



SIM808_GPS_应用文档_V1.00



手册名称:	SIM808 GPS 应用文档
版本:	1.00
日期:	2014-01-26
状态:	发布
对应英文文档:	SIM808_GPS_Application Note_V1.00.doc

一般事项

SIMCom把本手册作为一项对客户的服务，编排紧扣客户需求，章节清晰，叙述简要，力求客户阅读后，可以通过AT命令轻松使用模块，加快开发应用和工程计划的进度。

SIMCom不承担对相关附加信息的任何独立试验，包含可能属于客户的任何信息。而且，对一个包含SIMCom模块、大些的电子系统而言，客户或客户的系统集成商肩负其系统验证的责任。

由于产品版本升级或其它原因，本手册内容会不定期进行更新。除非另有约定，本手册仅作为使用指导，本手册中的所有陈述、信息和建议不构成任何明示或暗示的担保。手册中信息修改，恕不另行通知。

版权

本手册包含芯讯通无线科技(上海)有限公司的专利技术信息。除非经本公司书面许可，任何单位和个人不得擅自摘抄、复制本手册内容的部分或全部，并不得以任何形式传播，犯规者可被追究支付赔偿金。对专利或者实用新型或者外观设计的版权所有，SIMCom保留一切权利。

版权所有© 芯讯通无线科技(上海)有限公司2014年

目录

1. GPS 介绍	5
2. AT 命令	5
2.1. AT+CGPSPWR GPS开启或关闭	6
2.2. AT+CGPSRST GPS重启模式 (COLD /HOT/WARM)	7
2.3. AT+CGPSINF 获取当前GPS位置信息	7
2.4. AT+CGPSOUT GPS NMEA 数据输出控制	8
2.5. AT+ CGPSSTATUS GPS定位状态	10
3. CME 错误码概要	11
4. 示例	12
附录	13
A. NMEA格式	13
Message ID GGA: Global Positioning System Fixed Data	13
Message ID GLL: Geographic Position - Latitude/Longitude	14
Message ID GSA: GNSS DOP and Active Satellites	15
Message ID GSV: GNSS Satellites in View	16
Message ID RMC: Recommended Minimum Specific GNSS Data	17
Message ID VTG: Course Over Ground and Ground Speed	18
Message ID ZDA: Time & Date	18
B 相关文档	19
C 术语和缩写	19

版本历史

日期	版本	修改点描述	作者
2014-01-26	1.00	第一版	陈海兵

适用范围

本手册描述了 GPS 相关的 AT 命令操作方法，并提供了具体的实例供参考。
本手册适用于 SIM808。

1. GPS 介绍

本文主要介绍 GPS 功能的相关 AT 命令及其应用。

2. AT 命令

SIM808 GPS AT 命令概述。

命令	描述
AT+CGPSPWR	GPS 开启或关闭
AT+CGPSRST	GPS 重启模式 (COLD /HOT/WARM)
AT+CGPSINF	获取当前 GPS 位置信息
AT+CGPSOUT	GPS NMEA 数据输出控制
AT+CGPSSTATUS	GPS 定位状态
AT+CGPSPWR	GPS 开启或关闭
AT+CGPSRST	GPS 重启模式 (COLD /HOT/WARM)

2.1. AT+CGPSPWR GPS开启或关闭

AT+CGPSPWR GPS开启或关闭	
测试命令 AT+CGPSPWR=?	响应 +CGPSPWR: (0,1)
	OK
读命令 AT+CGPSPWR?	参数 参考写命令
	响应 模块返回当前GPS 开启或关闭状态 +CGPSPWR: <mode>
写命令 AT+CGPSPWR=<mode>	OK
	或 ERROR
	参数
	<mode> <u>0</u> 关闭 GPS 1 打开 GPS

2.2. AT+CGPSRST GPS重启模式 (COLD /HOT/WARM)

AT+CGPSRST GPS重启模式 (COLD /HOT/WARM)	
测试命令 AT+CGPSRST=?	<p>响应</p> <p>+CGPSRST: (列举所支持的<mode>)</p> <p>OK</p> <p>参数</p> <p>参考写命令</p>
读命令 AT+CGPSRST?	<p>响应</p> <p>模块返回当前GPS重启模式</p> <p>+CGPSRST: <mode></p> <p>OK</p> <p>参数</p> <p>参考写命令</p>
写命令 AT+CGPSRST=<mode>	<p>响应</p> <p>GPS重启模式</p> <p>OK</p> <p>或</p> <p>ERROR</p> <p>参数</p> <p><mode></p> <p>0 COLD 启动模式;</p> <p>1 HOT 启动模式</p> <p>2 WARM 启动模式</p>
参考	<p>注意:</p> <p>第一次启动推荐冷启动模式。</p>

2.3. AT+CGPSINF 获取当前GPS位置信息

AT+CGPSINF 获取当前 GPS 位置信息	
测试命令 AT+CGPSINF=?	<p>响应</p> <p>+CGPSINF: (0,2,4,8,16,32,64,128)</p> <p>OK</p> <p>参数</p> <p>参考 写命令</p>
写命令 AT+CGPSINF=<mode>	<p>模块将返回当前成功定位的 GPS 位置信息。这个命令应该在 GPS 定位成功后执行。</p> <p>如果 <mode>等于 0,</p> <p>响应</p> <p>+CGPSINF:</p>

	<p><mode>,<longitude>,<latitude>,<altitude>,<UTC time>,<TTFF>,<num>,<speed>,<course ></p> <p>OK</p> <p>参数:</p> <p><longitude> longitude</p> <p><latitude> latitude</p> <p><altitude> altitude</p> <p><UTC time> UTC time</p> <p>The Format is yyyyymmddHHMMSS</p> <p><TTFF> time to first fix (in seconds)</p> <p><num> satellites in view for fix</p> <p><speed > speed over ground</p> <p><course> course over ground.</p> <p>else if mode =2¹, 参数 参考 附录 A.1 “\$GPGGA”^[1]</p> <p>else if mode =2², 参数 参考 附录 A.2 “\$GPGLL”^[1]</p> <p>else if mode =2³, 参数 参考 附录 A.3 “\$GPGSA”^[1]</p> <p>else if mode =2⁴, 参数 参考 附录 A.4“\$GPGSV”^{[1][2]}</p> <p>else if mode =2⁵, 参数 参考 附录 A.5 “\$GPRMC”^[1]</p> <p>else if mode =2⁶, 参数 参考 附录 A.6 “\$GPVTG”^[1]</p> <p>else if mode =2⁷, 参数 参考 附录 A.7 “\$GPZDA”^[1]</p>										
参考	<p>注意:</p> <p>[1]不包括 参数:“Message ID”, “Checksum” and “<CR><LF>”;</p> <p>[2] 包括 参数:</p> <table><tr><td>Satellites in View</td></tr><tr><td>Satellite ID</td></tr><tr><td>Elevation</td></tr><tr><td>Azimuth</td></tr><tr><td>SNR (C/N0)</td></tr><tr><td>....</td></tr><tr><td>Satellite ID</td></tr><tr><td>Elevation</td></tr><tr><td>Azimuth</td></tr><tr><td>SNR (C/N0)</td></tr></table>	Satellites in View	Satellite ID	Elevation	Azimuth	SNR (C/N0)	Satellite ID	Elevation	Azimuth	SNR (C/N0)
Satellites in View											
Satellite ID											
Elevation											
Azimuth											
SNR (C/N0)											
....											
Satellite ID											
Elevation											
Azimuth											
SNR (C/N0)											

2.4. AT+CGPSOUT GPS NMEA 数据输出控制

AT+CGPSOUT GPS NMEA数据输出控制

测试命令

AT+CGPSOUT=?

响应

+CGPSOUT: (0-255)

OK

	<p>参数</p> <p>参考 写命令</p>
<p>读命令</p> <p>AT+CGPSOUT?</p>	<p>响应</p> <p>+CGPSOUT: <mode></p> <p>OK</p> <p>参数</p> <p>参考 写命令</p>
<p>写命令</p> <p>AT+CGPSOUT=<mode></p>	<p>响应</p> <p>控制 GPS NMEA 数据从AT命令口输出</p> <p>OK</p> <p>或</p> <p>ERROR</p> <p>参数</p> <p><mode></p> <p>如果等于0, 关闭GPS NMEA 数据从AT命令口输出; 否则, 如果</p> <p>第1位=1, 使能NMEA \$GPGGA数据输出, 参考 附录 A.1^[1]</p> <p>第2位=1, 使能NMEA \$GPGLL数据输出, 参考 附录 A.2^[1]</p> <p>第3位=1, 使能NMEA \$GPGSA数据输出, 参考 附录 A.3^[1]</p> <p>第4位=1, 使能NMEA \$GPGSV数据输出, 参考 附录 A.4^[2]</p> <p>第5位=1, 使能NMEA \$GPRMC数据输出, 参考 附录 A.5^[1]</p> <p>第6位=1, 使能NMEA \$GPVTG数据输出, 参考 附录 A.6^[1]</p> <p>第7位=1, 使能NMEA \$GPZDA数据输出, 参考 附录 A.7^[1]</p> <p>成功设置后, NMEA 数据将从AT命令口输出, NMEA 格式参考 附录A。</p>
<p>参考</p>	<p>注意</p> <p>1、出厂设置是 "AT+CGPSOUT=0"。</p> <p>2、255 将允许所有 NMEA 数据从 AT 命令口输出。</p>

2.5. AT+ CGPSSTATUS GPS定位状态

AT+CGPSSTATUS GPS定位状态	
测试命令 AT+CGPSSTATUS=?	<p>响应 +CGPSSTATUS: (列举所支持的 <status>s)</p> <p>OK</p> <p>参数 参考 读命令</p>
读命令 AT+CGPSSTATUS?	<p>响应 +CGPSSTATUS: <status></p> <p>OK</p> <p>参数 <status> 是一个字符串 "Location Unknown": GPS没开启 "Location Not Fix": GPS已开启，但还没有定位成功 "Location 2D Fix": GPS状态 是 2D 定位成功 "Location 3D Fix": GPS状态 是 3D 定位成功</p>
参考	

3. CME 错误码概要

以下错误信息是与 GPS 操作相关的，格式如下：+CME ERROR: <err>，具体错误码与错误信息如下表：

错误码	错误信息
890	GPS not running
891	GPS is running
892	GPS is fixing

4. 示例

如下表格“语法”列中黑色文字是输入给模块的AT命令，蓝色文字是模块返回值。

语法	说明
AT+CGPSPWR=1 OK	开启 GPS
AT+CGPSSTATUS? +CGPSSTATUS: Location 3D Fix OK	查询 GPS 定位状态 已定位成功
AT+CGPSINF=0 +CGPSINF: 0,3113.317683,12121.244232,51.563730,011400 27022006.085,16,13,0.072580,0.000000 OK AT+ CGPSOUT=8 OK \$GPGSA,A,3,02,09,05,193,29,08,26,15,04,07,10 ,,1.62,0.95,1.31*3C \$GPGSA,A,3,02,09,05,193,29,08,26,15,04,07,10 ,,1.62,0.95,1.31*3C	查看 GPS 定位信息 从 AT 命令口输出 NMEA 数据
AT+CGPSRST=0 OK \$GPGSA,A,1,,,,,,,,,99.99,99.99,99.99*30 \$GPGSA,A,1,,,,,,,,,99.99,99.99,99.99*30 \$GPGSA,A,3,02,15,10,05,26,09,29,04,07,,,,1.27, 0.95,0.84*01	重启 GPS(冷启动)
AT+CGPSRST=1 OK \$GPGSA,A,1,,,,,,,,,99.99,99.99,1.00*01 \$GPGSA,A,3,193,02,05,26,29,15,10,09,04,08,07 ,,1.23,0.93,0.80*34	重启 GPS(热启动)
AT+CGPSPWR=0 OK	关闭 GPS

附录

A. NMEA格式

Message ID GGA: Global Positioning System Fixed Data

Table 1: Global Positioning System Fixed Data

Name	Example	Unit	Description
Message ID	\$GPGGA		GGA protocol header
UTC Time	2153.000		hhmmss.sss
Latitude	3342.6618		ddmm.mmmmmm
N/S Indicator	N		N=north or S=south
Longitude	11751.3858		dddmm.mmmmmm
E/W Indicator	W		E=east or W=west
Position Fix Indicator	1		
Satellites Used	10		Range 0 to 12
HDOP	1.2		Horizontal Dilution of Precision
MSL Altitude	27.0	meters	
Units	M	meters	
Geoid Separation	-34.2	meters	Geoid-to-ellipsoid separation. Ellipsoid altitude = MSL Altitude + Geoid Separation.
Units	M	meters	
Age of Diff. Corr.		sec	Null fields when DGPS is not used
Diff. Ref. Station ID	0000		
Checksum	*5E		
<CR><LF>			End of message termination

Table 2: Position Fix Indicator Value

Position Fix Indicator Value	Description
0	Fix not available or invalid
1	GPS SPS Mode, fix valid

Message ID GLL: Geographic Position - Latitude/Longitude

Table 3: Geographic Position - Latitude/Longitude

Name	Example	Unit	Description
Message ID	\$GPGLL		GLL protocol header
Latitude	3723.2475		ddmm.mmmmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.3416		dddmm.mmmmmm
E/W Indicator	W		E=east or W=west
UTC Time	161229.487		hhmmss.sss
Status	A		A=data valid or V=data not valid
Mode	A		A=Autonomous, D=DGPS, E=DR, N = Output Data Not Valid R = Coarse Positionx
Checksum	*41		
<CR><LF>			End of message termination

Note:

Position was calculated based on one or more of the SVs having their states derived from almanac parameters, as opposed to ephemerides.

Message ID GSA: GNSS DOP and Active Satellites

Table 4: GNSS DOP and Active Satellites

Message ID	\$GPGSA	GSA protocol header
Mode 1	A	See Table A-5
Mode 2	3	See Table A-6
Satellite used in solution.1	07	SV on Channel 1
Satellite Used1	02	SV on Channel 2
....	
Satellite Used1	12	SV on Channel 12
PDOP2	1.8	Position Dilution of Precision
HDOP2	1.0	Horizontal Dilution of Precision
VDOP2	1.5	Vertical Dilution of Precision
Checksum	*33	
<CR><LF>		End of message termination

Note:

1. *Satellite used in solution.*
2. *Maximum DOP value reported is 50. When 50 is reported, the actual DOP may be much larger.*

Table 5: Mode 1 Value

Mode 1 Value	Description
M	Manual – Forced to operate in 2D or 3D mode
A	2D Automatic – Allowed to automatically switch 2D/3D

Table 6: Mode 2 Value

Mode 2 Value	Description
1	Fix not available
2	2D Fix (<4 SVs used)
3	3D Fix (>3 SVs used)

Message ID GSV: GNSS Satellites in View

Table 7: GNSS Satellites in View

Name	Example	Unit	Description
Message ID	\$GPGSV		GSV protocol header
Number of Messages	2		Total number of GSV messages to be sent in this group
Message Number 1	1		Message number in this group of GSV messages
Satellites in View 1	07		
Satellite ID	07		Channel 1 (Range 1 to 32)
Elevation	79	degrees	Channel 1 (Maximum 90)
Azimuth	048	degrees	Channel 1 (True, Range 0 to 359)
SNR (C/N0)	42	dBHz	Range 0 to 99, null when not tracking
....		
Satellite ID	27		Channel 4 (Range 1 to 32)
Elevation	27	degrees	Channel 4 (Maximum 90)
Azimuth	138	degrees	Channel 4 (True, Range 0 to 359)
SNR (C/N0)	42	dBHz	Range 0 to 99, null when not tracking
Checksum	*71		
<CR><LF>			End of message termination

Note:

Depending on the number of satellites tracked, multiple messages of GSV data may be required. In some software versions, the maximum number of satellites reported as visible is limited to 12, even though more may be visible.1

Message ID RMC: Recommended Minimum Specific GNSS Data

Table 8: Recommended Minimum Specific GNSS Data

Name	Example	Unit	Description
Message ID	\$GPRMC		RMC protocol header
UTC Time	161229.5		hhmmss.sss
Status ¹	A		A=data valid or V=data not valid
Latitude	3723.248		ddmm.mmmmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.34		dddmm.mmmmmm
E/W Indicator	W		E=east or W=west
Speed Over Ground	0.13	knots	
Course Over Ground	309.62	degrees	TRUE
Date	120598		ddmmyy
Magnetic Variation ²		degrees	E=east or W=west
East/West Indicator ²	E		E=east
Mode	A		A=Autonomous, D=DGPS, E=DR, N = Output Data Not Valid R = Coarse Position
Checksum	*10		
<CR><LF>			End of message termination

Note:

1. A valid status is derived from all the parameters set in the software. This includes the minimum number of satellites required, any DOP mask setting, presence of DGPS corrections, etc. If the default or current software setting requires that a factor is met, then if that factor is not met the solution will be marked as invalid.
2. SiRF Technology Inc. does not support magnetic declination. All “course over ground” data are geodetic WGS84 directions relative to true North.
3. Position was calculated based on one or more of the SVs having their states derived from almanac parameters, as opposed to ephemerides.

Message ID VTG: Course Over Ground and Ground Speed

Table 9: Course Over Ground and Ground Speed

Name	Example	Unit	Description
Message ID	\$GPVTG		VTG protocol header
Course	309.62	degrees	Measured heading
Reference	T		TRUE
Course		degrees	Measured heading
Reference	M		Magnetic
Speed	0.13	knots	Measured horizontal speed
Units	N		Knots
Speed	0.2	km/hr	Measured horizontal speed
Units	K		Kilometers per hour
Mode	A		A=Autonomous, D=DGPS, E=DR, N = Output Data Not Valid R = Coarse Position
Checksum	*23		
<CR><LF>			End of message termination

Note:

All “course over ground” data are geodetic WGS-84 directions.

Message ID ZDA: Time & Date

Table 10: Time & Date

Name	Example	Unit	Description
Message ID	\$GPZDA		ZDA protocol header
UTC time	181813	hhmmss	The UTC time units are: hh = UTC hours from 00 to 23 mm = UTC minutes from 00 to 59 ss = UTC seconds from 00 to 59 Either using valid IONO/UTC or estimated from default leap seconds
Day	14		Day of the month, range 1 to 31
Month	10		Month of the year, range 1 to 12

Year	2003		1980 to 2079
Local zone hour		hour	Offset from UTC (set to 00)
Local zone minutes ¹		minute	Offset from UTC (set to 00)
Checksum	*4F		
<CR><LF>			End of message termination

Note:

Not supported, reported as 00.

B 相关文档

编号	文档名称	说明
[1]	SIM800 Series_AT Command Manual	

C 术语和缩写

缩写	说明

联系我们:

芯讯通无线科技（上海）有限公司

地址：上海市金钟路 633 号晨讯科技大楼 A 楼

邮编：200335

电话：+86 21 3252 3300

传真：+86 21 3252 3020

网址：www.sim.com/wm

SIMCOM CONFIDENTIAL FILE