A76XX Series_BlueTooth _Application Note

LTE Module

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SIMCom Wireless Solutions Limited

SIMCom Headquarters Building, Building 3, No. 289 Linhong Road, Changning District, Shanghai P.R. China

Tel: +86 21 31575100

Email: simcom@simcom.com

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About Document

Version History

Revision	Date	Owner	Description
V1.00	2021.6.16		New version
V1.01	2021.10.14	yonghang.qin	Add the description about le client.
V1.02	2021.11.17	yonghang.qin	Added subsections 3.8 to 3.11
V1.03	2023.04.23	Junliang.dong	Related documents

Scope

This document presents the AT Command Set for SIMCom A76XX Series.

Contents

1 Introduction

1.1 Purpose of the document

Based on module AT command manual, this document will introduce BlueTooth application process. Developers could understand and develop application quickly and efficiently based on this document.

1.2 Related documents

[1] A76XX_Series_AT_Command_Manual

1.3 Conventions and abbreviations

In this document, the GSM engines are referred to as following term:

ME (Mobile Equipment);

MS (Mobile Station);

TA (Terminal Adapter);

DCE (Data Communication Equipment) or facsimile DCE (FAX modem, FAX board);

In application, controlling device controls the GSM engine by sending AT Command via its serial interface.

The controlling device at the other end of the serial line is referred to as following term:

TE (Terminal Equipment);

DTE (Data Terminal Equipment) or plainly "the application" which is running on an embedded system;

2 AT Commands for BlueTooth

2.1 Overview of AT Commands for BlueTooth

Command	Description
AT+BLEPOWER	Power on/off Ble Device
AT+BLESTATUS	Inquiry current BLE connect status
AT+BLEHOST	Get or Set host name
AT+BLEADDR	Inquiry Current Ble Address
AT+BLESREG	Register GATT Server
AT+BLESDREG	Deregister GATT Server
AT+BLESSAD	Add a service
AT+BLESSRM	Remove a service
AT+BLESSCAD	Add a characteristic to an existed service
AT+BLESSCRM	Remove a characteristic
AT+BLESSDAD	Add a descriptor to an existed service
AT+BLESSDRM	Remove a descriptor
AT+BLESSSTART	Start a service
AT+BLESSSTOP	Stop a service
AT+BLESSETADVDATA	Set adverting package
AT+BLESCLRADVDATA	Clear adverting package
AT+BLESSETADVPARAM	Set adverting parameters
AT+BLESLSTART	Start advertising
AT+BLESLSTOP	Stop advertising
AT+BLEADV	Set adverting parameters
AT+BLEDISCONN	Disconnect BLE connection
AT+BLESIND	Send an indication to a client
AT+BLESNTY	Send a notice to a client
AT+BLESRSP	Send a Response to a Client'S Read or Write Operation
	+BLESRREQ Read request received from remote device
	+BLESWREQ Write request received from remote device
	+BLESCON Notify When a Connection's Status Change
	+BLEMTU Exchange mtu request received from remote device
AT+BLECREG	Register GATT Client
AT+BLECDREG	Deregister GATT Client

AT+BLESCAN	Scan Surrounding BLE Device
	+BLESCANRST Notify When Find a BLE Device
AT+BLECGDT	Get Device Type
AT+BLECCON	Connect GATT Client to Remote LE/Dual-mode Device
AT+BLECDISC	Disconnect GATT Client to Remote LE/Dual-mode Device
AT+BLECSS	Search Peer's Service
AT+BLECGC	Search Peer's Characteristic
AT+BLECGD	Search Peer's Characteristic Descriptor
AT+BLECRC	Read Peer's Characteristic
AT+BLECWC	Write Peer's Characteristic
AT+BLECRD	Read Peer's Descriptor
AT+BLECWD	Write Peer's Descriptor
	+BLECNTY Notify When Get a Notication from Peer's Device
	+BLECIND Notify When Get a Indication from Peer's Device

3 BlueTooth Examples

3.1 Check the Bluetooth Mac Address.

AT+BLEADDR?	//Read the Bluetooth Mac Address
+BLEADDR: 00:00:00:00:00:00	
	//Invalid Mac Address, need to set mac address.
OK	

3.2 Power on the BLE Device.

AT+BLEPOWER=1	//Power on the BLE Device
OK	//Time-consuming operation, it may take 3-5 seconds.

3.3 Start a GATT server

AT+BLESREG	//Register a GATT server
+BLESREG: 0,ABCDEF50	
OK	
AT+BLESSAD=0,"1802",30,1,4	//Add a GATT service
+BLESSAD: 0,ABCDEF50,1802,1,4,0	
OK	
AT+BLESSCAD=0,"2A06",4,38,3	//Add a Characteristic to an Existed Service
+BLESSCAD: 0,ABCDEF50,2A06,4,0	
OK	
AT+BLESSDAD=0,"2902",4,0	//Add a Descriptor to an Existed Service

+BLESSD: 0,1802,0210,0,0

OK
AT+BLESSSTART=0,0   //Start server

OK
AT+BLESLSTART=0   //Start Advertising
+BLESLSTART: 0,ABCDEF50

OK

3.4 Stop a GATT server

AT+BLESLSTOP=0   //Stop Advertising
+BLESLSTOP: 0,ABCDEF50

OK

3.5 Set Host Device Name

AT+BLEHOST?   // Inquiry host device name
+BLEHOST: SIMCOM BLE,df:45:e6:29:65:c0

OK
AT+BLEHOST="SIMCOM BLE"   //Set host device name
OK

3.6 Receive the write request

+BLESWREQ: //When the remote device sends a write request or
ABCDEF50,1,0,"21:00:56:ef:3a:52",17,1234,0,0, a write operation, the BLE device will report this
0   URC.

3.7 Receive the read request

+BLESRREQ: **ABCDEF50,1,0,"21:00:56:ef:3a:52",17,19,0,** **AT+BLESRSP=0,"1234"** **+BLESRSP: 0,ABCDEF50,1,17** **OK**	//When the remote device sends a read request, the BLE device will report this URC. //Send a response to the remote device

3.8 Start a GATT client and Connect to the remote server

AT+BLECREG
+BLECREG: 0,ABCDEF00
 	
OK
AT+BLESCAN=0,1
OK
 	
+BLESCANRST:
0,0,"15:c6:3a:19:1f:a2",180,"1EFF06000109200266
53F7466F9FD56D60171DB3938BEFC79ACDE67C
3766FB"
 	
+BLESCANRST:
0,1,"27:3f:cf:19:e1:52",185,"1EFF0600010F200265
AE5D974A725F967071535422F699C03BF8E0CA9
8BBDD"
 	
+BLESCANRST:
0,2,"08:54:10:00:cc:ec",174,"1EFF0600010F20022
45355CD56A4091E8772FF25D548245E90D6D1568
3F5B5"
 	
+BLESCANRST:
0,3,"32:9c:bd:ad:d3:dd",174,"1EFF060001092002
D98520CB58C5221E3F6108CB572F96B7CEE1354
D38C0FD"
 	
+BLESCANRST:
0,4,"35:3c:41:5a:d5:d1",174,"1EFF0600010F20020
F6E187948EE89C6E900F24C454A35802ED13CEB
	//Register a GATT client
	
	//Start scanning
	
	//scan result

27B073"

+BLESCANRST:
0,5,"25:2f:9e:29:ea:6e",175,"1EFF060001092002D
BC23E23692788B74E4D442C5204E22DB9D255B0
AEF782"

+BLESCANRST:
0,6,"76:d6:7b:96:b3:46",175,"1EFF0600010920026
363EF6E59640E472B82D8BFCD4283BD4355912B
8FF3D5"

+BLESCANRST:
0,7,"01:37:bf:a1:ce:90",174,"1EFF06000109200240
86E54EE88F59D2DC8C81E9016242A5B3D0A3B4
B250E4"

+BLESCANRST:
0,8,"21:3b:93:0a:c3:34",177,"1EFF0600010920023
2E6A08A6C33CB8CCCD2BA6BF40D26196D16CA
8DA88F58"

+BLESCANRST:
0,9,"ac:07:5f:bb:61:c4",174,"031900000201060302
121808FF7D02010300FFCC"

+BLESCANRST:
0,10,"4f:fb:da:7c:81:08",176,"1EFF4C000719010E
202B888F0000052791B489FA4476814FF8911BFF4
FEE9F"

+BLESCANRST:
0,11,"78:06:d4:8e:a6:92",174,"02011A020A080BFF
4C0010063D1D6D6D5080"

+BLESCANRST:
0,12,"4f:69:75:64:36:bc",175,"02011A020A0C0AFF
4C0010051118FD054E"

+BLESCANRST:
0,13,"7c:31:71:ef:d4:4e",174,"02011A020A080BFF
4C0010062B1EFF4E3B40"

+BLESCANRST:
0,14,"4a:48:fe:c6:2a:79",174,"02011A020A0C0CFF
4C001007181F0BB1665248"

```
AT+BLESCAN=0,0                          //Stop scanning
OK
AT+BLECCON=14                           //connect to the remote server by index
OK

+BLECCON: 0,"4a:48:fe:c6:2a:79"         //connect to the remote server success
```

3.9 Read the characteristic value

```
AT+BLECGC?                              //Search Peer's Characteristic
+BLECGC: 0,0,0x2A00
+BLECGC: 0,1,0x2A01
+BLECGC: 0,2,0x2A02
+BLECGC: 0,3,0x2A03
+BLECGC: 0,4,0x2A04
+BLECGC: 1,5,0x2A05
+BLECGC: 2,6,0x8901

OK
AT+BLECRC=6                             //Read Peer's Characteristic
OK

+BLECRC: 6,"313233"
```

3.10   Write the characteristic value

```
AT+BLECGC?                              //Search Peer's Characteristic
+BLECGC: 0,0,0x2A00
+BLECGC: 0,1,0x2A01
+BLECGC: 0,2,0x2A02
+BLECGC: 0,3,0x2A03
+BLECGC: 0,4,0x2A04
+BLECGC: 1,5,0x2A05
+BLECGC: 2,6,0x8901

OK
AT+BLECWC=6,0,"HEX{123456}"             //Write Peer's Characteristic
```

OK

3.11　Close a connection

AT+BLECDISC=0   //Search Peer's Characteristic

OK

+BLEDISC: 0,"2b:3c:42:10:23:58"