FSC-BT100X

Sink Programming User Guide

Version 3.7

Revision History

Version	Data	Notes	Author
1.0	2015/10/10	First Release	Tony
2.0	2016/05/20	Add commands	Navy
3.0	2017/11/13	Add A2DP Source profiles	Navy
3.1	2018/01/25	Add commands	Navy
3.2	2018/08/31	Update Commands	Navy
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Contents

1. Introduction

This specification presents design guidelines for software engineers that use FSC-BT100X series modules for Bluetooth requirements.

1.1 Terms

Throughout this specification:

- { } ： Content between {...} is optional
- << ： Content behind << represents a *COMMAND* sent from Host to Module
- >> ： Content behind >> represents a *RESPONSE* sent from Module to Host

1.2 Hardware Interface

- GPIO
- PWM
- UART
- I2C Master/Slave
- I2S Master/Slave
- Analog Input/Output

1.3 Supported Bluetooth Profile

- SPP (Serial Port Profile)
- GATT Server (Generic Attribute Profile)
- GATT Client (Generic Attribute Profile)
- HFP Sink (Hands-Free Profile)
- A2DP Sink (Advanced Audio Distribution Profile)
- AVRCP Controller (Audio/Video remote controller Profile)
- AVRCP Target (Audio/Video remote controller Profile)
- HID Keyboard (Human Interface Profile)
- PBAP Server (Phonebook Access Profile)

1.4 Command Format

AT+ Command {=Param1{, Param2{, Param3...}}} <CR><LF>

- All commands start with “AT”, end with <CR><LF>
- <CR> stands for "carriage return", corresponding hex is 0x0D

- <LF> stands for "line feed", corresponding hex is 0x0A
- If command has parameter, parameter keep behind "="
- If command has multiple parameters, parameter must be separated by ","
- If command has response, response start with <CR><LF>, end with <CR><LF>
- Module will always report command's execution result using "OK" for success or "ERROR" for failure

e.g.

1. Read module's BR/EDR local name
   << *AT+NAME*
   >> *+NAME=Feasycom*
   >> *OK*

2. Pick up an incoming call when no call incoming actually
   << *AT+HFPANSW*
   >> *ERROR*

1.5 Indication Format

<CR><LF>+ Indication {=Param1{, Param2{, Param3...}}} <CR><LF>

- All indications start with <CR><LF>, end with <CR><LF>
- If indication has parameter, parameter keep behind "="
- If indication has multiple parameters, parameter must be separated by ","
- Hex value <FF> will be used instead of "," in some special indications

e.g.

1. Received "1234567890" from mobile phone via SPP profile
   >> *+SPPDATA=10,1234567890*
2. Call number "10086" use a mobile phone when HFP connected
   >> *+HFPSTAT=4*
   +HFPCID=10086
   +HFPCIE=China Mobile
   +HFPAUDIO=1
   +HFPSTAT=6

1.6 Module Default Settings

Local Name (BR/EDR)	FSC-BT1006A-0002
Local Name (LE)	FSC-BT1006A-LE-0002
Pin Code	0000
Secure Simple Pairing Mode	On
Physical UART Baudrate	115200bps/8/N/1

2.Command Table

2.1 General Commands

2.1.1 AT Command Test

Format: AT
Response: OK
Description: Test the communication between HOST and Module after power on, UART baudrate changed and etc.
Example: AT command test << *AT* >> *OK*

2.1.2 Bluetooth Profile Selection*<auto reboot>*

Format: AT+PROFILE{=Param} Param: A base-10 representation of a bit field, default:171, for each bit: BIT[0] SPP (Serial Port Profile) BIT[1] GATT Server (Generic Attribute Profile) BIT[2] GATT Client (Generic Attribute Profile) BIT[3] HFP Sink (Hands-Free Profile) BIT[4] HFP Source (Hands-Free Profile) BIT[5] A2DP Sink (Advanced Audio Distribution Profile) BIT[6] A2DP Source (Advanced Audio Distribution Profile) BIT[7] AVRCP Controller (Audio/Video remote controller Profile) BIT[8] AVRCP Target (Audio/Video remote controller Profile) BIT[9] HID Keyboard (Human Interface Profile) BIT[10] PBAP Server (Phonebook Access Profile)
Response: +PROFILE=Param
Description: BT1006X supports SPP, GATT Server, GATT Client, HFP Sink, A2DP Sink, AVRCP Controller, HID Keyboard, PBAP Server

The default program does not support PBAP and HID Keyboard.
Example: Read current profile selection >> AT+PROFILE << +PROFILE=171 << OK **Example**: Only Enable A2DP SINK,AVRCP Controller, >> AT+PROFILE=160 << OK

2.1.3 Read Firmware Version

Format: AT+VER
Response: +VER=Param Param: Firmware version (26 Bytes ASCII)
Example: Read module's firmware version << *AT+VER* >> *+VER=FSC-BT100X,V1.0.0,20160120* >> *OK*

2.1.4 Read BR/EDR MAC Address

Format: AT+ADDR
Response: +ADDR=Param Param: Module's BR/EDR MAC address (12 Bytes ASCII)
Example: Read Module's BR/EDR MAC address << *AT+ADDR* >> *+ADDR=DC0D30123456* >> *OK*

2.1.5 Read BLE MAC Address

Format: AT+LEADDR
Response: +LEADDR=Param Param: Module's LE MAC address (12 Bytes ASCII)

2.1.6 Read/Write BR/EDR Local Name

Format: AT+NAME {=Param1{, Param2}} Param1: BR/EDR local name (1~31 Bytes ASCII, default: FSC-BT1006A-0002) Param2: MAC address suffix (0/1, default:1) (0) Disable suffix (1) Enable suffix "-XXXX" (lower 4 bytes of MAC address) after local name
Response: +NAME=Param
Description: Write local name if parameter existence, otherwise read current local name
Example: Read current BR/EDR local name << *AT+NAME* >> *+NAME=Feasycom* >> *OK* **Example**: Change module's BR/EDR local name to "ABC" << *AT+NAME=ABC* >> *OK* **Example**: Change module's BR/EDR local name to "ABC" and enable suffix << *AT+NAME=ABC,1* >> *OK*

2.1.7 Read/Write BLE Local Name

Format: AT+LENAME {=Param1{, Param2}} Param1: BLE local name (1~25 Bytes ASCII, default: FSC-BT1006A-LE-0002) Param2: MAC address suffix (0/1, default:1) (0) Disable suffix

(1) Enable suffix “-XXXX” (lower 4 bytes of MAC address) after local name
Response: +LENAME=Param

2.1.8 Read/Write BLE Random Address Configuation*<need reboot>*

Format: AT+LECFG {=Param} Param1: BLE Random address enable(0/1, default:1) (0) Disable (1) Enable
Response: +LECFG=Param

2.1.9 Read/Write UART Baudrate

Format: AT+BAUD{=Param} Param: Baudrate (9600/19200/38400/57600/115200/230400/460800 /921600, default:115200)
Response: +BAUD=Param
Description: Module’s baudrate will be changed immediately after received this command

2.1.10 Read/Write Pin Code

Format: AT+PIN{=Param} Param: Pin code (4~15 Bytes ASCII, default:0000)
Response: +PIN=Param
Example: Read module’s pin code **<<** *AT+PIN* **>>** *+PIN=0000* **>>** *OK* **Example**: Change module’s pin code to “12345678”

<< AT+PIN=12345678 *>> OK*

2.1.11 Turn On/Off Secure Simple Pairing *<need reboot>*

Format: AT+SSP{=Param} Param: Simple pairing (0/1, default:1) (0) Turn off (1) Turn on
Response: +SSP=Param
Description: Pin code input will be bypassed if simple pairing is on in pairing procedure

2.1.12 Read/Write Class Of Device *<need reboot>*

Format: AT+COD{=Param} Param: Class of device (6 bytes ASCII, default:240404 Handsfree device)
Response: +COD=Param

2.1.13 Read/Clear Paired Record

Format: AT+PLIST{=Param} Param:(0/(1~8)/12 Bytes MAC address) (0) Clear all paired record (1~8) Clear specific paired record with index (MAC) Clear specific paired record with MAC address
Response1: +PLIST=Param1, Param2{, Param3} Param1: (1~8) Paired device's index Param2: (MAC) Paired device's MAC address Param3: (UTF8) Paired device's name **Response2**: +PLIST=E: End of the paired record
Example: Read module's paired record

<< AT+PLIST *>> +PLIST=1,1C5CF226D773, iPhone* *+PLIST=2, A0BC30075421, Samsung S8* *+PLIST=E* *>> OK* **Example**: Clear module's paired record *<< AT+PLIST=0* *>> OK*

2.1.14 Turn On/Off Throughput Mode*<need reboot>*

Format: AT+TPMODE{=Param} Param: Throughput mode (0/1, default:0) (0) Turn Off (1) Turn On
Response: +TPMODE=Param
Description: When SPP/GATT profile connected and throughput mode is on, the AT command will be de-active, every byte received via physical UART will be sent to air, vice visa
Example: Read current throughput mode *<< AT+TPMODE* *>> +TPMODE=1* *>> OK* **Example:** Turn off throughput mode *<< AT+TPMODE=0* *>> OK*

2.1.15 Read Module States

Format: AT+STAT
Response: +STAT=Param1, Param2, Param3, Param4, Param5, Param6, Param7, Param8, Param9 Param1: DEVSTAT Param2: SPPSTAT

Param3: GATTSTAT Param4: HFPSTAT Param5: A2DPSTAT Param6: PEERSTAT Param7: AVRCPSTAT Param8: HIDSTAT Param9: PBSTAT
Description: Refer to chapter 3 for state description, state may have different meanings according to profile selection

2.1.16 Turn On/Off Power On Auto Reconnect *<need reboot>*

Format: AT+AUTOCONN{=Param} Param: Option (0~15, default:3) (0) Turn Off (1-15) Turn on and reconnect times
Response: +AUTOCONN=Param
Description: Module will attempt to connect last device after power on if set

2.1.17 Scan Nearby Devices

Format: AT+SCAN {=Param} Param1:(0~1) (0) Stop scan (1) Scan nearby BR/EDR devices
Description: Refer to Chapter 3 for format description of scan result when in A2DP Slave mode.

2.1.18 Speaker Volume Setting

Format: AT+SPKVOL{=Param} Param: ('+'/'-')

Response: +SPKVOL =Param
Example: Read current speaker volume << *AT+SPKVOL* >> *+SPKVOL=14* **Example**: Increase audio speaker volume << *AT+SPKVOL=+* >> *OK*

2.1.19 I2S/PCM Format Configuration *<need reboot>*

Format: +I2SCFG{=Param} Param: A base-10 representation of a bit field, default:0, for each bit: BIT[0] 0: Disable I2S/PCM for audio input/output 1: Enable I2S/PCM for audio input/output BIT[1] 0: I2S/PCM master role 1: I2S/PCM slave role BIT[2] 0: 48000Hz sample rate 1: 44100Hz sample rate BIT[3-4] 00: I2S Philips standard format BIT[5-6] 00: 16-bit resolution 01: 24-bit resolution 10: 32-bit resolution
Example: Read current I2S/PCM configuration << *AT+I2SCFG* >> *+I2SCFG=0* **Example**: Set I2S/PCM configuration to: I2S master, 32-bit resolution,48kHz. I2S LRCLK: 48000Hz I2S BCLK: 3.072MHz (48000Hz * 32bit * 2Stereo) << *AT+I2SCFG=65* >> *OK*

2.1.20 I2S Channel Setting*< need reboot >*

Format: AT+I2SCHAN{=Param} Param: (0/1, default:0) (0) I2S Channel to Hardware I2S1

(1) I2S Channel to Hardware I2S2
Response: + I2SCHAN =Param
Description: I2S2 only supports output

2.1.21 Release All Connections

Format: AT+DSCA
Description: Module release all Bluetooth connections with remote device

2.1.22 Soft Reboot

Format: AT+REBOOT
Description: Module release all Bluetooth connections with remote device then reboot

2.1.23 Restore Factory Settings

Format: AT+RESTORE
Description: Module restore all factory settings then reboot

2.1.24 Enable Module

Format: AT+BTEN {=Param} Param: (0~1) (0) Bluetooth disable (1) Bluetooth enable
Description: Disconnect all device connected and put module enter unconnectable and undiscoverable state .Always effective even reboot.

2.1.25 Enter Pairing Mode

Format: AT+PAIR{=Param} Param: (0~1) (0) Exit Pairing Mode (1) Enter Pairing Mode
Description: put module enter or quit connectable and discoverable state.

2.1.26 Enable Print Log

Format: AT+PRINT{=Param} Param: (0~1) (0) Disable (1) Enable
Description: Enable module print the log(including states of profiles) to uart.

2.1.27 Audio Active PIO Delay Time Configuration

Format: AT+MUTEDELAY{=Param} Param: (0~60) Delay time = (Param * 50)ms
Description: The param is used to eliminate the "popo" noise when the audio just established.

2.1.28 LineIn Configuration *<need reboot>*

Format: AT+LINECFG{=Param} Param: (0~1) (0) Disable LineIn (1) Enable LineIn
Description: Bluetooth input source from linein

2.2 HFP Commands

2.2.1 Read HFP State

Format: AT+HFPSTAT
Response: +HFPSTAT=Param Param:(0~6) (0) Unsupported (1) Standby (2) Connecting (3) Connected (4) Outgoing call (5) Incoming call (6) Active call

2.2.2 Establish HFP Connection

Format: AT+HFPCONN{=Param} Param: MAC address of target device (12 Bytes ASCII)
Description: Module will reconnect to last HFP device if parameter not exist
Example: Connect to last HFP device << *AT+HFPCONN* >> *OK* **Example2**: Connect to specific HFP device with MAC address << *AT+HFPCONN=1C5CF226D773* >> *OK*

2.2.3 Release HFP Connection

Format: AT+HFPDISC
Description: Release current HFP connection with remote device

2.2.4 Dial/Redial Phone Number

Format: AT+HFPDIAL{=Param} Param: Phone number (1~25 Bytes ASCII)
Description: Dial specific number if parameter existence, otherwise redial
Example: Redial << *AT+HFPDIAL* >> *OK* **Example:** Dial number "075527924639" << *AT+HFPDIAL=075527924639* >> *OK*

2.2.5 Send DTMF code

Format: AT+HFPDTMF=Param Param: DTMF code (0~9/#/*)
Example: Send DTMF code "#" while talking << *AT+HFPDTMF=#* >> *OK*

2.2.6 Pick Up Incoming Call

Format: AT+HFPANSW
Description: Pick up an incoming call

2.2.7 Reject/Hung up Call

Format: AT+HFPCHUP
Description: Reject incoming call or hung up outgoing/active call

2.2.8 Transfer Voice Audio

Format: AT+HFPADTS{=Param} Param: Transfer direction (0/1) (0) Transfer voice audio from module to remote device (1) Transfer voice audio from remote device to module
Description: Transfer voice audio between module and remote device by default if no parameter existence

2.2.9 Mute Mic

Format: AT+MUTEMIC{=Param} Param: mute mic(0/1) (0) unmute (1) mute
Description: mute mic when call active

2.3.0 Start/Stop Voice Recognition of Remote Device

Format: AT+HFPVR=Param Param: On/off (0/1) (0) Stop (1) Start
Description: Start/Stop Voice Recognition of Remote Device (such as Siri for iOS devices)

2.3 A2DP/AVRCP Commands

2.3.1 Read A2DP State

Format: AT+A2DPSTAT

Response: +A2DPSTAT=Param Param:(0~4) (0) Unsupported (1) Standby (2) Connecting (3) Connected (4) Streaming

2.3.2 Establish A2DP Connection

Format: AT+A2DPCONN{=Param} Param: MAC address of target device (12 Bytes ASCII)
Description: Module will reconnect to last A2DP device if no parameter exist
Example: Connect to last A2DP device << *AT+A2DPCONN* >> *OK* **Example2**: Connect to specific A2DP device with MAC address << *AT+A2DPCONN=1C5CF226D773* >> *OK*

2.3.3 Release A2DP Connection

Format: AT+A2DPDISC
Description: Release current A2DP connection with remote device

2.3.4 Read A2DP Decoder

Format: AT+A2DPDEC
Response: +A2DPDEC=Param Param:(0~7) (0) INVALID (1) SBC

(2) MP3
(3) AAC
(4) FASTSTREAM
(5) APTX
(6) APTX-Sprint
(7) APTX-HD
(8) APTX-LL

2.3.5 Read/Write AVRCP Configuration

Format: AT+AVRCPCFG{=Param}
Param: A base-10 representation of a bit field, default:9, for each bit:
BIT[0] Auto get track ID3 information (title, artist, album) on track changed.default:1
BIT[1-3] Auto get track state (play progress) if value > 0. default:5(second)

Example: Read AVRCP configuration
<< AT+ AVRCPCFG
>> + AVRCPCFG =9
OK
Example: Get track play progress every 1 second
<< AT+ AVRCPCFG =3
>> OK

Description: Refer to Chapter 3 for indication format of track information and track state

2.3.6 Track Play/Pause

Format: AT+PLAYPAUSE

Description: Send play or pause command to remote media player according to current play status

2.3.7 Track Play

Format: AT+PLAY

Description: Send play command to remote media player

2.3.8 Track Pause

Format: AT+PAUSE
Description: Send pause command to remote media player

2.3.9 Track Stop

Format: AT+STOP
Description: Send stop command to remote media player

2.3.10 Track Forward

Format: AT+FORWARD
Description: Send forward command to remote media player

2.3.11 Track Backward

Format: AT+BACKWARD
Description: Send backward command to remote media player

2.3.12 Track FastForward

Format: AT+FFDW=Param Param: (0/1) (0) Fast Forward Release (1) Fast Forward Press

Description: Send fast forward command to remote media player

2.3.13 Track Rewind

Format: AT+RWD=Param Param: (0/1) (0) Rewind Release (1) Rewind Press
Description: Send rewind command to remote media player

2.4 TWS Commands

2.4.1 Read TWS State

Format: AT+PEERSTAT
Response: +PEERSTAT=Param Param:(0~4) (0) Unsupported (1) Standby (2) Connecting (3) Connected (4) Streaming

2.4.2 TWS Configuration *<need reboot>*

Format: AT+PEERCFG{=Param} Param: (0/1) (0) Disable Peer TWS (1) Enable Peer TWS

2.4.3 Pair TWS Device

Format: AT+PEERINQ=Param Param: (0/1) (0) Stop pair tws device (1) Start pair tws device
Description: If set, disconnect all established connections and pair another TWS peer device

2.4.4 Read/Clear TWS Paired Record

Format: AT+PEERDEV{=Param } Param:(0) Clear tws paired record
Response1: +PEERDEV=Param1, Param2 Param1: (0/1) Paired device's role(0-slave, 1-master) Param2: (MAC) Paired device's MAC address
Example: Read module's tws paired record << *AT+PEERDEV* >> *+PEERDEV=1,DC0D30000002* >> *OK* **Example**: Clear module's tws paired record << *AT+PEERDEV=0* >> *OK*
Description:Set the module into TWS slave role and reboot automatically after cleared.

2.4.5 Release TWS Connection

Format: AT+PEERDISC
Description: Release current TWS connection with remote device

2.5 Phonebook Access Commands

2.5.1 Download Phonebook

Format: AT+PBDOWN=Param1{, Param2} Param1: Phonebook type (0~5) (0) Phonebook (SIM Storage) (1) Phonebook (Phone Storage) (2) Received call log (3) Dialed call log (4) Missed call log (5) All call log Param2: Max items (1~65535, default:3000 for phonebook; 50 for call log)
Response: +PBDATA=Param1<FF>Param2<FF>Param3 {<FF>Param4} Param: Refer to Chapter 3 for format description of received phonebook data

2.6 Bluetooth Serial Commands (BR/EDR SPP)

2.6.1 Read SPP State

Format: AT+SPPSTAT
Response: +SPPSTAT=Param Param: Refer to Chapter 3 for state description

2.6.2 Establish SPP Connection

Format: AT+SPPCONN=Param Param: MAC address of target device (12 Bytes ASCII)
Description: If target device is mobile phone, mobile phone must have initialized a RFCOMM service before this

2.6.3 Release SPP Connection

Format: AT+SPPDISC
Description: Release current SPP connection with remote device

2.6.4 Send Data Via SPP

Format: AT+SPPSEND=Param1, Param2 Param1: Payload length (1~236) Param2: Payload (1~236Bytes UTF8)
Description: If throughput mode is on, this command is de-active
Example: Send data "1234567890" to remote device via SPP << *AT+SPPSEND=10,1234567890* >> *OK*

2.7 Bluetooth Serial Commands (LE GATT)

2.7.1 Read GATT State

Format: AT+GATTSTAT
Response: +GATTSTAT=Param Param: Refer to Chapter 3 for state description

2.7.2 Release GATT Connection

Format: AT+GATTDISC
Description: Release current GATT connection with remote device

2.7.3 Send Data Via GATT

Format: AT+GATTSEND=Param1, Param2 Param1: Payload length (1~100) Param2: Payload (1~100 Bytes UTF8)
Description: If throughput mode is on, this command is de-active
Example: Send data "1234567890" to remote device via GATT << *AT+GATTSEND=10,1234567890* >> *OK*

3. Indication Table

3.1 General Indications

3.1.1 Device State

Format: +DEVSTAT=Param Param: A base-10 representation of a bit field, for each bit: BIT[0] 0: Power Off; 1: Power On BIT[1] 0: BR/EDR Non Discoverable; 1: BR/EDR Discoverable BIT[2] 0: BLE Non Advertising; 1: BLE Advertising BIT[3] 0: BR/EDR Non Scanning; 1: BR/EDR Scanning BIT[4] 0: BLE Non Scanning; 1: BLE Scanning
Example: Module is power on, discoverable and advertising **>>** *+DEVSTAT=7*

3.1.2 Scan Result

Format: +SCAN =Param1<FF>Param2<FF>Param3<FF>Param4<FF>Param5<FF>Param6 Param1: Index (1~8) Param2: Device address type (0~2) (0)LE public address

(1)LE random address
(2)BR/EDR address
Param3: MAC address (12 Bytes ASCII)
Param4: RSSI (-255 ~ 0)
Param5: Size of Param6 if exist
Param6: Device Name for BR/EDR devices or advertising data for LE devices

Description: Param5/Param6 may not exist if remote device out of distance

Example: Scan BR/EDR nearby devices in 6.4s

<< *AT+SCAN=1,5*

>> *OK*

+SCAN=1<FF>2<FF>DC0D30000003<FF>-32<FF>8<FF>Feasycom

+SCAN=2<FF>2<FF>DC0D30000044<FF> -64<FF>8<FF>Feasycom_1234

+SCAN=3<FF>2<FF>DC0D30000097<FF>-47<FF>8<FF> TESTHID

3.1.3 Paired Success

Format: +PAIRED=Param
Param: MAC address (12 Bytes ASCII) of current paired device

3.2 HFP Indications

3.2.1 HFP State

Format: +HFPSTAT=Param
Param:(0~6)

(0) Unsupported
(1) Standby
(2) Connecting
(3) Connected
(4) Outgoing call
(5) Incoming call
(6) Active call

3.2.2 HFP Device Information

Format: +HFPDEV=Param1,Param2 Param1: (12 Bytes ASCII), Remote device's MAC address of current HFP connection Param2: (UTF8), Remote device's name of current HFP connection
Example: HFP connect success with device **>>** *+HFPDEV=1C5CF226D774,iPhone*

3.2.3 Incoming/Outgoing Call Number

Format: +HFPCID=Param Param:(1~25 Bytes ASCII), Call number
Example: Dial number 10086 **<<** *AT+HFPDIAL=10086* **>>** *+HFPSTAT=4* *+HFPCID=10086* *+HFPCIE=China Mobile* *+HFPAUDIO=1* **Example**: Incoming call with number 13265463800 **>>** *+HFPSTAT=5* *+HFPCID=13265463800* *+HFPCIE=Jerry* *+HFPAUDIO=1*

3.2.4 Incoming/Outgoing Call Name

Format: +HFPCIE=Param Param:(UTF8), Call name
Description: Not every mobile phone support this indication

3.2.5 HFP Voice Audio State

Format: +HFPAUDIO=Param

Param:(0/1)

(0) HFP voice audio disconnected, audio input/output routed to remote device

(1) HFP voice audio connected, audio input/output routed to module

3.2.6 HFP Device Network Signal Strength

Format: +HFPSIG=Param

Param:(0~5) Network signal strength of remote device

3.2.7 HFP Device Network Operator Selection

Format: +HFPNET=Param

Param:(UTF8) Network operator selection of remote device

3.2.8 HFP Device Roaming State

Format: +HFPROAM=Param

Param:(0/1) Roaming state of remote device

3.2.9 HFP Device Battery Level

Format: +HFPBATT=Param

Param:(0~5) Battery level of remote device

3.3 A2DP/AVRCP Indications

3.3.1 A2DP State

Format: +A2DPSTAT=Param

Param:(0~4)

(0) Unsupported

(1) Standby

(2) Connecting

(3) Connected
(4) Streaming

3.3.2 A2DP Device Information

Format: +A2DPDEV=Param
Param: (12 Bytes ASCII), Remote device's MAC address of current A2DP connection

3.3.3 AVRCP State

Format: +AVRCPSTAT=Param
Param:(0~3)
(0) Unsupported
(1) Standby
(2) Connecting
(3) Connected

3.3.4 Media Player State

Format: +PLAYSTAT=Param
Param:(0~4)
(0) Stopped
(1) Playing
(2) Paused
(3) Fast Forwarding
(4) Fast Rewinding

3.3.5 Media Player Play Progress

Format: +TRACKSTAT=Param1, Param2, Param3
Param1:(0~4), Media Player State
Param2:(Decimal ASCII), Elapsed time of current track in second
Param3:(Decimal ASCII), Total time of current track in second

Example: Read media player play progress every 3s

<< *AT+AVRCPCFG=7* **>>** *+TRACKSTAT=1,142000,248000* *+TRACKSTAT=1,145000,248000* *+TRACKSTAT=1,148000,248000*

3.3.6 Media Track Information

Format: +TRACKINFO=Param1 <FF> Param2 <FF> Param3 Param1: title Param2: artist Param3: ablum
Example: Phone playing song "Creep-Radio Head" **>>** *+TRACKINFO=Creep <FF> Radiohead <FF> Pablo Honey*

3.4 Phonebook Access Indications

3.4.1 PBAPC State

Format: +PBSTAT=Param Param:(0~4) (0) Unsupported (1) Standby (2) Connecting (3) Connected (4) Downloading

3.4.2 PB Entries Of Remote Devices

Format: +PBCNT=Param Param: Phonebook entries of remote device

3.4.3 Received Phonebook Data

Format1: +PBDATA=Param1 <FF> Param2 xFF \xParam3 {xFF Param4}
Param1: Type
(0) Phonebook (SIM Storage)
(1) Phonebook (Phone Storage)
(2) Received call log
(3) Dialed call log
(4) Missed call log
Param2: (UTF8), Name
Param3: (ASCII), Number
Param4: (15 Bytes ASCII), Call time
Format:
Year(4Bytes)Month(2Bytes)Day(2Bytes) T(1Byte)Hour(2Bytes)
Minute(2Bytes)Second(2Bytes). e.g. 20161012T152826 represents
2016/10/12/15/28/26
Format2: +PBDATA=E: Download complete

Description: Call time may not exist for some mobile phones

Example: Download all phonebook
<< *AT+PBDOWN=1*
>> *+PBCNT=234*
+PBDATA=1 <FF> Jack <FF> 18219146201
+PBDATA=1 <FF> kenan <FF> 8613771972680
……
+PBDATA=E
Example: Download 10 dialed call log
<< *AT+PBDOWN=3,10*
>> *+PBDATA=3 <FF> China Mobile <FF> 10086 <FF> 20171013T103516*
+PBDATA=3 <FF> Jerry <FF> 18688967507 <FF> 20171012T152826
……
+PBDATA=E

Description: See MSC example in 4.3

3.5 Bluetooth Serial Indications

3.5.1 SPP State

Format: +SPPSTAT=Param
Param:(0~3)
(0) Unsupported
(1) Standby
(2) Connecting
(3) Connected

3.5.2 GATT State

Format: +GATTSTAT=Param
Param:(0~3)
(0) Unsupported
(1) Standby
(2) Connecting
(3) Connected

3.5.3 SPP Device Information

Format: +SPPDEV=Param
Param: (12 Bytes ASCII), Remote device's MAC address of current SPP connection

3.5.4 GATT Device Information

Format: +GATTDEV=Param
Param: (12 Bytes ASCII), Remote device's MAC address of current GATT connection

3.5.5 SPP Received Data

Format: +SPPDATA=Param1, Param2
Param1: Payload length

Param2: Payload
Description: If throughput mode is on, only Param2 will be present
Example: Received data “1234567890” from remote device via SPP << *+SPPDATA=10,1234567890*

3.5.6 GATT Received Data

Format: +GATTDATA=Param1, Param2 Param1: Payload length Param2: Payload
Description: If throughput mode is on, only Param2 will be present
Example: Received data “1234567890” from remote device via GATT << *+GATTDATA=10,1234567890*

3.6 GPIO Indications

3.6.1 LED Pin

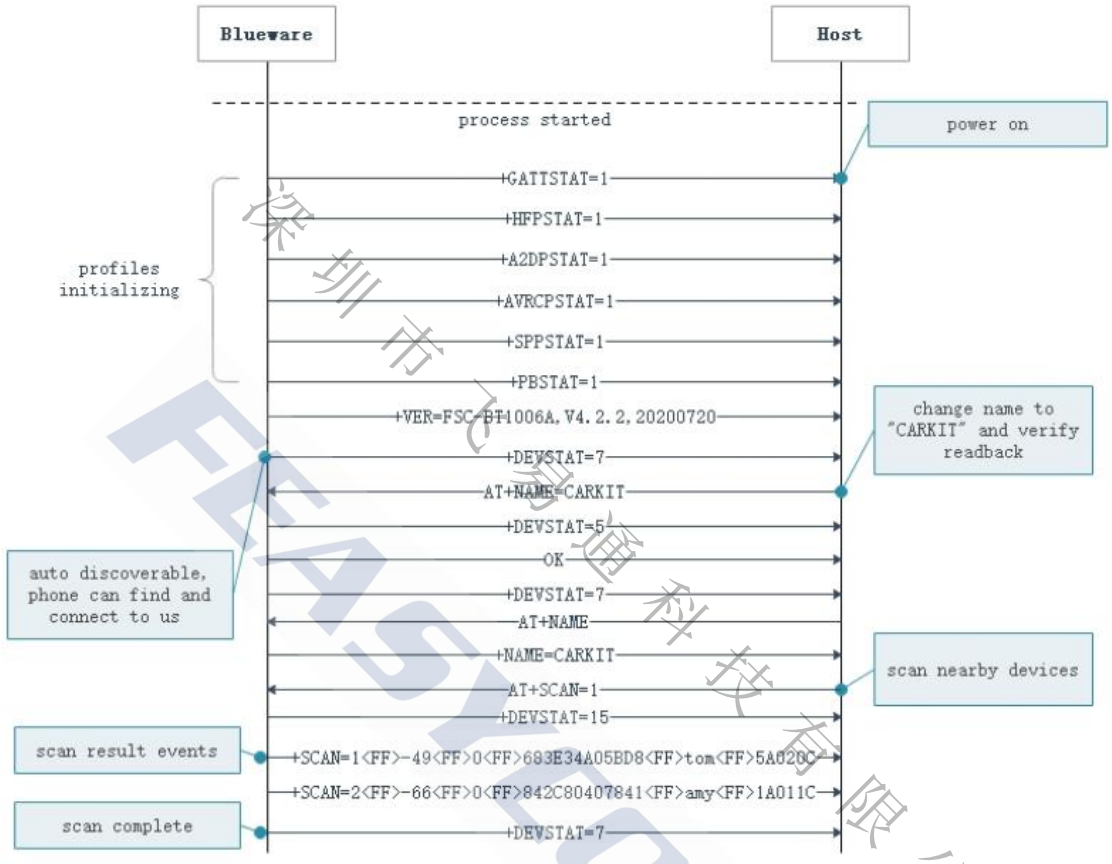
LED0(Output)	
Low Level	Initializing
Blink in 1Hz	Ready to connecting
High Level	Connected

3.6.2 State Pin

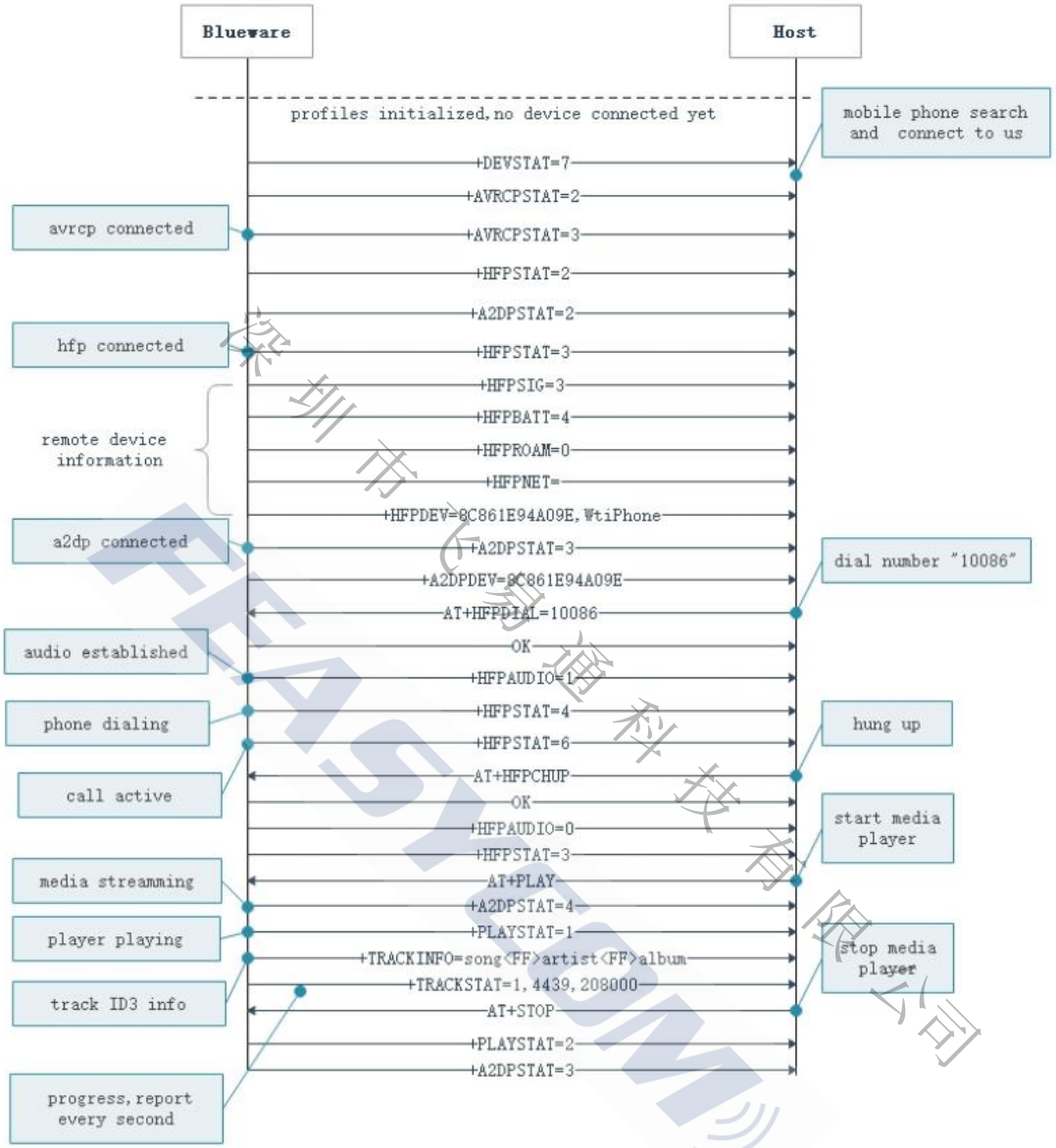
LED1(Output)	
Low Level	SPP/GATT Disconnected
High Level	SPP/GATT Connected

4.Example Message Sequence Charts

4.1MSC for profiles initializing and device scanning



4.2MSC for profiles connection and basic operations



4.3MSC for Phonebook/Contact photo downloading