

Ultra Low Power GPS Receiver *(May,2006 V10)*



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

Real-time navigating just got easier!

Mini BT-GPS Features

- 16 channels "All-in-View" tracking.
- Position accuracy of 10 Meters 2D RMS
- Support standard NMEA0183 at 38400 bps baud rate(defined by customer 4800 up to 57600)
- Compatible with Bluetooth devices with Serial Port Profile(SPP)
- Cold/warm/hot start (42/38/3~6 seconds)
- Compact design
- Mini-USB plug-in
- easy to carry, fit into your hand 76 (L) X 46 (W) X 20 (H) mm
- Light weight (50g)
- Ultra low power
- Up to 22hours Of continuous use every single full-charge
- Japan Origin cell rechargeable 1100mA Li-ion battery
- High sensitivity: -152dbm
- Integrated GPS receiver,
- Build-in High Gain antenna
- Ultra low power consumption: 45mA@3.6V(typ)

A very new technology "talking GPS receiver" is now on the road!!! Build-in POI (speed camera master) data base BT-GPS receiver, is the smallest, lightest receiver with GPS speed camera in market. Delicate portable design at high performance GPS technology is compatible to PDA, smart phone, laptop or tablet PC. No card, No cord, No hassles. Not only car navigation, but also your best friend of driving tool for certain dangerous road to remind, slow your speed and back home in safe, all by inside POI data base.

The ultra low power consumption provides you up to 22 hours of continuous use by every single charge, no hassles in constant recharge between uses.

The general USB cable enable dual function enrich device work on wire solution if Bluetooth interference.

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	35sec, average
Hot Start	5sec,
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	1100mAh Li-ion battery and 5V DC input
Operation Current	45mA (Typical)
Operation Time	22rs, after fully charged, in continuous
Charging time	3.0hrs. (Typical)

Environmental

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

Accuracy

Position	3meters CEP (50%), without SA (Horizontal) 7 meters (90%)
Velocity	515 m/sec. without SA
Time	±100 ns synchronized to GPS time

Datum

WGS-84 (or by demanded)

Dynamic Conditions

Altitude	10,000m Max
Velocity	515m/s
Acceleration	4g Max
Motional Jerk	4 m/sec ³ .

Interface

Communication Protocol	Communicate with host platform via Bluetooth (class 2) serial port profile Bluetooth communication distance 10 M. TYP.
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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) *
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Device Size

76 (L) X 46 (W) X 20 (H) mm

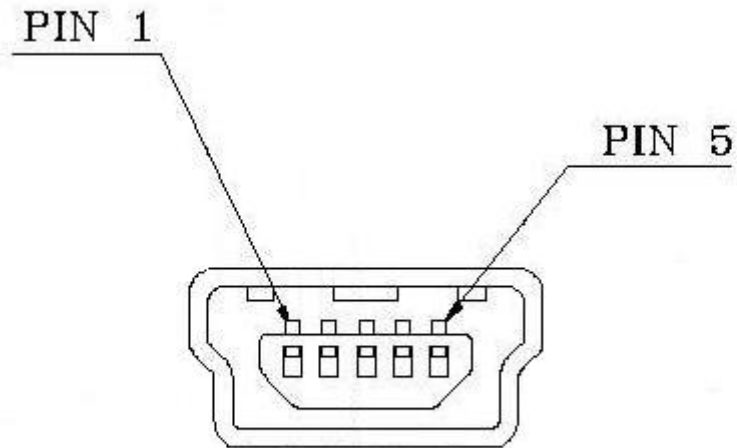
Accessories	Car charger (12V in, 5V output) AC adaptor (5.3V output, 500ma)
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*: (1):1sec output 1msg , (3): 3sec output 1msg

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All specifications are subject to change without notice

Pin Assignment Of USB Jack



Pin 1 : VCC (+5V)

Pin 5 : GND

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 Indicator	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.