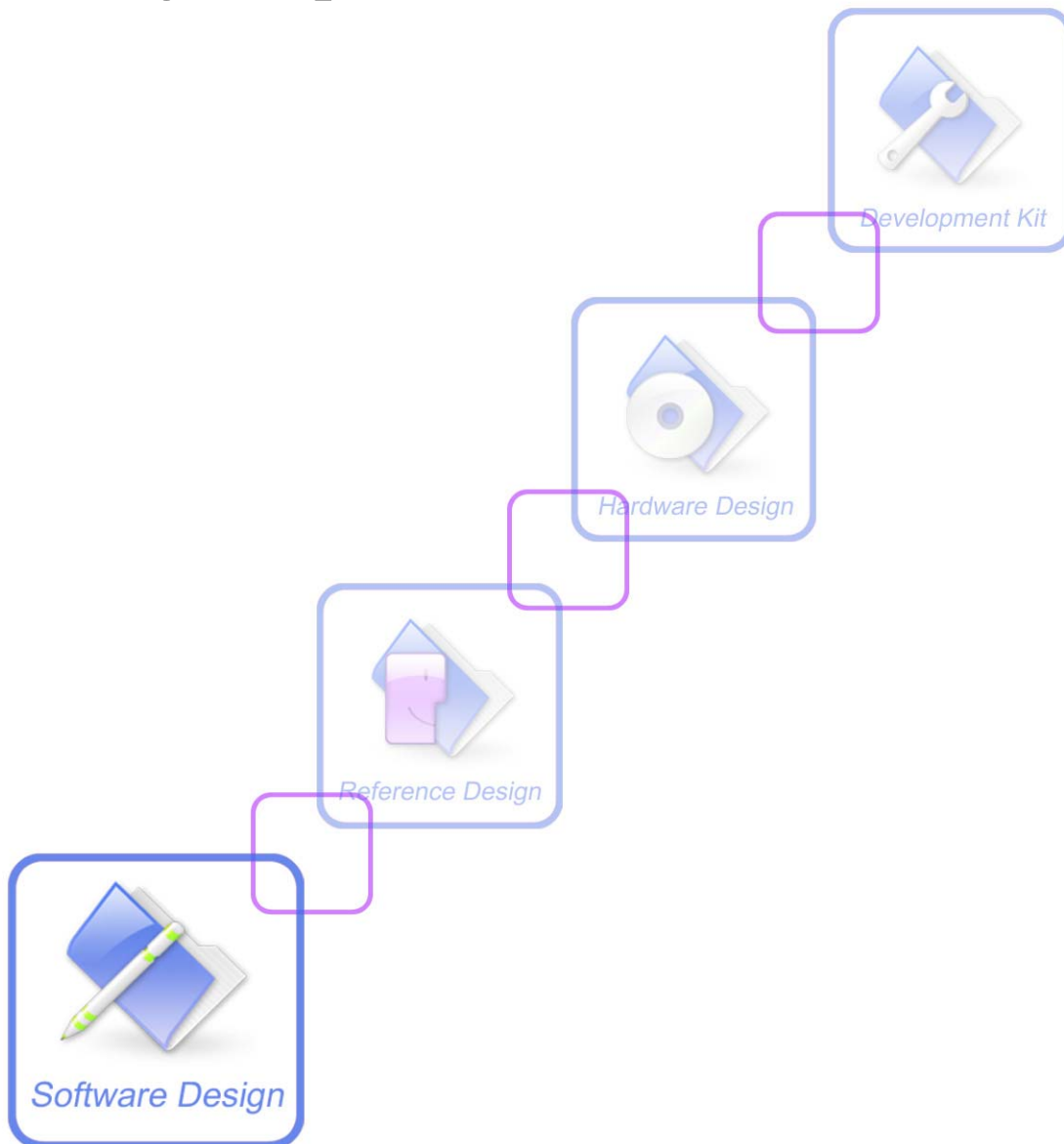




A company of SIM Tech

SIM18_NMEA

Messages_Specification_V1.00



Document Title	SIM18 NMEA Messages Specification
Version	1.00
Date	2011-2-9
Status	Release
Document Control ID	SIM18_NMEA Messages_Specification_V1.00

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Contents

Version History	5
Contents	3
1 Introduction	6
1.1 Scope of the document	6
1.2 Related documents	6
1.3 Term abbreviation	6
2 NMEA Messages	7
2.1 General Format of NMEA Messages	7
2.2 NMEA Output Messages	7
2.2.1 Message ID GGA: Global Positioning System Fixed Data	9
2.2.2 Message ID GLL: Geographic Position - Latitude/Longitude	10
2.2.3 Message ID GSA: GNSS DOP and Active Satellites	11
2.2.4 Message ID GSV: GNSS Satellites in View	12
2.2.5 Message ID RMC: Recommended Minimum Specific GNSS Data	13
2.2.6 Message ID VTG: Course Over Ground and Ground Speed	14
2.2.7 Message ID ZDA: Time & Date	15
2.2.8 Message ID 154: Extended Ephemeris ACK	16
2.2.9 Message ID 160: Watchdog Timeout and Exception Condition	17
2.3 NMEA Input Messages	18
2.3.1 Message ID 100: Set Serial Port	19
2.3.2 Message ID 101: Navigation Initialization	20
2.3.3 Message ID 103: Query/Rate Control	21
2.3.4 Message ID 104: LLA Navigation Initialization	22
2.3.5 Message ID 105: Development Data On/Off	23
2.3.6 Message ID 106: Select Datum	24
2.3.7 Message ID 107: Proprietary	25
2.3.8 Message ID 108: Proprietary	25
2.3.9 Message ID 110: Extended Ephemeris Debug	25
2.3.10 Message ID 117: System Turn Off	26
2.3.11 Message ID 120: Storage Configuration Setting	27

Table Index

TABLE 1-1: TERM ABBREVIATION	6
TABLE 2-1: NMEA OUTPUT/INPUT MESSAGE PARAMETERS	7
TABLE 2-2: SIM18 FREQUENTLY USED NMEA OUTPUT MESSAGES	7
TABLE 2-3: GGA DATA FORMAT	9
TABLE 2-4: POSITION FIX INDICATOR	9
TABLE 2-5: GLL DATA FORMAT	10
TABLE 2-6: GSA DATA FORMAT	11
TABLE 2-7: MODE 1	11
TABLE 2-8: MODE 2	11
TABLE 2-9: GSV DATA FORMAT	12
TABLE 2-10: RMC DATA FORMAT	13
TABLE 2-11: VTG DATA FORMAT	14
TABLE 2-12: ZDA DATA FORMAT	15
TABLE 2-13: EXTENDED EPHEMERIS ACK	16
TABLE 2-14: WATCHDOG AND EXCEPTION CONDITION NOTIFICATION	17
TABLE 2-15: SIM18 FREQUENTLY USED NMEA INPUT MESSAGES	18
TABLE 2-16: SET SERIAL PORT DATA FORMAT	19
TABLE 2-17: NAVIGATION INITIALIZATION DATA FORMAT	20
TABLE 2-18: RESET MODE VALUE	20
TABLE 2-19: QUERY/RATE CONTROL DATA FORMAT	21
TABLE 2-20: MESSAGES	21
TABLE 2-21: LLA NAVIGATION INITIALIZATION DATA FORMAT	22
TABLE 2-22: RESET MODE VALUE	22
TABLE 2-23: DEVELOPMENT DATA ON/OFF DATA FORMAT	23
TABLE 2-24: SELECT DATUM DATA FORMAT	24
TABLE 2-25: PROPRIETARY	25
TABLE 2-26: PROPRIETARY	25
TABLE 2-27: EXTENDED EPHEMERIS DEBUG	25
TABLE 2-28: SYSTEM TURN OFF	26
TABLE 2-29: STORAGE CONFIGURATION OPTION SETTINGS FORMAT	27

Version History

Date	Version	Description of change	Author
2011-2-9	1.00	Origin	

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1 Introduction

1.1 Scope of the document

This document presents details of the frequently used NMEA messages supported by SIMCom SIM18 GPS module, does not provide information about the complete NMEA-0183, user can refer to the related documents for more information.

1.2 Related documents

- (1). NMEA-0183 Standard For Interfacing Marine Electronic Devices
- (2). SiRF NMEA Reference Manual

1.3 Term abbreviation

Table 1-1: Term abbreviation

Term	Definition
1PPS	1 pulse per second
ABP	Almanac Based Position
ACK	ACKnowledge
DGPS	Differential Global Positioning System
NMEA	National Marine Electronics Association
OSP	One Socket Protocol
SBAS	Satellite Based Augmentation System
SDK	Software Development Kit
SRAM	Static Random Access Memory
SW	Software
SVs	Satellites
PDOP	Position Dilution of Precision
HDOP	Horizontal Dilution of Precision
VDOP	Vertical Dilution of Precision

2 NMEA Messages

2.1 General Format of NMEA Messages

NMEA messages use the ASCII character set and have a defined format. Each message begins with a \$ (hex 0x24) and end with a carriage return and line feed (hex 0x0D 0x0A, represented as <CR><LF>). Each message consists of one or more fields of ASCII letters and numbers, separated by commas. After the last field, and before the <CR><LF> is a checksum consisting of an asterisk (*, hex 0x2A) followed by two ASCII characters representing the hexadecimal value of the checksum. The checksum is computed as the exclusive OR of all characters between the \$ and * characters.

Table 2-1 illustrates the NMEA output/input message parameters.

Table 2-1: NMEA output/input message parameters

Parameter	Example	Contents
Start	\$GPGGA \$PSRF<MID>	Message Identifier. Input messages begin at MID 100.
Sequence	Data	Message specific data. Refer to a specific message section for <data>...<data> definition.
Checksum	*CKSUM	CKSUM is a two-hex ASCII character. Checksums is required in all input messages.
Payload	<CR> <LF>	Each message is terminated using Carriage Return (CR) Line Feed (LF) which are \r\n. Because \r\n are not printable ASCII characters, they are omitted from the example strings, but must be sent to terminate the message and cause the receiver to process that input message.

Note:

- (1). All fields in all proprietary NMEA messages are required, none are optional and are comma delimited.
- (2). In some numeric fields representing a single data element, leading zeros before a decimal are suppressed. A single "0" character preceding the decimal point is maintained. In compound numeric structures (such as LAT or LONG), leading zeros are suppressed only on the leftmost element. Trailing zeros are not suppressed.

2.2 NMEA Output Messages

Table 2-2: SIM18 Frequently Used NMEA Output Messages

Message	Description
---------	-------------

GGA	Time, position and fix type data
GLL	Latitude, longitude, UTC time of position fix and status
GSA	GPS receiver operating mode, satellites used in the position solution, and DOP values
GSV	Number of GPS satellites in view satellite ID numbers, elevation, azimuth, & SNR values
RMC	Time, date, position, course and speed data
VTG	Course and speed information relative to the ground
ZDA	PPS timing message (synchronized to PPS)
154	Extended Ephemeris ACK
160	Watchdog Timeout and Exception Condition

A full description of the listed NMEA messages is provided in the following sections.

2.2.1 Message ID GGA: Global Positioning System Fixed Data

Table 2-3 contains the values for the following example:

```
$GPGGA,091926.000,3113.3166,N,12121.2682,E,1,09,0.9,36.9,M,7.9,M,,0000*56<CR><LF>
```

Table 2-3: GGA Data Format

Name	Example	Unit	Description
Message ID	\$GPGGA		GGA protocol header
UTC Time	091926.000		hhmmss.sss
Latitude	3113.3166		ddmm.mmmmm
N/S Indicator	N		N=north or S=south
Longitude	12121.2682		dddmm.mmmmm
E/W Indicator	E		E=east or W=west
Position Fix Indicator	1		See Table 2-4
Satellites Used	09		Range 0 to 12
HDOP	0.9		Horizontal Dilution of Precision
MSL Altitude	36.9	meters	
Units	M	meters	
Geoid Separation	7.9	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	*56		
<CR><LF>			End of message termination

Table 2-4: Position Fix Indicator

Value	Description
0	Fix not available or invalid
1	GPS SPS Mode, fix valid
2	Differential GPS, SPS Mode, fix valid
3-5	Not supported
6	Dead Reckoning Mode, fix valid

Note: 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.

2.2.2 Message ID GLL: Geographic Position - Latitude/Longitude

Table 2-5 contains the values for the following example:

\$GPGLL,3113.3157,N,12121.2684,E,094051.000,A,A*59<CR><LF>

Table 2-5: GLL Data Format

Name	Example	Unit	Description
Message ID	\$GPGLL		GLL protocol header
Latitude	3113. 3157		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12121. 2684		dddmm.mmmm
E/W Indicator	E		E=east or W=west
UTC Time	094051. 000		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 Position 1
Checksum	*59		
<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.

2.2.3 Message ID GSA: GNSS DOP and Active Satellites

Table 2-6 contains the values for the following example:

\$GPGSA,A,3,07,02,26,27,09,04,15, , , , ,1.8,1.0,1.5*33<CR><LF>

Table 2-6: GSA Data Format

Name	Example	Unit	Description
Message ID	\$GPGSA		GSA protocol header
Mode 1	A		See Table 2-7
Mode 2	3		See Table 2-8
Satellite Used ^[1]	07		SV on Channel 1
Satellite Used ^[1]	02		SV on Channel 2
....		
Satellite Used ^[1]			SV on Channel 12
PDOP ^[2]	1.8		Position Dilution of Precision
HDOP ^[2]	1.0		Horizontal Dilution of Precision
VDOP ^[2]	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 value 50 is reported, the actual DOP may be much larger.

Table 2-7: Mode 1

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

Table 2-8: Mode 2

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

2.2.4 Message ID GSV: GNSS Satellites in View

Table 2-9 contains the values for the following example:

```
$GPGSV,3,1,11,26,68,023,37,15,64,251,33,05,45,058,34,29,33,253,33*75<CR><LF>
```

```
$GPGSV,3,2,11,27,32,164,30,21,25,315,29,02,24,140,31,08,19,048,29*70<CR><LF>
```

```
$GPGSV,3,3,11,09,16,180,25,18,08,284,27,10,08,085,18*4E<CR><LF>
```

Table 2-9: GSV Data Format

Name	Example	Unit	Description
Message ID	\$GPGSV		GSV protocol header
Number of Messages ^[1]	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]	11		
Satellite ID	26		Channel 1 (Range 1 to 32)
Elevation	68	degrees	Channel 1 (Maximum 90)
Azimuth	023	degrees	Channel 1 (True, Range 0 to 359)
SNR (C/N0)	37	dBHz	Range 0 to 99, null when not tracking
....		
Satellite ID	29		Channel 4 (Range 1 to 32)
Elevation	33	degrees	Channel 4 (Maximum 90)
Azimuth	253	degrees	Channel 4 (True, Range 0 to 359)
SNR (C/N0)	33	dBHz	Range 0 to 99, null when not tracking
Checksum	*75		
<CR><LF>			End of message termination

Note:

^[1] 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.

2.2.5 Message ID RMC: Recommended Minimum Specific GNSS Data

Table 2-10 contains the values for the following example:

```
$GPRMC,094330.000,A,3113.3156,N,12121.2686,E,0.51,193.93,171210,,,A*68<CR><LF>
```

Table 2-10: RMC Data Format

Name	Example	Unit	Description
Message ID	\$GPRMC		RMC protocol header
UTC Time	094330.000		hhmmss.sss
Status ^[1]	A		A=data valid or V=data not valid
Latitude	3113.3156		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12121.2686		dddmm.mmmm
E/W Indicator	E		E=east or W=west
Speed Over Ground	0.51	knots	
Course Over Ground	193.93	degrees	True
Date	171210		ddmmyy
Magnetic Variation ^[2]		degrees	E=east or W=west
East/West Indicator ^[2]			E=east
Mode	A		A=Autonomous, D=DGPS, E=DR, N = Output Data Not Valid R = Coarse Position ^[3]
Checksum	*68		
<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.

2.2.6 Message ID VTG: Course Over Ground and Ground Speed

Table 2-11 contains the values for the following example:

\$GPVTG,83.37,T,,M,0.00,N,0.0,K,A*32<CR><LF>

Table 2-11: VTG Data Format

Name	Example	Unit	Description
Message ID	\$GPVTG		VTG protocol header
Course	83.37	degrees	Measured heading
Reference	T		True
Course		degrees	Measured heading
Reference	M		Magnetic ^[1]
Speed	0.00	knots	Measured horizontal speed
Units	N		Knots
Speed	0.0	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 ^[2]
Checksum	*32		
<CR><LF>			End of message termination

Note:

^[1]SiRF Technology Inc. does not support magnetic declination. All “course over ground” data are geodetic WGS84 directions.

^[2]Position was calculated based on one or more of the SVs having their states derived from almanac parameters, as opposed to ephemerides.

2.2.7 Message ID ZDA: Time & Date

This message is included only with systems which support a time-mark output pulse identified as “1PPS”. Outputs the time associated with the current 1PPS pulse. Each message is output within a few hundred ms after the 1PPS pulse is output and tells the time of the pulse that just occurred.

Table 2-12 contains the values for the following example:

```
$GPZDA,091926.000,17,12,2010,*,*55<CR><LF>
```

Table 2-12: ZDA Data Format

Name	Example	Unit	Description
Message ID	\$GPZDA		ZDA protocol header
UTC time	091926.000	Hhmmss.sss	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 .sss= UTC micro seconds Either using valid IONO/UTC or estimated from default leap seconds
Day	17		Day of the month, range 1 to 31
Month	12		Month of the year, range 1 to 12
Year	2010		1980 to 2079
Local zone hour ^[1]		hour	Offset from UTC
Local zone minutes ^[1]		minute	Offset from UTC
Checksums	*55		
<CR><LF>			End of message termination

Note:

^[1]Not supported by SiRF.

2.2.8 Message ID 154: Extended Ephemeris ACK

The SiRFInstantFix software uses Message ID 154 to acknowledge NMEA input messages 107, 108 or 110. See chapter 2.3.7 , chapter 2.3.8 and chapter 2.3.9 for detail.

Table 2-13 contains the values for the following example:

\$PSRF154,110*3B<CR><LF>

Table 2-13: Extended Ephemeris ACK

Name	Example	Unit	Description
Message ID	\$PSRF154		PSRF154 protocol header
ACK ID	110	N/A	Message ID of the message to ACK (107, 108, 110)
Checksum	*3B		
<CR> <LF>			End of message termination

2.2.9 Message ID 160: Watchdog Timeout and Exception Condition

This message notifies a PVT product host of a watchdog timeout or processor exception in the receiver. The consistent accumulation of these notification messages by the host can produce statistics for:

- Reliability measurement and analysis
- For troubleshooting purposes

For SIM18, it has the critical purpose of enabling the host to determine the need for reloading the patch RAM. The watchdog event and some exception events are indications of potential corruption in the patch RAM. This message enables the host to initiate the patch download protocol.

Typically, upon receipt of this message, the host requests to switch the receiver into binary OSP messaging mode. Already in OSP messaging mode, the host polls the software version of the receiver, and the response contains the actual patch status of the receiver. The host then compares this status with the last applied patch according to the patch maintenance value stored in the host. If the software version response does not indicate the up-to-date patch status, the host initiates the reload of the required patch according to the latest patch maintenance value stored in the host. After completing the patch procedure using the binary OSP messages, the host switches back to NMEA mode for normal operation to continue.

Table 2-14 contains the values for the following example:

\$PSRF160,W,1,0*5A<CR><LF>

Table 2-14: Watchdog and Exception Condition Notification

Name	Example	Unit	Description
Message ID	\$PSRF160		PSRF160 protocol header
Event condition	W		W: Watchdog time-out event E: Reserved: Exception condition event
Patch RAM corruption	1		0: Intact, not corrupted 1: Corrupted, need to restore
Exception code	0		Hexadecimal value of the processor exception code register (0 if event 'W')
Checksum	*5A		
<CR><LF>			End of message termination

2.3 NMEA Input Messages

This section describes the NMEA input messages, which can be input into SIM18 by the host over SIM18 host interface.

Table 2-15: SIM18 Frequently Used NMEA Input Messages

Message	Description
100	SetSerialPort: Set Port parameters and protocols
101	NavInit: Parameters required to start using X/Y/Z ^[1] .
103	Query NMEA Message and/or set output rate
104	LLANavInit: Parameters to Start Using Lat/Long/Alt ^[2]
105	DevDataOn/Off: Development Data Messages On/Off
106	Selection of Datum for Coordinate Transformation
107	Extended ephemeris proprietary message
108	Extended ephemeris proprietary message
110	Extended ephemeris debug
117	System Turn Off
120	Storage Configuration Setting

Note

^[1] Input coordinates must be WGS84.

NMEA input messages 100 to 200 are SiRF proprietary NMEA messages.

A full description of the listed NMEA messages is provided in the following sections.

2.3.1 Message ID 100: Set Serial Port

This command message is used to set the protocol (OSP or NMEA) and/or the communication parameters (Baud rate, data bits, stop bits, and parity).

When a valid message is received, the parameters are stored in battery-backed SRAM and the receiver resumes, after a reset, using the saved parameters.

Table 2-16 contains the input values for the following example:

Switch to OSP protocol at 9600,8,N,1

\$PSRF100,1,19200,8,1,0*38<CR><LF>

Table 2-16: Set Serial Port Data Format

Name	Example	Unit	Description
Message ID	\$PSRF100		PSRF100 protocol header
Protocol	1		0=OSP 1=NMEA
Baud	19200		1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200
DataBits	8		8 only
StopBits	1		1 only
Parity	0		0=None only
Checksum	*38		
<CR> <LF>			End of message termination

Note

- For SIM18, operation at speeds below 38400 carries risk of dropped messages when using SGEE.
- For SIM18, operation at speeds below 19200 carries risk of dropped messages in OSP mode.

2.3.2 Message ID 101: Navigation Initialization

This command restarts the receiver, and specifies the type of restart. Optionally, it may also initialize position (in X, Y, Z ECEF coordinates), clock drift, GPS Time Of Week and GPS Week Number. This enables the receiver to search for the correct satellite signals at the correct signal parameters. Correct initialization parameters enable the receiver to quickly acquire signals. Table 2-17 contains the input values for the following example:

Start using known position and time.

```
$PSRF101,-2686700,-4304200,3851624,96000,497260,921,12,3*2F<CR><LF>
```

Table 2-17: Navigation Initialization Data Format

Name	Example	Unit	Description
Message ID	\$PSRF101		PSRF101 protocol header
ECEF X	-2686700	meters	X coordinate position
ECEF Y	-4304200	meters	Y coordinate position
ECEF Z	3851624	meters	Z coordinate position
ClkDrift	96000	Hz	Clock Drift of the Receiver ^[1]
TimeOfWeek	497260	sec	GPS Time Of Week
WeekNo	921		GPS Week Number
ChannelCount	12		Range 1 to 12
ResetCfg	3		See Table of Reset Mode Value
Checksum	*2F		
<CR><LF>			End of message termination

Note

^[1] Use 0 for last saved value if available. If this is unavailable, a default value of 96250 is used.

Table 2-18: Reset Mode Value

Value	Description
1	Hot start
2	Warm start (no init)
3	Warm start (with init)
4	Cold start
8	Factory start

2.3.3 Message ID 103: Query/Rate Control

This command is used to control the output of only standard NMEA messages GGA, GLL, GSA, GSV, RMC, and VTG. It also controls the ZDA message in software that supports it. Using this command message, standard NMEA messages may be polled once, or setup for periodic output. Checksums may also be enabled or disabled depending on the needs of the receiving program. NMEA message settings are saved in battery-backed memory for each entry when the message is accepted. Table 2-19 contains the input values for the following example:

Query the GGA message with checksum enabled

```
$PSRF103,08,00,1,01*1D<CR><LF>
```

Table 2-19: Query/Rate Control Data Format

Name	Example	Unit	Description
Message ID	\$PSRF103		PSRF103 protocol header
Msg	08		Message to control. See Table 2-20. ^[1]
Mode	00		0 = Set Rate 1 = Query one time 2 = ABP On 3 = ABP Off
Rate	1	sec	Output Rate, 0 = Off 1–255 = seconds between messages ^[2]
CksumEnable	01		0=Disable Checksum 1=Enable Checksum
Checksum	*1D		
<CR><LF>			End of message termination

Note

^[1]The Msg field is ignored if the Mode field has values of 2 or 3 (ABP On/Off).

^[2]The Rate field is ignored unless the Mode field is set to 0 (Set Rate).

Table 2-20: Messages

Value	Description
0	GGA
1	GLL
2	GSA
3	GSV
4	RMC
5	VTG
8	ZDA (if 1PPS output is supported)

Note

In TricklePower mode, the update rate specifies TricklePower cycles rather than seconds. If the TP cycle is set at 5 seconds, then an update rate of 2 means to output the message every 2 cycles, or 10 seconds.

2.3.4 Message ID 104: LLA Navigation Initialization

This command is used to cause a restart of the receiver, and to specify the type of restart. Optionally, it may also initialize position (in latitude, longitude, and altitude), clock drift, GPS Time Of Week and GPS Week Number. This enables the receiver to search for the correct satellite signals at the correct signal parameters. Correct initialization parameters enable the receiver to quickly acquire signals.

Table 2–21 contains the input values for the following example:

Start using known position and time.

```
$PSRF104,37.3875111,-121.97232,0,96000,237759,1946,12,1*06<CR><LF>
```

Table 2-21: LLA Navigation Initialization Data Format

Name	Example	Unit	Description
Message ID	\$PSRF104		PSRF104 protocol header
Lat	37.3875111	degrees	Latitude + = North (Range 90 to -90)
Lon	-121.97232	degrees	Longitude + = East (Range 180 to -180)
Alt	0	meters	Altitude position
ClkDrift	96000	Hz	Clock Drift of the Receiver ^[1]
TimeOfWeek	237759	sec	GPS Time Of Week
WeekNo	1946		Extended GPS Week Number
ChannelCount	12		Range 1 to 12
ResetCfg	1		See Table 2-11
Checksum	*06		
<CR><LF>			End of message termination

Note

^[1]Use 0 for last saved value if available. If this is unavailable, a default value of 96,250 Hz is used.

Table 2-22: Reset Mode Value

Value	Description
1	Hot start
2	Warm start (no init)
3	Warm start (with init)
4	Cold start
8	Factory start

2.3.5 Message ID 105: Development Data On/Off

This command turns development data (debug messages) on and off. Development data can be used to help diagnose system problems since many parts of the software contain messages that are output when problems are detected. \$PSRF105,1*3E<CR><LF>

Table 2-23 contains the input values for the following example:

\$PSRF105,1*3E<CR><LF>

Table 2-23: Development Data On/Off Data Format

Name	Example	Unit	Description
Message ID	\$PSRF105		PSRF105 protocol header
Debug	1		0=Off 1=On
Checksum	*3E		
<CR><LF>			End of message termination

2.3.6 Message ID 106: Select Datum

This message allows the selection of an alternate map datum. The receiver software may contain one or more alternate datums in addition to WGS84, the default GPS datum. The table below lists some datums that may be in a particular software build. In addition, other datums may have been added by either SiRF or by developers with SDK software access. Available datums, if different from the list below, should be documented in the system or software documentation. \$PSRF106,178*32<CR><LF>

Table 2-24 contains the input values for the following examples:

1. Datum select TOKYO_MEAN

\$PSRF106,178*32<CR><LF>

Table 2-24: Select Datum Data Format

Name	Example	Unit	Description
Message ID	\$PSRF106		PSRF106 protocol header
Datum	178		21=WGS84 178=TOKYO_MEAN 179=TOKYO_JAPAN 180=TOKYO_KOREA 181=TOKYO_OKINAWA
Checksum	*32		
<CR><LF>			End of message termination

2.3.7 Message ID 107: Proprietary

This message is reserved for SiRFInstantFix usage only. The content of this message is proprietary. message parameter definitions.

Table 2-25 contains the message parameter definitions.

Table 2-25: Proprietary

Name	Example	Unit	Description
Message ID	\$PSRF107		PSRF107 protocol header
Extended Ephemeris			Proprietary message
Checksum			
<CR><LF>			End of message termination

2.3.8 Message ID 108: Proprietary

This message is reserved for SiRFInstantFix usage only. The content of this message is proprietary.

Table 2-26 contains the message parameter definitions.

Table 2-26: Proprietary

Name	Example	Unit	Description
Message ID	\$PSRF108		PSRF108 protocol header
Extended Ephemeris			Proprietary message
Checksum			
<CR><LF>			End of message termination

2.3.9 Message ID 110: Extended Ephemeris Debug

This message allows control of a SiRFInstantFix debug flag. Turning on the flag forces the receiver to ignore broadcast ephemeris from the satellites and only use SiRFInstantFix ephemeris for navigation. Table 2-27 contains the message parameter definitions.

Table 2-27: Extended Ephemeris Debug

Name	Example	Unit	Description
Message ID	\$PSRF110		PSRF110 protocol header
DEBUG_FLAG	0x01000000		0x01000000 = Debug flag on, ignore broadcast ephemeris 0x00000000 = Debug flag off, normal operation
Checksum			
<CR><LF>			End of message termination

2.3.10 Message ID 117: System Turn Off

This message requests that the GPS receiver perform an orderly shutdown and switch to hibernate mode.

Table 2-29 contains the values for the following example:

\$PSRF117,16*0B<CR><LF>

Table 2-28: System Turn Off

Name	Example	Unit	Description
Message ID	\$PSRF117		Message ID
Sub ID	0x10(Decimal: 16)		0x10: System turn off
Checksum	*0B		
<CR><LF>			End of message termination

Note

MID is valid after “SW Version: GSD4e_1.0.0-P1_RPATCH.02-08/05/2010 217 GSD4e”.

MID117 is invalid for “SW Version: GSD4e_1.0.0-P1 12/18/2009 352 GSD4e”.

2.3.11 Message ID 120: Storage Configuration Setting

This message sets storage configuration options to determine on which storage media the different types of system data will be physically stored.

Table 2-29 contains the input values for the following example:

1. Store patches on I2Cserial flash and extended ephemeris data on I2C EEROM.

\$PSRF120,F,R,*<checksum><CR><LF>

Table 2-29: Storage Configuration Option Settings Format

Name	Example	Unit	Description
Message ID	\$PSRF120		Message ID
Patch Storage Setting	F		<p>“N” = Do not store to I2C serial flash (default)</p> <p>“F” = Store to I2C serial flash</p> <p>“0” = No change applied to patch</p>
	R		<p>“H” = Storage available on host</p> <p>“R” = I2C EEROM provided for SIM18 access (default)</p> <p>“F” = Store to parallel FLASH</p> <p>“N” = No storage</p> <p>“0” = No change applied to patch storage settings</p>
CheckSum	*...		
<CR><LF>			End of message termination

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