GPS-1200 Bluetooth GPS

User's Manual V1.4

The equipment version marketed in US is restricted to usage of the channels 1-11 only.

This document is subject to change without notice.
Date: **Aug 29th**,**2005**

YTEC Bluetooth GPS Receiver

SONY's 3rd generation
High sensitivity
GPS SOC chip

- **Dual Mode(Wireless And Wired Navigation Mode)**
- **12 Parallel Satellite-Tracking Channels**
- **Built-in WAAS/EGNOS Demodulator**
- **Superior Navigation Performance**
- **NMEA0183 v3.01**

CONTENTS

YOUNGTEK ELECTRONICS CORP.
4F, No. 5, Technology Rd., Science-Based Industrial Park, Hsinchu 300, Taiwan, R.O.C.

Revision History

Ver.	Date	Description
1.0	May. 6th, 2005	Initial Release
1.1	Jun. 2nd, 2005	Add power saving mode notes and user tips.
1.2	Jul. 4th, 2005	Update NMEA outputs, power saving, accessory notes, and user tips.
1.3	Jul. 27th, 2005	Reduce power on/off time. Update user tips.
1.4	Aug.29th, 2005	Update Bluetooth Connection Guide.

Tel: +886-3-6669968
Fax: +886-3-6669967
Web: http://www.ytec.com.tw/gps
Sales contact: gps-sales@ytec.com.tw
Technical contact: gps-fae@ytec.com.tw

1. Overview

1. GPS-1200 provides GPS data to location service device via both wireless and wired connections (dual mode).

2. GPS-1200 adopts electronic switch, supports intelligent power saving, battery low power indication. It saves battery power and thus extends usable time.

3. The GPS-1200 Bluetooth GPS receiver relieves user from wired constraint connecting GPS-1200 and electronic map display device by employing the newest Bluetooth wireless technology.

4. (optional) At the same time, it also meets the demand of wired connection using USB connector and UART serial communication interfaces.

5. In addition, the built-in battery and charging capability relieves user from the constraint of power cord being always connected.

6. In addition to the built-in passive antenna, an external active antenna option is supported for better signal reception. It is especially useful for cases such as in-car sun-light shielding environment.

7. Easy to charge using the ubiquitous USB connector.

2.Designation(1/2)

2.Designation(2/2)

No.		Function
①	GPS/Power Status LED (Green/Orange)	Green light *GPS sky searching mode: "Blinking" (duty cycle on : off = 1sec : 1sec) *Tracking mode: "Blinking" (duty cycle on : off = 0.5sec :0.5sec) *Fixed mode: "Always on"
		Orange light **Charging state: "Blinking" during charging and off once battery has been fully charged. *Non-charging state: "Always on" once low battery has been detected.
②	Bluetooth Status LED (Blue)	*Stand-by: "Blinking" (duty cycle on : off = 0.32sec : 2.24sec) *Connection: "Blinking" (duty cycle on : off = 0.32sec : 0.64sec) *Power on: "blinking" once power on process has completed. *Power off: "On" while power button is pushed, "blinking" once power off has been recognized, and "off" once power off process has completed.
③	Power Button	(turn on) Push and hold until blue light is blinking. (turn off) Push and hold until blue light is OFF.
④	External Antenna Connector Port	You may use an external active antenna instead of the built-in patch antenna if necessary.
⑤	Power Jack/Data Port	To recharge the internal battery/Connect to charging cable

** Blinking duty cycle of orange LED depends on power level of battery.
(Orange LED is off at full battery)

3. Dimensions

4. Mandatory Components(1/2)

1. Bluetooth GPS Mouse (GPS-1200-BODY1) x 1

2. Lithium Battery (GPS-1200-BTLI1) x 1

3. Car Charger with Female USB Plug (GPS-1200-ADCC1) x 1

4. Charging Cable (GPS-1200-CBCG1) x 1

5. CD-ROM (GPS-1200-CDYT1) x 1

✶ **In the Mandatory Components of GPS-1200, wireless navigation with Bluetooth is recommended.**

✶ **Charging Cable is a standard USB cable without signal lines. You may "NOT" use a common one to replace the charging cable. However, you might use "Mini-USB to USB" data cable in the optional accessories if you want to do wired navigation on computing devices such as notebook.**

4. Mandatory Components(2/2)

①

②

③

④

⑤

5. Getting Started

1. Charge the battery

- **The battery ought to be fully charged before using GPS-1200.**
  1. **Please connect the charging cable to the power jack and car (or optionally, travel) charger first, and then plug charger into an electrical outlet. Orange LED is "OFF" if battery is fully charged.**
  2. **GPS-1200 can also be charged automatically via USB port, such as that of PC/Notebook.**

2. Turn on the GPS-1200

- **Push the power button and hold it until the blue light flashes. If the power level of battery is enough, the blue light keeps flashing and the system turn on process has completed.**

3. Connect to Bluetooth-enabled PDA or computing devices

- **Perform Bluetooth device discovery from your PDA or computing devices. Refer to the user manual of your Bluetooth-enabled PDA or computing devices for Bluetooth connection instructions.**

4. (option) Connect to PDA or computing devices by mini-USB

- **GPS-1200 supports wired and wireless mode to transfer GPS data to PDA or computing devices. If one wants to do wired navigation simultaneously, mini-USB transmission line (mini-USB to USB) could be connected.**

6. User Tips(1/2)

1. Some environments, such as in tunnels, high buildings etc., may affect signal receptions.

2. For people who turns off the receiver and turns on it at place far away from previous location, e.g. having an overseas traveling, it is suggested to put the receiver at open sky environment to fix the position. This allows a receiver having best performance.

3. Some principles are suggested to use GPS-1200 efficiently.
    1. Please place the GPS-1200 in the good reception environment, such as open sky.
    2. Once low battery indicator is on (Orange LED is ON), please recharge the GPS battery immediately.

4. Some e-mapping application may turn off Bluetooth connection when operate e-mapping functions. In this case, one needs to re-establish the Bluetooth connection manually before continuing the navigation. Please also note, most newly designed navigation application do not have this interruption.

5. To save the battery power, if the Bluetooth connection has been lost for 15 minutes, GPS function will be turned off automatically. GPS continues to function, as Bluetooth connection is re-established. If the Bluetooth connection keeps lost for another 15 more minutes, the system power will be fully turned off automatically.

6. User Tips(2/2)

6. As the battery low condition is detected during usage and before the battery is fully used up, system may try to disable GPS function firstly (green light is off) and then fully turns off the system power. Before the system power is turned off, charge the battery will resume the GPS function. Please note that if battery power is used up, system will be off immediately.

7. As the battery low condition is detected during power on procedure, GPS & Bluetooth functions are both disabled. Charge it immediately to resume normal functions.

8. The Bluetooth wireless and wired connection could be established individually or simultaneously. Please note that the wired communication accessory is optional. They are not included in the standard package.

9. Please do not leave the GPS-1200 Bluetooth GPS receiver at high temperature environment beyond system specification.

10. Use only power charger provided by the manufacturer.

11. Interval of 1 second is required between power off and power on. That is to say, after power off and immediately press power button within 1 second could not power on it. In this case, just release the power button, wait 1 second, and follow power on procedure to power on it.

7. Optional Accessories(1/2)

1. Active Antenna(GPS-1200-ANTA1)

2. Travel Charger with Female USB Plug (GPS-1200-ADTC1) x 1

3. Mini-USB to PS2(GPS-12000-CBPS1) x 1

4. PS2 to PDA & Car Charger (Y-Cable)(GPS-1200-CBPS2) x 1

5. PDA/Smart Phone Proprietary Transition Connector(GPS-1200-CBxyn)
   - **This accessory might vary depending on your PDA/Smart Phone.**

6. Mini-USB(UART) to USB Data Cable(GPS-1200-CBDU1) x 1

✶ **If you want to do wired navigation with "Mini-USB(UART) to USB Data Cable" , you should install USB data cable driver first.**

7. Optional Accessories(2/2)

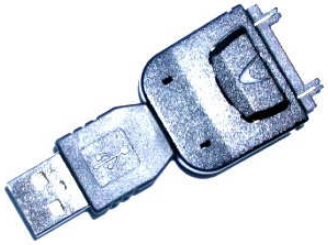
①

②

③

④

⑤



⑥

Appendix A. Charging Illustration

1. Car charging
2. Travel charging
3. Y-cable
4. General charging
   - (plug to USB port of PC/NB)

②

①

③

④

Appendix B. Bluetooth Connection Guide

1. **Turn on GPS-1200 and navigation device (e.g. PDA/Smart phone)**

2. **Discover Bluetooth device from PDA/Smart phone and input PIN code (default : 0000) if necessary.**

3. **Select device GPS-1200 to set up connection.**

Following illustrations are based on HP iPAQ PDA as an example.

1. PDA main screen

2. Click on iPAQ Bluetooth icon, then select "Manager".

3. Click "New" at the bottom bar.

4. Bluetooth Connection Wizard starts and click "Next".

5. Several steps require you to locate a device and connect it . Then, it automatically discovers Bluetooth devices placed around the PDA. Then, click "BT-GPS".

6. Select "Bluetooth Serial Port" of Service Selection and click "Next".

7. Connection shortcuts were successfully created. click "Finish".

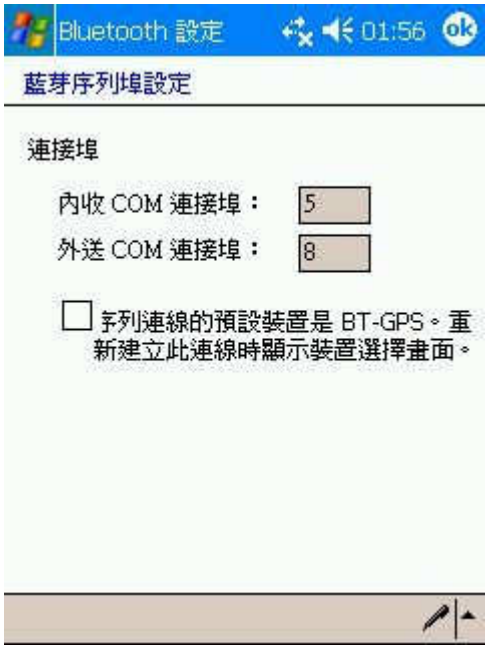
8. **Connection was successfully established with Bluetooth GPS receiver on Bluetooth Serial Port.**
   To connect with BT GPS, double click "BT-GPS Bluetooth Serial Port" icon.

9. **Once it is successfully connected, you will see the screen likes above.**

10. **Then, if you want to see more information, click "Active Connections".**

11. You will see the connection status.

✶To identify the Bluetooth COM port number for your PDA



1. **Click the Bluetooth icon. Select "Bluetooth Setting". Select "Service" in the bottom and "Serial Port". Click "Advanced" button. Use Outbound COM Port" number for your navigation software environment setup.**

2. **iPAQ 22xx/38xx/39xx/54xx/55xx series : COM8**

Appendix C. Mini-USB Connection Guide

Two optional transmission lines can be used to connect GPS-1200 to navigation devices if Bluetooth device is not available. As following.

1. **Mini-USB to USB**
2. **Y-Cable**

①

②

Appendix D. GPS-1200 Spec.

GPS receiver:	**L1, C/A code, 12 channels**
Tracking sensitivity:	**–152dBm (average) or better**
Acquisition sensitivity:	**–139dBm (average) or better**
TTFF (Time to First Fix):	**Cold Start: 50s (average) / 60s (95% possibility) Warm Start: 35s (average) / 40s (95% possibility) Hot Start: 2s (minimum) / 6s (95% possibility)**
Positioning accuracy:	**Standard Positioning Service (SPS) WAAS (optional) 2DRMS: approx. 5m**
Measurement data output:	**Update time: 1 second NMEA output protocol: V.3.01 Baud rate: 38400 bps (8-N-1) Datum: WGS-84 Type: GPGGA, GPGSA, GPGSV, GPRMC**
Power consumption:	**75mA (average)**
Bluetooth:	**Bluetooth version 1.2 compliant Class 2 operation (up to 10 meter range) Serial Port Profile (SPP)**
Output terminal:	**Type B Mini-USB**
Antenna Type:	**1. Built in Patch Antenna 2. Extended active antenna (MMCX)**
Battery:	**3.7V 850mAh Lithium battery, built-in charger**
LED:	**Power (orange), GPS (green) Bluetooth (blue)**
Dimension:	**64(L) x 39(W) x18.5(H) mm**
Operating temperature:	**-20℃ ~ +60℃**
Storage temperature:	**-20℃ ~ +60℃; Battery: -20~45℃**

Appendix E. NMEA Protocol Spec.

GPS-1200 outputs 4 types of sentences: *GPGGA*, *GPGSA*, *GPSV*, *GPRMC*

The NMEA-0183 Output Messages are shown as below:

NMEA Record	Descriptions
GPGGA	Global positioning system fixed data
GPGSA	GNSS DOP and active satellites
GPGSV	GNSS satellites in view
GPRMC	Recommended minimum specific GNSS data

Single message example

```
$GPGGA,112350,3536.6006,N,13944,8931,E,1,08,00.9,00098.1,M,039.2,M,,*44
$GPGSA,A3,09,10,17,18,21,26,28,29,,,,,02.1,00.9,01.8*00
$GPGSV,3,1,11,05,02,178,00,08,03,039,00,09,52,208,46,10,34,120,43*77
$GPGSV,3,2,11,15,09,322,26,17,20,175,41,18,28,313,38,21,43,283,48*78
$GPGSV,3,3,11,26,59,023,50,28,18,063,39,29,50,044,45,,,,*46
$GPRMC,112350,A,3536.6006,N,13944.8931,E,000.0,016.2,240304,,,A*7B
```

GPGGA data format: (1/2)

The example of GPGGA:
$GPGGA, 012041,3537.1464,N,13943.8529,E,2,07,01.2,00101.2,M,039.2,M,04,0000*42

Contents	Example	Units	Descriptions
Sentence ID	$GPGGA		GGA header
UTC Time	012041		hh: Hours mm: Minutes ss: Seconds
Latitude	3537.1464		ddmm.mmmm *1
N/S Indicator	N		N: North Latitude, S: South Latitude
Longitude	13943.8529		dddmm.mmmm *1
East/West	E		E: East Longitude, W: West Longitude *1
GPS Quality Indicator	2		0: Disabled 1: GPS positioning 2: D-GPS positioning
Number of satellites	07		Number of satellites used in positioning calculation(00 to 12)
HDOP	01.2		*2
Altitude	9.0	Meters	*3
Units	M		Meters
Geoidal Separation	039.2	Meters	*4
Units	M		Meters
Age of DGPS data	04	Seconds	Time elapsed since D-GPS reception *5
DGPS reference station ID	0000		
Checksum	42		
<CR><LF>			End of sentence

GPGGA data format: (2/2)

Note:

***1: The Longitude is always expressed as 0 degree when the Latitude is 90 degree, and is expressed as Longitude 0(180) degree East when the Longitude is 0(180) degree West.**

***2: The DOP value is expressed as two integer digits and one decimal digit.**

Values 99.9 and higher are expressed as 99.9.

***3: The elevation is expressed as five integer digits and one decimal digit.**

Values of 99999.9 or more (-99999.9 or less) are expressed as 99999.9 (-99999.9)

***4: The difference from the geoidal surface is expressed as three integer digits and one decimal digit.**

***5: The DGPS Age is expressed as two integer digits.**

GPGSA data format:

The example of GPGSA:
$GPGSA,A,3,05,06,09,14,18,23,25,30,,,,,01.6,01.0,01.3*05

Contents	Example	Descriptions
Sentence ID	$GPGSA	GSA header
Mode	A	M: Manual A: Automatic
Positioning mode	3	1: Fix not available 2: 2D 3: 3D
Satellite ID number	05	ID number of satellite used in solution
Satellite ID number	06	ID number of satellite used in solution
…		Display of quantity used(12 max)
PDOP	01.6	*
HDOP	01.0	*
VDOP	01.3	*
Checksum	05	
<CR><LF>		End of sentence

Note:

*** The DOP value is expressed as two integer digits and one decimal digit.**
Values 99.9 and higher are expressed as 99.9.

GPGSV data format:

The example of GPGSV:
$GPGSV,2,1,08,05,61,056,35,06,12,158,41,09,23,066,41,14,52,321,42*70

Contents	Example	Unit	Explanation
Sentence ID	$GPGSV		GSV header
Total number of sentences	2		Total number of GSV sentences output(1 to 9) *1
Sentence number	1		Sequence number within total number(1 to 9)
Total number of satellites in view	08		Number of satellites visible from receiver
Satellite ID number	05		Satellite ID (01 to 32) *2
Elevation	61	Degrees	Elevation angle of satellite as seen from receiver (00 to 90)
Azimuth	056	Degrees	Satellite azimuth as seen from receiver (000 to 359)
SNR (C/N)	35	dBHz	Received signal level C/N (00 to 99) *3
...			
Satellite ID number	14		Write for four satellites
Elevation	52	Degrees	
Azimuth	321	Degrees	
SNR (C/N	42	dBHz	
Checksum	70		
<CR><LF>			End of sentence

Note:

***1 For 4800bps, the maximum output lines are 3 lines.**
***2 It is outputted in order of Satellite ID number.**
***3 "00" when not tracking**

GPRMC data format: (1/2)

The example of GPRMC:
$GPRMC,093931,A,3536.5987,N,13944.8905,E,000,0,090.7,241203,,,A*76

Contents	Example	Unit	Explanation
Sentence ID	$GPRMC		RMC header
UTC of position	093931		hhmmss
Status	A		A: Data valid V: Data invalid
Latitude	3536.5987		ddmm.mmmm
North/South	N		N: North Latitude S: South Latitude
Longitude	13944.8905		dddmm.mmmm *1
East/West	E		E: East Longitude, W: West Longitude *1
Speed over ground	000.0	Knots	Receiver's speed *2
Course over ground	090.7	Degrees	Receiver's direction of travel Moving clockwise starting at due north
Date	241203		ddmmyy
Magnetic variation		Degrees	*3
East/West			E: East, W: West *3
Mode Indicator	A		A: Autonomous D: D-GPS N: Data invalid *4
Checksum	76		
<CR><LF>			End of sentence

GPRMC data format: (2/2)

Note:

***1: The Longitude is always expressed as 0 degree when the Latitude is 90 degree, and is expressed as Longitude 0(180) degree East when the Longitude is 0(180) degree West.**

***2: The Speed over ground is expressed as three integer digits and one decimal digit. Values 999.9 and higher are expressed as 999.9.**

***3: Travel direction (Degree Magnetic) is not output.**

***4: Positioning system mode indicator.**

Appendix F. FCC Statement – Bluetooth

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. To maintain compliance with FCC RF exposure compliance requirements, please avoid direct contact to the transmitting antenna during transmitting.