EG25-G&EC2x Series
BT Application Note

LTE Standard Module Series

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About the Document

Revision History

Version	Date	Author	Description
1.0	2020-03-13	Rami ZHANG/ Henry FAN	Initial
1.1	2020-06-19	Rami ZHANG/ Henry FAN	Added AT commands, URC and operation steps related to HFP-AG (Audio Gateway) (Chapter 2.5, 3.3 and 4.3)

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1 Introduction

Bluetooth (BT) is a wireless technology standard used for exchanging data between fixed and mobile devices over short distances using short-wavelength UHF radio waves in the industrial, scientific and medical radio bands. Bluetooth includes classic Bluetooth and BLE (Bluetooth Low Energy). This document mainly introduces BT function of the Quectel LTE standard modules that can be used in combination with Quectel FC20 series & FC21 modules so as to realize device interconnection through current wireless technology with the lowest power consumption.

The development of classic Bluetooth is based on SPP and HFP* protocols. SPP intends to establish a transmission channel between the local Bluetooth device and the remote Bluetooth device to realize data interaction and cost while maintaining a similar communication range. HFP* stands for hands-free protocol and is a type of Bluetooth used to make voice calls, such as answer, hang up, or reject a call and perform voice calls. HFP* defines audio gateway (AG*) role and hands-free (HF*) role: HF* is the remote audio inputting/outputting mechanism for the audio gateway and provides several remote control functionalities, which are generally used as the car Bluetooth; AG is the input/output gateway of an audio device, which is generally used for mobile phones. Currently this document introduces HFP-AG* related AT commands.

Bluetooth Low Energy (Bluetooth LE or BLE) is a wireless personal area network technology designed and marketed by the Bluetooth Special Interest Group aimed at novel applications in the healthcare, fitness, beacons, security, and home entertainment industries. Compared to Classic Bluetooth, Bluetooth Low Energy is intended to provide considerably reduced power consumption. The Bluetooth Low Energy is based on the GATT (Generic Attribute Profile) protocol, which is a general specification for sending and receiving very short data segments called attributes over a Bluetooth connection.

The applicable LTE standard modules of this document are:

- EG25-G
- EC2x series [1]: EC25 series, EC21 series, EC20 R2.1

NOTES

1. [1] BT function on EC2x series modules is under development.
2. "*" means under development.

2 Description of BT AT Commands

2.1. AT Command Syntax

2.1.1. Definitions

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

2.1.2. AT Command Syntax

The **AT** or **at** prefix must be added at the beginning of each command line. Entering **<CR>** will terminate a command line. Commands are usually followed by a response that includes **<CR><LF><response><CR><LF>**. Throughout this document, only the response **<response>** will be presented, **<CR><LF>** are omitted intentionally.

Table 1: Type of AT Commands and Responses

Test Command	**AT+<cmd>=?**	This command returns the list of parameters and value ranges set by the corresponding Write Command or internal processes.
Read Command	**AT+<cmd>?**	This command returns the currently set value of the parameter or parameters.
Write Command	**AT+<cmd>=<p1> [,<p2>[,<p3>[...]]]**	This command sets the user-definable parameter values.
Execution Command	**AT+<cmd>**	This command reads non-variable parameters affected by internal processes in the module.

2.2. General BT AT Commands

2.2.1. AT+QBTPWR   Turn on/off BT

This command turns on or turns off BT.

AT+QBTPWR Turn on/off BT	
Test Command **AT+QBTPWR=?**	Response **+QBTPWR: (**list of supported **<enable>**s**)** **OK**
Read Command **AT+QBTPWR?**	Response **+QBTPWR: <enable>** **OK**
Write Command **AT+QBTPWR=<enable>**	Response **OK**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<enable>	Integer type. Turns on/off BT.
	0 Turn off BT
	1 Turn on SPP/BLE
	2 Turn on HFP-AG*

Example

AT+QBTPWR=1   //Turn on SPP/BLE.
OK

NOTE

1. Before turning on BT with this command, please make sure to execute **AT+QCFG="spi/set",1** to configure UART driver and then reboot the module. For more details about the AT command, you can contact Quectel Technical Supports.
2. "*" means under development.

2.3. Description of BLE AT Commands

2.3.1. General BLE AT Commands

2.3.1.1. AT+QBTLEADDR   Read Local Address of BLE Device

AT+QBTLEADDR Read Local Address of BLE Device	
Test Command **AT+QBTLEADDR=?**	Response **OK**
Read Command **AT+QBTLEADDR?**	Response **+QBTLEADDR: <BLE_addr>** **OK**
Maximum Response Time	10 s
Characteristics	/

Parameter

<BLE_addr>   String type. Local address of BLE device. e.g.: "A662616202C3".

Example

AT+QBTLEADDR?   //Query the local address of the BLE device.
+QBTLEADDR: "A662616202C3"

OK

2.3.1.2. AT+QBTNAME   Set the Local Name of BT Device

This command is used to set or read the local name of BT device.

AT+QBTNAME Set the Local Name of BT Device	
Test Command **AT+QBTNAME=?**	Response **OK**
Read Command **AT+QBTNAME?**	Response **+QBTNAME: <device_name>** **OK**
Write Command **AT+QBTNAME=<device_name>**	Response **OK**

Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<device_name>   String type. The local name of the BT device.

Example

AT+QBTNAME?   //Query the local name of the BT device.
+QBTNAME: "MYBTDEVICE"

OK

2.3.2. AT Commands of BLE GATT Service

2.3.2.1. AT+QBTGATREG   Register to/Deregister From a GATT Service

AT+QBTGATREG Register to/Deregister From a GATT Service	
Test Command **AT+QBTGATREG=?**	Response **+QBTGATREG: (**list of supported **<op>**s**),<GATT_ID>** **OK**
Read Command **AT+QBTGATREG?**	Response **[+QBTGATREG: <GATT_ID>** **…]** **OK**
Write Command **AT+QBTGATREG=<op>[,<GATT_ID>]**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configurations will not be saved.

Parameter

\<op\>	Integer type. Indicate to register to/deregister from the GATT service.
	0 Deregister from the GATT service.
	1 Register to the GATT service. When the parameter is set to 1, **\<GATT_ID\>** should be ignored.
\<GATT_ID\>	Integer type. GATT ID.

Example

AT+QBTGATREG=1	//Register to a GATT service.
+QBTGATREG: 1,131106	
OK	
AT+QBTGATREG?	//Query the registered GATT ID.
+QBTGATREG: 131106	
OK	
AT+QBTGATREG=0,131106	//Deregister a GATT service.
OK	

2.3.2.2. AT+QBTGATSS Add/Remove a Service

AT+QBTGATSS Add/Remove a Service	
Test Command **AT+QBTGATSS=?**	Response **+QBTGATSS: (**list of supported **\<op\>**s**),\<GATT_ID\>,\<serv _ID\>,\<serv_UUID\>,\<primary\>** **OK**
Write Command **AT+QBTGATSS=\<op\>,\<GATT_ID\>,\<s erv_ID\>[,\<serv_UUID\>,\<primary\>]**	Response If **\<op\>** is set to 0, parameters **\<serv_UUID\>** and **\<primary\>** should be omitted, remove the service: **OK** Or **ERROR** If **\<op\>** is set to 1, parameters **\<serv_UUID\>** and **\<primary\>** should be entered, add the service: **OK** Or **ERROR**
Maximum Response Time	10 s

| Characteristics | The AT command takes effect immediately. |
| | The configurations will not be saved. |

Parameter

<op>	Integer type. Indicate to add/remove a service.
	0 Remove a service
	1 Add a service
<GATT_ID>	Integer type. GATT ID.
<serv_ID>	Integer type. Service ID. Range: 0–65535.
<serv_UUID>	Integer type. Service UUID.
<primary>	Integer type. Whether the service is primary.
	0 Not primary service
	1 Primary service

Example

AT+QBTGATSS=1,131106,1,6154,1	//Add a service.
OK	
AT+QBTGATSS=0,131106,1	//Delete a service.
OK	

2.3.2.3. AT+QBTGATSC   Add/Remove a Characteristic to an Existing Service

AT+QBTGATSC Add/Remove a Characteristic to an Existing Service	
Test Command **AT+QBTGATSC=?**	Response **+QBTGATSC: (**list of supported **<op>**s**),<GATT_ID>,<serv_ID>,<character_ID>,<serv_UUID>,<value_length>,<prop>,<attrvalue_flag>,<value>** **OK**
Write Command **AT+QBTGATSC=<op>,<GATT_ID>,<serv_ID>,<character_ID>[,<serv_UUID>,<value_length>,<prop>,<attrvalue_flag>,<value>]**	Response If **<op>** is set to 0, parameters **<serv_UUID>**, **<value_length>**, **<prop>**, **<attrvalue_flag>** and **<value>** should be omitted, remove the characteristic: **OK** Or **ERROR** If **<op>** is set to 1, parameters **<serv_UUID>**, **<value_length>**, **<prop>**, **<attrvalue_flag>** and **<value>** should be entered, add the characteristics:

	OK Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configurations will not be saved.

Parameter

<op>	Integer type. Indicate to add/remove a characteristic. 0 Remove a characteristic 1 Add a characteristic
<GATT_ID>	Integer type. GATT ID.
<serv_ID>	Integer type. Service ID. Range: 0–65535.
<serv_UUID>	Integer type. Characteristic UUID.
<character_ID>	Integer type. Characteristic ID.
<prop>	Integer type. Characteristic properties. Different values represent different properties.
<value_length>	Integer type. The length of the characteristic. Range: 0–128. Unit: byte.
<attrvalue_flag>	Integer type. Attribute value flags. Defines how the characteristic value can be accessed.
<value>	String type. Characteristic value.

Example

```
AT+QBTGATSC=1,131106,1,1,10793,7,18,16,"quectel"        //Add a characteristic.
OK
AT+QBTGATSC=0,131106,1,1                                 //Remove a characteristic.
OK
```

2.3.2.4. AT+QBTGATSD Add/Remove a Descriptor to an Existing Characteristic

AT+QBTGATSD Add/Remove a Descriptor to an Existing Characteristic	
Test Command **AT+QBTGATSD=?**	Response **+QBTGATSD: (**list of supported **<op>**s**),<GATT_ID>,<serv_ID>,<character_ID>,<desc_ID>,<serv_UUID>,<value_length>,<prop>,<attrvalue_flag>,<value>** **OK**
Write Command **AT+QBTGATSD=<op>,<GATT_ID>,<se**	Response If **<op>** is set to 0, parameters **<serv_UUID>**,

rv_ID>,<character_ID>,<desc_ID>[,<serv_UUID>,<value_length>,<prop>,<attrvalue_flag>,<value>]	**<value_length>**, **<prop>**, **<attrvalue_flag>** and **<value>** should be omitted, remove the descriptor: **OK** Or **ERROR** If **<op>** is set to 1, parameters **<serv_UUID>**, **<value_length>**, **<prop>**, **<attrvalue_flag>** and **<value>** should be entered, add the descriptor: **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configurations will not be saved.

Parameter

<op>	Integer type. Indicate to add/remove a descriptor.
	0 Remove a descriptor
	1 Add a descriptor
<GATT_ID>	Integer type. GATT ID.
<serv_ID>	Integer type. Service ID. Range: 0–65535.
<character_ID>	Integer type. Characteristic ID.
<desc_ID>	Integer type. Descriptor ID.
<prop>	Integer type. Descriptor properties. Different values represent different properties.
<serv_UUID>	Integer type. Characteristic UUID.
<value_length>	Integer type. The length of the descriptor. Range: 0–128. Unit: byte.
<attrvalue_flag>	Integer type. Attribute value flags. Defines how the characteristic value can be accessed.
<value>	String type. Descriptor value.

Example

AT+QBTGATSD=1,131106,1,1,1,10498,7,2,0,"quectel"	//Add a descriptor.
OK	
AT+QBTGATSD=0,131106,1,1,1	//Remove a descriptor.
OK	

2.3.2.5. AT+QBTGATDBALC   Request to Allocate the Database

AT+ QBTGATDDBALC Request to Allocate the Database	
Test Command **AT+QBTGATDBALC=?**	Response **+QBTGATDBALC: <GATT_ID>,<num_of_attrhandle>,<perferred_StartHandle>** **OK**
Write Command Allocate the database **AT+QBTGATDBALC=<GATT_ID>,<num_of_attrhandle>,<perferred_start_handle>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configurations will not be saved.

Parameter

<GATT_ID>	Integer type. GATT ID.
<num_of_attrhandle>	Integer type. Number of attribute handles.
<perferred_StartHandle>	Integer type. StartHandle the application prefers. 0 indicates no preference.

Example

AT+QBTGATDBALC=131106,200,0   //Allocate the database.
OK

2.3.2.6. AT+QBTGATDBDEALC   Request to De-allocate Database

AT+QBTGATDBDEALC Request to De-allocate Database	
Test Command **AT+QBTGATDBDEALC=?**	Response **+QBTGATDBDEALC: <GATT_ID>** **OK**
Write Command **AT+QBTGATDBDEALC=<GATT_ID>**	Response **OK** Or **ERROR**

Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<GATT_ID>	Integer type. GATT ID.

Example

<pre>
AT+QBTGATDBDEALC=131106   //De-allocate the database.
OK
</pre>

2.3.2.7. AT+QBTGATSIND   Send an Indication

AT+QBTGATSIND Send an Indication	
Test Command **AT+QBTGATSIND=?**	Response **+QBTGATSIND: <GATT_ID>,<conn_ID>,<attr_handle>,<value_length>,<value>** **OK**
Write Command **AT+QBTGATSIND=<GATT_ID>,<conn_ID>,<attr_handle>,<value_length>,<value>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configurations will not be saved.

Parameter

<GATT_ID>	Integer type. GATT ID.
<conn_ID>	Integer type. Connection ID.
<attr_handle>	Integer type. Handle of attribute. Range: 0–65535.
<value_length>	Integer type. The length of the indication. Range: 0–128. Unit: byte.
<value>	String type. Content of the indication.

Example

AT+QBTGATSIND=131106,1048576,14,4,"1111"   //Send an indication.
OK

2.3.2.8. AT+QBTGATSNOD   Send a Notification

AT+QBTGATSNOD Send a Notification	
Test Command AT+QBTGATSNOD=?	Response +QBTGATSNOD: <GATT_ID>,<conn_ID>,<attr_handle>,<value_length>,<value> OK
Write Command AT+QBTGATSNOD=<GATT_ID>,<conn_ID>,<attr_handle>,<value_length>,<value>	Response OK Or ERROR
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configurations will not be saved.

Parameter

<GATT_ID>	Integer type. GATT ID.
<conn_ID>	Integer type. Connection ID.
<attr_handle>	Integer type. Handle of attribute. Range: 0–65535.
<value_length>	Integer type. The length of the notification. Range: 0–128. Unit: byte.
<value>	String type. Content of the notification.

Example

AT+QBTGATSNOD=131106,1048576,14,4,"1111"   //Send a notification.
OK

2.3.2.9. AT+QBTGATADV   Set Advertising Parameters

AT+QBTGATADV Set Advertising Parameters	
Test Command AT+QBTGATADV=?	Response +QBTGATADV: <GATT_ID>,<min_interval>,<max_interval>

	OK
Write Command **AT+QBTGATADV=<GATT_ID>,<min_in** **terval>,<max_interval>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configurations will not be saved.

Parameter

<GATT_ID>	Integer type. GATT ID.
<min_interval>	Integer type. Minimum advertising intervals. The value should not be greater than that of **<max_interval>**.
<max_interval>	Integer type. Maximum advertising intervals. Range: 20–10240. Unit: ms.

Example

AT+QBTGATADV=131106,800,2000	//Set advertising parameters.
OK	

2.3.2.10. AT+QBTGATRRSP   Read Data

AT+QBTGATRRSP Read Data	
Test Command **AT+QBTGATRRSP=?**	Response **+QBTGATRRSP: <GATT_ID>,<conn_ID>,<attr_handle>,** **(**list of supported **<result>**s**),<value_length>,<value>** **OK**
Write Command **AT+QBTGATRRSP=<GATT_ID>,<conn** **_ID>,<attr_handle>,<result>,<value_le** **ngth>,<value>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	/

Parameter

<GATT_ID>	Integer type. GATT ID.
<conn_ID>	Integer type. Connection ID.
<attr_handle>	Integer type. Handle of attribute. Range: 0–65535.
<value_length>	Integer type. The length of return value. Range: 0–128. Unit: byte.
<value>	Integer type. Parameter response.
<result>	Integer type. Indicate whether the operation is successful.
	0 Succeed
	1 Fail

Example

AT+QBTGATRRSP=131106,10000,6549,0,7,"quectel"	//Read data.
OK	

2.3.2.11. AT+QBTGATWRSP   Send Response to the Write Data

AT+QBTGATWRSP Send Response to the Written Data	
Test Command **AT+QBTGATWRSP=?**	Response **+QBTGATWRSP: <GATT_ID>,<conn_ID>,<attr_handle>,** **(**list of supported **<result>**s**)** **OK**
Write Command **AT+QBTGATWRSP=<GATT_ID>,<conn _ID>,<attr_handle>,<result>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	/

Parameter

<GATT_ID>	Integer type. GATT ID.
<conn_ID>	Integer type. Connection ID.
<attr_handle>	Integer type. Handle of attribute. Range: 0–65535.
<result>	Integer type. Indicate whether the operation is successful.
	0 Succeed
	1 Fail

Example

AT+QBTGATWRSP=131106,10000,6594,0   //Send response to the written data.
OK

2.3.2.12. AT+QBTGATSA   Whether to Activate Database Service

AT+QBTGATSA Whether to Activate Database Service	
Test Command **AT+QBTGATSA=?**	Response **+QBTGATSA: <GATT_ID>,<serv_ID>,<active>** **OK**
Write Command **AT+QBTGATSA=<GATT_ID>,<serv_ID>,<active>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configurations will not be saved.

Parameter

<GATT_ID>	Integer type. GATT ID.
<serv_ID>	Integer type. Service ID. Range: 0–65535.
<active>	Integer type. Whether to activate database service.
	0 Do not activate database service
	1 Activate database service

Example

AT+QBTGATSA=131106,1,1   //Activate database service.
OK

2.3.2.13. AT+QBTGATDA   Add Database

AT+QBTGATDA Add Database	
Test Command **AT+QBTGATDA=?**	Response **+QBTGATDA: <GATT_ID>** **OK**

Write Command **AT+QBTGATDA=<GATT_ID>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<GATT_ID>	Integer type. GATT ID.

Example

AT+QBTGATDA=131106   //Add database.
OK

2.3.2.14. AT+QBTGATDISC   Disconnect Server Actively

AT+QBTGATDISC Disconnect Server Actively	
Test Command **AT+QBTGATDISC=?**	Response **+QBTGATDISC: <GATT_ID>,<conn_ID>** **OK**
Write Command **AT+QBTGATDISC=<GATT_ID>,<conn_ID>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configurations will not be saved.

Parameter

<GATT_ID>	Integer type. GATT ID.
<conn_ID>	Integer type. Connection ID.

Example

AT+QBTGATDISC=131106,10000   //Disconnect server actively.
OK

2.3.2.15. AT+QBTGATPER   Start Peripheral Mode

AT+QBTGATPER Start Peripheral Mode	
Test Command **AT+QBTGATPER=?**	Response **+QBTGATPER: <GATT_ID>** **OK**
Write Command **AT+QBTGATPER=<GATT_ID>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<GATT_ID>   Integer type. GATT ID.

Example

AT+QBTGATPER=131106   //Start peripheral mode.
OK

2.4. Description of SPP AT Commands

2.4.1. AT+QBTSPPACT   Activate/Deactivate SPP Device

AT+QBTSPPACT Activate/Deactivate SPP Device	
Test Command **AT+QBTSPPACT=?**	Response **+QBTSPPACT: (**list of supported **<activate>**s**)** **OK**
Write Command	Response

AT+QBTSPPACT=<activate>	OK Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<activate>	Integer type. Indicate to activate or deactivate the SPP device.
	0 Deactivate
	1 Activate

Example

AT+QBTSPPACT=1   //Activate SPP device.
OK

2.4.2. AT+QBTSPPDIC   Disconnect From the SPP Device

AT+QBTSPPDIC Disconnect From the SPP Device	
Test Command **AT+QBTSPPDIC=?**	Response **+QBTSPPDIC: (**list of supported **<discon>**s**)** **OK**
Write Command **AT+QBTSPPDIC=<discon>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<discon>	Integer type. Indicate to disconnect from the SPP device.
	1 Disconnect

Example

AT+QBTSPPDIC=1   //Disconnect from the SPP device.
OK

2.4.3. AT+QBTSPPWRS   Write Message to Remote Device

AT+QBTSPPWRS Write Message to Remote Device	
Test Command AT+QBTSPPWRS=?	Response **+QBTSPPWRS: <value_length>,<value>** **OK**
Write Command AT+QBTSPPWRS=<value_length>,<value>	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configurations will not be saved.

Parameter

<value>	String type. Message payload.
<value_length>	Integer type. Message payload length.

Example

AT+QBTSPPWRS=7,"quectel"   //Write message to remote device.
OK

2.5. Description of HFP-AG* AT Commands

2.5.1. AT+QBTSCAN   Enable/Disable to Scan Remote Device Automatically

AT+QBTSCAN Enable/Disable to Scan Remote Device Automatically	
Test Command **AT+QBTSCAN=?**	Response **+QBTSCAN: (**list of supported **<enable>**s**)** **OK**

Write Command **AT+QBTSCAN=<enable>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<enable>	Integer type. Indicate to enable or disable to scan the remote device automatically. 1 Enable 0 Disable

Example

AT+QBTSCAN=1   //Enable to scan remote device automatically.
OK

2.5.2. AT+QBTAVREG   Register to AV* Function

AT+QBTAVREG Register to AV* Function	
Test Command **AT+QBTAVREG=?**	Response **+QBTAVREG: (**list of supported **<op>**s**)** **OK**
Write Command **AT+QBTAVREG=<op>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<op>	Integer type. Register to AV function. 1 Register to AV function.

Example

AT+QBTAVREG=1	//Register to AV function.
OK	

2.5.3. AT+QBTAVACT   Activate/Deactivate AV* Function

AT+QBTAVACT Activate/Deactivate AV* Function	
Test Command **AT+QBTAVACT=?**	Response **+QBTAVACT: (**list of supported **<op>**s**)** **OK**
Write Command **AT+QBTAVACT=<op>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<op>	Integer type. Indicate to activate or deactivate AV function.
	1 Activate
	0 Deactivate

Example

AT+QBTAVACT=1	//Activate AV function.
OK	

2.5.4. AT+QBTAVCON   Controls the Status That the Remote Device Connects to AV* Function

AT+QBTSCAN Controls the Status That the Remote Device Connects to AV* Function	
Test Command **AT+QBTAVCON=?**	Response **+QBTHFGCON: (**range of supported **<op>**s**),<address>,< conn_ID>** **OK**

Write Command **AT+QBTAVCON=<op>[,<address>][,<conn_ID>]**	Response If **<op>**=1, **<conn_ID>** should be omitted, the remote device connects to AV function: **+QBTAVCON: 1,<conn_ID>** **OK** If **<op>**=2, **<conn_ID>** should be omitted, the remote device cancels to connect to AV function: **OK** If **<op>**=0, **<address>** should be omitted, the remote device disconnect from AV function: **OK** If there is any error: **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<op>	Integer type. Controls the status that the remote device connects to AV function.
	0 Disconnect from AV function
	1 Connect to AV function
	2 Cancel to connect to AV function
<conn_ID>	Integer type. The connection ID.
<address>	String type. The Bluetooth address of the remote device.

Example

AT+QBTAVCON=1,"2000:00:00893c"   //Connect to AV function.
+QBTAVCON: 1,83245

OK
AT+QBTAVCON=0,83245   //Disconnect from AV function.
OK

2.5.5. AT+QBTHFGCON   Controls the Status That the Remote Device Connects to HFP-AG*

AT+QBTHFGCON Controls the Status That the Remote Device Connects to HFP-AG	
Test Command **AT+QBTHFGCON=?**	Response **+QBTHFGCON: (**list of supported **<op>**s**),<address>** **OK**
Write Command **AT+QBTHFGCON=<op>,<address>**	Response **OK** Or **ERROR**
Maximum Response Time	10 s
Characteristics	The AT command takes effect immediately. The configuration will not be saved.

Parameter

<op>	Integer type. Controls the status that the remote device connects to HFP-AG. 0 Disconnect from HFP-AG 1 Connect to HFP-AG
<address>	String type. The Bluetooth address of the remote device.

Example

AT+QBTHFGCON=0,"2000:00:00893c"	//Connect to HFP-AG.
OK	
AT+QBTHFGCON=1,"2000:00:00893c"	//Disconnect from HFP-AG.
OK	

> **NOTE**
>
> "*" means HFP-AG and AV function are under development.

3 Description of URCs

3.1. BLE Related URCs

3.1.1. +QBTGATSCON   Notify the GATT Connection

+QBTGATSCON Notify the GATT Connection	
+QBTGATSCON=<GATT_ID>,<conn_ID>,<address>, <mtu>	

Parameter

<GATT_ID>	Integer type. GATT ID.
<conn_ID>	Integer type. Connection ID.
<address>	String type. Connecting device address.
<mtu>	Integer type. The maximum transmission unit to announce to a remote device during connection establishment.

Example

+QBTGATSCON: 131106,1000,"69b4:67:55370a",23

3.1.2. +QBTGATSDCON   Notify the GATT Disconnection

+QBTGATSDCON Notify the GATT Disconnection	
+QBTGATSDCON=<GATT_ID>,<conn_ID>,<address>	

Parameter

<GATT_ID>	Integer type. GATT ID.
<conn_ID>	Integer type. Connection ID.
<address>	String type. Device address that is disconnected.

Example

+QBTGATSDCON: 131106,0,"69b4:67:55370a"

3.1.3. +QBTGATSRRSP　Notify Client to Read GATT Service Data

+QBTGATSRRSP　Notify Client to Read GATT Service Data	
+QBTGATSRRSP=<GATT_ID>,conn_ID>,<attr_handle>	

Parameter

<GATT_ID>	Integer type. GATT ID.
<conn_ID>	Integer type. Connection ID.
<attr_handle>	Integer type. Handle of attribute. Range: 0–65535.

Example

+QBTGATSRRSP: 131106,1000,14

3.1.4. +QBTGATSWRSP　Notify Client to Write GATT Service Data

+QBTGATSWRSP　Notify Client to Write GATT Service Data	
+QBTGATSWRSP=<GATT_ID>,<conn_ID>,<attr_handle>,<value>	

Parameter

<GATT_ID>	Integer type. GATT ID.
<conn_ID>	Integer type. Connection ID.
<attr_handle>	Integer type. Handle of attribute. Range: 0–65535.
<value>	String type. Content of the written data.

Example

+QBTGATSWRSP: 131106,1000,14,"1234"

3.2. SPP Related URCs

3.2.1. +QBTSPPDATAIND   Report Data

+QBTSPPDATAIND   Report Data
+QBTSPPDATAIND: <value>,<value_length>

Parameter

<value>	String type. Data payload.
<value_length>	Integer type. Data payload length.

Example

+QBTSPPDATAIND: "66998855",8

3.2.2. +QBTSPPCONNECT   Notify SPP Connection

+QBTSPPCONNECT   Notify SPP Connection
+QBTSPPCONNECT: <queueID>,<channel>,<address>

Parameter

<queueID>	Integer type. Identifier of the SPP instance which has been activated.
<channel>	Integer type. Local server number, which is a reference ID used by the CM.
<address>	String type. The address of the device connected SPP.

Example

+QBTSPPCONNECT: 32,1,"4887:64:d8b950"

3.2.3. +QBTSPPDISCONNECT   Notify SPP Disconnection

+QBTSPPDISCONNECT   Notify SPP Disconnection
+QBTSPPCONNECT: <queueID>,<channel>,<address>

Parameter

<queueID>	Integer type. Identifier of the SPP instance which has been activated.
<channel>	Integer type. Local server number, which is a reference ID used by the CM.
<address>	String type. The address of the device disconnected from SPP.

Example

+QBTSPPDISCONNECT: 32,1,"4887:64:d8b950"

3.3. HFP-AG* Related URCs

3.3.1. +QBTSEARCHDEVICES   Notify the Scanned Device Bluetooth Name and Address

+QBTSEARCHDEVICES   Notify the Scanned Device Bluetooth Name and Address
+QBTSEARCHDEVICES: <device_name>,<address>

Parameter

<device_name>	String type. The Bluetooth name of the scanned device.
<address>	String type. The Bluetooth address of the scanned device.

Example

+QBTSEARCHDEVICES: "phone","2000:00:00893c"

3.3.2. +QBTAVCONNECT   Notify That Remote Device Connects to AV* Function

+QBTAVCONNECT   Notify That Remote Device Connects to AV* Function
+QBTAVCONNECT: <conn_ID>,<address>

Parameter

<conn_ID>	Integer type. The connection ID.
<address>	String type. The Bluetooth address of the remote device connected to AV function successfully.

Example

+QBTAVCONNECT: 83245,"2000:00:00893c"

3.3.3. +QBTAVDISCONNECT   Notify That Remote Device Disconnects From AV* Function

+QBTAVDISCONNECT   Notify That Remote Device Disconnects From AV* Function
+QBTAVDISCONNECT: <conn_ID>

Parameter

<conn_ID>	Integer type. The connection ID.

Example

+QBTAVDISCONNECT: 83245

3.3.4. +QBTHFGCONNECT   Notify That Remote Device Connects to HFP-AG*

3.3.4.   +QBTHFGCONNECT   Notify That Remote Device Connects to HFP-AG*
+QBTHFGCONNECT: <conn_ID>,<address>

Parameter

<conn_ID>	Integer type. The connection ID.
<address>	String type. The Bluetooth address of the remote device connected to HFP-AG.

Example

+QBTHFGCONNECT: 83245,"2000:00:00893c"

3.3.5. +QBTHFGDISCONNECT   Notify That Remote Device Disconnects From HFP-AG*

+QBTHFGDISCONNECT   Notify That Remote Device Disconnects From HFP-AG*
+QBTHFGDISCONNECT: <conn_ID> <address>

Parameter

<conn_ID>	Integer type. The connection ID.
<address>	String type. The Bluetooth address of the remote device connected to HFG-AG.

Example

+QBTHFGDISCONNECT: 83245,"2000:00:00893c"

3.3.6. +QBTHFGANSWER   Notify That HF Answers the Call

+QBTHFGANSWER Notify That HF Answers the Call	
+QBTHFGANSWER: <conn_ID>	

Parameter

<conn_ID>	Integer type. The connection ID.

Example

+QBTHFGANSWER: 83245

3.3.7. +QBTHFGREJECT   Notify That HF Rejects the Call

+QBTHFGREJECT Notify That HF Rejects the Call	
+QBTHFGREJECT: <conn_ID>	

Parameter

<conn_ID>	Integer type. The connection ID.

Example

+QBTHFGREJECT: 83245

NOTE

"*" means HFP-AG and AV function are under development.

---

4 Examples

4.1. BLE Communication

A set of AT commands are provided to support basic BLE operation, including scanning, advertising, connecting and so on. Quectel FC20 series & FC21 modules supports to communicate between the applicable LTE Standard modules and other BLE devices.

Here is a simple example on BLE process when the module works as a BLE server.

```
AT+QBTPWR=1
OK
AT+QBTGATREG=1                                  //Register to the GATT service.
+QBTGATREG: 1,131106

OK
AT+QBTGATDBALC=131106,200,0                     //Allocate the database.
OK
AT+QBTGATSS=1,131106,1,6154,1                   //Add a service.
OK
AT+QBTGATSC=1,131106,1,1,10793,7,18,16,"quectel"   //Add a characteristic.
OK
AT+QBTGATSD=1,131106,1,1,1,10498,7,2,0,"quectel"   //Add a descriptor.
OK
AT+QBTGATSC=1,131106,1,2,10777,7,6,32,"quectel"    //Add another characteristic.
OK
AT+QBTGATSA=131106,1,1                          //Activate the database service.
OK
AT+QBTGATDA=131106                              //Add the database.
OK
AT+QBTGATPER=131106                             //Start peripheral mode.
OK
```

4.2. SPP Activation

Here is a simple example on the SPP activation process when the module works as a SPP server. Quectel FC20 series & FC21 modules supports to communicate between the applicable LTE Standard modules and other SPP devices.

```
AT+QBTPWR=1                        //Turn on BT.
OK
AT+QBTSPPACT=1                     //Activate SPP.
OK
```

4.3. HFP-AG* Operation

Here is a simple example on HFP-AG operation when the module works as an HFP-AG server.

```
AT+QBTPWR=2                                          //Enable HFP-AG.
OK
AT+QBTSCAN=1                                         //Enable to scan the Bluetooth devices.
OK


+QBTSEARCHDEVICES: "phone","2000:00:00893c"


+QBTSEARCHDEVICES: "HUAWEI Mate F","88f8:72:68ef6e"


...


AT+QBTSCAN=0                                         //Disable scanning.
OK
AT+QBTAVREG=1                                        //Register to AV* function.
OK
AT+QBTAVACT=1                                        //Activate AV* function.
OK
AT+QBTAVCON=1,"2000:00:00893c"                       //Connect to AV* function.
+QBTAVCON: 1,83245


OK
AT+QBTHFGCON=1,"2000:00:00893c"                      //Connect to HFP-AG.
OK


+QBTHFGCONNECT: 83245,"2000:00:00893c"
```

NOTE

"*" means HFP-AG and AV function are under development.

5 Appendix A Reference

Table 2: Terms and Abbreviations

Abbreviation	Description
AG	Audio Gateway
AV	Audio Video
BLE	Bluetooth Low Energy
BT	Bluetooth
CM	Connection Manager
GATT	Generic Attribute Profile
HF	Hands Free
HFP	Hands-free Profile
ID	Identity
SPP	Serial Port Profile
URC	Unsolicited Result Code
UUID	Universally Unique Identifier