FSC-BT910x General AT Command Set

Release 2.0

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[中文]

Chapter 1

Description

This guide is provided for engineers to develop FSC-BT910x series Bluetooth modules.

1.1 Module Default Parameters

Name	<Model_Number>-XXXX Example: FSC-BT9101-1234
LE-Name	<Model_Number>-LE-XXXX Example: FSC-BT9101-LE-1234
PIN Code	0000
Secure Simple Pairing Mode	OFF
Service UUID	FFF0
Write UUID	FFF2
Notify UUID	FFF1
UART Baudrate	115200/8/N/1

Chapter 2

AT Command Description

2.1 Specification Description

Applicable to the entire document

- {} : Content included in {⋯} is optional
- << : **COMMAND** sent by the host to the module
- >> : Module responds to the host’s **RESPONSE/EVENT**

2.2 AT Command Format

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

- All commands start with **AT** and end with **<CR><LF>**
- **<CR>** represents carriage return, corresponding to HEX 0x0D
- **<LF>** represents line feed, corresponding to HEX 0x0A
- If the instruction contains parameters, the parameters should be separated by **=**
- If the instruction contains parameters, the parameters should be separated by **,**
- If the command has a response, the response starts with **<CR><LF>** and ends with **<CR><LF>**
- The module should always return the command execution result (returns **OK** on success, returns **ERROR** on failure)

Example: Read module Bluetooth name

```
Send: <<AT+NAME<CR><LF>
Response: >><CR><LF>+NAME=FSC-BT9101<CR><LF>
Response: >><CR><LF>OK<CR><LF>
```

Write unsupported Baud rate

```
Send: <<AT+BAUD=0<CR><LF>
Response: >><CR><LF>ERROR<CR><LF>
```

2.3 Event Format

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

- All events start with <CR><LF> and end with <CR><LF>
- If the event contains parameters, they should be placed after "="
- If the event contains multiple parameters, they should be separated by ","

Example: Return current SPP connection status in command mode

```
Response: >><CR><LF>+SPPSTAT=3<CR><LF>
```

Chapter 3

Command Table

3.1 General Commands

3.1.1 AT+HELP - Query firmware functions and command description

Command	AT+HELP
Response	<MODULE DEFAULT PARAMETER> <COMMAND SUMMARY: DESCRIPTION: PROFILE CATEGORY>
Description	Use the help command to obtain basic summary information

3.1.2 AT - UART Communication Test

Command	AT
Response	OK
Description	Test UART communication between the host and the module after power-on or Baud rate change

Example:

<< AT

>> OK

3.1.3 AT+REBOOT - Software Reset

Command	AT+REBOOT
Response	OK
Description	The module will reboot

Example:

<< AT+REBOOT

>> OK

3.1.4 AT+RESTORE - Restore Factory Settings

Command	AT+RESTORE
Response	OK
Description	The module will restore factory settings

Example:

<< AT+RESTORE

>> OK

3.1.5 AT+BTEN - Read/Write Current Bluetooth Operating Mode

Command	AT+BTEN{=Param}
Param	Enable Bluetooth (0/1, default:0) 0: Disconnect all connections, disable discoverable/connectable 1: Enable discovery/connection
Response	**+BTEN=Param**
Description	Read/Write current Bluetooth operating mode

3.1.6 AT+NAME - Read/Write BR/EDR Bluetooth Name

Command	AT+NAME{=Param{,Param1}}
Param	BR/EDR Bluetooth Name (1~29 Bytes ASCII)
Param1	Enable MAC address suffix (0~2, default:0) 0: Disable suffix 1: Enable suffix “XXXX” (last 4 Bytes of MAC address) 2: Enable suffix “XXXXXX” (last 6 Bytes of MAC address)
Response	**+NAME=Param**
Param	Bluetooth Name
Description	Write local name if parameter existence, otherwise read current local name

Example:

Set BR/EDR Bluetooth name and disable suffix

<< AT+NAME=ABC,0

>> OK

Set BR/EDR Bluetooth name to “ABC” and automatically add address suffix

<< AT+NAME=ABC,1

>> OK

Read BR/EDR Bluetooth name

<< AT+NAME

>> +NAME=ABC-XXXX

>> OK

3.1.7 AT+LENAME - Read/Write BLE Bluetooth Name

Command	**AT+LENAME{=Param{,Param1}}**
`Param`	BLE Bluetooth Name (1~29 Bytes ASCII)
`Param1`	Enable MAC address suffix (0~2, default:0) 0: Disable suffix 1: Enable suffix “-XXXX” (last 4 Bytes of MAC address) 2: Enable suffix “-XXXXXX” (last 6 Bytes of MAC address)
Response	**+LENAME=Param**
`Param`	Bluetooth Name
Description	Set the BLE Bluetooth name, use the sub-parameter to display the address suffix

3.1.8 AT+PIN - Read/Write Pairing PIN code

Command	**AT+PIN{=Param}**
`Param`	Pairing PIN code (4~15 Bytes ASCII, default:0000)
Response	**+PIN=Param**
Description	The pairing PIN code is valid when +SSP=0

Example:

Read pairing PIN code

<< AT+PIN

>> +PIN=0000

>> OK

Change pairing PIN code to 1234

<< AT+PIN=1234

>> OK

3.1.9 AT+PLIST - Read/Clear Paired Records

Command	**AT+PLIST{=Param}**
`Param`	(0 / 1~8) (0) Clear all paired records (1~8) Clear the paired record with the specified index
Response1	**+PLIST=Param, Param1**
`Param`	(1~8) Paired device index
`Param1`	(MAC) MAC address of the paired device
Response2	**+PLIST=** Paired record query completed
Description	If a parameter exists, delete the corresponding pairing information; otherwise, only read the pairing list

Example: Read module’s paired records

<< AT+PLIST

>> +PLIST=1,1C5CF226D773

+PLIST=2,A0BC30075421

>> OK

Example: Clear all paired records of the module

<< AT+PLIST=0

>> OK

3.1.10 AT+BAUD - Read/Write UART Baud rate

Command	AT+BAUD{=Param}
Param	Baud rate (9600/19200/38400/57600/115200/ 230400/460800/921600/256000/512000/1000000, default:115200)
Response	**+BAUD=Param**
Param	Baud rate
Description	The module will switch Baud rate immediately after receiving this command
Note	After sending the Baud rate setting command, please switch the serial port Baud rate to communicate with the module

Example:

Read UART Baud rate

<< AT+BAUD

>> +BAUD=115200

>> OK

Set UART Baud rate

<< AT+BAUD=230400

>> OK

3.1.11 AT+VER - Read Firmware Version

Command	AT+VER
Response	**+VER{=Param,Param1}**
Param	Firmware version
Param1	Module model

Example:

<< AT+VER

>> +VER=8.0.0,FSC-BT9101

>> OK

3.1.12 AT+ADDR - Read BR/EDR Bluetooth MAC Address

Command	**AT+ADDR**
Response	**+ADDR=Param**
`Param`	Module’s BR/EDR Bluetooth MAC address (12 Bytes ASCII)

Example:

<< AT+ADDR

>> +ADDR=DC0D30010203

>> OK

3.1.13 AT+LEADDR - Read BLE Bluetooth MAC Address

Command	**AT+LEADDR**
Response	**+LEADDR=Param**
`Param`	Module’s BLE Bluetooth MAC address (12 Bytes ASCII)

3.1.14 AT+COD: Read/Write Class Of Device

Command	**AT+COD=Param**
`Param`	Class of device (6 bytes ASCII, default:240404 Handsfree device)
Response	**+COD=Param**
Note	Restart the module to apply the change

Related configurations refer to COD.

3.1.15 AT+TPMODE - Enable/Disable Throughput Mode

Command	AT+TPMODE{=Param}
Param	Mode (0~1, default:0) 0: Command mode | 1: Throughput mode
Response	**+TPMODE=Param**
Description	When connected under SPP/GATT profile and throughput mode is on, AT commands will be disabled, every byte received via UART will be sent to the remote end

3.1.16 AT+FLOWCTL - Enable/Disable UART Flow Control

Command	AT+FLOWCTL{=Param}
Param	Option (0~1, default:0) 0: Disable flow control | 1: Enable flow control
Response	**+FLOWCTL=Param**
Description	Enable/Disable UART flow control

3.1.17 AT+SSP - Enable/Disable Secure Simple Pairing

Command	AT+SSP{=Param}
Param	PROFILE mode (0~1, default:0) 0: Disable SSP | 1: Enable SSP
Response	**+SSP=Param**
Note	Requires restart to take effect

3.1.18 AT+MODE - Read/Write Bluetooth Profile

Command	AT+MODE{=Param}
Param	Pairing mode (0~4, default:4) (0) NONE PROFILE (1) SPP PROFILE (2) HID PROFILE (3) BLE PROFILE (4) ALL PROFILE
Response	**+MODE=Param**

3.1.19 AT+AUTOCONN - Set Bluetooth Power-on Reconnection

Command	AT+AUTOCONN{=Param}
`Param`	0: Disable auto-reconnection 1: Enable auto-reconnection
Response	**+AUTOCONN=Param**
Description	After power-on, the module will attempt to establish connections with devices in the paired list according to the set PROFILE

3.1.20 AT+PIOCFG - Enable/Disable IO Control Module

Command	AT+PIOCFG{=Param,Param1}
`Param`	0: Disable command/transmission mode switch function 1: Enable command/transmission mode switch function
`Param1`	0: Disable Bluetooth disconnect function 1: Enable Bluetooth disconnect function
Response	**+PIOCFG=Param**
Description	Use pins to control transmission mode and connection status
Note	Requires restart to take effect after changing status

3.1.21 AT+DSCA - Disconnect All Connections

Command	AT+DSCA
Description	Module disconnects all Bluetooth connections with remote devices, used in command mode

3.1.22 AT+SCAN - Scan Nearby Devices

Command	AT+SCAN{=Param{,Param1}}
`Param`	Scan type (0~2) 0: Stop scan 1: Scan nearby BR/EDR devices 2: Scan nearby BLE devices
`Param1`	(1~48) Scan period. unit:1.28s, default:12.8s
Description	Format description reference: *+SCAN - Scan Result*

3.1.23 AT+SECURITY - Enable/Disable Security Verification

Command	AT+SECURITY{=Param}
`Param`	Mode (0~1, default:0) 0: Security verification off 1: Security verification on
Response	**+SECURITY=Param**
Description	Enable/Disable security verification
Note	Requires restart to take effect

Example:

Enable security verification

<< AT+SECURITY=1

>> OK

Get security verification information

<< AT+SECURITY

>> +SECURITY=1

OK

3.1.24 AT+TXPOWER - Read/Write Transmit Power

Command	AT+TXPOWER{=Param}
Param	Transmit power (0~6, default:3） 0: -12dBm 1: -8dBm 2: -4dBm 3: 0dBm 4: 4dBm 5: 8dBm 6: 10dBm
Response	**+TXPOWER=Param**
Param	Transmit power
Description	Modify transmit power, requires restart to take effect after command setting

Example:

Read transmit power

<< AT+TXPOWER

>> +TXPOWER=3

>> OK

Set transmit power to 10dBm

<< AT+TXPOWER=6

>> OK

3.1.25 AT+UARTCFG - Read/Write UART Configuration

Command	**AT+UARTCFG{=Param}**
`Param`	Configuration (0~5,default:0) bit0: 0 - 1 stop bit 1 - 2 stop bits bit2~bit1: 00 - None 01 - Odd 10 - Even
Response	**+UARTCFG=Param**
`Param`	Configuration (0~5)
Description	Modify UART configuration (stop bits and parity bit)

Example:

Get current UART configuration

<< AT+UARTCFG=0

>> OK

Set UART odd parity

<< AT+UARTCFG=2

>> OK

3.1.26 AT+LINKCFG - Automatic Search Link Configuration

Command	AT+LINKCFG{=Param}
Param	Configuration (0~2,default:0) 0: Disable automatic search link 1: SPP automatic search link 2: BLE automatic search link
Description	If this command is configured, the module will automatically search for links based on the configuration

3.1.27 AT+RSSICFG - Read/Write RSSI Configuration

Command	AT+RSSICFG{=Param{,Param1}}
Param	High RSSI value
Param1	Low RSSI value
Description	PIN34 is pulled low when signal strength is greater than Param PIN34 is pulled high when signal strength is less than Param1 Level remains unchanged when signal strength is between Param ~ Param1

Example: Configure -30~-60 signal strength indication

<< AT+RSSICFG=30,60

>> OK

3.2 SPP Commands

3.2.1 AT+SPPSTAT - Read SPP Status

Command	AT+SPPSTAT
Response	+SPPSTAT=Param
Description	Format description reference: *+SPPSTAT - SPP Status*

3.2.2 AT+SPPCFG - Read/Write SPP Configuration

Command	AT+SPPCFG{=Param}
`Param`	Configuration (0~1, default:0) 0: Disable SPP dynamic registration 1: Enable SPP dynamic registration
Response	+SPPCFG=Param
Description	After enabling dynamic registration, the module will register the SPP service when connecting and unregister the SPP service when disconnecting

3.2.3 AT+SPPCONN - Establish SPP Connection

Command	AT+SPPCONN{=Param}
`Param`	Target device MAC address (12 Bytes ASCII)

Example: Initiate connection to Bluetooth device with address 112233445566

<< AT+SPPCONN=112233445566

>> OK

3.2.4 AT+SPPDISC - Disconnect SPP Connection

Command	AT+SPPDISC
Description	Disconnect current SPP connection with remote device

3.2.5 AT+SPPSEND - Send Data Via SPP

Command	AT+SPPSEND{=Param{,Param1}}
`Param`	Payload length (1~236)
`Param1`	Payload (1~236 Bytes UTF8)
Description	If throughput mode is on, this command will be disabled

Example: Send data “1234567890” to remote device via SPP

<< AT+SPPSEND=10,1234567890

>> OK

3.3 GATT Commands

3.3.1 AT+GATTSTAT - Read GATT Status

Command	AT+GATTSTAT
Response	+GATTSTAT=Param
Description	Format description reference: *+GATTSTAT - Connection Status Report*

3.3.2 AT+ADVADDR - Enable/Disable Broadcast Address

Command	AT+ADVADDR{=Param}
`Param`	Mode (0~1, default:1) 0: Disable broadcast address 1: Enable broadcast address
Response	+ADVADDR=Param
Description	Enable/Disable broadcast address

3.3.3 AT+IBEACON - Enable/Disable iBeacon Broadcast

Command	**AT+IBEACON{=Param}**
`Param`	Mode (0~1, default:0) 0: Disable iBeacon broadcast 1: Enable iBeacon broadcast
Response	**+IBEACON=Param**
Description	Enable/Disable iBeacon broadcast

3.3.4 AT+ADVDATA - Read/Write BLE Broadcast 0xFF Data

Command	**AT+ADVDATA{=Param}**
`Param`	Manufacturer defined broadcast data (data length not exceeding 26)
Response	**+ADVDATA=Param**
`Param`	Tag is broadcast data of 0xFF
Description	The manufacturer’s custom broadcast data tag is 0xFF
Note	To enable module broadcast custom data, set AT+IBEACON=1 first, then set custom broadcast data

Example:

Read manufacturer custom broadcast data content, \x is HEX data

<< AT+ADVDATA

>> +ADVDATA=\x03\x01\x02

>> OK

Write manufacturer custom broadcast data content, \x is HEX data

<< AT+ADVDATA=\x03\x01\x02

>> OK

3.3.5 AT+ADBLE - Enable/Disable AndroidBLE

Command	**AT+ADBLE{=Param}**
`Param`	Mode (0~1, default:1) 0: Disable AndroidBLE 1: Enable AndroidBLE
Response	**+ADBLE=Param**
Description	When Enable on, SPP and BLE will have two different addresses When Disable, SPP and BLE will share the same address

3.3.6 AT+UUIDCFG - Read/Write UUID

Command	**AT+UUIDCFG{=Param{,Param1}{,Param2}}**
`Param`	Service UUID (default:0000)
`Param1`	Write UUID (default:0000)
`Param2`	Notify UUID (default: 0000)
Response	**+UUIDCFG=Param,Param1,Param2**
Description	Custom data transmission reset UUID, supports 32/128 bit UUID. Default parameters: Service UUID = 0xFFF0 Write UUID = 0XFFF2 Notify UUID = 0XFFF1

3.3.7 AT+GATTSEND - Send Data Via GATT

Command	**AT+GATTSEND{=Param{,Param1}}**
`Param`	Payload length (1~236)
`Param1`	Payload (1~236 Bytes UTF8)
Description	If throughput mode is on, this command will be disabled

Example: Send data “1234567890” to remote device via GATT

<< AT+GATTSEND=10,1234567890

>> OK

3.3.8 AT+LESTAT - Read LE Status

Command	**AT+LESTAT**
Response	**+LESTAT=Param**
Description	Format description reference: *+LESTAT - Connection Status Report*

3.3.9 AT+LECCONN - Initiate Connection to Specified Address

Command	**AT+LECCONN{=Param{,Param1}{,Param2}{,Param3}}**
`Param`	12-byte device address + 1-byte address type
`Param1`	Communication service UUID
`Param2`	Communication write characteristic UUID
`Param3`	Communication notify characteristic UUID
Response	**OK**
Description	Initiate connection to specified device, parameters consist of 12 bytes (device address) and 1 byte (address type). Generally, address type is “0” or “1”. Address type acquisition method: Use the second parameter returned by AT+SCAN scan, example: +SCAN=0,0,DC0D30001ED4,-65,10,FSC-BT946 Connection command: AT+LECCONN=DC0D30001ED40

Example:

Connect to specified device, 0 is address type

<< AT+LECCONN=DC0D3000039E0

>> OK

Initiate connection to specified address, use FFF0, FFF2, FFF1 for communication

<< AT+LECCONN=DC0D3000039E0,FFF0,FFF2,FFF1

>> OK

3.3.10 AT+LESEND - Send Data to Remote Device

Command	**AT+LESEND=Param1,Param2**
`Param1`	Payload length (1~236)
`Param2`	Payload (1~236 Bytes UTF8)
Response	**OK**
Description	If throughput mode is on, this command will be disabled

Example:

Send data “1234567890” to remote BLE device

<< AT+LESEND=10,1234567890

>> OK

3.4 HID Commands

3.4.1 AT+HIDSTAT - Read HID Status

Command	**AT+HIDSTAT**
Response	**+HIDSTAT=Param**
Description	Format description reference: *+HIDSTAT - HID Status*

3.4.2 AT+HIDCONN - Establish HID Connection

Command	**AT+HIDCONN{=Param}**
`Param`	Target device MAC address (12 Bytes ASCII)

3.4.3 AT+HIDDISC - Disconnect HID Connection

Command	AT+HIDDISC
Description	Disconnect current HID connection with remote device

3.4.4 AT+HIDOSK - Show/Hide Keyboard

Command	AT+HIDOSK
Description	Show/Hide Keyboard (IOS Only)

3.4.5 AT+HIDMODE - Read/Write HID Mode

Command	AT+HIDMODE{=Param}
`Param`	HID keyboard input mode (0~1), default 1 (0) HEX key code (1) ASCII key code (English)
Note	The module can support various keyboard languages through specific firmware, such as: TURKEY SPAIN PORTUGAL FRANCE GERMANY ITALY CZECH JAPAN

3.4.6 AT+HIDDLY - Read/Write HID Transmission Interval

Command	AT+HIDDLY{=Param}
`Param`	HID report period in millisecond, default 10 ms

3.4.7 AT+HIDSEND - Send Data Via HID

Command	AT+HIDSEND{=Param{,Param1}}
Param	Report length
Param1	Report payload
Note	For special key code: 0x0D -> ENTER 0x08 -> BACKSPACE 0x09 -> TAB 0x20 -> SPACE
Description	If throughput mode is on, this command will be disabled

Example: Send character ‘A’ to remote device (on AT+HIDMODE=1)

>> AT+HIDSEND=1,A

<< OK

Example: Send character ‘A’ to remote device (on AT+HIDMODE=0)

<< AT+HIDSEND=4, xA1 x01 x00 x04

>> OK

Note: Data is HEX, corresponding actual data as follows:

41 54 2B 48 49 44 53 45 4E 44 3D 34 2C A1 01 00 04 0d 0a

Where:

A1 : report start

01 : page id 1

00 : modifier

04 : key code

The module will automatically send key release events

Chapter 4

Events Table

4.1 +SPPSTAT - SPP Status

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

4.2 +SCAN - Scan Result

Format1	+SCAN={ : Start scanning
Format2	**+SCAN =Param,Param1,Param2,Param3,Param4,Param5**
Param	List index
Param1	Address type (1 byte)
Param2	Address (12 bytes)
Param3	RSSI
Param4	Device name length
Param5	Device name
Format3	+SCAN=} : Stop scanning

Example:

Scan devices

<< AT+SCAN=1

>> +SCAN={

>> +SCAN=0,1,70CFC9A98840,-43,24,LE-Bose QuietControl 30

>> +SCAN=1,1,DC0D30001ED4,-65,10,WEWQ-45AE

>> +SCAN=}

4.3 +GATTSTAT - Connection Status Report

Indication	+GATTSTAT=Param
Param	(0) Unsupported (1) Standby (2) Connecting (3) Connected
Description	In command mode, when module connection status changes, actively reported via +GATTSTAT

Example:

Connection successful

>> +GATTSTAT=3

4.4 +LESTAT - Connection Status Report

Indication	+LESTAT=Param
Param	(0) Unsupported (1) Standby (2) Connecting (3) Connected
Description	In AT Command mode, when module connection status changes, actively reported via +LESTAT

Example:

Connection successful

>> +LESTAT=3

4.5 +HIDSTAT - HID Status

Format	+HIDSTAT=Param
Param	(0) Unsupported (1) Standby (2) Connecting (3) Connected

Chapter 5

Application and Development

Please refer to:

- FSC-BT910x User Guide

This guide is intended to provide technical support and resource references for the product development and mass production based on FSC-BT910x series modules. It includes hardware design references, functional description, quick development kits, quick start, obtain firmware version, typical application development examples, and firmware upgrade methods, etc.

Chapter 6

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Chapter 7

Appendix

7.1 PDF Download

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