SIM7060 Series_GNSS_Application Note

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About Document

Document Information

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Revision	Date	Owner	Status / Comments
1.00	Jul 10, 2010	Zhao.wang	First Release
1.01	Dec 14, 2018	Zhao.wang	Modify the AT+CGNSRST
1.02	Jan 16, 2019	Zhao.wang	Modify the AT+CGNSINF
1.03	May 23, 2019	Wenjie.lai	Revised

Related Documents

[1] SIM7020 Series_AT Command Manual_V1.03

This document applies to the following products:

Name	Type	Size (mm)	Comments
SIM7060C	NB1+GNSS	24*24	Band 1/3/5/8
SIM7060G	NB2+GNSS	24*24	Band 1/2/3/4/5/8/12/13/17/18/19/20/25/26/28/66/70/71

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Figure and Table

1 Purpose of this document

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

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

2 Introduction

SIM7060 series module combines GNSS technology for satellite navigation. Featuring an industry-standard interface and GNSS function, it allows variable assets to be tracked seamlessly at any location and anytime with signal coverage.

SIM7060 series includes SIM7060G and SIM7060C, among which SIM7060G is MT2625+MT3333 and SIM7060C is MT2625+AG3331.

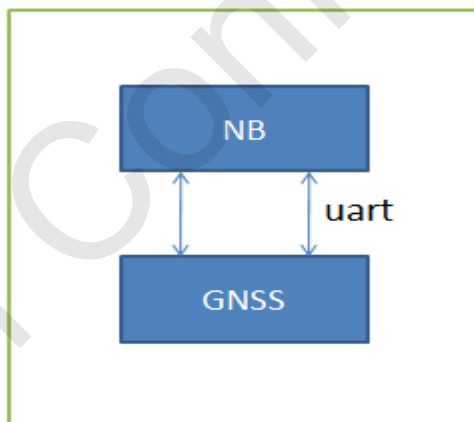GNSS application provides a method to interact with a GNSS module.

Figure 1   SIM7060 series system connection

3 AT Command

SIM7060 series modules provide GNSS AT commands are as follows:

Commands	Description
AT+CGNSPWR	GNSS power control
AT+CGNSINF	GNSS navigation information parsed from NMEA sentences

AT+CGNSRST	GNSS Reset Mode
AT+CGNSTST	Send data received from GNSS to AT UART

3.1 AT+CGNSPWR GNSS Power Control

AT+CGNSPWR GNSS Power Control	
Test Command **AT+CGNSPWR=?**	Response **+CGNSPWR: (**list of supported **<mode>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CGNSPWR?**	Response TA returns the current status of GNSS Power supply **+CGNSPWR: <mode>** **OK**
	Parameters See Write Command
Write Command **AT+CGNSPWR=<mode>**	Response **OK** or **ERROR**
	Parameters **<mode>** <u>0</u> Turn off GNSS power supply 1 Turn on GNSS power supply
Reference	

3.2 AT+CGNSINF GNSS Navigation Information Parsed from NMEA Sentences

AT+CGNSINF GNSS Navigation Information Parsed from NMEA Sentences	
Execution Command **AT+CGNSINF**	Response **+CGNSINF: <GNSS run status>,<Fix status>,<UTC date & Time>,<Latitude>,<Longitude>,<MSL Altitude>,<Speed Over Ground>,<Course Over Ground>,<Fix Mode>,<Reserved1>,<HDOP>,<PDOP>,<VDOP>,<Reserved2>,<GNSS**

	Satellites in View>,<GPS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA> **OK**

	Parameters
	 <GNSS run status>
	     0 GNSS off
	     1 GNSS on
	 <Fix status>
	     0 Not fixed position
	     1 Fixed position
	 See below table 1.

Reference	

Table 1   AT+CGNSINF return parameters

Index	Parameter	Unit	Range	Length
1	GNSS run status	--	0-1	1
2	Fix status	--	0-1	1
3	UTC date & Time	yyyyMMddhhmmss.sss	yyyy: [1980,2039] MM : [1,12] dd: [1,31] hh: [0,23] mm: [0,59] ss.sss:[0.000,60.999]	18
4	Latitude	±dd.dddddd	[-90.000000,90.000000]	10
5	Longitude	±ddd.dddddd	[-180.000000,180.000000]	11
6	MSL Altitude	meters		8
7	Speed Over Ground	Km/hour	[0,999.99]	6
8	Course Over Ground	degrees	[0,360.00]	6
9	Fix Mode	--	0,1,2[1]	1
10	Reserved1			0
11	HDOP	--	[0,99.9]	4
12	PDOP	--	[0,99.9]	4
13	VDOP	--	[0,99.9]	4
14	Reserved2			0
15	GNSS Satellites in View	--	[0,99]	2
16	GPS Satellites Used	--	[0,99]	2
17	GLONASS Satellites	--	[0,99]	2

	Used			
18	Reserved3			0
19	C/N0 max	dBHz	[0,55]	2
20	HPA[2]	meters	[0,9999.9]	6
21	VPA[2]	meters	[0,9999.9]	6
				Total：(94) chars

Note:
1. **The range of <Fix Mode> depends on the GNSS chip used.**
2. **Reserved.**

3.3 AT+CGNSRST GNSS Reset Mode

AT+CGNSRST GNSS Reset Mode	
Test Command **AT+CGNSRST=?**	Response **+CGNSRST: (0-2)** **OK**
	Parameters See Write Command
Write Command **AT+CGNSRST=<n>**	Response If send ok: **OK** If send false: **ERROR**

	Parameters
	<n>
	    0 Reset GNSS in COLD start mode
	    1 Reset GNSS in HOT start mode
	    2 Reset GNSS in WARM start mode

Reference	

3.4 AT+CGNSTST Send Data Received from GNSS to AT UART

AT+CGNSTST Send Data Received from GNSS to AT UART

Test Command **AT+CGNSTST=?**	Response **+CGNSTST: (0-1),(1-255)** **OK**
	Parameters See Write Command
Read Command **AT+CGNSTST?**	Response **+CGNSTST: \<mode\>** **OK**
	Parameters See Write Command
Write Command **AT+CGNSTST=\<mode\>**[,**\<cont\>**]	Response **OK** or **ERROR**

	Parameters
	\<mode\>
	    <u>0</u> Turn off GNSS test mode
	    1 Turn on GNSS test mode
	\<cont\> The number of NMEA data package
	    1-255

Reference	

4 CME Error Code

The following errors are related to GNSS. The format is like this: +CME ERROR: \<err\>. The detail error code and description is list in the following table.

Code	Description
895	GNSS baud rate selected by HW
891	GNSS data check sum err

5 GNSS Example

AT Command	Response	Description
AT+CGNSPWR=1	OK	Turn on GNSS power
AT+CGNSPWR=0	OK	Turn off GNSS power
AT+CGNSINF	+CGNSINF: 1,1,20150327014838.000,31.221783,121.354	Read GNSS navigation information

528,114.600,0.28,0.0,1,,1.9,2.2,1.0,,8,4,,,42,,

OK

AT+CGNSRST=0	OK	Restart GNSS in cold start mode
AT+CGNSTST=1	OK	Send NMEA data to AT UART

Appendix

A Terms and Abbreviations

Abbreviation	Definition
APN	Access Point Name
URC	Unsolicited Result Code
FTP	File Transfer Protocol
GGA	Global Positioning System Fixed Data
GLL	Geographic Position - Latitude/Longitude
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
AGPS	Assisted GPS
DGPS	Differential Global Positioning System
GPRS	General Packet Radio Service
GSA	GNSS DOP and Active Satellites
GSV	GNSS Satellites in View
HPA	Horizontal Position Accuracy
VPA	Vertical Position Accuracy
GEO-Fence	A geographic area
HTTP	The Hypertext Transfer Protocol
HDOP	Horizontal Dilution of Precision
HTTP	Hypertext Transfer Protocol
NMEA	National Marine Electronics Association
NMEA	National Marine Electronics Association
PDOP	Position Dilution of Precision
PDP	Packet Data Protocol
RMC	Recommended Minimum Specific GNSS Data
VDOP	Vertical Dilution of Precision
VTG	Course Over Ground and Ground Speed
ZDA	Time & Date

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