (<https://www.bluetooth.com/specifications/specs/core-specification/>).

2.2.8. AT+QBLEGATTSSRV Establish a BLE Service

The command establishes a BLE service when the module is operating as a peripheral device or a multi-role device.

AT+QBLEGATTSSRV Establish a BLE Service

Write Command AT+QBLEGATTSSRV=<srv_UUID>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration is not saved.

Parameter

<srv_UUID> String type. BLE service UUID. Length: 4 bytes or 32 bytes.

NOTE

1. Only two BLE services can be established through the command.
2. You must first initialize the BLE functionality through **AT+QBLEINIT** to set the module as a peripheral device or a multi-role device, and then establish a BLE service through **AT+QBLEGATTSSRV**. Otherwise, the Bluetooth advertising, scan and connection functions cannot be used normally.

2.2.9. AT+QBLEGATTCHAR Set BLE Characteristic UUID

The command sets BLE characteristic UUID when the module is operating as a peripheral device or a multi-role device.

AT+QBLEGATTCHAR Set BLE Characteristic UUID	
Write Command AT+QBLEGATTCHAR=<char_UUID>[,<att_cfg>]	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations are not saved.

Parameter

<char_UUID>	String type. Characteristic UUID. Length: 4 bytes or 32 bytes.
<att_cfg>	Integer type. Property configuration of characteristic UUID. Range: 0–FF. bit7–bit0 represent different properties, which are shown below. You can configure the corresponding bit. 0 indicates that the property is disabled and 1 indicates that the property is enabled. For example, FF indicates that properties corresponding to bit7–bit0 are enabled.
bit7–bit5	Reserved
bit4	Read
bit3	Indicate
bit2	Notify
bit1	Write no response
bit0	Write

NOTE

- Maximum two BLE characteristic UUIDs can be set through the command. When **<att_cfg>** is omitted, the property of each characteristic UUID is Read, Notify and Write no response by default.
- When the module is operating as a peripheral device or a multi-role device, you must establish a BLE service through **AT+QBLEGATTSSRV**, and then set BLE characteristic UUID through **AT+QBLEGATTCHAR**. Otherwise, the Bluetooth advertising, scan and connection functions cannot be used normally.

2.2.10. AT+QBLEGATTSSRVDONE Complete BLE Service Establishment

The command completes BLE service establishment when the module is operating as a peripheral device or a multi-role device.

AT+QBLEGATTSSRVDONE Complete BLE Service Establishment

Execute Command AT+QBLEGATTSSRVDONE	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

NOTE

When the module is operating as a peripheral device or a multi-role device, you must set BLE characteristic UUID through **AT+QBLEGATTSSCHAR**, and then complete the BLE service establishment through **AT+QBLEGATTSSRVDONE**. Otherwise, the Bluetooth advertising, scan and connection functions cannot be used normally.

2.2.11. AT+QBLEADVSTART Start BLE Advertising

The command starts BLE advertising when the module is operating as a peripheral device or a multi-role device.

AT+QBLEADVSTART Start BLE Advertising

Read Command AT+QBLEADVSTART?	Response +QBLEADVSTART: <adv_state> OK If there is any error: ERROR
Execution Command AT+QBLEADVSTART	Response OK Or ERROR
Maximum Response Time	1000 ms
Characteristics	-

Parameter

<adv_state> Integer type. BLE advertising state.
0 Advertising stopped

1 Advertising started

2.2.12. AT+QBLEADVSTOP Stop BLE Advertising

The command stops BLE advertising when the module is operating as a peripheral device or a multi-role device.

AT+QBLEADVSTOP Stop BLE Advertising	
Execution Command AT+QBLEADVSTOP	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

2.2.13. AT+QBLEADV Start BLE Advertising Quickly

The command starts BLE advertising quickly.

AT+QBLEADV Start BLE Advertising Quickly	
Read Command AT+QBLEADV?	Response +QBLEADV: <adv_state> OK If there is any error: ERROR
Write Command AT+QBLEADV=<adv_state>	Response OK Or ERROR
Maximum Response Time	1000 ms
Characteristics	-

Parameter

<adv_state>	Integer type. BLE advertising state.
0	Advertising stopped
1	Advertising started

NOTE

1. If BLE functionality is not initialized and BLE service is not established, you can start the advertising directly through **AT+QBLEADV**. The following default BLE service is established by the module:
 - Service UUID: 0x6E400001B5A3F393E0A9E50E24DCCA9E.
 - Characteristic UUID for receiving data: 0x6E400002B5A3F393E0A9E50E24DCCA9E.
Properties: Write, Write no response.
 - Characteristic UUID for sending data: 0x6E400003B5A3F393E0A9E50E24DCCA9E.
Property: Notify.
2. The module is configured as a peripheral device automatically if you execute **AT+QBLEADV** to start advertising directly after the module is booted.

2.2.14. AT+QBLEGATTSNTFY Send GATT Data by Notification

The command sends GATT data by notification when the module is operating as a peripheral device or a multi-role device.

AT+QBLEGATTSNTFY Send GATT Data by Notification	
Write Command AT+QBLEGATTSNTFY=<conn_idx>,<UUID>,<hex_length>,<data>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<conn_idx>	Integer type. Peer device index assigned by the module automatically when the BLE connection is established. Range: 0–6. Default value: 0.
<UUID>	String type. Characteristic UUID. Length: 4 bytes or 32 bytes.
<hex_length>	Integer type. Hex data length. The module will convert <data> to hexadecimal format before transmission when this optional parameter is used. For example, if <data> is 123456, the module will convert it to 0x123456 and send it.
<data>	String type. GATT data. Maximum length: 244 bytes.

2.2.15. AT+QBLESCAN Enable/Disable BLE Scan

The command enables or disables BLE scan when the module is operating as a central device or a multi-role device.

AT+QBLESCAN Enable/Disable BLE Scan	
Read Command AT+QBLESCAN?	Response +QBLESCAN: <scan_state> OK If there is any error: ERROR
Write Command AT+QBLESCAN=<scan>[,<timeout>]	Response If <scan> is 0: OK If <scan> is 1: OK +QBLESCAN: <name>,<address_type>,<BLE_addr> If <scan> is 2 or 3: OK +QBLESCAN: <name>,<address_type>,<BLE_addr>,<RS SI>,<adv_data> If there is any error. ERROR
Maximum Response Time	1000 ms
Characteristics	-

Parameter

<scan_state>	Integer type. Current BLE scan state. 0 Scan is disabled 1 Scan is enabled
<scan>	Integer type. Enable/disable BLE scan. 0 Disable BLE scan 1 Enable BLE scan but do not output <adv_data> . 2 Enable BLE scan and output <adv_data> . <timeout> must be specified in this mode. 3 Enable BLE scan and output <adv_data> . Only connectable advertising packets are scanned in this mode.
<timeout>	Integer type. Scan duration. Range: 500–10000. Unit: ms. It must be set when <scan> is 2.
<name>	String type. Scanned BLE device name.

<address_type>	Integer type. BLE device address type. 0 Public address 1 Random address
<BLE_addr>	String type. BLE device address represented as a 48-bit hexadecimal string, e.g., "58D391010203".
<RSSI>	Integer type. Received signal strength indicator value.
<adv_data>	String type. Scanned advertising data and response data.

NOTE

If you execute **AT+QBLESCAN** to enable the BLE scan immediately after the module is booted, the module is automatically configured as a central device.

2.2.16. AT+QBLESCANPARAM Query/Set BLE Scan Parameters

The command queries or sets BLE scan parameters when the module is operating as a central device or a multi-role device.

AT+QBLESCANPARAM Query/Set BLE Scan Parameters	
Read Command AT+QBLESCANPARAM?	Response +QBLESCANPARAM: <scan_interval>,<scan_window> OK If there is any error: ERROR
Write Command AT+QBLESCANPARAM=<scan_interval>,<scan_window>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations are not saved.

Parameter

<scan_interval>	Integer type. BLE scan interval. Range: 18–4096 (Time range: 11.25 ms to 2.56 s). Unit: timeslot (1 timeslot = 0.625 ms). Default value: 100.
<scan_window>	Integer type. BLE scan window. <scan_window> is less than or equal to <scan_interval> . Range: 17–4096 (Time range: 10.625 ms–2.56 s). Unit: timeslot (1 timeslot = 0.625 ms). Default value: 30.

NOTE

The configured scan parameters do not take effect immediately during an ongoing scan. You must disable scanning and then enable it again to apply the configured parameters.

2.2.17. AT+QBLESCANKWSET Set Keyword Filtering

The command sets the keyword filtering.

AT+QBLESCANKWSET Set Keyword Filtering	
Write Command AT+QBLESCANKWSET=<enable>[,<keyword_num>[,<keyword1>[,<keyword2>[,...[,<keyword5>]]]]]	Response OK Or ERROR
Maximum Response Time	1000 ms
Characteristics	The command takes effect immediately. The configurations are not saved.

Parameter

<enable>	Integer type. Enable or disable keyword filtering. 0 Disable 1 Enable
<keyword_num>	Integer type. Keyword count. Range: 0–5.
<keywordx>	String type. Keywords for filtering BLE advertising data of target device.

2.2.18. AT+QBLECONN Connect to Peripheral Device

The command connects the module to a peripheral device when the module is operating as a central device or a multi-role device.

AT+QBLECONN Connect to Peripheral Device	
Write Command AT+QBLECONN=<addr_type>,<peer_addr>[,<timeout>]	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations are not saved.

Parameter

<addr_type>	Integer type. Peripheral device address type. 0 Public address 1 Random address
<peer_addr>	String type. Peripheral device BLE address.
<timeout>	Integer type. Timeout from connection initiation to connection completion. Range: 1000–60000. Unit: ms. Default value: 15000.

NOTE

If you execute **AT+QBLECONN** to connect to a peripheral device immediately after the module is booted, the module is automatically configured as a central device.

2.2.19. AT+QBLECONNPARAM Configure Connection Parameters

The command configures connection parameters when the module is operating as a peripheral device or a central device.

AT+QBLECONNPARAM Configure Connection Parameters	
Read Command AT+QBLECONNPARAM?	Response +QBLECONNPARAM: <conn_idx>,<con_interval>,<timeout>,<latency> OK If there is any error: ERROR
Write Command AT+QBLECONNPARAM=<conn_idx>,<con_interval>,<timeout>,<latency>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<conn_idx>	Integer type. Peer device index assigned by the module automatically when the BLE connection is established. Range: 0–6. Default value: 0.
<con_interval>	Integer type. Connection interval. Range: 6–3200 (Time range: 7.5 ms to 4 s) Unit: 1.25 ms.

<timeout>	Integer type. BLE link supervision timeout. Range: 10–3200 (Time range: 100 ms to 32 s). Unit: 10 ms.
<latency>	Integer type. Number of connection events skipped by the peripheral device. Range: 0–499 (0x0000 to 0x01F3).

NOTE

The relationship among **<con_interval>**, **<timeout>** and **<latency>** should be as follows: **<con_interval>** × **<latency>** is less than the value of **<timeout>**.

2.2.20. AT+QBLEGATTCWR Send GATT Data by Write Command

The command sends GATT data by a Write Command when the module is operating as a central device or a multi-role device.

AT+QBLEGATTCWR Send GATT Data by Write Command	
Write Command AT+QBLEGATTCWRCMD=<conn_idx>,<UUID>,<hex_length>,<data>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<conn_idx>	Integer type. Peer device index assigned by the module automatically when the BLE connection is established. Range: 0–6. Default value: 0.
<UUID>	String type. Characteristic UUID. Length: 4 bytes or 32 bytes.
<hex_length>	Integer type. Hex data length. The module will convert <data> to hexadecimal format before transmission when this optional parameter is used. For example, if <data> is 123456, the module will convert it to 0x123456 and send it.
<data>	String type. GATT data.

2.2.21. AT+QBLEGATTCWRREQ Send GATT Data by Write Request

The command sends GATT data by a Write Request when the module is operating as a central device or a multi-role device.

AT+QBLEGATTCWRREQ Send GATT Data by Write Request	
Write Command AT+QBLEGATTCWRREQ=<conn_idx>	Response OK

>,<UUID>[,<hex_length>],<data>	Or ERROR
Maximum Response Time	1000 ms
Characteristics	-

Parameter

<conn_idx>	Integer type. Peer device index assigned by the module automatically when the BLE connection is established. Range: 0–6. Default value: 0.
<UUID>	String type. Characteristic UUID. Length: 4 bytes or 32 bytes.
<hex_length>	Integer type. Hex data length. The module will convert <data> to hexadecimal format before transmission when this optional parameter is used. For example, if <data> is 123456, the module will convert it to 0x123456 and send it.
<data>	String type. GATT data.

2.2.22. AT+QBLEGATTSCFGREAD Configure GATT Server Characteristic Data

This command configures the GATT server characteristic data to be read by a GATT client when the module is operating as a peripheral device.

AT+QBLEGATTSCFGREAD Configure GATT Server Characteristic Data	
Write Command AT+QBLEGATTSCFGREAD=<UUID>[,<hex_length>],<data>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<UUID>	String type. Characteristic UUID. Length: 4 bytes or 32 bytes.
<hex_length>	Integer type. Hex data length. When this parameter is specified, <data> is automatically parsed as hexadecimal data.
<data>	String type. GATT server characteristic data to be configured. Maximum length: 64 bytes.

2.2.23. AT+QBLEGATTCNTFCFG Enable/Disable Notification

The command enables or disables notification when the module is operating as a central device or a multi-role device.

AT+QBLEGATTTCNTFCFG Enable/Disable Notification

Write Command AT+QBLEGATTTCNTFCFG=<conn_id x>,<UUID>,<enable>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<conn_idx>	Integer type. Peer device index assigned by the module automatically when the BLE connection is established. Range: 0–6. Default value: 0.
<UUID>	String type. Characteristic UUID. Length: 4 bytes or 32 bytes.
<enable>	Integer type. Enable/Disable notification. 0 Disable 1 Enable

2.2.24. AT+QBLEDISCONN Disconnect BLE Connection with Peer Device

This command disconnects the BLE connection with the peer device when the module is operating as a central device or a peripheral device.

AT+QBLEDISCONN Disconnect BLE Connection with Peer Device

Write Command AT+QBLEDISCONN	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

2.2.25. AT+QBLEIDXDISC Disconnect Specified BLE Connection

The command disconnects the specified BLE connection when the module is operating as a multi-role device.

AT+QBLEIDXDISC Disconnect Specified BLE Connection

Write Command AT+QBLEIDXDISC=[<conn_idx>]	Response OK Or
---	-----------------------------

	ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<conn_idx>	Integer type. Peer device index assigned by the module automatically when the BLE connection is established. Range: 0–6. Default value: 0.
-------------------------	--

2.2.26. AT+QBLESTAT Query BLE Device State

The command queries the state of BLE device when the module is operating as a central device or a peripheral device.

AT+QBLESTAT Query BLE Device State	
Execution Command AT+QBLESTAT	Response +QBLESTAT: <BLE_state> OK If there is any error: ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<BLE_state>	String type. Current state of BLE device.
"NOINIT"	Uninitialized
"INIT"	Initialized
"ADVERTISING"	Advertising
"CONNECTED"	Connected
"DISCONNECTED"	Disconnected

2.2.27. AT+QBLEIDXCONNSTAT Query BLE Connection State of Specified Device

The command queries the BLE connection state of a specified device when the module is operating as a multi-role device.

AT+QBLEIDXCONNSTAT Query BLE Connection State of Specified Device

Write Command AT+QBLEIDXCONNSTAT=<conn_idx>	Response +QBLEIDXCONNSTAT: <conn_idx>,<conn_state> OK If there is any error. ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<conn_idx>	Integer type. Peer device index assigned by the module automatically when the BLE connection is established. Range: 0–6. Default value: 0.
<conn_state>	Integer type. BLE connection state. 0 Not connected 1 Connected

2.2.28. AT+QBLECONNLIST Query List of Connected Devices

The command queries the list of connected devices when the module is operating as a multi-role device.

AT+QBLECONNLIST Query List of Connected Devices

Execution Command AT+QBLECONNLIST	Response +QBLECONNLIST: <conn_idx>[,<peer_role>,<MTU_value>,<BLE_addr>] ... OK If there is any error: ERROR
Maximum Response Time	500 ms
Characteristics	-

Parameter

<conn_idx>	Integer type. Peer device index assigned by the module automatically when the
-------------------------	---

	BLE connection is established. Range: 0–6. Default value: 0.
<peer_role>	Integer type. Peer device role.
	0 Central device
	1 Peripheral device
<MTU_value>	Integer type. Maximum transmission unit value. Range: 23–247. Unit: byte.
<BLE_addr>	String type. Peer device address represented as a 48-bit colon-separated hexadecimal string, e.g., "58:D3:91:01:02:03".

NOTE

When you execute **AT+QBLECONNLIST** to query the list of connected devices, if there is no BLE connection for the peer device index, **<peer_role>**, **<MTU_value>** and **<BLE_addr>** are omitted.

2.2.29. AT+QBLETRANMODE Specify Characteristic UUID and Enable Module to

Enter Transparent Transmission Mode

The command specifies the characteristic UUID and enables the module to enter transparent transmission mode when the module is operating as a peripheral device or central device.

AT+QBLETRANMODE Specify Characteristic UUID and Enable Module to Enter Transparent Transmission Mode

Write Command AT+QBLETRANMODE=<UUID>	Response OK Or ERROR
Maximum Response Time	500 ms
Characteristics	The command takes effect immediately. The configuration is not saved.

Parameter

<UUID>	String type. Characteristic UUID. Length: 4 bytes or 32 bytes.
---------------------	--

NOTE

- When the module is operating as a central device, after establishing the BLE connection and discovering the peer device service (URC: **+QBLEINFO: "DOWN"**), execute **AT+QBLETRANMODE** to set the module to transparent transmission mode. After disconnecting the BLE connection, the module exits transparent transmission mode automatically. You can only send data in transparent transmission mode by **AT+QBLEGATTCWR**.

2. When the module is operating as a peripheral device, after enabling advertising or establishing the BLE connection, execute **AT+QBLETRANMODE** to set the module to transparent transmission mode. If automatic advertising is enabled, the module does not exit transparent transmission mode after the BLE connection is terminated. If automatic advertising is disabled, the module exits transparent transmission mode automatically after the BLE connection is terminated. You can only send data in transparent transmission mode by **AT+QBLEGATTSENTFY**.

2.2.30. +++ Exit Transparent Transmission Mode

The command enables the module to exit the transparent transmission mode.

+++ Exit Transparent Transmission Mode	
Execution Command +++	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The command does not require <LF> .

2.2.31. AT+QBLESERVERENV Save/Clear Configured Parameters

The command saves or clears the configured parameters when the module is operating as a peripheral device. If the configured parameters are saved successfully, they are still valid after the module is rebooted.

AT+QBLESERVERENV Save/Clear Configured Parameters	
Write Command AT+QBLESERVERENV=<env>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<env>	Integer type. Save/Clear configured parameters.
<u>0</u>	Clear the configured parameters
<u>1</u>	Save the configured parameters, including the advertising data, BLE device name, the scan response data, the advertising interval, service UUID and characteristic UUID.

NOTE

1. If you have cleared the parameters, you need to configure them again using the relevant commands after the module is rebooted, and then save them with **AT+QBLESERVERENV**.
2. You must complete the BLE service establishment through **AT+QBLEGATTSSRVDONE** first, and then save the configured parameters through **AT+QBLESERVERENV**.

2.2.32. AT+QBLEDCSPROPSHOW Enable/Disable Display of Characteristic

Properties of Peer Service

The command enables or disables the display of the characteristic properties of the peer service when the module is operating as a central device or a multi-role device.

AT+QBLEDCSPROPSHOW Enable/Disable Display of Characteristic Properties of Peer Service	
Write Command AT+QBLEDCSPROPSHOW=<enable>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration is not saved.

Parameter

<enable>	Integer type. Enable or disable the display of the characteristic properties of the peer service.
<u>0</u>	Disable
1	Enable

NOTE

1. If the display of the characteristic properties of the peer service is enabled, **+QBLEINFO: <char>,<prop>** is reported. If the display of the characteristic properties of the peer service is disabled, **+QBLEINFO: <char>** is reported.
2. For more details about **<char>** and **<prop>**, please see Chapter 3.3.

2.2.33. AT+QBLEADVCHL Set BLE Advertising Channel

The command sets the BLE advertising channel when the module is operating as a peripheral device.

AT+QBLEADVCHL Set BLE Advertising Channel	
Write Command AT+QBLEADVCHL=<chl>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

Parameter

<chl>	Integer type. Selected advertising channel.
1	Channel 37
2	Channel 38
3	Channel 37 and channel 38
4	Channel 39
5	Channel 37 and channel 39
6	Channel 38 and channel 39
7	Channel 37, channel 38 and channel 39

NOTE

1. This command must be executed before the BLE advertising starts.
2. If this command is not executed to set the BLE advertising channel, all channels will be enabled by default.

2.2.34. AT+QBLEPAIRENABLE Enable/Disable Module to Pair with Other Devices via BLE

The command enables or disables the module to pair with other devices via BLE when the module is operating as a peripheral device.

AT+QBLEPAIRENABLE Enable/Disable Module to Pair with Other Devices via BLE	
Read Command AT+QBLEPAIRENABLE?	Response +QBLEPAIRENABLE: <enable> OK

	If there is any error: ERROR
Write Command AT+QBLEPAIRENABLE=<enable>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration is not saved.

Parameter

<enable>	Integer type. Enable or disable the module to pair with other devices via BLE.
0	Disable the module to pair with other devices via BLE
1	Enable the module to pair with other devices via BLE without a PIN code
2	Enable the module to pair with other devices via BLE with a PIN code

NOTE

AT+QBLEPAIRENABLE must be executed before a BLE service establishment is completed via **AT+QBLEGATTSSRVDONE**, and it can only be executed once after the module is booted.

2.2.35. AT+QBLEPASSCODECFG Query/Set Pairing PIN Code

The command queries or sets the pairing PIN code when the module is operating as a peripheral device.

AT+QBLEPASSCODECFG Query/Set Pairing PIN Code	
Read Command AT+QBLEPASSCODECFG?	Response +QBLEPASSCODECFG: <passcode> OK If there is any error: ERROR
Write Command AT+QBLEPASSCODECFG=<passcode>	Response OK Or ERROR
Maximum Response Time	300 ms

Characteristics

The command takes effect immediately.
The configuration is saved automatically.

Parameter

<passcode> Integer type. Pairing PIN code. Range: 000000–999999. When the module is booted for the first time, a 6-digit numeric PIN code is generated randomly and saved.

NOTE

1. Before executing **AT+QBLEPASSCODECFG=<passcode>** to set the pairing PIN code, enable the pairing function using **AT+QBLEPAIRENABLE=<enable>**.
2. After executing **AT+QBLEPASSCODECFG=<passcode>**, the module will clear all paired device information and re-enable the pairing function. If the module is already in a connected state when the command is executed, the connection will be terminated.

2.2.36. AT+QBLECLRPAIRINFO Clear BLE Pairing Information

The command clears the BLE pairing information when the module is operating as a peripheral device.

AT+QBLECLRPAIRINFO Clear BLE Pairing Information

Execution Command AT+QBLECLRPAIRINFO	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	-

NOTE

If **AT+QBLECLRPAIRINFO** is executed while a BLE connection is active, the BLE connection will be disconnected after the command is executed.

3 Description of URCs

3.1. +QBLESTAT URC Indicating BLE Connection State Change

+QBLESTAT URC Indicating BLE Connection State Change

+QBLESTAT: <event> This URC indicates BLE connection state changes.

Parameter

<event>	String type. Event reported when BLE connection state changes.
"CONNECTED"	BLE connection is established
"DISCONNECTED"	BLE connection is disconnected

3.2. +QBLEMTU URC Indicating BLE MTU Value Change

+QBLEMTU URC Indicating BLE MTU Value Change

+QBLEMTU: <MTU_value> This URC indicates BLE MTU value changes.

Parameter

<MTU_value>	Integer type. Maximum transmission unit value. Range: 23–247. Unit: byte.
--------------------------	---

3.3. +QBLEINFO URC Indicating Peer Service Discovery Result After BLE Connection

When the module successfully connects to the peer device as a central device or a multi-role device, the URC is reported to display the characteristic UUID and characteristic property of the peer device.

+QBLEINFO URC Indicating Peer Service Discovery Result After BLE Connection	
+QBLEINFO: <char>[,<prop>]	The URC indicates the peer service discovery result upon successful establishment of BLE connection.

Parameter

<char>	String type.
	"DOWN" Discovered peer device service
<prop>	Others Characteristic UUID of peer device. Length: 4 bytes or 32 bytes.
	Integer type. Property configuration of characteristic UUID. Range: 0–FF. bit7–bit0 represent different properties, which are shown below. You can configure the corresponding bit. 0 indicates that the property is disabled and 1 indicates that the property is enabled.
	bit0 Reserved
	bit1 Read
	bit2 Write no response
	bit3 Write
	bit4 Notify
	bit5 Indicate
	bit6–bit7 Reserved

3.4. +QBLEPEERINFO URC Indicating Messages Received from Peer

This URC indicates BLE device received messages from peer after BLE connection, BLE disconnection or MTU update.

+QBLEPEERINFO URC Indicating Messages Received from Peer	
+QBLEPEERINFO: <conn_idx>,<peer_role>,<BLE_addr>	This URC indicates BLE device received messages from peer after BLE connection, BLE disconnection or MTU update.

Parameter

<conn_idx>	Integer type. Peer device index assigned by the module automatically when the BLE connection is established. Range: 0–6. Default value: 0.
<peer_role>	Integer type. Peer device role. 0 Central device 1 Peripheral device
<BLE_addr>	String type. Peer device address represented as a 48-bit colon-separated hexadecimal string, such as "58:D3:91:01:02:03".

3.5. +QBLERECV URC Indicating BLE Device Received Data

+QBLERECV URC Indicating BLE Device Received Data

+QBLERECV: <conn_idx>,<UUID>,<length>\r\n<data>\r\n This URC indicates BLE device received data.

Parameter

<conn_idx>	Integer type. Peer device index assigned by the module automatically when the BLE connection is established. Range: 0–6. Default value: 0.
<UUID>	String type. Characteristic UUID. Length: 4 bytes or 32 bytes.
<length>	Integer type. Length of received data. Unit: byte.
<data>	String type without double quotation marks. Received data.

4 Examples

This chapter provides the main AT command examples in practical applications of the module as a peripheral device, central device, and multi-role device. You must download and install the Bluetooth application nRF Connect. For QCOM tool, please contact Quectel Technical Support. For details about QCOM tool usage, please refer to **document [2]**.

4.1. Peripheral Role

During the connection establishment process, the BLE device that accepts the connection request is defined as the peripheral device. After the BLE connection is established, the peripheral device operates as a slave in the link layer.

4.1.1. Setting Module as a Peripheral Device

```

AT+QBLEINIT=2,1           //Set the module as a peripheral device for initializing BLE.
OK
AT+QBLEADVPARAM=150,150   //Set BLE advertising parameters.
OK
AT+QBLEGATTSSRV="FFF1"    //Establish a BLE service and set the service UUID to "FFF1".
OK
AT+QBLEGATTSCCHAR="FFF2"  //Set BLE characteristic UUID to "FFF2".
OK
AT+QBLEGATTSCCHAR="FFF3"  //Set BLE characteristic UUID to "FFF3".
OK
AT+QBLEGATTSSRVDONE       //Complete the BLE service establishment.
OK
AT+QBLENAME="QUECHSM110XC" //Set BLE device name to "QUECHSM110XC".
OK
AT+QBLEADDR?              //Query BLE device address.
+QBLEADDR: "C200000000AA"

OK
AT+QBLEADVSTART           //Start BLE advertising.
OK

```

4.1.2. Connecting to nRF Connect Application

Step 1: Click "**SCAN**" to scan for peripheral devices, select "**QUECHSM110XC**" in the scan results, and then click "**CONNECT**", as shown in the figure below.

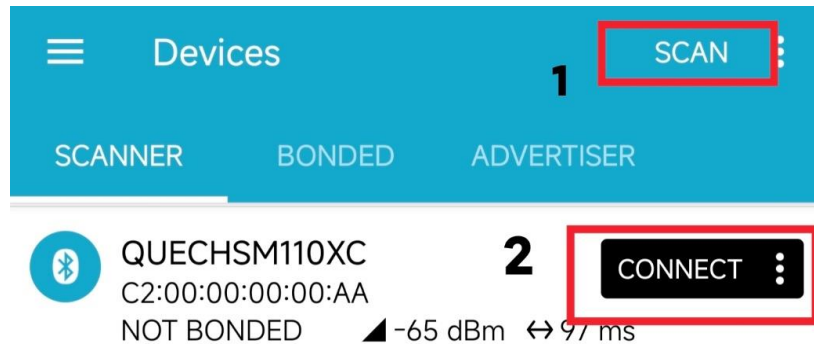


Figure 2: Scanning Result

Step 2: After the module is connected successfully, "**CONNECTED**" is displayed in the interface, and the added UUIDs are displayed in "**CLIENT**":

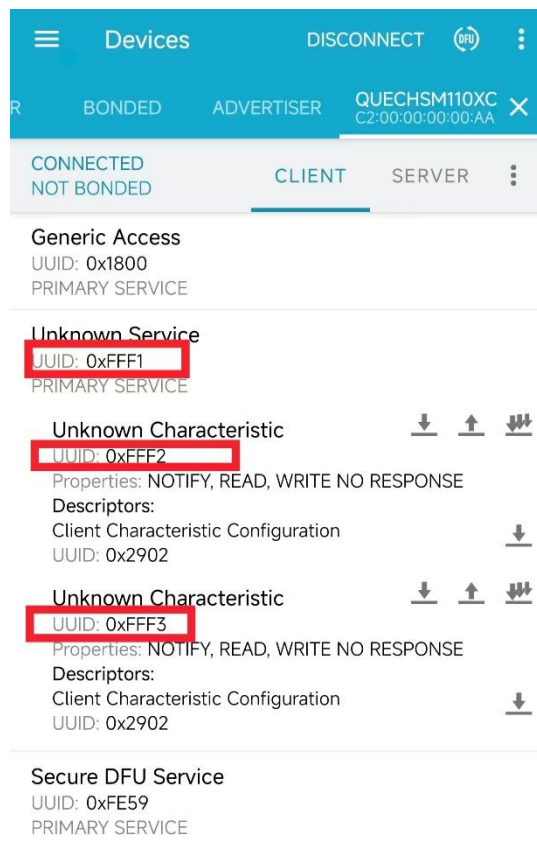


Figure 3: Connected Successfully

4.1.3. Sending Data to Module

Step 1: Select an editable characteristic, and click the upward arrow.

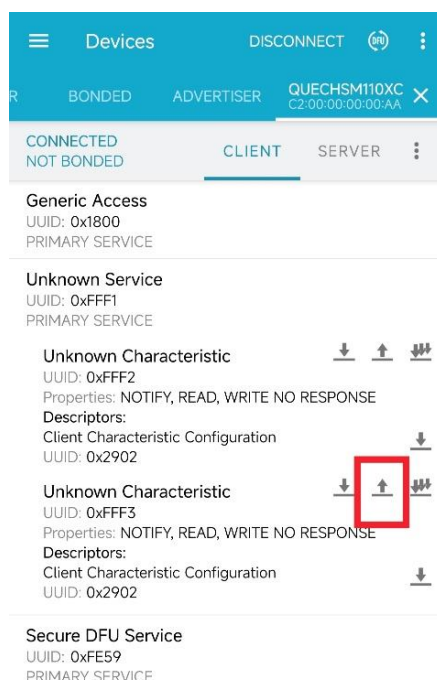


Figure 4: Editing Characteristic

Step 2: Input the data to be sent in "TEXT" format. Then click "**SEND**", as shown in the figure below.

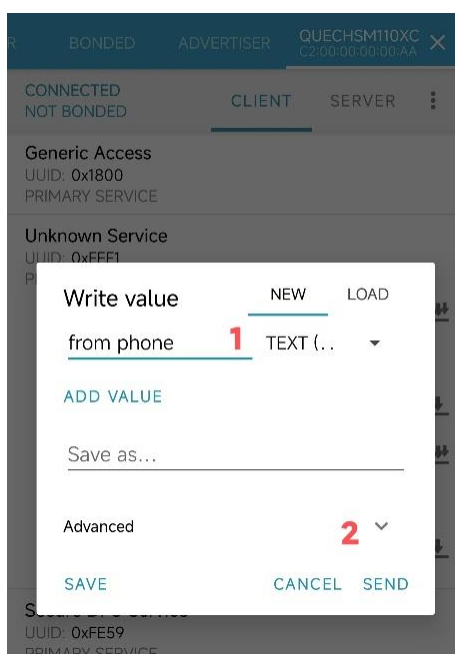


Figure 5: Sending Data

Once the data is sent successfully, the data received by the module is output via the serial port and displayed in the QCOM tool.

from phone

4.1.4. Sending Data to nRF Connect Application

Step 1: Use the QCOM tool to send the following command to send data to UUID 0xFFFF2 by notification:

```
AT+QBLEGATTSTNTFY=0,"FFF2","from HSM110XC"
OK
```

Step 2: The received data is displayed in the Value field of the Unknown Characteristic with UUID 0xFFFF2 in the nRF Connect application, as shown in the figure below.

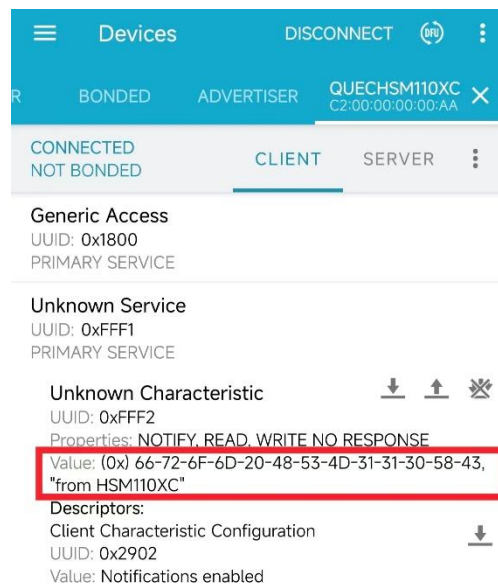


Figure 6: Received Data in UUID 0xFFFF2

4.2. Central Role

During the connection establishment process, the BLE device that initiates the connection request is defined as the central device. After the BLE connection is established, the central device operates as a host in the link layer.

4.2.1. Setting Module as a Central Device

```
AT+QBLEINIT=1 //Set the module as the central device for initializing BLE.
OK
AT+QBLESCAN=1 //Enable BLE scan.
OK
+QBLESCAN: "test_phone",1,"7F88CFB8E8C3"
AT+QBLESCAN=0 //Disable BLE scan.
OK
AT+QBLECONN=1,"7F88CFB8E8C3" //Connect to a peripheral device.
OK
+QBLESTAT: "CONNECTED"
+QBLEPEERINFO: 0,1,"7F88CFB8E8C3"
+QBLEMTU: 247
+QBLEPEERINFO: 0,1,"7F88CFB8E8C3"
+QBLEINFO: "2B3A"
+QBLEINFO: "2B29"
+QBLEINFO: "046C"
+QBLEINFO: "3344"
+QBLEINFO: "DOWN"
```


4.2.2. Configuring nRF Connect Application

4.2.2.1. Adding a Peripheral Device

Step 1: Start nRF Connect application. Then click "Configure GATT server".

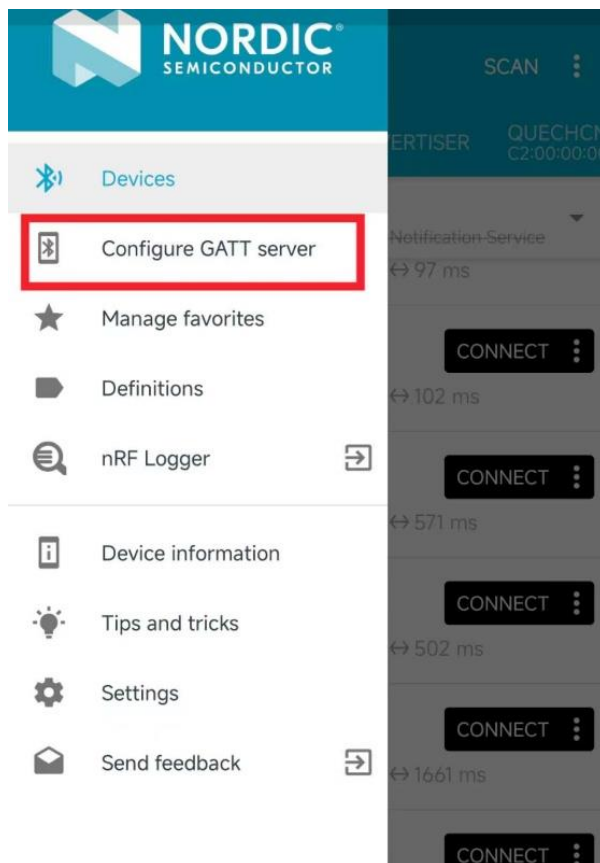


Figure 7: Configuring GATT Server

Step 2: Add a peripheral device named "my service". Set service UUID to 0xFF01 and characteristic UUID to 0xFF05.

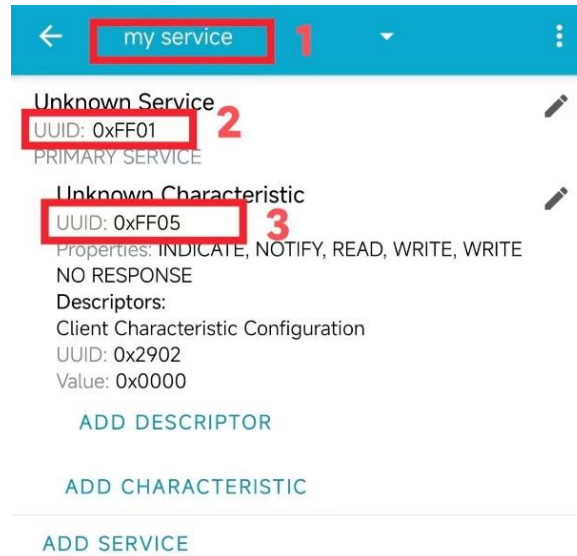


Figure 8: Configuring UUIDs

4.2.2.2. Adding Advertiser and Starting to Advertise

Step 1: Select "ADVERTISER" and click the plus sign in the lower-right corner.

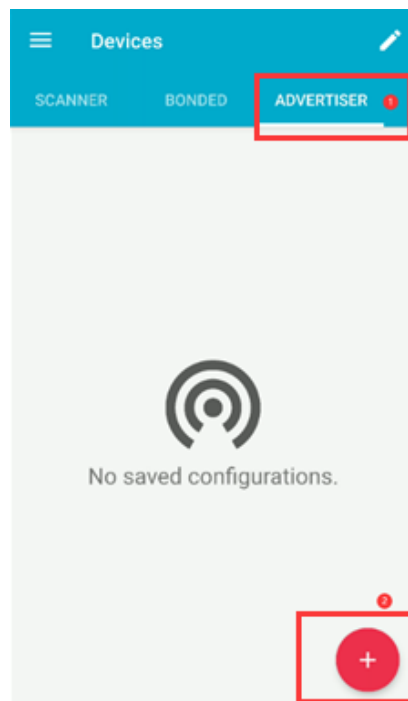


Figure 9: Adding Advertiser

Step 2: First, input "test_phone" in as "Display name". Then, click "ADD RECORD" and click "Flags", "Complete Local Name" and "16-bit Service UUID: 0xFF09" in "Advertising data". After that, click "Connectable" in "Options". Finally, click "OK".

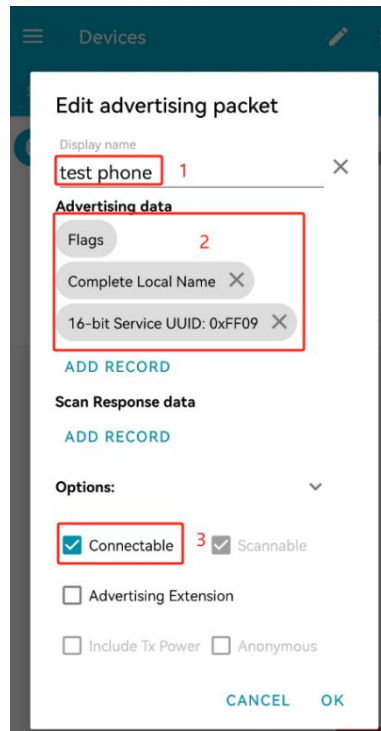


Figure 10: Editing Advertising Packet

Step 3: Advertising starts after the configuration is completed. You can set the advertisement duration manually, as shown in the figure below.

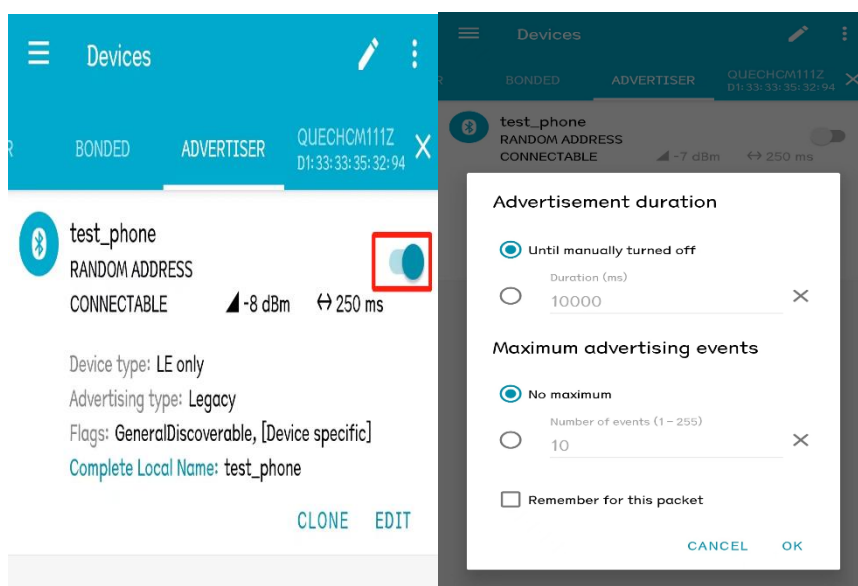


Figure 11: Setting Advertisement Duration Manually

4.2.3. Sending Data to Module

Step 1: Select an editable characteristic, and click the upward arrow, as shown in the figure below.

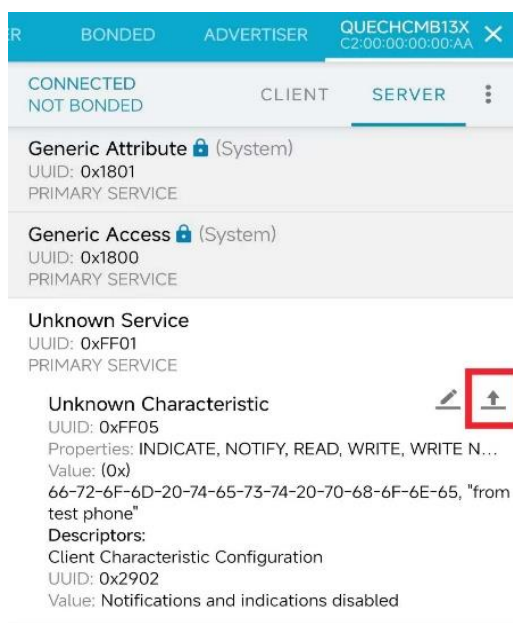


Figure 12: Editing Characteristic

Step 2: Input the data to be sent in "TEXT" format. Then click "SEND".

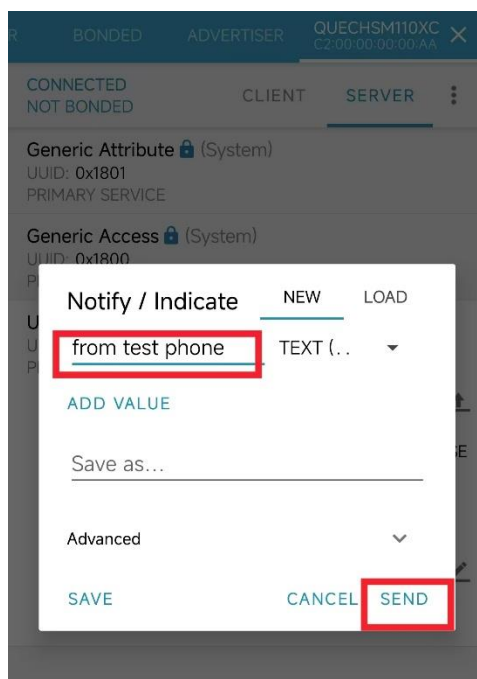


Figure 13: Sending Data

After the data is sent successfully, the data received by the module is output via the serial port and displayed in QCOM tool.

from test phone

4.2.4. Sending Data to nRF Connect Application

Step 1: Step 1: Use QCOM tool to send the following command.

AT+QBLEGATTCWRCMD=0,"FF05","write to test phone"
OK

Step 2: The received data is displayed in the Value field of the Unknown Characteristic with UUID 0xFF05 in the nRF Connect application.

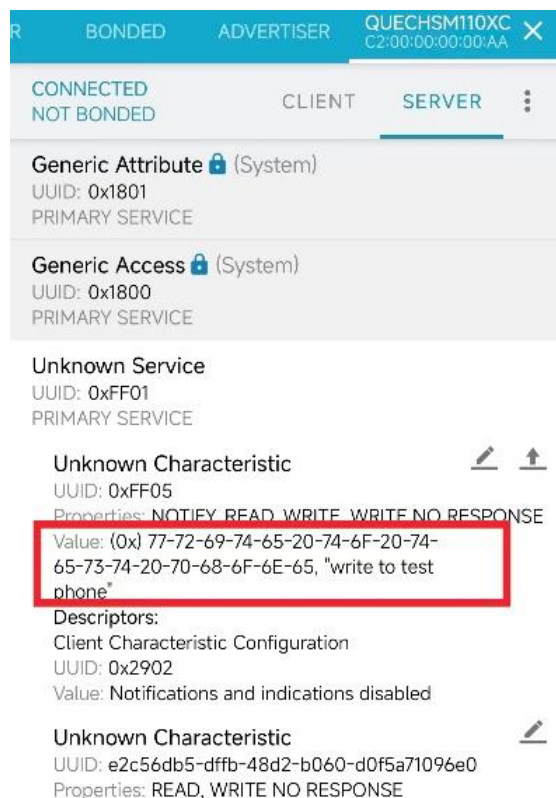


Figure 14: Received Data in UUID 0xFF05

4.3. Multi-role Device

When the module is operating as a multi-role device it supports simultaneous connections with up to two central devices and five peripheral devices.

```

AT+QBLEINIT=4 //Set the module as a multi-role device for initializing BLE.
OK
AT+QBLEGATTSSRV="FFF1" //Establish a BLE service and set the service UUID to "FFF1".
OK
AT+QBLEGATTSSCHAR="FFF2" //Set BLE characteristic UUID to "FFF2".
OK
AT+QBLEGATTSSCHAR="FFF3" //Set BLE characteristic UUID to "FFF3".
OK
AT+QBLEGATTSSRVDONE //Complete the BLE service establishment.
OK
AT+QBLENAME="QuecHSM110XC" //Set BLE device name to "QuecHSM110XC".
OK
AT+QBLEADDR? //Query BLE device address.
+QBLEADDR: "D13333353294"

OK
AT+QBLEADVPARAM=150,150 //Set BLE advertising parameters.
OK
AT+QBLEADVSTART //Start BLE advertising.
OK
+QBLESTAT: "CONNECTED" // Module used as peripheral device is connected to central device.
+QBLEPEERINFO: 0,0,"54:f9:67:e8:28:74" //The peer device information, including the index, role
and MAC address.
+QBLEMTU: 247 //MTU is 247 bytes.
+QBLEPEERINFO: 0,0,"54:f9:67:e8:28:74" //The peer device information, including the index, role and
MAC address.
AT+QBLEADVSTART //Start BLE advertising.
OK
+QBLESTAT: "CONNECTED" //Module used as peripheral device is connected to central device.
+QBLEPEERINFO: 1,0,"5b:4d:48:bd:f5:14" //The peer device information, including the index, role
and MAC address.
+QBLEMTU: 247 //MTU is 247 bytes.
+QBLEPEERINFO: 1,0,"5b:4d:48:bd:f5:14" //The peer device information, including the index, role
and MAC address.
AT+QBLESCAN=1 //Enable BLE scan.
OK
+QBLESCAN: "Simple_Peripheral",1,"cc3732356583" //The target peripheral device is scanned.
AT+QBLESCAN=0 //Disable BLE scan.
OK

```

```
AT+QBLECONN=1,"cc3732356583" //Connect to the peripheral device.
OK
+QBLESTAT: "CONNECTED" //Successful connection.
+QBLEPEERINFO: 1,1,"cc:37:32:35:65:83" //The peer device information, including the index, role
and MAC address.
+QBLEMTU: 247 //MTU is 247 bytes.
+QBLEPEERINFO: 1,1,"cc:37:32:35:65:83" //The peer device information, including the index, role
and MAC address.
+QBLEINFO: "2ac9" //Service UUID of the peer device.
+QBLEINFO: "0783b03e8535b5a07140a304d2495cb8"
+QBLEINFO: "2901"
+QBLEINFO: "0783b03e8535b5a07140a304d2495cba"
+QBLEINFO: "2901"
+QBLEINFO: "fff3"
+QBLEINFO: "2901"
+QBLEINFO: "DOWN" //Discover the peer device service.
...
AT+QBLEGATTSNTFY=0,"FFF3","FROM BLE MASTER" //Send data to the target central
device when the module is operating
as a peripheral device.
OK
AT+QBLEGATTCWRCMD=2,"FFF2","from HSM110XC" //Send data to the target peripheral device
when the module is operating as a central
device.
OK
AT+QBLEIDXDISC=0 //Disconnect the BLE connection with the specified device.
OK
+QBLESTAT: "DISCONNECTED" //Successful disconnection.
+QBLEPEERINFO: 0,0,"54:f9:67:e8:28:74" //The peer device information, including the
index, role and MAC address.
```

5 Appendix References

Table 2: Related Documents

Document Names
[1] Quectel_HSM110XC_Hardware_Design
[2] Quectel_QCOM_User_Guide

Table 3: Terms and Abbreviations

Abbreviation	Description
AD	Advertising Data
BLE	Bluetooth Low Energy
DCE	Data Circuit-terminating Equipment
DTE	Data Terminal Equipment
GATT	Generic Attribute Profile
ID	Identifier
IP	Internet Protocol
MAC	Medium Access Control
MT	Mobile Terminal
MTU	Maximum Transmission Unit
PIN	Personal Identification Number
RI	Ring Indicator
RSSI	Received Signal Strength Indicator

RX	Receive
TX	Transmit
URC	Unsolicited Result Code
URL	Uniform Resource Locator
UUID	Universally Unique Identifier