CELPHONE
Damit Ihre Kommunikation steht

Specification — Code-Nr.: 60631022

Photos

Electrical properties

1. Introduction of MARINE SMART GPS RECIVER

1.1 Overview

The Marine Smart GPS Receiver is a total solution GPS receiver, designed based on SiRF Star Architecture. This positioning application meets strict needs such as car navigation, mapping, surveying, security, agriculture and so on. Only clear view of sky and certain power supply are necessary to the unit. It communicates with other electronic utilities via compatible TTL and saves critical satellite data by built–in backup memory. With low power consumption, the GM23 tracks up to 48 satellites at a time, re-acquires satellite signals in 100 ms and updates position data every second.

Trickle-Power allows the unit operates a fraction of the time and Push-to-Fix permits user to have a quick position fix even though the receiver usually stays off.

1.2. Features

G-Mouse provides a host of features that make it easy for integration and use.

1. Use the advanced SIRFstar GPS module, the module got high performance DSP core(ARM7TDMI CPU), allow users to design different applications, store in the module, to provide the most economic solution for anybody.
2. High performance tracks up to 48 satellites.
3. High sensitivity (-163 dBm) for indoor fixes. The SiRFstar GPS module can acquire in only seconds even at low signal levels. As part of SiRF's patented multi-mode GPS, the SiRFstar GPS module can track signal levels as low as -163 dBm. The SiRFstar supports real-time navigation in urban canyons as well as high sensitivity acquisition needed for indoor environments.
4. Differential capability utilizes real-time RTCM corrections producing 1-5 meter position accuracy.
5. Compact design ideal for applications with minimal space.
6. A rechargeable battery sustains internal clock and memory. The battery is recharged during normal operation.
7. LED display status: The LED provides users visible positioning status. LED "ON" when power connected and "BLINKING" when MARINE GPS SMART RECIVER got positioned.
8. Built-in WAAS Demodulator.
9. Water proof design for industry standard.

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1.3.3. Environmental Characteristics

1)Working Temperature: -20~+65°C
2) Storage temperature: -40 ~85°C
3) Humidity：≦95%

1.3.4. Electrical Characteristics

1) Input voltage: 5.0 +/- 10% V DC
2) Inpur current：〈80mA
3) Backup battery: +3.0V DC (Inner Rechargeable Lithium battery).

1.3.5. Performance

1) Channels: 48
2) Update rate: 1 second.
3) Acquisition time (average)
Hot start: 〈1 second(open sky).
Cold start: 〈48 second(open sky).
4) Position accuracy:
Position: 〈10m 90% no SA
Velocity: 0.1 m/sec no SA
Time: 1 second synchronized GPS time
5) Dynamic Conditions:
Altitude: 60,000 ft max
Velocity: 515 m/sec (1,000 knots) max
Acceleration: 4G max

1.3.6. Interfaces

1) Dual channel TTL compatible level, with user selectable baud rate (9600-Default, 4800, 19200, 38400)
2) NMEA 0183 Version 3.01 ASCII output (GPGGA, GPGSA, GPGSV, GPRMC, option GPGLL,GPVTG).

2. Operational Characteristics

2.1. Initialization Setup

After the initial self-test is complete, the G-mouse will begin the process of satellite acquisition and tracking. The acquisition process is fully automatic and, under normal circumstances, will take approximately 48 seconds to achieve a position fix (38 seconds if ephemeris data is know). After a position fix has been calculated, valid position and time information will be transmitted over the output channel(s).
The G-Mouse utilizes initial data such as last stored position, data and time as well as satellite orbital data to achieve maximum acquisition performance. If significant inaccuracy exists in the initial data, or if the orbital data is obsolete, it may take a long time to achieve a navigation solution. The G-mouse Auto-locate feature is capable of automatically determining a navigation solution without intervention from the host system. However, acquisition performance can be improved if the host system initialized the G-mouse following the occurrence of one or more of the following events:
1)The GPS receiver is not in use for more than 3 months or transportation over distances further than 500 kilometers.
2)Failure of the external memory battery without system standby power.

2.2. Navigation

After the acquisition process is complete, the G-Mouse will begin sending valid navigation information over its output channels. These data include:
1) Latitude/longitude/altitude
2) Velocity
3) Date/time
4) Satellite ,receiver status and Error estimates

3. Appendix A Software Protocol

A.1 NMEA Transmitted Message

GPS engine board use First GPSTM as the core, and output NMEA-0183 V3.01 standard format message. The default communication parameters for NMEA output are 9600 baud, 8 data bits, 1 stop bit, and no parity.

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Table A-0 NMEA-0183 Output Messages

NMEA Sentence	Description
GPGGA	Global positioning system fixed data
GPGLL	Geographic position latitude \ longitude
GPGSA	GNSS DOP and active satellites
GPGSV	GNSS satellites in view
GPRMC	Recommended minimum specific GNSS data
GPVTG	Course over ground and ground speed
GPZDA	Data and Time

A.1.1 Global Positioning System Fix Data (GGA)

Samples:$GPGGA,002153.000,3342.6618,N,11751.3858,W,1,10,1.2,27.
0,M,-34.2,M,,0000*5E

Table A-1 GGA Data Format

Name	Example	Unit	Description
Message ID	$GPGGA		GGA protocol header
UTC Time	002153.000		hhmmss.sss
Latitude	3342.6618		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	11751.3858		dddmm.mmmm
E/W Indicator	W		E=east or W=west
Position Fix Indicator	1		See Table A-2
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 A-2 Position

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*

Fix Indicator

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A.1.2 Geographic Position - Latitude/Longitude (GLL)
Samples:$GPGLL,3723.2475,N,12158.3416,W,161229.487,A,A*41

Table A-3 GLL Data Format

Name	Example	Unit	Description
Message ID	$GPGLL		GLL protocol header
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.3416		dddmm.mmmm
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*
Checksum	*41		
<CR> <LF>			End of message termination

A

A.1.3 GNSS DOP and Active Satellites (GSA)
Samples:$GPGSA,A,3,07,02,26,27,09,04,15, , , , , ,1.8,1.0,1.5*33

Table A-4 GSA Data Forma

Name	Example	Unit	Description
Message ID	$GPGSA		GSA protocol header
Mode 1	A		See Table A-5
Mode 2	3		See Table A-6
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 : Satellite used in solution.

Table A-5 Mode 1

Value	Description
M	Manual—forced to operate in 2D or 3D mode
A	2D Automatic—allowed to automatically switch 2D/3D

Table A-6 Mode 2

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

A.1.4 GNSS Satellites In View (GSV)
Samples:

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$GPGSV,2,1,07,07,79,048,42,02,51,062,43,26,36,256,42,27,27,138,42*1
$GPGSV,2,2,07,09,23,313,42,04,19,159,41,15,12,041,42*41

Table A-7 GSV Data Format

A.

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]	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

A.1.5 Recommended Minimum Specific GNSS Data (RMC)

Samples:$GPRMC,054301.691,A,3047.4542,N,12045.7363,E,1.39,344.6
6,170409,,,A*64

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Table A-8RMCDataFormat

Name	Example	Unit	Description
Message ID	$GPRMC		RMC protocol header
UTC Time	054301.691		hhmmss.sss
Status[1]	A		A=data valid or V=data not valid
Latitude	3047.4542		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12045.7363		dddmm.mmmm
E/W Indicator	E		E=east or W=west
Speed Over Ground	1.39	knots	
Course Over Ground	344.66	degrees	True
Date	170409		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*
Checksum	*64		
<CR> <LF>			End of message termination

Note: SiRF Technology Inc. does not support magnetic declination.
All "course over ground" data are geodetic WGS84 directions relative to true North.

A.1.6 Course Over Ground and Ground Speed (VTG)
Samples: $GPVTG,309.62,T, ,M,0.13,N,0.2,K,A*23

Table A-9 VTG Data Format

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[1]
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*
Checksum	*23		
<CR> <LF>			End of message termination

Note: All "course over ground" data are geodetic WGS84.
A.1.7 Time & Date (ZDA)
Samples: $GPZDA,181813,14,10,2003,,*4F

4. Appendix B Coordinate System and Output Settings
I B.1 Coordinate System
World standard coordinate system WGS84 is builds in.
I B.2 Output Settings
Coordinate System: WGS84.
Baud rate: 9600
Output message: GGA, GSA, GSV, RMC

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Table A-10 ZDA Data Format

Name	Example	Unit	Description
Message ID	$GPZDA		ZDA protocol header
UTC time	181813	hhmmss	The UTC time units are as follows: 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 1to 31
Month	10		Month of the year, range 1 to 12
Year	2003		1980 to 2079
Local zone hour[1]		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

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