



# Ultra Low Power GPS Receiver

*with Bluetooth™ by Wonde Proud*

GPS BT-55S

## ***Key Benefits***

***Compact design  
-easy to carry***

***Light Weight***

***Ultra low power  
-up to 15 hours  
after fully charged***

***Integrated GPS  
receiver, High gain  
antenna and  
Bluetooth  
transceiver***

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

*Real-time navigating just got easier!*

The Wonder-X GPS BT-55S GPS Receiver with Bluetooth combines proven wireless technologies that allows you to receive positioning data and connect to mobile computing devices wirelessly. The Wonde Proud GPS BT-55S provides high position accuracy and has reliable tracking capabilities. The ultra low power design gives you up to 15 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

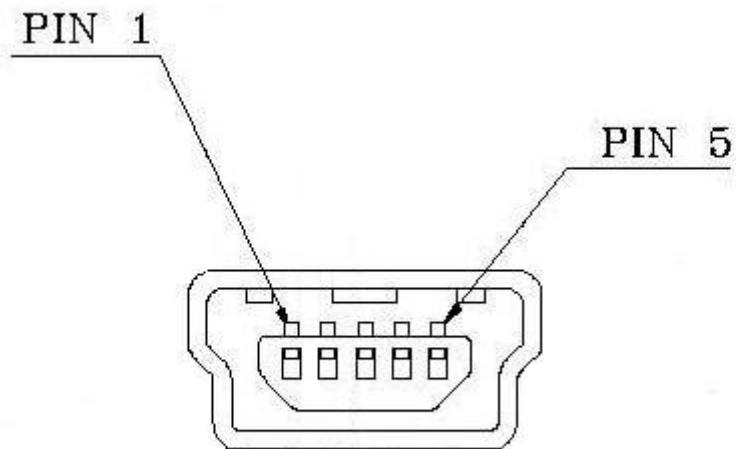
## Specifications

General		Accuracy	
GPS Chip	NEMERIX GPS Module		Position
Frequency	L1, 1575.42MHz	3meters CEP (50%), without SA (Horizontal)	7 meters (90%)
C/A Code	1.023MHz chip rate	Velocity	0.1 m/sec. without SA
Channels	16 CH all in view tracking	Time	±100 ns synchronized to GPS time
Antenna (Internal)	Built-in low noise		
External Antenna Port Active MMCX Antenna		Datum	
		WGS-84 (or by demanded)	
Sensitivity		Dynamic Conditions	
To – 152Bm Tracking, Superior Urban Canyon Performance		Altitude	10,000m Max
Acquisition Rate		Velocity	Hor.300km/hour ; Ver.36km/hour Max
Cold Start	45 sec, average	Acceleration	2g Max
Warm Start	38 sec, average	Motional Jerk	4 m/sec <sup>3</sup> .
Hot Start	6 sec, average		
Reacquisition	1sec		
Accuracy		Interface	
Position	5m CEP (50%), 9m (90%)	Communication Protocol	Communicate with host platform via
Velocity	0.1m/sec, without SA		Bluethooth (class 2) serial port profile
Time	±100ns synchronized to GPS time		Bluethooth communication distance 10 M. TYP.
Power		GPS Protocol	
Built-in rechargeable 720mAh Li-ion battery and 5 V DC input		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) *	
Operation Current	45mA (Typical)		
Operation Time	15hrs, after fully charged, in continuous		
Charging time	3.0hrs. (Typical)	Device Size	
Environmental		61.5 (L) X 43.8 (W) X 21.5 (H) mm 2.42 (L) X 1.72 (W) X 0.84 (H) inch	
Operating Temperature - 20 °C to + 60 °C		Accessories	Car charger (12V in, 5V output) AC adaptor (5.3V output, 500ma)
Relative Humidity	5% to 90% non-condensing		
*: (1):1sec output 1msg , (3): 3sec output 1msg			

Bluetooth is a trademark owned by Bluetooth SIG, Inc.

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 active 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 asterix ‘\*’ 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 bytewise 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.

## **\$GPGLL**

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

Field	Format	Min chars	Max chars	Notes
Message ID	\$GPGLL	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. <sup>ss</sup>	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.