

M-1000

Bluetooth GPS Receiver



User's Guide

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Rev.A

HOLUX Technology Inc.

1F, No. 30, R&D Rd. II, HsinChu City 300, Science-based Industrial Park, Taiwan

TEL: 03-6687000 FAX: 03-6687111

Website: www.holux.com

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1. Overview



(Fig.1)

The **HOLUX M-1000 Bluetooth GPS Receiver** (Fig. 1) is a total solution GPS receiver with Bluetooth, UART interface and built-in rechargeable battery for high sensitivity to tracking signal. **M-1000** design is based on Media Tek Inc.(MTK) GPS solution-MT3318 low power Architecture.

M-1000 is a dual-function GPS receiver. Not only transmit satellite information through the PDA or Notebook by Bluetooth interfaces but also is a G-Mouse GPS receiver through a *HOLUX* designed data cable (Optional cable, see chapter 6) to deliver satellite signal to the device without Bluetooth interface.

M-1000 meets the requirement of field application, such as car navigation, mapping, agriculture surveying and security use under clear view of sky. M-1000 contacts to other device through Bluetooth interface, and built-in rechargeable Li-ion battery to save satellite information such as the status of satellite signal, the previous available location, date and time.

With the advanced technology, M-1000 can track up to 32 satellites simultaneously, re-acquires satellite signals in 0.1 microsecond and updates position data per second.

2. Packing List

Thank you for purchasing the M-1000 Bluetooth GPS Receiver. Before you start, make sure that the following items are included in your package. If any of these items are missing, please contact your original local *HOLUX* dealer or distributor.

- M-1000 Bluetooth GPS receiver 1 Set
- Car Cigarette adapter 1 Set
- User guide and Driver CD 1 Pcs
- M-1000 Quick Guide 1 Pcs
- Warranty card 1 Pcs

Option

- Travel power supply 1 Set
- *HOLUX* USB data cable 1 Set

3. Main features

- Built in MTK MT3318 Low power consumption GPS chipset.
- 32 parallel satellite-tracking channels for fast acquisition and reacquisition.
- Superior sensitivity up to -159 dBm.
- Built-in WAAS/EGNOS Demodulator without any additional hardware. Or use the high-sensitive software to get the fast acquisition and reacquisition in the urban, canyon and foliage environments.
- Compatible with Bluetooth Serial Port Profile (SPP) completely.
- Low power consumption. Built-in rechargeable and changeable Lithium-ion battery, the working time can last 17 hours maximum.
- Provide expand terminal contact to other system without Bluetooth device.
- Support NMEA0183 V 3.01 data protocol
- 3 color-LEDs indicate to show the status of device.
- FLASH based program memory. New software revisions upgradeable through serial interface.
- Small, sleek, and lightweight design easily fits in your hand.
- Over-Temperature protection
- Enhanced algorithms -SnapLock and SnapStart provide superior navigation, performance in urban, canyon and foliage environments.
- For Car navigation, Marine navigation, Fleet management, AVL, Personal navigation, Tracking System, and Mapping device application.

4. Technical Specification

4.1. Basic Specification

- Chipset : MTK MT3318 chipset.
- Channels : 32 parallel satellite-tracking channels.
- Frequency : 1575.42 MHz
- Receiver : L1, C/A code.

4.2. Acquisition Time (refer to MTK chip specification)

- Reacquisition : 0.1 second.
- Cold start : < 36 seconds.
- Warm start : < 33 seconds .
- Hot start : < 1 second

4.3. Receiver Accuracy

- Normal : < 3 meters CEP without SA.
- Enable EGNOS or WAAS :
 - Position: < 2.2 meters, horizontal 95% of time
< 5 meters, Vertical 95% of time
- Velocity : within 0.1 meters / second
- Time : 0.1 microsecond synchronized GPS time

4.4. Use Limitation

- Altitude : < 18,000 meters (60,000 feet)
- Velocity: : < 515 meters/ second (1000Knots)
- Acceleration : 4 G.
- Jerk : 20 meters / second³, max

4.5. Power Supply

- External Voltage: 5VDC +/-5%
- Batteries :
 - Main Power: Built-in rechargeable Lithium-ion for system power.
 - Backup Power: Rechargeable Lithium-ion battery for memory backup.
- Working voltage: 40~50mA (Normal mode).
35mA (Power Saving).
- Auto Power Saving mode.
- Circuit protection on M-1000 when over-temperature condition - 50℃ occurs.

4.6. Output and Interface

- Output
 - I. Output protocol

Baud Rate : 38400 bps

Data bit : 8

Parity : No

Stop bit : 1

II. Format. NMEA0183 V3.01 : GPGGA (1time/1 sec), GPGSA (1 time/5 sec.), GPGSV (1time /5 sec.), GPRMC (1time /1 sec.), GPVTG (1 time/1 sec), (GLL, or MTK NMEA Command for optional).

III. Datum : WGS84.

● **Input/ Output Interface:**

I. Compatible Bluetooth Serial Port Profile (SPP), Version1.2 and class 2(up to 10 meter range).

II. In/Out Port. GPS signal (Out)/Command(In) with CMOS Level ◦ Mini USB Type B Connector and Cable option :

(a) GR230-A2 (USB data cable)

4.7. Physical

- Size : 65 × 43 × 17.6 mm
- Weight : < 53 g
- Operating Temperature : -10℃ to + 60℃(under the un-charging condition);
Charging Temperature : 0℃ to + 45℃
- Storage Temperature : -20℃ to + 60℃
- Operating humidity : 5% to 95% No condensing

4.8. Other Functions

- Bluetooth frequency: 2.4 ~2.48GHz
- Bluetooth Input Sensitivity: -85dBm
- Low sensitivity of receiving satellite signal : -159 dBm
- LED Functions : Indicate Bluetooth status, GPS status, Battery Status and
Battery charging status

5. Getting Started

STEP 1. Charge Battery

Please charge battery till LED off for the first time.

Power cable plug in Power cable connect to power socket



Charge Battery

Battery indicator light:

Power too low ----- Red LED

Charging ----- Green LED

Full or Not in charging -- LED off



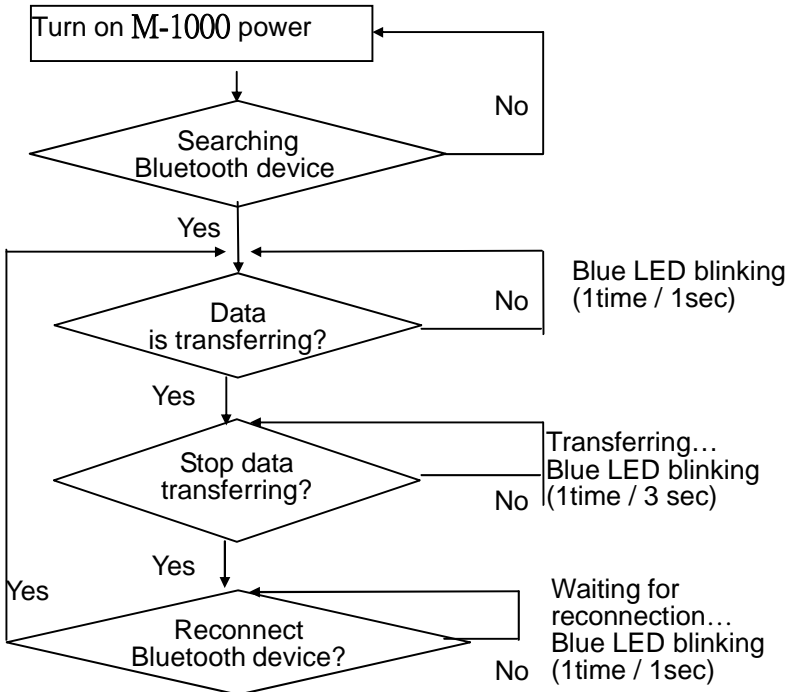
Mini USB socket



Power switch

STEP 2. Turn on the power

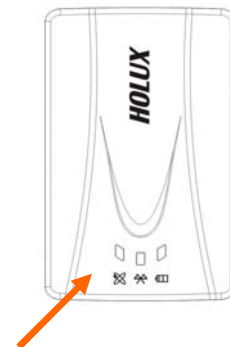
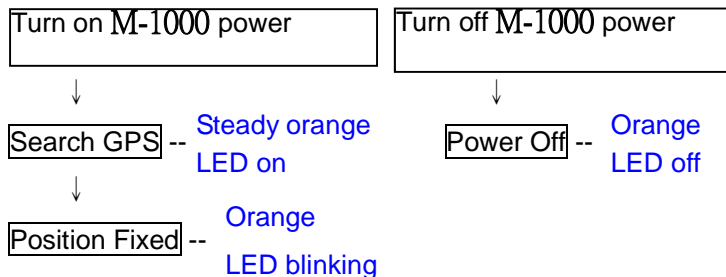
Bluetooth Status -



Note:
Some PDAs have to re-open Bluetooth manager for Bluetooth device re-connection.

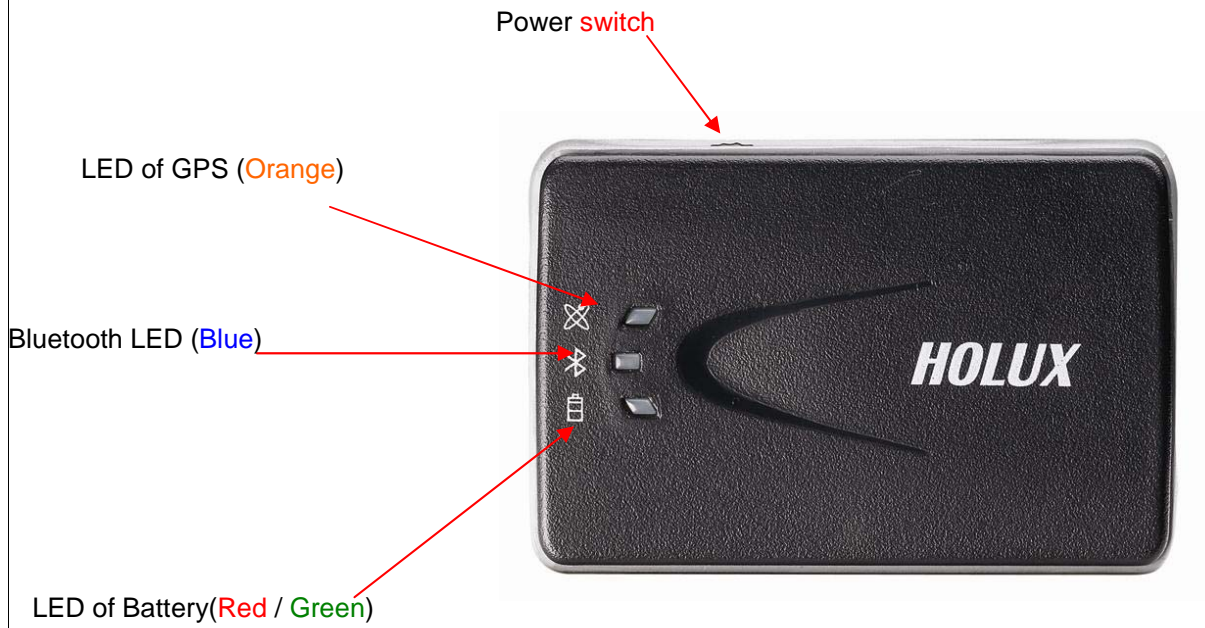
GPS Status ---

Put M-1000 in clear view of the sky without any obstruction for better satellite acquiring.






5.1. Hardware Description

1). M-1000 Body description see Fig. 2:



(Fig.2)

2). LED status :

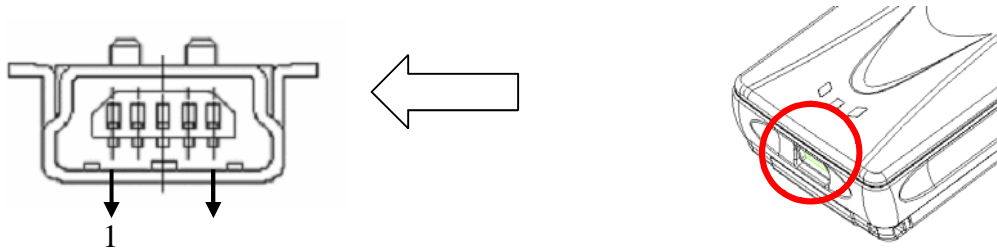
SYMBOL	COLOR	STATUS		DESCRIPTION
 Bluetooth	Blue	Blinking	1 times / 1 sec	Search Bluetooth Device
			1 time / 1 sec	Standby Mode
			1 time / 3 sec	Transferring Data
 Battery	Red	Light on		Power too low
	Green	Light on		In charging
	N/A	Light off		Battery full or Not in charging
 GPS	Orange	Light on		Acquiring Satellites
		Blinking	1 time / 1 sec	Position Fixed

3). Power Switch :

- a. Power on, Orange light is on.
- b. Power off, Orange light is off.

4). Power Jack & Data Port, see Fig.3

Jack type: Mating face of 5 pin Mini USB Type B female.
 Pin definition see table 1.

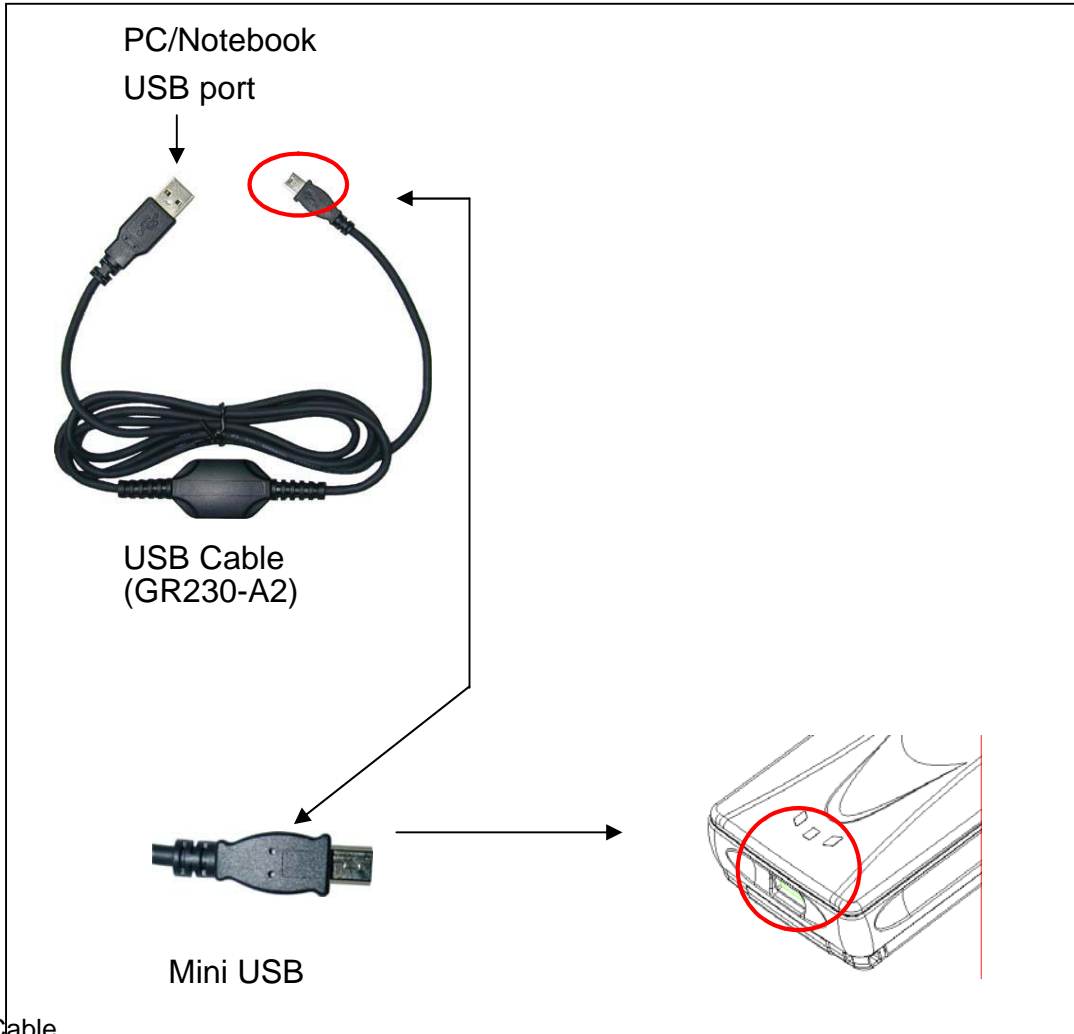


(Fig.3)

Table 1

Pin	Pin Name	Signal and description
1	GND	Signal ground, Battery charging ground.
2	NC	
3	TXD	Transmit Data. From organizer to peripheral.(Voltage Level is 3.3V ~ 5.0V).
4	RXD	Receive Data. Form peripheral to organizer.(Voltage level is 3.3V ~ 5.0V).
5	VCHARG	Positive terminal of DC adaptor that powers the internal charging circuit of Li-Ion battery. The approved power supply is 5.0V +/- 5%@800mA.

5). Optional accessories, and connector description, see Fig. 4



USB Cable
(GR230-A2)

(Fig.4)

Notics : This data cable is designed by HOLUX specially for G-mouse function, can't be replaced by common USB cable. The ordinary USB cable can only provide the charging function.

5.2. Bluetooth device connection installation

The following is the steps of software installation to setup on PDA, DELL AXIM x51v with Bluetooth Manager. For other PDA or laptop device, the steps might vary.

1. In Pocket PC setting→system panel, enable “manage GPS automatically”.

Note:The setting may vary in other PocketPC or Smartphone , please check the manual or consult the technical service respectively.



2. Tap the Bluetooth icon to start “Bluetooth Manager” on PocketPC to enable Bluetooth function.



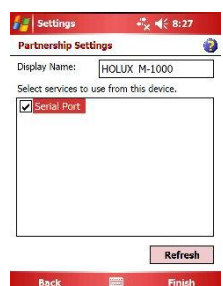
3. In “Devices” panel , tap “New partnership” to search Bluetooth devices nearby. If the result is not found, tap “Refresh” to research again.



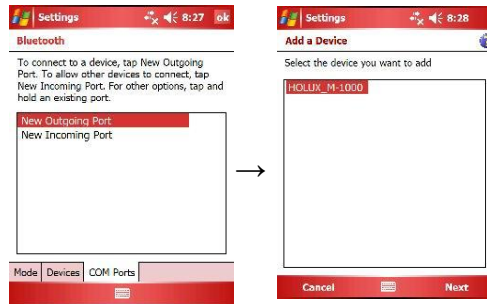
4. Choose the Bluetooth device “HOLUX_M-1000” and tap “Next”



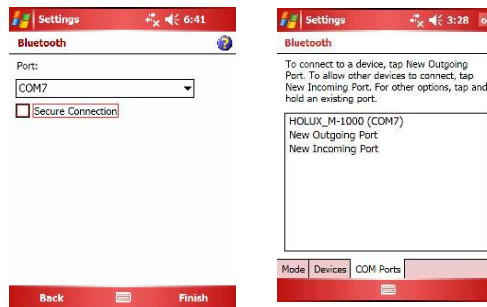
5. Connect to “Serial port” or “SPP Slave”, then tap “Finish”



6. Go to the “COM ports” panel to tap “New Outgoing Port”, choose “HOLUX_M-1000” device and tap “Next”.



7. Select the COM port, then tap finish, it will show as right figure, and tap “OK” to finish the Bluetooth setting. Recommend not to use “Secure Connection” which may cause unstable connection.



8. Then you can enable your navigation map program to enjoy GPS function now.

5.3. Installation of Mini GPS Viewer program

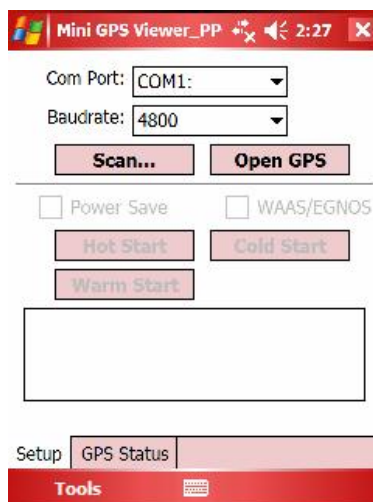
We provide a program “Mini GPS viewer.exe” for end user to watch the satellite signal receiving status on laptop or PDA device.

For Windows 2000/XP OS, you can execute “Mini GPS viewer_PC” directly.

For Microsoft Pocket PC, please copy “Mini GPS viewer_PPC” to SD card or device, then execute “Mini GPS viewer_PPC”.

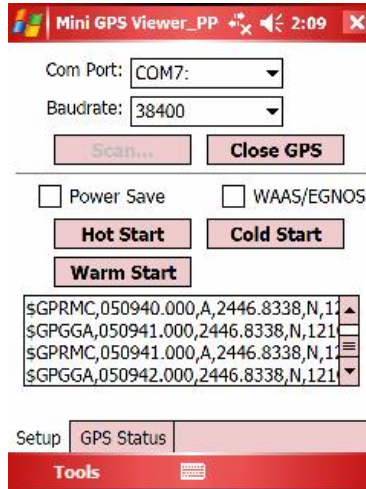
5.4. Execute the Mini GPS Viewer program

- 1) The following window is shown after executing Mini GPS Viewer_PPC,(see Fig. 5). The Windows 2000/XP version is just different on display.



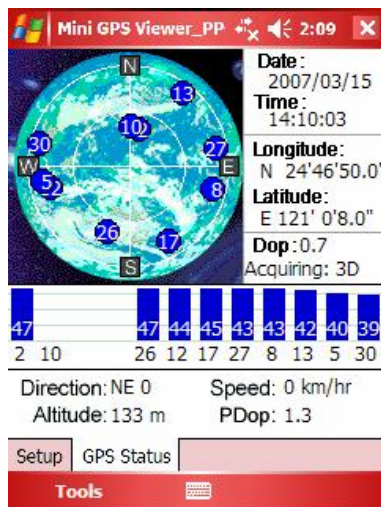
(Fig. 5)

- 2) Setup the Baud rate : 38400, then tap “Scan” button to scan your COM Port. Select your COM Port respectively, then tap “Open GPS” button. Check log screen below if the satellite data is receiving correctly.



(Fig. 6)

- 3) Select “GPS Status” panel to observe the GPS information status , see Fig. 7.



(Fig. 7)

- 4) In “setup” panel you can see “Hot Start” 、 “Warm Start” 、 “Cold Start” 、 which allow you to re-acquisition of Ephemeris and Almanac. Basically the satellites are always moving in the sky, if Ephemeris and Almanac data in GPS receiver can’t meet real satellites status upon you if GPS receiver is over 0.5 hour power off but you are no longer in the previous position , it takes more time for the GPS receiver to get GPS position fix soon. We suggest you can click “Cold Start” or “Warm start” to re-acquisition. Or you can remove the battery for 3 seconds and reinsert it, this operation is the same with “Cold Start”.

6. Optional cable accessory

Option cable accessory is provided to meet customers' need, see table 1. With the data cable connected, it can transmit data with PDA, NoteBook easily as the G-mouse role.

Table 1

Item	Description	Note
GR230-A2	HOLUX USB data cable	

7. Driver Installation

The following is the steps of installation GR230-A2 USB data cable.

7.1 System Requirement

CPU: IBM, Pentium II or above, or other compatible PC.

Memory: above 32 MB

System: Windows 2000/XP

7.2 Installation

- I. Starts the driver installer from driver CD.
- II. Connect GR-230-A2 USB data cable to computer. System will search new hardware and install the driver automatically
- III. Connect M-1000 GPS receiver with USB data cable.

7.3 Important

Verify the COM port to start using your own navigation software.

- I. Click **<Start>** menu, select → **<Setting>**, then enter→ **<Controller>**
- II. After entering **<Controller>**, and select **<System>**.
- III. Select **<Device Manager>**.
- IV. Find the **< Connector(COM & LPT)>** and check the Virtual COM Port, which was created by the USB driver.

Please note that the virtual COM port number might be different from every computer. Before using navigation software, please confirm the COM Port numbers created by your computer and provided by your navigation software. Otherwise, the navigating software won't receive the satellite signal, because of the un-match COM Port setting.

8. Warranty

The M-1000 is warranted to be free from defects in material and functions for a period of one year from the date of purchase. Any failure of this product within this period under normal conditions will be replaced at no charge to the customers.

- **M-1000 has built Li-battery inside, please avoid closing to high temperature environment or sun shine directly for a long time.**

9. Troubleshooting

Problems	Possible Reasons	Methods
No GPS output but GPS timer is counting	Weak or no GPS signal at the place of M-1000	Test under open sky at a fix location and run Mini GPS Viewer “Cold start” function.
	The ephemeris and almanac data in GPS memory is no longer valid after no use for a long time.	Remove the Battery for 3 seconds and re-insert, then power on to test again.
Execute fail	Bluetooth function unstable	Power On/Off M-1000. Re-Start PDA or PC and refer to section 5.2 “Bluetooth device connection installation” to re-connect.
Can not open the COM port	Bluetooth connection interrupted or COM port is conflicted/occupied by other programs.	Check the Bluetooth connection again, Check and close other programs that might conflict with.
Can not find M-1000	Poor Bluetooth connection	Re-Start PDA or PC and refer to section 5.2 “Bluetooth device connection installation” .

Federal Communications Commission (FCC) 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.