Ultra Low Power GPS Receiver

with Bluetooth™

BT-GPS

Key Benefits

Compact design -easy to carry

Light Weight

Ultra low power -up to 30 hours after fully charged (930 mA Li-ion Battery)

High Performance

Integrated GPS receiver, Active antenna, and Bluetooth transceiver

Power consumption: 45mA@3.6V (typ.)

Ultra Low Power GPS Receiver and the Convenience of Bluetooth™ Technology

Real-time navigating just got easier!

This Bluetooth GPS Receiver with Bluetooth combines proven wireless technologies that allows you to receive positioning data and connect to mobile computing devices wirelessly. The BT-GPS provides high position accuracy and has reliable tracking capabilities. The ultra low power design gives you up to 24 hours of continuous usage and eliminates constant recharging between uses.

With optional waterproof case, you can put it on the roof of a vehicle that boosts your reception capabilities when driving through congested urban.

It's easy to connect the GPS receiver to your mobile devices, such as pocket PCs, PDAs and mobile phones using Bluetooth wireless connectivity. A few simple steps will have you connected and navigating in minutes.

Applications

- Automotive
- Fleet management/Asset tracking
- Personal/Portable Navigation (PDA, Pocket PC etc.)
- Location Based Services enabled devices
- Sports and Recreation
- Geographic Surveying

Specifications

General

GPS Chip	NEMERIX GPS Module
Frequency	L1, 1575.42MHz
C/A Code	1.023MHz chip rate
Channels	16 CH all in view tracking
Antenna (Internal)	Built-in low noise
	External Antenna Port Active MMCX Antenna

Sensitivity

To – 152Bm Tracking, Superior Urban Canyon Performance

Acquisition Rate

Cold Start	45 sec, average
Warm Start	35 sec, average
Hot Start	5 sec
Reacquisition	1sec
Accuracy	
Position	5m CEP (50%), 9m (90%)
Velocity	0.1m/sec, without SA
Time	±100ns synchronized to GPS time

Power

Built-in rechargeable 850mAh Li-ion battery and 5 V DC input

Operation Current	45mA (Typical)
Operation Time	30hrs, after fully charged, in continuous
Charging time	2.5hrs. (Typical)

Environmental

Operating Temperature	- 20 °C to + 60 °C
Relative Humidity	5% to 90% non-condensing

*: (1):1sec output 1msg , (3): 3sec output 1msg

Accuracy

Position

3meters CEP (50%), without SA (Horizontal) 7 meters (90%)

Velocity	500 m/sec. without SA
Time	±100 ns synchronized to GPS time

Datum

WGS-84 (or by demanded)

Dynamic Conditions

Altitude	<18,000m
Velocity	<515m/sec
Acceleration	<4g
Motional Jerk	20 m/sec.

Interface

Communication Protocol

Communicate with host platform via

Bluetooth (class 2) serial port profile

Bluetooth communication distance 10 M. TYP.

GPS Protocol

Default: NMEA-0183 (V3.01) – GGA(1), GSA(3),

GSV(3), RMC(1),VTG(1),Band rate 38400 bps,

Data bit : 8, stop bit : 1(Default) *

Device Size

81 (L) X 44 (W) X 20 (H) mm

3.2 (L) X 1.75 (W) X 0.79 (H) inch

Accessories	Car charger (12V in, 5V output)
	AC adaptor (5V output, 500ma)

All specifications are subject to change without notice

Appendix : Software Specification

NMEA Protocol

The software is capable of supporting the following NMEA message formats

NMEA Message Prefix	Format	Direction
SGPGGA(1)*	GPS fix data.	Out
SGPGLL	Geographic position Latitude / Longitude.	Out
SGPGSA(3)*	GNSS DOP and actives satellites	Out
SGPGSV(3)*	Satellites in view.	Out
SGPRMC(1)*	Recommended minimum specific GNSS data.	Out
SGPVTG(1)*	Velocity and track over ground.	Out
SGPZDA	Date and time.	Out

*: (1): 1sec output 1msg , (3): 3sec output 1msg , 9600 baud rate (Standard output)

General NMEA Format

The general NMEA format consists of an ASCII string commencing with a '$' character and terminating with a <CR><LF> sequence. NMEA standard messages commence with 'GP' then a 3-letter message identifier. NemeriX specific messages commence with $PNMRX followed by a 3 digit number. The message header is followed by a comma delimited list of fields optionally terminated with a checksum consisting of an asterisk '*' and a 2 digit hex value representing the checksum. There is no comma preceding the checksum field. When present, the checksum is calculated as a byte wise exclusive of the characters between the '$' and '*'. As an ASCII representation, the number of digits in each number will vary depending on the number and precision, hence the record length will vary. Certain fields may be omitted if they are not used, in which case the field position is reserved using commas to ensure correct interpretation of subsequent fields.

The tables below indicate the maximum and minimum widths of the fields to allow for buffer size allocation.

$GPGGA

This message transfers global positioning system fix data. The $GPGGA message structure is shown below:

Field	Format	Min chars	Max chars	Notes
Message ID	$GPGGA	6	6	GGA protocol header.
UTC Time	hhmmss.sss	2,2,2.3	2,2,2.3	Fix time to 1ms accuracy.
Latitude	float	3,2.4	3,2.4	Degrees * 100 + minutes.
N/S Indicator	char	1	1	N=north or S=south
Longitude	float	3,2.4	3,2.4	Degree * 100 + minutes.
E/W indicator	Char	1	1	E=east or W=west
Position Fix Indictor	Int	1	1	0: Fix not available or invalid. 1: GPS SPS mode. Fix available.
Satellites Used	Int	2	2	Number of satellites used to calculate fix.
HDOP	Float	1.1	3.1	Horizontal Dilution of Precision.
MSL Altitude	Float	1.1	5.1	Altitude above mean seal level
Units	Char	1	1	M Stands for “meters”.
Geoid Separation	Int	(0) 1	4	Separation from Geoid, can be blank.
Units	Char	1	1	M Stands for “meters”.
Age of Differential Corrections	int	(0) 1	5	Age in seconds Blank (Null) fields when DGPS is not used.
Diff Reference Corrections	int	4	4	0000.
Checksum	*xx	(0) 3	3	2 digits.
Message terminator	<CR> <LF>	2	2	ASCII 13, ASCII 10.

$GPGLL

This message transfers Geographic position, Latitude, Longitude, and time. The $GPGLL message structure is shown below:

Field	Format	Min chars	Max chars	Notes
Message ID	$GPGLL	6	6	GLL protocol header.
Latitude	Float	1,2.1	3,2.4	Degree * 100 + minutes.
N/S Indicator	Char	1	1	N=north or S=south.
Longitude	Float	1,2.1	3,2.4	Degree * 100 + minutes.
E/W indicator	Character	1	1	E=east or W=west.
UTC Time	hhmmss.sss	1,2,2.1	2,2,2.3	Fix time to 1ms accuracy.
Status	Char	1	1	A Data Valid. V Data invalid.
Mode Indicator	Char	1	1	A Autonomous
Checksum	*xx	(0) 3	3	2 digits.
Message terminator	<CR><LF>	2	2	ASCII 13, ASCII 10.

$GPGSA

This message transfers DOP and active satellites information. The $GPGSA message structure is shown below:

Field	Format	Min chars	Max chars	Notes
Message ID	$GPGSA	6	6	GSA protocol header.
Mode	Char	1	1	M Manual, forced to operate in selected mode. A Automatic switching between modes.
Mode	Int	1	1	1 Fix not available. 2 2D position fix. 3 3D position fix.
Satellites Used	Int	2	2	SV on channel 1.
Satellites Used	Int	2	2	SV on channel 2.
…	.	..	..	..
Satellites Used	Int	2	2	SV on channel 12.
PDOP	Float	1.1	3.1	
HDOP	Float	1.1	3.1	
VDOP	Float	1.1	3.1	
Checksum	*xx	0	3	2 digits
Message terminator	<CR> <LF>	2	2	ASCII 13, ASCII 10

$GPGSV

This message transfers information about satellites in view. The $GPGSV message structure is shown below. Each record contains the information for up to 4 channels, allowing up to 12 satellites in view. In the final record of the sequence the unused channel fields are left blank with commas to indicate that a field has been omitted.

Field	Format	Min chars	Max chars	Notes
Message ID	$GPGSV	6	6	GSA protocol header.
Number of messages	Int	1	1	Number of messages in the message sequence from 1 to 3.
Message number	Int	1	1	Sequence number of this message in current sequence, form 1 to 3.
Satellites in view	Int	1	2	Number of satellites currently in view.
Satellite Id	Int	2	2	Satellite vehicle 1.
Elevation	Int	1	3	Elevation of satellite in degrees.
Azimuth	Int	1	3	Azimuth of satellite in degrees.
SNR	Int	(0) 1	2	Signal to noise ration in dBHz, null if the sv is not in tracking.
Satellite Id	Int	2	2	Satellite vehicle 2.
Elevation	Int	1	3	Elevation of satellite in degrees.
Azimuth	Int	1	3	Azimuth of satellite in degrees.
SNR	Int	(0) 1	2	Signal to noise ration in dBHz, null if the sv is not in tracking.
Satellite Id	Int	2	2	Satellite vehicle 3.
Elevation	Int	1	3	Elevation of satellite in degrees.
Azimuth	Int	1	3	Azimuth of satellite in degrees.
SNR	Int	(0) 1	2	Signal to noise ration in dBHz, null if the sv is not in tracking.
Satellite Id	Int	2	2	Satellite vehicle 4.
Elevation	Int	1	3	Elevation of satellite in degrees.
Azimuth	Int	1	3	Azimuth of satellite in degrees.
SNR	Int	(0) 1	2	Signal to noise ration in dBHz, null if the sv is not in tracking.
Checksum	*xx	(0) 3	3	2 digits.
Message terminator	<CR> <LF>	2	2	ASCII 13, ASCII 10.

$GPRMC

This message transfers recommended minimum specific GNSS data. The $GPRMC message format is shown below.

Field	Format	Min chars	Max chars	Notes
Message ID	$GPRMC	6	6	RMC protocol header.
UTC Time	hhmmss.sss	1,2,2.1	2,2,2.3	Fix time to 1ms accuracy.
Status	char	1	1	A Data Valid. V Data invalid.
Latitude	Float	1,2.1	3,2.4	Degrees * 100 + minutes.
N/S Indicator	Char	1	1	N=north or S=south.
Longitude	Float	1,2.1	3,2.4	Degrees * 100 + minutes.
E/W indicator	Char	1	1	E=east or W=west.
Speed over ground	Float	1,1	5.3	Speed over ground in knots.
Course over ground	Float	1.1	3.2	Course over ground in degrees.
Date	ddmmyy	2,2,2	2,2,2	Current date.
Magnetic variation	Blank	(0)	(0)	Not used.
E/W indicator	Blank	(0)	(0)	Not used.
Mode	Char	1	1	A Autonomous
Checksum	*xx	(0) 3	3	2 digits.
Message terminator	<CR> <LF>	2	2	ASCII 13, ASCII 10.

$GPVTG

This message transfers Velocity, course over ground, and ground speed. The $GPVTG message format is shown below.

Field	Format	Min chars	Max chars	Notes
Message ID	$GPVTG	6	6	VTG protocol header.
Course (true)	Float	1.1	3.2	Measured heading in degrees.
Reference	Char	1	1	T = true heading.
Course (magnetic)	Float	1.1	3.2	Measured heading (blank).
Reference	Char	1	1	M = magnetic heading.
Speed	Float	1.1	4.2	Speed in knots.
Units	Char	1	1	N = knots.
Speed	Float	1.1	4.2	Speed
units	Char	1	1	K = Km/h.
Mode	Char	1	1	A Autonomous
Checksum	*xx	(0) 3	3	2 digits.
Message terminator	<CR> <LF>	2	2	ASCII 13, ASCII 10.

$GPZDA

This message transfers UTC Time and Date. Since the latency of preparing and transferring the message is variable, and the time does not refer to a particular position fix, the seconds precision is reduced to 2 decimal places. The $GPZGA message format is shown below.

Field	Format	Min chars	Max chars	Notes
Message ID	$GPZDA	6	6	ZDA protocol header.
UTC time	hhmmss.ss	2,2,2.2	2,2,2.2	00000000.00 to 235959.99
UTC day	dd	2	2	01 to 31, day of month.
UTC month	mm	2	2	01 to 12.
UTC Year	yyyy	4	4	1989-9999.
Local zone hours	Int	(-)2	(-)2	Offset of local time zone (-13) to 13.
Local zone minutes	Unsigned	2	2	
Checksum	*xx	(0) 3	3	2 digits.
Message terminator	<CR> <LF>	2	2	ASCII 13, ASCII 10.