A7600 Series_ LBS_Application Note

LTE Module

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About Document

Version History

Version	Date	Chapter	What is new
V1.00	2020.06.19		New version

Scope

This document presents the AT Command Set for SIMCom A7600 Series, including A7600XX-XXXX, A5360E, and A7670X.

Contents

1 Introduction

1.1 Purpose of the document

Based on module AT command manual, this document will introduce LBS application process.

Developers could understand and develop application quickly and efficiently based on this document.
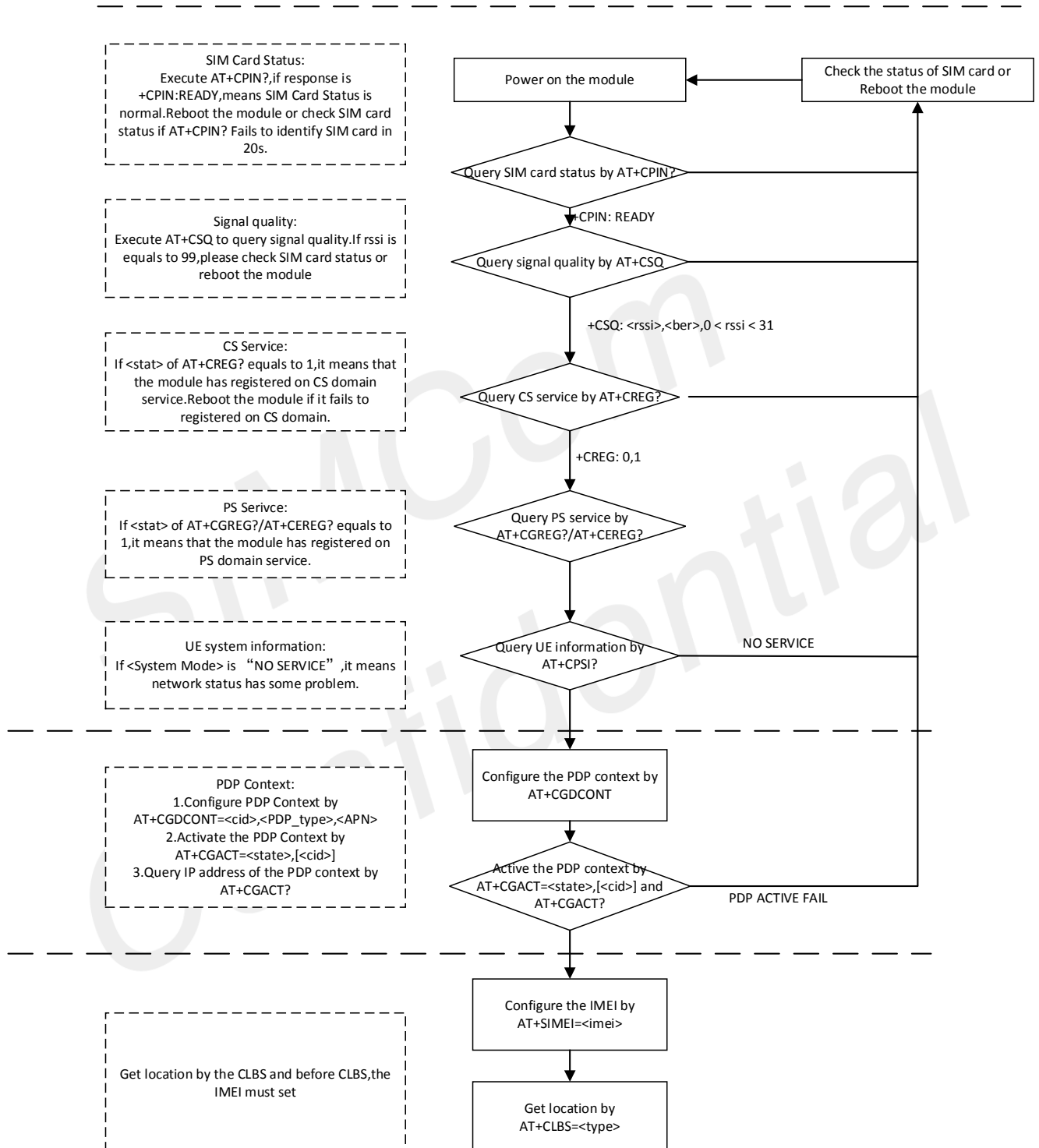
1.2 Related documents

[1] A7600 Series_AT Command Manual

1.3 Conventions and abbreviations

PDP   Packet Data Protocol;

LBS   Location Based Services;

URC   Unsolicited result codes;

DNS   Domain Name Server;

UTC   Coordinated Universal Time;

YYYY/MM/DD   Year/Month/Day;

HH:MM:SS   Hour:Minute:Second;

IMEI   International Mobile Equipment Identity;

UCS2   Unicode

1.4 The process of LBS AT Commands

SIM Card Status:
Execute AT+CPIN?,if response is +CPIN:READY,means SIM Card Status is normal.Reboot the module or check SIM card status if AT+CPIN? Fails to identify SIM card in 20s.

Signal quality:
Execute AT+CSQ to query signal quality.If rssi is equals to 99,please check SIM card status or reboot the module

CS Service:
If <stat> of AT+CREG? equals to 1,it means that the module has registered on CS domain service.Reboot the module if it fails to registered on CS domain.

PS Serivce:
If <stat> of AT+CGREG?/AT+CEREG? equals to 1,it means that the module has registered on PS domain service.

UE system information:
If <System Mode> is "NO SERVICE",it means network status has some problem.

PDP Context:
1.Configure PDP Context by AT+CGDCONT=<cid>,<PDP_type>,<APN>
2.Activate the PDP Context by AT+CGACT=<state>,[<cid>]
3.Query IP address of the PDP context by AT+CGACT?

Get location by the CLBS and before CLBS,the IMEI must set

Power on the module ← Check the status of SIM card or Reboot the module

Query SIM card status by AT+CPIN?

+CPIN: READY

Query signal quality by AT+CSQ

+CSQ: <rssi>,<ber>,0 < rssi < 31

Query CS service by AT+CREG?

+CREG: 0,1

Query PS service by AT+CGREG?/AT+CEREG?

Query UE information by AT+CPSI? — NO SERVICE

Configure the PDP context by AT+CGDCONT

Active the PDP context by AT+CGACT=<state>,[<cid>] and AT+CGACT? — PDP ACTIVE FAIL

Configure the IMEI by AT+SIMEI=<imei>

Get location by AT+CLBS=<type>

1.5 Error Handling

1.5.1 Failed to Get Location

If it is failed to get location, please check the following aspects:

1. Query the status of the specified PDP context by **AT+CGACT?** command to check whether the specified PDP context has been activated.

2.When the **<ret_code>** in the URC **:+CLBS: <ret_code>[,<longitude>,<latitude>,<acc>,<date>,<time>]** is not 0, it indicates an error code,please refer to the chapter 2.2.1.

For more details, please refer to the chapter 2.2

2 AT Commands for LBS

2.1 Overview of AT Commands for LBS

Command	Description
AT+CLBS	Base station location

2.2 Detailed Description of AT Commands for LBS

2.2.1 AT+CLBS Base station location

The write command is used to base station location.

AT+ CLBS Base station location	
Test Command **AT+CLBS=?**	Response 1) **+CLBS:** **(1,2,3,4,9),(1-15),(-180.000000-180.000000),(-90.000000-90.000000),(0,1)** **OK**
Write Command **AT+CLBS=<type>[,<cid>[,** **[<longitude>,<latitude>],[<lon_type>]]]**	Response **OK** 1)type = 1,get longitude and latitude **+CLBS: <ret_code>[,<longitude>,<latitude>,<acc>]** 2)type = 2,get detail address **+CLBS: <ret_code>[,<detail_addr>]** 3)type = 3,get access times **+CLBS: <ret_code>[,<times>]**

4)type = 4,get longitude latitude and date time
+CLBS:
<ret_code>[,<longitude>,<latitude>,<acc>,<date>,<time>]

5)type = 9, report positioning error
+CLBS: <ret_code>

6)
+CLBS: <ret_code>

ERROR

Parameter Saving Mode	NO_SAVE
Maximum Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<type>	A numeric parameter which specifies the location type. 1 use 3 cell's information 2 get detail address 3 get access times 4 get longitude latitude and date time 9 report positioning error
<cid>	A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). 1…15
<longitude>	Current longitude in degrees.
<latitude>	Current latitude in degrees.
<detail_addr>	Current detail address. It based the UCS2 coding. Each 4 characters in the URC is for one UCS2 character.
<acc>	Positioning accuracy.
<lon_type>	The type of longitude and latitude 0 WGS84，the default type 1 GCJ02.
<times>	access service times.
<data>	service date(UTC, the format is YYYY/MM/DD).
<time>	service time(UTC, the format is HH:MM:SS).
<ret_code>	The result code. 0 Success 1 Parameter error returned by server. 2 Service out of time returned by server. 3 Location failed returned by server. 4 Query timeout returned by server. 5 Certification failed returned by server.

	6 Server LBS error success.
	7 Server LBS error failed.
	80 Report LBS to server success
	81 Report LBS to server parameter error
	82 Report LBS to server failed
	110 Other Error
	8 LBS is busy.
	9 Open network error.
	10 Close network error.
	11 Operation timeout.
	12 DNS error.
	13 Create socket error.
	14 Connect socket error.
	15 Close socket error.
	16 Get cell info error.
	17 Get IMEI error.
	18 Send data error.
	19 Receive data error.
	20 NONET error.
	21 Net not opened.

NOTE

The LBS is only support in GSM/WCDMA /LTE net mode.It needs to make sure the network available before executing the AT+CLBS write command.

3 LBS Examples

Before LBS related operations, we should ensure the following:
Ensure GPRS network is available:

```
AT+CSQ
+CSQ: 23,0

OK
AT+CREG?
+CREG: 0,1

OK
AT+CGREG?
+CGREG: 0,1

OK
```

3.1 Get location

Following commands shows how to get location

AT+SIMEI=864424040019280	//set IMEI first if no IMEI
OK	
AT+CLBS=1	//type = 1,get longitude and latitude
OK +CLBS: 0,106.638084,29.489428,550	
AT+CLBS=2	// type = 2,get detail address
OK +CLBS: 0,91cd5e865e02002053575cb8533a002073899 a6c8def002097608fd15de54e1a548c4fe1606f5 31690e875354fe178147a7696620028897f90e8 520696620029	

AT+CLBS=3	// type = 3,get access times
OK	
+CLBS: 0,0	
AT+CLBS=4	// type = 4,get longitude latitude and date time
OK	
+CLBS:	
0,106.638084,29.489428,550,2020/6/17,9:34:16	

AT+CLBS=3	// type = 3,get access times