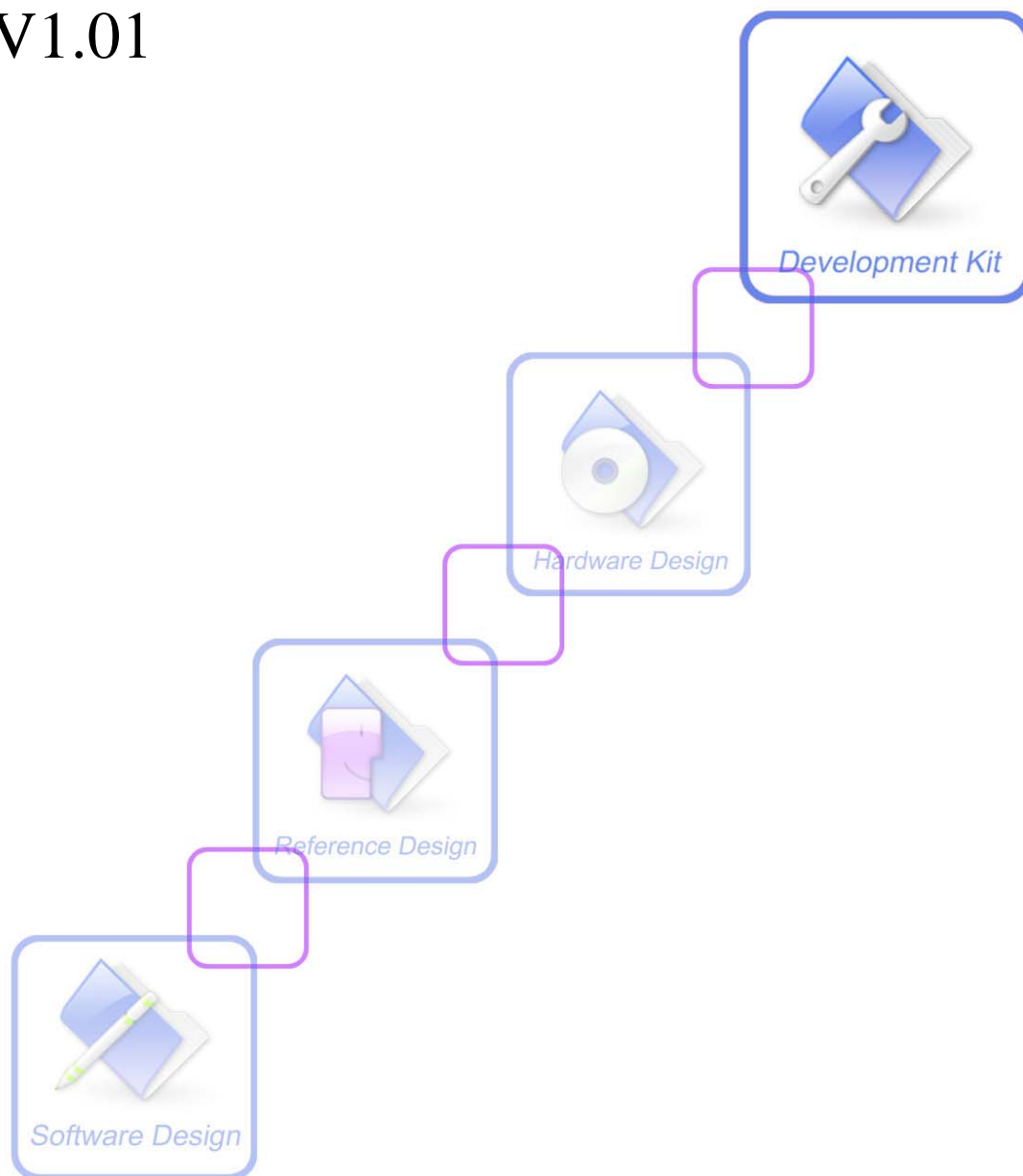




SIM928A GNSS Application Note

V1.01



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VERSION HISTORY

Date	Version	Description of change	Author
2014.04.17	1.00	Origin	
2014.09.17	1.01	Change description of AT+CGNSDBG	

SCOPE

This document describes how to use the GNSS function of SIM928A through AT commands. Examples are also given for reference.

This document is subject to change without notice at any time.

1 Introduction

1.1 Scope of the document

This document presents details of GNSS data development.

1.2 Related documents

SN	Document name	Remark
[1]	<i>SIM28 / 68R / 68V NMEA Specification</i>	<i>SIM28/68R/68V_NMEA Specification_V1.01</i>

1.3 Term abbreviation

Table 1-1: Term abbreviation

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

2 GNSS Application

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

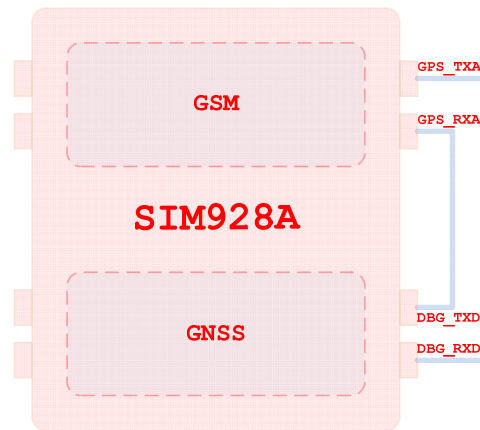


Figure 2-1: SIM928A System connection

The basic application contains the following AT commands:

Table 2-1: GNSS application related AT commands

Commands	Description
AT+CGNSDBG	Use GSM Debug Uart to communicate with GNSS part
AT+CGNSIPR	Baud rate setting of GSM Debug Uart
AT+CGNSSEQ	Define the last NMEA sentence that parsed
AT+CGNSINF	GNSS navigation information parsed from NMEA sentences
AT+CGNSURC	GNSS navigation,GEO-fence and speed alarm URC report control
AT+CGNSCMD	Command send to GNSS from GSM Debug UART
AT+CGNSTST	Send data received from Debug Uart to Main UART, this is a test command
AT+CGNSSAV	Save file that received from HTTP server.
AT+CGNSCHK	Check local AGPS data or firmware update files
AT+CGNSUPD	GNSS module firmware update
AT+CGNSDEL	Delete local AGPS data or firmware update files
AT+CGNSAID	Define AGPS method used
AT+CGNSSPI	Send GSM Debug Uart received data to GSM SPI interface
AT+CGNSSYN	Synchronize GSM time to GPS output UTC time
AT+CGNSVER	Get GNSS version information
AT+CGEOSET	Setting of GEO-fences (indicate as URC,or check status by AT+CGEOCHK)
AT+CGEOCHK	Check current GEO-fences status
AT+CSPDSET	Setting of Speed Alarm(indication as URC, or check status by AT+CGEOCHK)
AT+CSPDCHK	Check current speed status

2.1 AT+CGNSDBG Use GSM Debug Uart to communicate with GNSS part

AT+CGNSDBG Use GSM Debug Uart to communicate with GNSS part	
Test Command AT+CGNSDBG=?	Response +CGNSDBG: (0-1)
	OK
Read Command AT+CGNSDBG?	Parameter See Write Command
	Response TA returns the current value of GSM Debug Uart mode +CGNSDBG: <mode>
Write Command AT+CGNSDBG=<mode>	OK
	ERROR
	Parameter <mode> 0 Not Use GSM Debug Uart 1 Use GSM Debug Uart
	Note Factory setting is "AT+CGNSDBG=0 ".

2.2 AT+CGNSIPR Baud rate setting of GSM Debug Uart

AT+CGNSIPR Baud rate setting of GSM Debug Uart	
Test Command AT+CGNSIPR=?	Response +CGNSIPR: (4800,9600,19200,38400,57600,115200,230400,460800) OK
	Parameter See Write Command
Read Command AT+CGNSIPR?	Response +CGNSIPR: <rate> OK
	Parameter See Write Command.
Write Command AT+CGNSIPR=<rate>	Response This command determines the data rate of the TA on the NMEA output (Debug UART) serial interface. The new rate takes effect after response ok. OK
	Parameter <rate> Baud rate per second 4800 9600 19200 38400 57600 <u>115200</u> 230400 460800
Reference	Note Factory setting is "AT+CGNSIPR= <u>115200</u> ".

2.3 AT+CGNSSEQ Define the last NMEA sentence that parsed

AT+CGNSSEQ Define the last NMEA sentence that parsed	
Test Command AT+CGNSSEQ=?	Response +CGNSSEQ: "last sentence" OK
	Parameter See Write Command
Read Command AT+CGNSSEQ?	Response TA returns the current setting of last sentence parsed: +CGNSSEQ: <last sentence> OK
	Parameter See Write Command
Write Command AT+CGNSSEQ=<last sentence>	Response OK ERROR
	Parameters <last sentence> is a string type parameter: " GGA " refer to "GP GGA " or "GL GGA " or "GN GGA " " GLL " refer to "GP GLL " or "GL GLL " or "GN GLL " " GSA " refer to "GP GSA " or "GL GSA " or "GN GSA " " RMC " refer to "GP RMC " or "GL RMC " or "GN RMC " " VTG " refer to "GP VTG " or "GL VTG " or "GN VTG " " ZDA " refer to "GP ZDA " or "GL ZDA " or "GN ZDA " " GSV " refer to "GP GSV " or "GL GSV " or "GN GSV "
Reference	Note Factory setting is: AT+CGNSSEQ="RMC" .

Table 2-2: parsed NMEA message

Message	Description	Possible Talker Identifiers
GGA	Time, position and fix type data	GP
GLL	Latitude, longitude, UTC time of position fix and status	GP,GN
GSA	GNSS receiver operating mode, satellites used in the position solution, and DOP values	GP, GN
GSV	Number of GNSS satellites in view satellite ID numbers, elevation, azimuth, & SNR values	GP,GL,GN
RMC	Time, date, position, course and speed data	GP,GN
VTG	Course and speed information relative to the ground	GP
ZDA	PPS timing message (synchronized to PPS)	GP

Table 2-3: parsed GNSS navigation parameters

Parameters	Description
UTC Time	Parsed from "\$--RMC" NMEA sentence
fix status	Parsed from "\$--RMC" NMEA sentence
Latitude	Parsed from "\$--RMC" NMEA sentence
N/S Indicator	Parsed from "\$--RMC" NMEA sentence
Longitude	Parsed from "\$--RMC" NMEA sentence
E/W Indicator	Parsed from "\$--RMC" NMEA sentence
Speed Over Ground	Parsed from "\$--RMC" NMEA sentence
Course Over Ground	Parsed from "\$--RMC" NMEA sentence
Date	Parsed from "\$--RMC" NMEA sentence
Magnetic Variation	Reserved
East/West Indicator	Reserved
RMC mode	Parsed from "\$--GGA" NMEA sentence
HDOP	Parsed from "\$--GGA" NMEA sentence
MSL Altitude	Parsed from "\$--GGA" NMEA sentence
Units	Parsed from "\$--GGA" NMEA sentence
Geoid Separation	Reserved
Units	Reserved
Age of Diff. Corr.	Reserved
Diff. Ref. Station ID	Reserved
Satellites Used	Parsed from "\$--GGA" NMEA sentence
PDOP	Parsed from "\$--GGA" NMEA sentence
VDOP	Parsed from "\$--GGA" NMEA sentence
Satellites in View	Parsed from "\$--GSV" NMEA sentence
HPA	Reserved
VPA	Reserved

2.4 AT+CGNSINF GNSS navigation information parsed from NMEA sentences

AT+CGNSINF GNSS navigation information parsed from NMEA sentences	
Write Command AT+CGNSINF	<p>Response</p> <p>+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>,<GPS Satellites in View>,<GPS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA></p> <p>OK</p> <p>Parameter See below table.</p>
Reference	

Table 2-4: AT+CGNSINF return Parameters

Index	Parameter	Unit	Range	Length
1	GPS run status	--	0-1	1
2	Fix status	--	0-1	1
3	UTC date&Time	yyyyMMddh hmmss.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.ddd ddd	[-90.000000,90.000000]	10
5	Longitude	±ddd.ddd ddd	[-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	GPS Satellites in View	--	[0,99]	2
16	GNSS Satellites Used	--	[0,99]	2
17	GLONASS Satellites in View	--	[0,99]	2
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 part used.
2. Reserved.

2.5 AT+CGNSURC GNSS navigation, GEO-fences and speed alarm URC report

AT+CGNSURC GNSS navigation, GEO-fences and speed alarm URC report	
Test Command AT+CGNSURC=?	Response +CGNSURC: (0-255),(0-1),(0-1)
	OK
Read Command AT+CGNSURC?	Parameters See Write Command
	Response TA returns the current URC setting +CGNSURC: <Navigation mode>,<GEO mode>,<speed mode>
	OK
	Parameters See Write Command
	Unsolicited Result Code +UGNSINF: <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>,<Satellites in View>,<Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA>
Write Command AT+CGNSURC=<Navigation mode>,<GEO mode>,<speed mode>	Parameters <Navigation mode>: <u>0</u> turn off navigation data URC report 1 turn on navigation data URC report,and report every GNSS FIX 2 turn on navigation data URC report,and report every 2 GNSS FIX ... 255 turn on navigation data URC report,and report every 255 GNSS FIX <GEO mode>: <u>0</u> turn off GEO-fence cross URC report 1 turn on GEO-fence cross URC report <speed mode>: <u>0</u> turn off speed alarm URC report 1 turn on speed alarm URC report
Reference	Note 1. Factory setting is "AT+CGNSURC= <u>0</u> , <u>0</u> , <u>0</u> ". 2. URC "+UGNSINF:"parameters are the same as "+CGNSINF:" return.

2.6 AT+CGNSCMD Command send to GNSS from GSM Debug UART

AT+CGNSCMD Command send to GNSS from GSM Debug UART	
Test Command AT+CGNSCMD=?	Response +CGNSCMD: (0-1),"CmdString"
	OK
	Parameters See Write Command
Write Command AT+CGNSCMD=<cmdtype>,<CmdString>	Response If send ok: OK
	If send false ^[3] : ERROR
	Parameters < CmdType> 0: NMEA style command 1: HEX style command < CmdString > command string For example,if you want to send "\$PMTK000*32<CR><LF>" command to GNSS: You can use: AT+CGNSCMD=0,"\$PMTK000*32" Or: AT+CGNSCMD=1,"24504D544B3030302A33320D0A"
Reference	Note 1. See 《SIM28 / 68R / 68V NMEA Specification V1.01》 2. <CmdString> max length is 258. 3. Debug UART isn't open or occupied by GNSS(AT+CGNSDBG).

2.7 AT+CGNSTST Send data received from Debug Uart to Main UART

AT+CGNSTST Send data received from Debug Uart to Main UART	
Test Command AT+CGNSTST=?	Response +CGNSTST: (0-1) OK
	Parameters See Write Command
Read Command AT+CGNSTST?	Response GNSS test mode on/off +CGNSTST: <mode> OK
	Parameters See Write Command
Write Command AT+CGNSTST=<mode>	Parameters <mode> <u>0</u> : turn off GNSS test mode 1 : turn on GNSS test mode
Reference	Note

2.8 AT+CGNSSAV Save file that received from HTTP server

AT+CGNSSAV Save file that received from HTTP server	
Test Command AT+CGNSSAV=?	Response +CGNSSAV: (0-3) OK
	Parameters See Write Command
Read Command AT+CGNSSAV?	Response TA returns the current mode of file save +CGNSSAV: <mode> OK
	Parameters See Write Command
Write Command AT+CGNSSAV=<mode>	Parameters <mode> <u>0</u> : HTTP download file will not save as file 1 : save as "1.BIN", this file is used as firmware DA file 2 : save as "2.BIN", this file is used as firmware file. 3 : save as "3.BIN",this file is used as AGPS file.
Reference	Note

2.9 AT+CGNSCHK Check local AGPS data or firmware update files

AT+CGNSCHK Check local AGPS data or firmware update files	
Test Command AT+CGNSCHK=?	<p>Response</p> <p>+CGNSCHK: (1-3)</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>
Write Command AT+CGNSCHK=<file ID>	<p>Response</p> <p>TA returns the current status of files</p> <p>+CGNSCHK: <file ID>,<file exist>,<file size></p> <p>OK</p> <p>Parameters</p> <p><file ID></p> <p>1 "1.BIN"</p> <p>2 "2.BIN"</p> <p>3 "3.BIN"</p> <p><file exist></p> <p>0 file not exist</p> <p>1 file exist</p> <p><file size></p> <p>0 file size is zero</p> <p>other value file size large than zero</p>
Reference	Note

2.10 AT+CGNSUPD GNSS module firmware update

AT+CGNSUPD GNSS module firmware update	
Test Command AT+CGNSUPD=?	<p>Response</p> <p>+CGNSUPD: (0-1)</p> <p>OK</p>
Read Command AT+CGNSUPD?	<p>Response</p> <p>TA returns the last update firmware mode</p> <p>+CGNSUPD: <mode></p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>
Write Command AT+CGNSUPD=<mode>	<p>Response</p> <p>If send ok:</p> <p>OK</p> <p>If update is already in process,will return false:</p> <p>ERROR</p> <p>Parameters</p> <p><mode>:firmware update mode</p> <p>0: default</p> <p>1: reserved</p>
Reference	<p>Note</p> <p>1. The firmware update process will report as URC "+UGNSUPD:". </p> <p>2. URC Format: "+UGNSUPD:<status>,<percent>"</p> <p>Parameters</p> <p><status> firmware update status</p> <p>0: updating in process</p> <p>1: error appeared and stopped</p> <p><percent> firmware update percent(step is 5 percent)</p> <p>0,5,10,15...95,100</p>

2.11 AT+CGNSDEL Delete local AGPS data or firmware update files

AT+CGNSDEL Delete local AGPS data or firmware update files	
Test Command AT+CGNSDEL=?	Response +CGNSDEL: (1-3) OK
	Parameters See Write Command
Write Command AT+CGNSDEL=<file ID>	Response TA returns the current value of file save mode +CGNSCHK: <file ID>,<file exist>,<file size> OK
	Parameters <file ID> 1 "1.BIN" 2 "2.BIN" 3 "3.BIN" <file exist> 0 file not exist 1 file exist <file size> 0 file size is zero other value file size large than zero
Reference	Note

2.12 AT+CGNSAID Define AGPS method used

AT+CGNSAID Define AGPS method used	
Test Command AT+CGNSAID=?	Response +CGNSAID: (0-31)[,(0-1)[,(0-1)[,(0-720)]]] OK
Read Command AT+CGNSAID?	Response TA returns the current status of AGPS +CGNSAID: <mode>,<time aid>,<location aid>,<duration> OK
Write Command AT+CGNSAID=<mode>[,<time aid>,<location aid>,<duration>]	Response If send ok: OK If send false: ERROR
	Parameters <mode>:AGPS mode 0: not use EPO file 1-14: send <mode> specified days EPO data to GNSS 15~30: reserved 31: EPO Aid method <time aid>: time aid 0: not use time aid 1: use time aid <location aid>:location aid 0: not use location aid 1: use location aid <duration>: Range is from 0 to 720 minutes. In EPO aid mode, this parameter specifies the period to send EPO aid data to GNSS.
Reference	Note

2.13 AT+CGNSSPI Send GSM Debug Uart received data to GSM SPI interface

AT+CGNSSPI Send GSM Debug Uart received data to GSM SPI interface	
Test Command AT+CGNSSPI=?	Response +CGNSSPI: (0-2),(0-2),(0-8) OK
	Parameters See Write Command
Read Command AT+CGNSSPI?	Response TA returns the current config of SPI +CGNSSPI: <mode>,<cs num>,<speed> OK
	Parameters See Write Command

Write Command AT+CGNSSPI=<mode>,<cs num>,<speed>	Parameters																				
	<mode> SPI mode																				
	<u>0</u> : not use SPI Port to send NMEA sentence																				
	1: config SPI to 4 line mode ,and send NMEA sentence to SPI																				
	2: config SPI to 3 line mode ,and send NMEA sentence to SPI																				
	<cs num> : SPI chip select pin setting																				
	<table><tr><th>Value</th><th>PIN Name</th><th>Description</th></tr><tr><td><u>0</u></td><td>DCD</td><td>CS 0</td></tr><tr><td>1</td><td>SPI_CS</td><td>CS 1</td></tr><tr><td>2</td><td>--</td><td>CS 2</td></tr></table>	Value	PIN Name	Description	<u>0</u>	DCD	CS 0	1	SPI_CS	CS 1	2	--	CS 2								
	Value	PIN Name	Description																		
	<u>0</u>	DCD	CS 0																		
	1	SPI_CS	CS 1																		
2	--	CS 2																			
	<speed> : SPI clock setting																				
	<table><tr><th>Value</th><th>SPI speed (MHz)</th></tr><tr><td><u>0</u></td><td>26/512</td></tr><tr><td>1</td><td>26/256</td></tr><tr><td>2</td><td>26/128</td></tr><tr><td>3</td><td>26/64</td></tr><tr><td>4</td><td>26/32</td></tr><tr><td>5</td><td>26/16</td></tr><tr><td>6</td><td>26/8</td></tr><tr><td>7</td><td>26/4</td></tr><tr><td>8</td><td>26/2</td></tr></table>	Value	SPI speed (MHz)	<u>0</u>	26/512	1	26/256	2	26/128	3	26/64	4	26/32	5	26/16	6	26/8	7	26/4	8	26/2
	Value	SPI speed (MHz)																			
	<u>0</u>	26/512																			
	1	26/256																			
2	26/128																				
3	26/64																				
4	26/32																				
5	26/16																				
6	26/8																				
7	26/4																				
8	26/2																				
	Note:																				
	SPI speed=(26/512)* 2 ^(frequency level) Mhz																				
Reference	Note																				
	Factory setting is "AT+CGNSSPI=0,0,0".																				

2.14 AT+CGNSSYN Synchronize GSM time to GNSS output UTC time

AT+CGNSSYN Synchronize GSM time to GNSS output UTC time	
Test Command AT+ CGNSSYN=?	Response +CGNSSYN: (0-1) OK
	Parameters See Write Command
Read Command AT+ CGNSSYN?	Response TA returns the current setting of time Synchronization +CGNSSYN: <interval> OK
	Parameters See Write Command
Write Command AT+CGNSSYN=<interval>	Parameters <interval> 0 turn off time sync 1~1440 allow module time sync to GNSS output UTC time every <interval> specified minutes
Reference	Note

2.15 AT+CGNSVER Get GNSS version information

AT+CGEOCHK Get GNSS version information	
Read Command AT+CGNSVER	Response TA returns GNSS Version information +CGNSVER: <version> OK
	Parameter <version> GNSS version information ,for example: B03V20SIM968_11
Reference	Note 1. If GNSS is off,it will return the latest know version information.

2.16 AT+CGEOSET Setting of GEO-fences

AT+CGEOSET Setting of GEO-fences	
Test Command AT+ CGEOSET=?	<p>Response</p> <p>+CGNSSSET:<GEO ID>,<mode>,<shape>,<latitude0>,<longitude0>,<latitude1> <radius>,<longitude1>,<latitude2>,<longitude2>,<latitude3>,<longitude3>,<latitude4>,<longitude4></p> <p>OK</p> <p>Parameter</p> <p>See Write Command</p>
Read Command AT+ CGEOSET?	<p>Response</p> <p>TA returns the current settingg of GEO-fences</p> <p>+CGNSSSET: 0,<mode>,<shape>,<latitude0>,<longitude0>,<latitude1> <radius>,<longitude1>,<latitude2>,<longitude2>,<latitude3>,<longitude3>,<latitude4>,<longitude4></p> <p>+CGNSSSET: 1,<mode>,<shape>,<latitude0>,<longitude0>,<latitude1> <radius>,<longitude1>,<latitude2>,<longitude2>,<latitude3>,<longitude3>,<latitude4>,<longitude4></p> <p>2,<mode>,<shape>,<latitude0>,<longitude0>,<latitude1> <radius>,<longitude1>,<latitude2>,<longitude2>,<latitude3>,<longitude3>,<latitude4>,<longitude4></p> <p>3,<mode>,<shape>,<latitude0>,<longitude0>,<latitude1> <radius>,<longitude1>,<latitude2>,<longitude2>,<latitude3>,<longitude3>,<latitude4>,<longitude4></p> <p>4,<mode>,<shape>,<latitude0>,<longitude0>,<latitude1> <radius>,<longitude1>,<latitude2>,<longitude2>,<latitude3>,<longitude3>,<latitude4>,<longitude4></p> <p>OK</p> <p>Parameter</p> <p>See Write Command</p>
Write Command AT+ CGEOSET= <GEO ID n>,<mode>,<shape>,<latitude0>,<longitude0>,<latitude1> <radius>,<longitude1>,<latitude2>,<longitude2>,<latitude3>,<longitude3>,<latitude4>,<longitude4>	<p>Response</p> <p>OK</p> <p>ERROR</p> <p>Parameters</p> <p><GEO ID n> GEO-fence ID from 0 to 4.</p> <p><mode></p>

<p>itude2>,<latitude3>,<longitude3>,<latitude4>,<longitude4></p>	<p>0: Disable Geo-Fence. 1: Reports when enters the Geo-Fence. 2: Report when leaves the Geo-Fence. 3: Report when enters or leaves the Geo-Fence.</p> <p><shape> 1: Circularity with center and radius 2: Circularity with center and one point on the circle 3: Triangle 4: Quadrangle</p> <p><latitude0> The latitude of a point which is defined as the center of the Geo-Fence circular region or first point.</p> <p><longitude0> The longitude of a point which is defined as the center of the Geo-Fence circular region or first point.</p> <p><latitude1>\<radius> The radius of a circular or latitude of 2nd point.</p> <p><longitude1> The longitude of 2nd point.</p> <p><latitude2> The latitude of 3rd point.</p> <p><longitude2> The longitude of 3rd point.</p> <p><latitude3> The latitude of 4th point.</p> <p><longitude3> The longitude of 4th point.</p> <p><latitude4> The latitude of 5th point, this parameter is reserved.</p> <p><longitude4> The longitude of 5th point, this parameter is reserved.</p>
Reference	Note

2.17 AT+CGEOCHK Check current GEO-fences status

AT+CGEOCHK Check current GEO-fences status	
Read Command AT+CGEOCHK= <GEO ID>	<p>Response</p> <p>TA returns the specifies GEO fence status:</p> <p>+CGEOCHK: <GEO ID N^[1]>,<mode>,<shape>,<status>,<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>,<GPS Satellites in View>,<GPS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA></p> <p>OK</p> <p>Parameter</p> <p>See AT+CGNSINF</p>
Read Command AT+ CGEOCHK?	<p>Response</p> <p>TA returns the all GEO fences status:</p> <p>+CGEOCHK: 0,<mode>,<shape>,<status>,<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>,<GPS Satellites in View>,<GPS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA></p> <p>+CGEOCHK: 1,<mode>,<shape>,<status>,<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>,<GPS Satellites in View>,<GPS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA></p> <p>+CGEOCHK: 2,<mode>,<shape>,<status>,<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>,<GPS Satellites in View>,<GPS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA></p> <p>+CGEOCHK: 3,<mode>,<shape>,<status>,<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>,<GPS Satellites in View>,<GPS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA></p>

	<p> <GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA> +CGEOCHK: 4,<mode>,<shape>,<status>,<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>,<GPS Satellites in View>,<GPS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA> </p> <p>OK</p>
Reference	<p>Note</p> <ol style="list-style-type: none"> 1. N is from 0 to 4. 2. URC information is: <p> +UGEOIND: <GEO ID N^[1]</p>

2.18 AT+CSPDSET Setting of Speed Alarm

AT+ CSPDSET Setting of Speed Alarm	
Test Command AT+ CSPDSET=?	Response + CSPDSET: (0-1),(0-999.99) OK
	Parameters See Write Command
Read Command AT+ CSPDSET?	Response TA returns the current speed alarm config +CSPDSET: <mode>,<config speed> OK
	Parameters See Write Command
Write Command AT+CSPDSET=<mode>,< config speed>	Parameters <mode> 0: not actived 1 :actived < config speed> current speed,unit is km/hour <speed status> 0 : not acitved, 1: in , 2: speed is large than < config speed>
Reference	Note If the condition is met,An URC indication will send: +USPDIND: <mode>,<config speed>,<speed status>,<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>,<GPS Satellites in View>,<GPS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA>

2.19 AT+CSPDCHK Check current speed status

AT+CSPDCHK Check current speed status	
Read Command AT+ CSPDCHK?	<p>Response</p> <p>TA returns the current value of GNSS Power Control PIN</p> <p>+CSPDCHK: <mode>,<config speed>,<speed status>,<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>,<GPS Satellites in View>,<GPS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA></p> <p>OK</p> <p>Parameter</p> <p>The following parameters, please see AT+CGNSINF for reference:</p> <p><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>,<GPS Satellites in View>,<GPS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA></p>
Reference	Note

3 HTTP file download and save procedure

Example 1: EPO file download

Step	Description	AT commands or response
1	Contype config	AT+SAPBR=3,1, "Contype","GPRS"
2	APN config	AT+SAPBR=3,1,"APN","CMNET"
3	Active	AT+SAPBR=1,1
4	Save as AGPS file	AT+CGNSSAV=3
5	Init HTTP	AT+HTTPINIT
6	Set CID 1	AT+HTTPPARA="CID",1
7	Config HTTP server address	AT+HTTPPARA="URL","http://116.236.221.75:6766/MTK30.bin"
8	GET file	AT+HTTPACTION=0
9	HTTP URC indication	+HTTPACTION:0,200,276480
10	Not Save as file	AT+CGNSSAV=0

Example 2: GNSS firmware file download

Step	Description	AT commands or response
1	Contype config	AT+SAPBR=3,1, "Contype","GPRS"
2	APN config	AT+SAPBR=3,1,"APN","CMNET"
3	Active	AT+SAPBR=1,1
4	Save as AGPS file	AT+CGNSSAV=2
5	Init HTTP	AT+HTTPINIT
6	Set CID 1	AT+HTTPPARA="CID",1
7	Config HTTP server address	AT+HTTPPARA="URL","http://116.236.221.75:6766/B02V11SIM928A11.bin"
8	GET file	AT+HTTPACTION=0
9	HTTP URC indication	+HTTPACTION:0,200, 486144
10	Not Save as file	AT+CGNSSAV=0

4 GNSS module firmware update procedure

Step	Description	AT commands or response
1	GNSS module firmware update start	AT+CGNSUPD=0
2	firmware update process URC	+UGNSUPD:0,0 +UGNSUPD:0,5 +UGNSUPD:0,10 +UGNSUPD:0,15 +UGNSUPD:0,20 +UGNSUPD:0,25 +UGNSUPD:0,30 +UGNSUPD:0,35 +UGNSUPD:0,40 +UGNSUPD:0,45 +UGNSUPD:0,50 +UGNSUPD:0,55 +UGNSUPD:0,60 +UGNSUPD:0,65 +UGNSUPD:0,70 +UGNSUPD:0,75 +UGNSUPD:0,80 +UGNSUPD:0,85 +UGNSUPD:0,90 +UGNSUPD:0,95 +UGNSUPD:0,100
3	Check new GNSS version information	AT+CGNSVER
Reference	<p>Note</p> <p>1. The whole update process will take about 100 seconds.</p>	

Contact us:

Shanghai SIMCom Wireless Solutions Ltd.

Add: Building A, SIM Technology Building, No.633 Jinzhong Road, Changning District, Shanghai,
P. R. China 200335

Tel: +86 21 3252 3300

Fax: +86 21 3252 3020

URL: www.sim.com/wm