

FSC-BT9xx Programming Manual

V2.3

深圳飞思通科技有限公司
FEASYCOM

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1. Introduction

BT9xx is one of Feasycom's Bluetooth dual mode serial, comply with Bluetooth 4.0 standard, downward compatible with Bluetooth 2.1,3.0, support audio stream(call,music) and data transmission channel(Classic SPP,LE GATT)work simultaneously, support HFP,A2DP,VRCP,SPP,GATT,etc profiles.

BT9xx with a set of simplified AT Command list, offer the effective & common in using interface, shortening development cycle.

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2. Description

2.1 Definitions

- ❖ {}: Content between {} is optional
- ❖ H : Content coming next is from HOST to BT9xx
- ❖ B : Content coming next is from BT9xx to HOST

2.2 Command Syntax

Format: AT+Command{=Param1{,Param2...}}<CR><LF>

Restrictions:

- ❖ All commands must begin with 'AT', end with <CR><LF>
- ❖ <CR> is short for Carriage-Return(Hexadecimal:0x0D)
- ❖ <LF> is short for Line-Feed(Hexadecimal:0x0A)
- ❖ If command include the parameter, Parameter must follow behind '='
- ❖ If command include several parameter, Parameters must be separated by ','
- ❖ If the AT Command is query command, the BT9XX module will offer the corresponding Response.
- ❖ BT9xx All responses will end with OK/ERROR

Example

1.Query Device Name:

```
H:AT+NAME<CR><LF>
B:<CR><LF>+NAME=Feasycom<CR><LF>
B:<CR><LF>OK<CR><LF>
```

2.Modify Device Name to 'ABC':

```
H:AT+NAME=ABC<CR><LF>
B:<CR><LF>OK<CR><LF>
```

2.3 Indication Syntax

Format: <CR><LF>+Indication{=Param1{,Param2...}}<CR><LF>

Restrictions:

- ❖ All indications must begin with <CR><LF>, end with <CR><LF>
- ❖ If there are several parameters, the parameter must be separated by ','

Example:

Make a call on cellphone:

```
B:<CR><LF>+HFPSTAT=4<CR><LF>  
B:<CR><LF>+HFPAUDIO=1<CR><LF>  
B:<CR><LF>+HFPSTAT=6<CR><LF>
```

2.4 File Description

This Programming Manual only for common using, not apply to all the specific occasions.

3. Command Table

3.1 Common Command Table

UART Communication Test: AT
Response: OK
Description: For some scenarios (such as baudrate changed), the HOST must send this command to make sure the UART communication established successfully with remote device
Example: UART communication test H: AT B: OK
AT+NAME{=Param1{,Param2}}: Query/Modify Device Name
Param1: Device Name(1~31 Bytes ASCII) Param2: Address Suffix(0/1) (0) Disable (1) Enable: '-xxxx' will be appended after Device Name, where 'xxxx' is the last 4 bytes of MAC address
Response: +NAME=Param1
Description: Query Device Name if parameter omitted, or change Device Name using rules above
Example1: Query module name H: AT+NAME B: +NAME=Feasycom B: OK Example2: Modify module name as 'ABC' H: AT+NAME=ABC B: OK Example3: Modify Device name to 'ABC' and enable suffix

<p>H: AT+NAME=ABC,1 B: OK</p>
<p>Query/Modify Module LE Device: AT+LENAME{=Param1{,Param2}}</p>
<p><i>Param1: Device Name(1~31 Bytes ASCII)</i> <i>Param2: Address Suffix(0/1)</i> <i>(0) Disable</i> <i>(1)Enable: '-xxxx' will be appended after Device Name, where 'xxxx' is the last 4 bytes of MAC address</i></p>
<p>Response: +LENAME=Param1</p>
<p>Description: Query Device Name if parameter omitted, or change Device Name using rules above</p>
<p>Example1: Query module name H: AT+LENAME B: +NAME=Feasycom B: OK Example2: Modify module name as 'ABC' H: AT+LENAME=ABC B: OK Example3: Modify module name as 'ABC', enable suffix H: AT+LENAME=ABC,1 B: OK</p>
<p>Query/Modify module paring code:AT+PIN{=Param}</p>
<p><i>Param: Module paring code(4~15 Bytes ASCII)</i></p>
<p>Response: +PIN=Param</p>
<p>Example1: Query module paring code H: AT+PIN B: +PIN=0000 B: OK Example2: Modify module paring code as " 12345678" H: AT+PIN=12345678 B: OK</p>

AT+SSP{=Param1} : Enable/Disable Simple Pairing Feature
Param: Param1 :Simple Pairing Feature(0/1) (0)Disable (1)Enable
Response :+SSP=Param
Description : When Simple Pairing is enabled, Device Pin Code can be bypassed in pairing procedure
AT+ADDR : Query Device MAC Address
Response :+ADDR=Param Param1 :Device MAC Address(12 Bytes ASCII)
Example : Query Device MAC Address H: AT+ADDR B: +ADDR=DC0D30123456 B: OK
AT+VER : Query Device Firmware Version
Response :+VER=Param Param1 :Device Firmware Version (21 Bytes ASCII)
Example : Query Device Firmware Version H: AT+VER B: +VER=BT906,V1.0.0,20160120 B: OK
AT+BAUD{=Param1} : Query/Modify Device Baudrate
Param:Device Baudrate (2400/4800/9600/19200/38400/57600/115200/ 230400/256000/460800/512000/921600)
Response :+BAUD=Param
Description :The HOST's baudrate must be modified synchronously after this command sent

<p>AT+COD{=Param1}: Query/Modify Class Of Device</p>
<p><i>Param1: Class Of Device (6 Bytes ASCII)</i></p>
<p><i>Response: +COD=Param</i></p>
<p>AT+PLIST{=Param1}: Query/Delete Paired Record</p>
<p><i>Param: (0/1~8/12 Bytes MAC)</i> <i>(0)Delete All Paired Record</i> <i>(1~8)Delete One Paired Record of Specified Index</i> <i>(MAC)Delete One Paired Record of Specified MAC Address</i></p>
<p><i>Response1: +PLIST={</i> <i>Response2: +PLIST=Param1,Param2,Param3</i> <i>Param1:(1~8).Device SN</i> <i>Param2:(MAC).Device Mac Address</i> <i>Param3:(UTF8). Name of Remote Device(UTF8)</i> <i>Response3: +PLIST=}</i></p>
<p><i>Example1: Query Paired Record</i> H: AT+PLIST B: +PLIST={ +PLIST=1,1C5CF226D773,iPhone +PLIST=2,A0BC30075421,Samsung Note 7 +PLIST=} B: OK <i>Example2: Clear Paired Record</i> H: AT+PLIST=0 B: OK</p>
<p>AT+SCAN{=Param1{,Param2{,Param3}}}: Scan Nearby Device</p>
<p><i>Param1: Scan Operation (0/1/2/3)</i> <i>(0)Turn off the searching</i> <i>(1)Scan BR/EDR Device Only</i> <i>(2)Scan LE Device Only</i> <i>(3)Scan Both BR/EDR and LE Device</i> <i>Param2: Scan Period(1~48).Unit:1.28s, scan 12.8s by default</i> <i>Param3: Scan Filter(1~31 Bytes ASCII).If set, only device whose name same to filter will be displayed</i></p>

<p>Description: Refer to Indication Part for Scan Result</p>
<p>Example: Scan nearby BR/EDR device whose name is 'Feasycom' for 6.4 seconds</p> <p>H: AT+SCAN=1,5,Feasycom</p> <p>B: OK</p> <p>+SCAN=1,1,DC0D30000003,-32,8,Feasycom</p> <p>+SCAN=2,1,DC0D30000044,-64,8,Feasycom</p> <p>+SCAN=3,1,DC0D30000097,-47,8,Feasycom</p>
<p>AT+TPMODE{=Param1}: Enable/Disable Throughput Mode</p>
<p>Param1: Throughput Mode(0/1)</p> <p>(0)Disable</p> <p>(1)Enable</p>
<p>Response: +TPMODE=Param</p>
<p>Description: If throughput mode enabled and SPP/LE-GATT connected, communication between HOST and remote side is raw(no prefix/suffix)</p>
<p>Example1: Query Throughput Mode status</p> <p>H: AT+TPMODE</p> <p>B: +TPMODE=1</p> <p>B: OK</p> <p>Example2: Disable Throughput Mode</p> <p>H: AT+TPMODE=0</p> <p>B: OK</p>
<p>AT+STAT: Query Device State</p>
<p>Response: +STAT=Param1,Param2,Param3,Param4,Param5,Param6</p> <p>Param1:DEVSTAT</p> <p>Param2:SPPSTAT</p> <p>Param3:GATTSTAT</p> <p>Param4:HFPSTAT</p> <p>Param5:A2DPSTAT</p> <p>Param6:AVRCPSTAT</p>
<p>Description: Refer to Indication Part for state</p>
<p>Example: Query Device Status</p>

<p>H: AT+STAT B: +STAT=5,1,1,3,3,3 B: OK</p>
<p>AT+DSCA: Disconnect All Connections</p>

Description: Disconnect All Connections Manually

<p>AT+REBOOT: Device Reboot</p>
<p>Description: Reboot Device Manually</p>
<p>Restore to Default Settings: AT+RESTORE</p>
<p>Description: Restore to Default Settings and Reboot</p>
<p>Response: +MUTESPK=Param</p>
<p>I2S Setting: AT+I2SCFG{=Param1{,Param2{,Param3}}}</p>
<p>Param1:Audio Interface(0/1) (0)Set Audio Interface as " Analog" (1)Set Audio Interface as "I2S" Param2:I2S Master& Slave(0/1) (0) Set I2S as Master Mode (1)Set as I2S Slave Mode Param3:I2S Sampling Rate(44100/48000).Effective, when I2S work as Slave</p>
<p>Response: +I2SCFG=Param1,Param2,Param3</p>
<p>Description: Only when module work as audio TX Port, can set the I2S as slave mode</p>
<p>Example1:Query presentI2S Configuration H: AT+I2SCFG B: +I2SCFG=1,0,44100 B: OK Example2:Set I2S work as slave mode, Sampling rate 48000Hz H: AT+I2SCFG=1,1,48000 B: OK</p>

3.2 SPP Command Table

AT+SPPCONN{=Param1}: SPP Connect to Remote Device
<i>Param1: MAC Address of Remote Device (12 Bytes ASCII)</i>
<i>Description: Reconnect to last paired device if parameter not exist or connect to device with specified MAC Address</i>
<p><i>Example1: Reconnect to last paired device</i></p> <p>H: AT+SPPCONN</p> <p>B: OK</p> <p><i>Example2: Connect to specified device</i></p> <p>H: AT+SPPCONN=1C5CF226D773</p> <p>B: OK</p>
AT+SPPDISC: SPP Disconnect with Remote Device
<i>Description: Disconnect SPP connection with remote device</i>
AT+SPPSEND=Param1,Param2: Transfer Data Via SPP
<p><i>Param1: Payload size</i></p> <p><i>Param2: Payload</i></p>
<i>Description: Only effective when throughput mode disabled</i>
<p><i>Example: Send "1234567890" to remote device via SPP</i></p> <p>H: AT+SPPSEND=10,1234567890</p> <p>B: OK</p>

3.3 GATT Command Table

AT+GATTSEND=Param1,Param2: Transfer Data Via GATT
<i>Param1: Payload size</i>

<i>Param2: Payload</i>
<i>Description: Only effective when throughput mode disabled</i>
<p><i>Example: Send "1234567890" to remote device via GATT</i></p> <p>H: AT+GATTSEND=10,1234567890</p> <p>B: OK</p>

3.4 Data transmission command(GATT Client)

GATT start the connection: AT+LECCONN=Param1,Param2,Param3, Param4
<p># Param1: address + address type</p> <p># Param2: Service UUID</p> <p># Param3: Write UUID</p> <p># Param4: Notify UUID</p>
<p><i>Description: Start the connection with LService's device,param1 have 13 bytes, 12 bytes address + 1 bytes address type(can use AT+SCAN=2 get the information),UUID can be 16 or 128 bits. Remarks: If AT+TPMODE=1,disable status feeback; AT+TPMODE=0, enable status feeback. Default mode: AT+TPMODE=1</i></p>
<p><i>Example: Start the connection with address: 0018E40C67D5,address type:0</i></p> <p>Device UUID: 6E400001B5A3F393E0A9E50E24DCCA9E</p> <p>Write Authority UUID: 6E400002B5A3F393E0A9E50E24DCCA9E</p> <p>Notify Authority UUID: 6E400003B5A3F393E0A9E50E24DCCA9E</p> <p>H: AT+LECCONN=0018E40C67D50,6E400001B5A3F393E0A9E50E24DCCA9E, 6E400002B5A3F393E0A9E50E24DCCA9E,6E400003B5A3F393E0A9E50E24 DCCA9E</p> <p>B: OK</p>
GATT Disconnect: AT+LECDISC
<i>Description: Disconnect present GATT Connection, only valid for AT+TPMODE=0</i>
GATT DATA Sending: AT+LECSEND=Param1,Param2

Param1: Total length for sending data
Param2: Sent data

Description: Param can not include <CR><LF>character

Example: Send Data "1234567890" via GATT to remote device

H: AT+GATTSEND=10,1234567890

B: OK

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4. Indication Table

<p>+DEVSTAT=Param1: Device State Changed</p>								
<p><i>Param1:</i> Base-10 representation of a bit field <i>BIT[0]:</i> (0-Powered Off; 1-Powered On) <i>BIT[1]:</i> (0-BR/EDR Not Discoverable; 1-BR/EDR Discoverable) <i>BIT[2]:</i> (0-BLE Not Discoverable; 1-BLE Discoverable) <i>BIT[3]:</i> (0-BR/EDR Not Scanning; 1-BR/EDR Scanning) <i>BIT[4]:</i> (0-BLE Not Scanning; 1-BLE Scanning)</p>								
<p><i>Example:</i> Device powered on (<i>BIT[0]:1</i>), both BR/EDR and LE are discoverable (<i>BIT[1]:1</i> and <i>BIT[2]:1</i>) B: +DEVSTAT=7</p>								
<p>+SPPSTAT=Param1: SPP State Changed</p>								
<p><i>Param1:</i> (0/1/2/3)</p> <table border="1"> <tr> <td>(0)</td> <td>Uninitialized</td> </tr> <tr> <td>(1)</td> <td>Standby</td> </tr> <tr> <td>(2)</td> <td>Connecting</td> </tr> <tr> <td>(3)</td> <td>Connected</td> </tr> </table>	(0)	Uninitialized	(1)	Standby	(2)	Connecting	(3)	Connected
(0)	Uninitialized							
(1)	Standby							
(2)	Connecting							
(3)	Connected							
<p>+GATTSTAT=Param1: GATT State Changed</p>								
<p><i>Param1:</i> (0/1/2/3)</p> <table border="1"> <tr> <td>(0)</td> <td>Uninitialized</td> </tr> <tr> <td>(1)</td> <td>Standby</td> </tr> <tr> <td>(2)</td> <td>Connecting</td> </tr> <tr> <td>(3)</td> <td>Connected</td> </tr> </table>	(0)	Uninitialized	(1)	Standby	(2)	Connecting	(3)	Connected
(0)	Uninitialized							
(1)	Standby							
(2)	Connecting							
(3)	Connected							
<p>+LECSTAT=Param1: LE Client State Changed</p>								
<p><i>Param1:</i> (0/1/2/3)</p> <ul style="list-style-type: none"> (0) No active (1) Not connected (2) Connecting (3) Connected 								
<p>+SPPDATA=Param1,Param2: Data Received Via SPP</p>								

<i>Param1:Payload Length</i> <i>Param2:Payload</i>
<i>Example: Received data "1234567890" via SPP</i> B: +SPPDATA=10,1234567890
+GATTDATA=Param1,Param2: Data Received Via GATT
<i>Param1:Payload Length</i> <i>Param2:Payload</i>
<i>Example: Received data "1234567890" via GATT</i> B: +GATTDATA=10,1234567890

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