

Holux

Wireless GPS Logger

M-241



User's Guide

OCT 2007
Rev.A

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Declaration of Conformity

The following products is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the laws of the Member States relating to R&TTE Directive (1999/5/EC) that include the Electromagnetic Compatibility Directive (89/336/EEC) and Low Voltage Directive (73/23/EEC). The listed standard as below were applied:

The following Equipment:

Product : Wireless GPS Logger
Trade name : **HOLUX**
Model Number : M-241

This product is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the laws of the Member States relating to R&TTE Directive (1999/5/EC) that include the Electromagnetic Compatibility Directive (89/336/EEC) and Low Voltage Directive (73/23/EEC), the following standards were applied:

1999/5/EC:
ETSI EN 300 328 :
ETSI EN 301 489-17 :
ETSI EN 301 489-1 :
:
:
73/23/EEC:
EN 60950-1 :
:

The following importer/manufacturer is responsible for this declaration:

Company Name : **HOLUX Technology, Inc**
Company Address : **1F, No.30, R&D Rd. II, Hsinchu City 300, Taiwan (R.O.C.)**
Telephone : **886-3-6687000** Facsimile : **886-3-6687111**

Person is responsible for marking this declaration:

<u>Philip Yu</u>	<u>Vice President</u>
Name (Full Name)	Position/ Title
<u>October-16-2007</u>	
Date	Legal Signature

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1. Overview

The HOLUX **M-241** wireless GPS logger provides real time coordinate logging and easy-to-use trip guiding service. The **M-241** can record up to 130,000 positions, each position including longitude, latitude, time, and altitude. The log file can be downloaded for analysis via USB connection. You can combine these positions with your Digital camera photos to share the track histories and photo locations to mapping application software such as Google Earth.

Position information, moving speed, free logging volume and the date & time can be shown on the LCD display directly at any time. The M-241 supports distance and time logging modes, kilometer and mile distance units, and 3 languages (English, Traditional Chinese, and Simplified Chinese).

Because the M-241 provides a Bluetooth interface, you can use it freely while driving without the clutter of cables.

Enjoy the GPS life!

The **M-241** is a high performance wireless GPS logger with the following features:

1. Dual interface (Bluetooth + GPS-mouse by USB cable).
2. Compatible with Bluetooth Serial Port Profile (SPP) completely.
3. Powered by one AA battery.
4. LCD display (32mm L* 8.9mm W) to show position information, speed, capable logging memory size, date & time.
5. Capable memory size to record up to 130,000 positions, including longitude, latitude, time, and altitude.
6. Personal settings to select the logging mode by distance or time, unit by Kilometer or mile, and 3 languages (English, Traditional Chinese, and Simplified Chinese) support.

Applications:

- * Vehicle tracing & Location base services
- * Navigation with PDA/Notebook/Smartphone devices
- * Car navigation
- * Marine navigation
- * Distance measurement
- * Sports and Recreation
- * Fleet Management

Software application program:

A user-friendly software utility is provided with the following functions:

- * Download recorded data to PC.
- * Recording mode setting (Time / Distance)
- * Erase recorded data
- * Output data format
 - (1) Save exploring data to KML file format (Interface with Google Earth)
 - (2) NMEA file format (*.txt)
 - (3) Binary file format
 - (4) GPX file format

2. Packing List

Thank you for purchasing the **M-241** wireless GPS logger. 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.

1. M-241 wireless GPS logger	1 Set
2. AA Battery	1 Set
3. Car Charger *+ USB cable	1 Set
4. User guide and Driver CD	1 Pcs
5. M-241 Quick Guide	1 Pcs
6. Warranty card	1 Pcs
7. Nylon strap	1 Pcs

Option

1. Travel power supply	1 Set
------------------------	-------

* Car Charger can only be used as the power supply adapter, it does not have any battery charging function.

3. Main features

1. Built-in MTK Low power consumption GPS chipset.
2. 32 parallel satellite-searching channels for fast acquisition and reacquisition.
3. Superior sensitivity, up to -159 dBm.
4. Built-in WAAS/EGNOS/MSAS Demodulator without any additional hardware.
5. Completely compatible with Bluetooth Serial Port Profile (SPP).
6. Low power consumption. Use AA alkaline batteries (or rechargeable batteries) for up to 12 hours of operation.
7. Provide expanded terminal contact to other systems without the Bluetooth device.
8. Support NMEA0183 V 3.01 data protocol
9. Compact and lightweight design for ease of use.
10. LCD display (32mm * 8.9mm /128 * 32 pixels) to show position information, speed, capable logging memory size, date & time.
11. Capable memory size to record up to 130,000 position data, including longitude, latitude, time, and altitude.
12. Personal setting to choose the logging mode by distance or time, unit by Kilometer or mile, and 3 languages (English, Traditional Chinese, Simplify Chinese) support.

4. Specification

- 32 parallel satellite searching channels
- Receiver: L1, 1575.42 MHz
- Frequency: 1.023 MHz
- Update frequency: 1 Hz.
- Antenna type: Built-in
- Satellite signal reception sensitivity: -159dBm

Specifications

- Dimensions: 32.1mm X 30mm X 74.5mm
- Weight (excluding battery): < 39g.
- Switch: Slider switch
- 1 AA alkaline battery lasts for up to 12 hours of operation
- Operating temperature: 0 °C to + 50 °C
- Storage temperature: -10 °C to + 60 °C
- Operating humidity: 5% to 90%

◆ Non DGPS (Differential GPS) :

- Position : 3.0 M CEP excluding SA
- Velocity: 0.1M / sec.
- Interval: 0.1 sec to Sync GPS

Positioning

◆ DGPS (EGNOS/WAAS/MSAS) :

- Position: < 2.2 M., Horizontal deviation 95% time
< 5 M., Vertical deviation 95 % time

*The above data is based on the specifications of the MTK GPS chip

Positioning

Timing

- Time to reposition < 0.1 sec average
- Hot boot 1 sec
- Warm boot 33 sec
- Cold boot 36 sec

*The above data are based on specifications of the MTK GPS chip

◆ Bluetooth compatible serial specifications (SPP)

- Bluetooth V1.2 compatible
- Bluetooth class 2 (within 10m of range in open space)
- Frequency: 2.400 to 2.480 GHz
- Modulation: FHSS / GFSK
- RF channels: 79
- Input sensitivity: -85dBm
- Output power: +2dBm

Protocol and Interface

◆ **Output port: Mini-USB (CMOS Level)**

• **NMEA protocol output: V 3.01**

Baud rate: 38400 bps

Data bits: 8

Sync bits: N

End bit: 1

• **Output interface:**












Standard: GPGGA (1 time per second), GPGSA (1 time per second),
GPGSV (1 time per second), GPRMC (1 time per second), GPVTG (1
time per second).

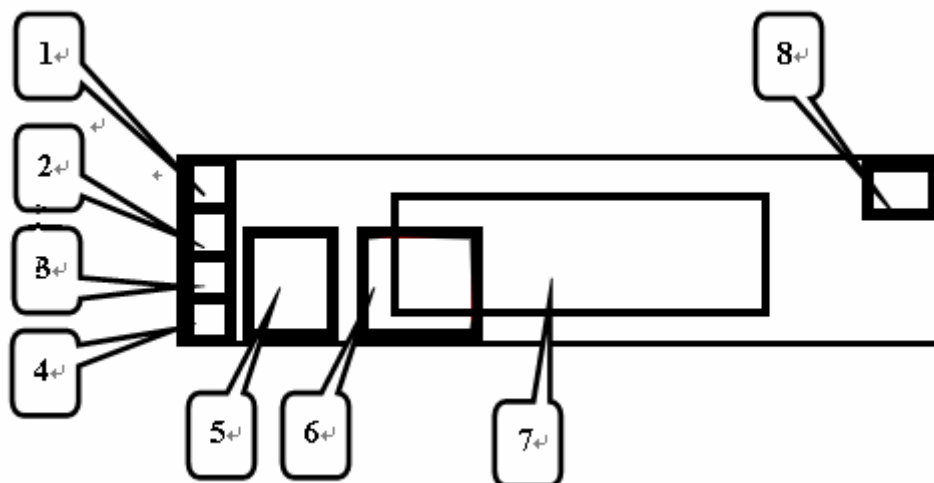
- Physical Specifications**
- **Sea level: Max** 18,000 M (60,000 feet)
 - **Velocity:** Max 515 M./sec (1000 knots)
 - **Acceleration:** Max 4G
 - **Vibration:** 20 M/ second³, Max.
-

Buttons 1 Power switch, 2 Buttons (Menu and Confirm)

- LCD display page**
- System and satellite positioning status
 - Time
 - Position
 - Velocity
 - Distance measurement
 - Setup
-

5. Icons & Indicators

Position	Icon	Descriptions	Position	Icon	Descriptions
1		Log by Time	2		Measure Distance On
1		Log by Distance	4		Lock On
3		Log On	7		Device & PC Connected
4		Waypoint	8		Battery is Full
6		GPS Fix	8		Battery is exhausted
5		Bluetooth Connection			



6. Product Overview

1 LCD Screen

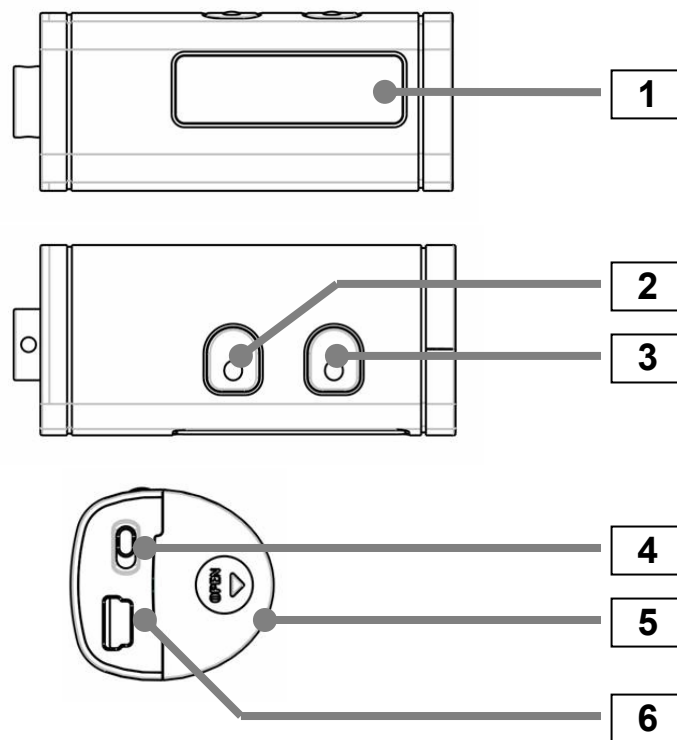
2 MENU Button

3 ENTER Button

4 Power Switch

5 Battery Cover

6 USB Port



7. Basic Operations

Before you use

1. If the user wants to use M-241 to record the coordinate for matching the GPS coordinate of the picture in the camera, because the integration of the two parties is performed under the comparison of the time, it is recommended for the user to adjust the clock time in the camera to match the GPS time in the M-241.
2. M-241 does not have the water-proof feature; please pay attention to the moisture while using it in a rainy day.
3. Before turning off, please press "stop" button to prevent log data damaged when in logging mode.
4. Before changing a new battery, please turn off power first.

Button Definition

MENU Button -> Change & Select function.

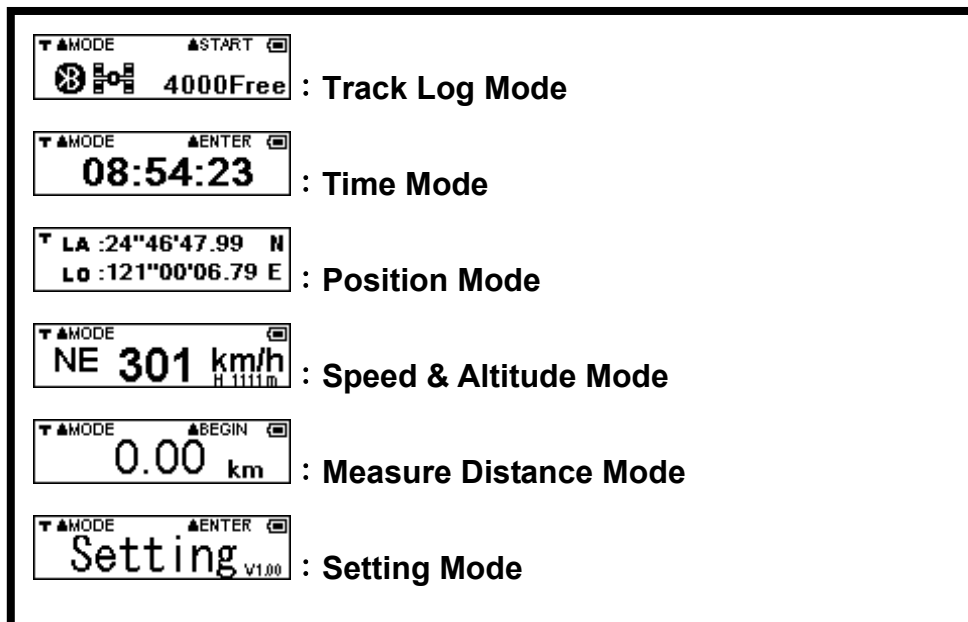
ENTER Button -> Confirm your select.

Except during the Setting Mode, user may press the "MENU" key and "ENTER" key at the same time, all keys function will "LOCK", and press the "MENU" key and "ENTER" key at the same time again, to cancel the "LOCK" status.

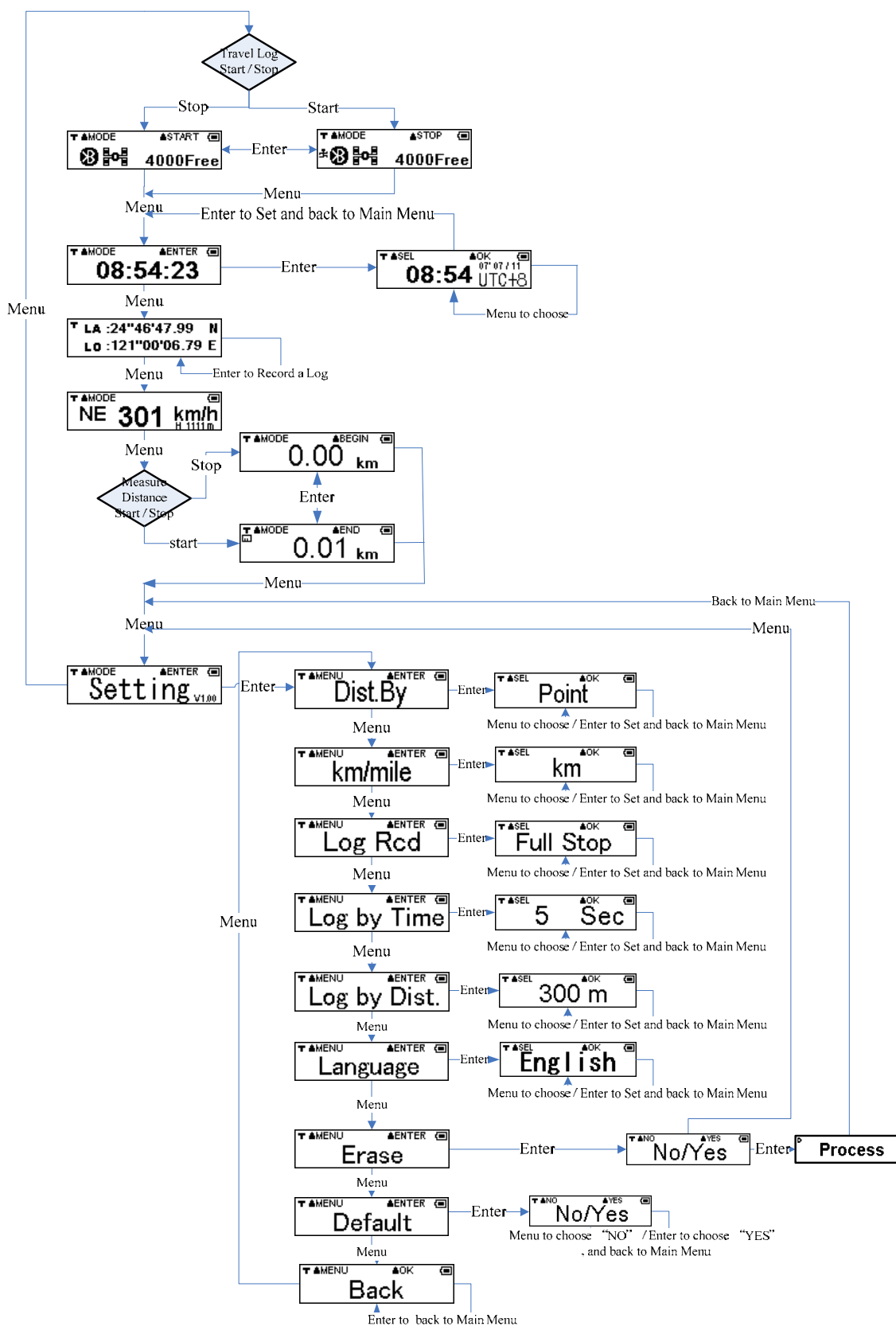
* LCD screen will show the reference button function.

How to select a mode

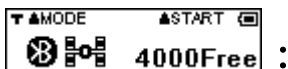
1. Turn on the power switch. The device will turn on and show the Track Log Mode on the LCD.
2. There are 6 operational modes on this device. Please use the MENU Button to change operation mode. (**Track Log Mode** -> **Time Mode** -> **Show Position Mode** -> **Show Speed & Altitude Mode** -> **Measure Distance Mode** -> **Setting Mode** -> **Track Log Mode.**)



Operational flow



Operational menu description

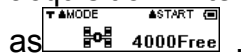




Menu: Go to Time mode

Enter: Start / Stop the recording GPS data.

Note:

1. When power on M-241, user will see “ GPS Searching” before GPS acquisition. After GPS is fixed, you will see the screen



2. When user starts the “Track Log” function, the “  ” icon will appear on the bottom-left corner of the screen.
3. The “ XXXXFree ” signifies how many log data can be recorded.
4. When Bluetooth is connection, the icon “  ” will show up.



Menu: Go to Position Information mode

Enter: Go to select the Time Zone Adjustment

Note:

1. This is UTC* time receiving from GPS, which can't be adjusted but time zone selecting is allowed. .

*UTC means the Greenwich Mean Time (Coordinated Universal Time).

2. Before GPS acquisition, screen will show “  ” only.

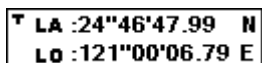


Menu: Adjust the UTC time to meet user's local time (circular:

+8,+9,+10,+11,+12,+13,-12,-11,-10,-9,-8,-7,-6,-5,-4,-3,-2,-1,0,+1,+2,+3,+4,+5,+6,+7,Esc*)

Enter: Setting and back to Time mode

*Esc: means to cancel the change and restore to the previous setting.

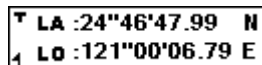


: Position Information Mode

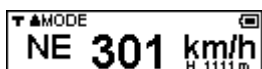
Menu: Go to Speed & Altitude Information mode

Enter: Record a current track log data once

Note: When Recording a current track log data once, the "📍" icon will show for one second on the bottom-left corner of the screen.



Note: Because the satellite signal may be shifted easily due to the interference when the moving speed is less than 10 km/hr or under the environment with tall buildings that the satellite signal is not good, it is normal that the user may see the shift of the satellite coordinate while being in the static state.



: Speed & Altitude Information Mode

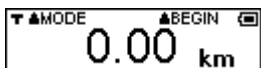
Menu: Go to Measure Distance mode

Enter: No Function

Note:

1. Current Speed (Unit: km/h or mph) and altitude (Unit: m or ft) will show on the LCD.
2. You can select the unit in setting mode, refer to km/mile menu.

Because the satellite signal may be shifted easily due to the interference when the moving speed is less than 10 km/hr or under the environment with tall buildings that the satellite signal is not good, it is normal that the user may see the shift of the satellite coordinate while being in the static state.




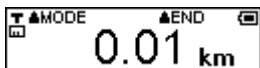
: Measure Distance Mode

Menu: Go to Setting mode

Enter: Start / Stop to measure distance

Note:

1. When user enables the “Measure Distance” function, the “” icon will show on the top-left corner of the screen



2. Because the satellite signal may be shifted easily due to the interference when the moving speed is less than 10 km/hr or under the environment with tall buildings that the satellite signal is not good, the user may see the shift of the satellite coordinate while being in the static state. Thus, while the distance is being measured, it is normal that there might be accumulated error and the displayed total measured distance will be different from the actual distance.
3. You can select the unit in setting mode, refer to km/mile menu.



: Setting Mode

Menu: Go to Track Log Mode page

Enter: Go to “Distance By” menu of Setting mode

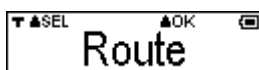
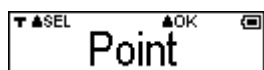


Menu: Go to km/mile menu of Setting mode

Enter: Go to select “Point” or “Route”

Note:

1. “Distance By” signifies that Measure Distance is by “The beeline between Begin Point and End Point” or by “Route (Path) of all points”.

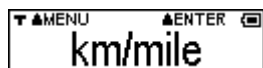


Menu: Select “Point” or “Route”

Enter: Setting and back to Setting mode

NOTE:

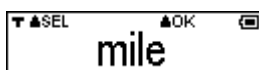
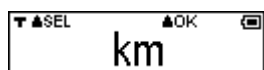
1. When the user select the “Point” logging method, the logged distance is the straight line distance between the starting point and the end point.
2. If the “Route” logging method is selected , the logged distance will be the accumulated distance of each segment between the log points. However, because the distance between any two log points may have error, the accumulated distance value may have increased error with the increase of the number of the log points.



Menu: Go to Log record mode menu of Setting mode

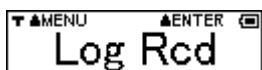
Enter: Go to select “km” or “mile”

Note: “km/mile” signifies that the Units of Measure Distance and show speed are “km” or “mile”.



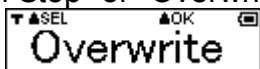
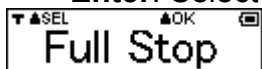
Menu: Select “km” or “mile”

Enter: Setting and back to Setting mode



Menu: Go to Log by Time menu of Setting mode

Enter: Select "Full Stop" or "Overwrite"

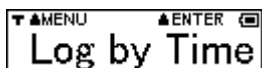


Menu: Select "Full Stop" or "Overwrite"

Enter: Setting and back to Setting mode

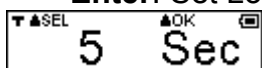
Note:

1. "Full Stop" -> Recording log data -> flash full -> Stop recording.
"Overwrite" -> Recording log data -> flash full -> Overwrite the first log.
-



Menu: Go to Log by Distance menu of Setting mode

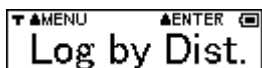
Enter: Set Log Mode to "By Time" and select number of Sec.



Menu: select the logging frequency .(circular: 5,10,15,30,60,120,Esc*)

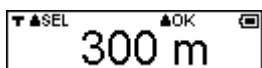
Enter: Setting and back to Setting mode

*Esc means to cancel the change and restore to the previous setting.



Menu: Go to Language menu of Setting mode

Enter: Set Log Mode to "By Distance" and select the number of meters.

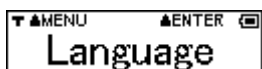


Menu: select the logging interval

circular :50,100,150,200,300,500,1000 meters , Esc*)

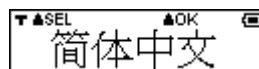
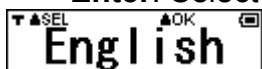
Enter: Setting and back to Setting mode

*Esc means to cancel the change and restore to the previous setting.



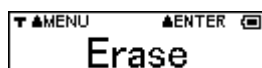
Menu: Go to Erase menu of Setting mode

Enter: Select Language



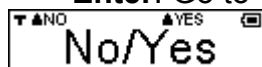
Menu: Select Language. (circular: English,繁體中文,简体中文)

Enter: Setting and back to Setting mode



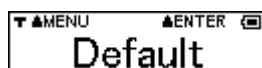
Menu: Go to Default menu of Setting mode

Enter: Go to "YES / NO" status



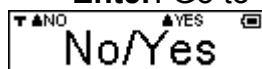
Menu: Not erased and back to Setting Mode

Enter: Erase all of track log data and back to Setting Mode



Menu: Go to Back menu of Setting mode

Enter: Go to "YES / NO" status



Menu: No change and back to Setting Mode

Enter: Restores device back to factory default settings and back to Setting Mode



Menu: Go to "Distance By" menu of Setting mode

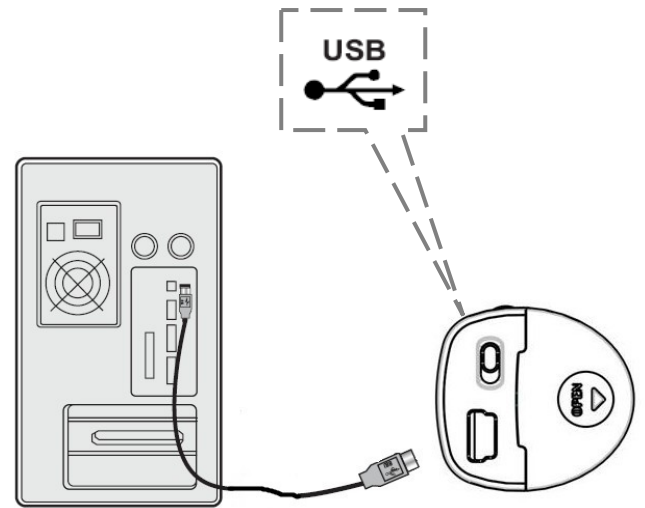
Enter: Back to Setting Mode

8. Connecting the device to the PC

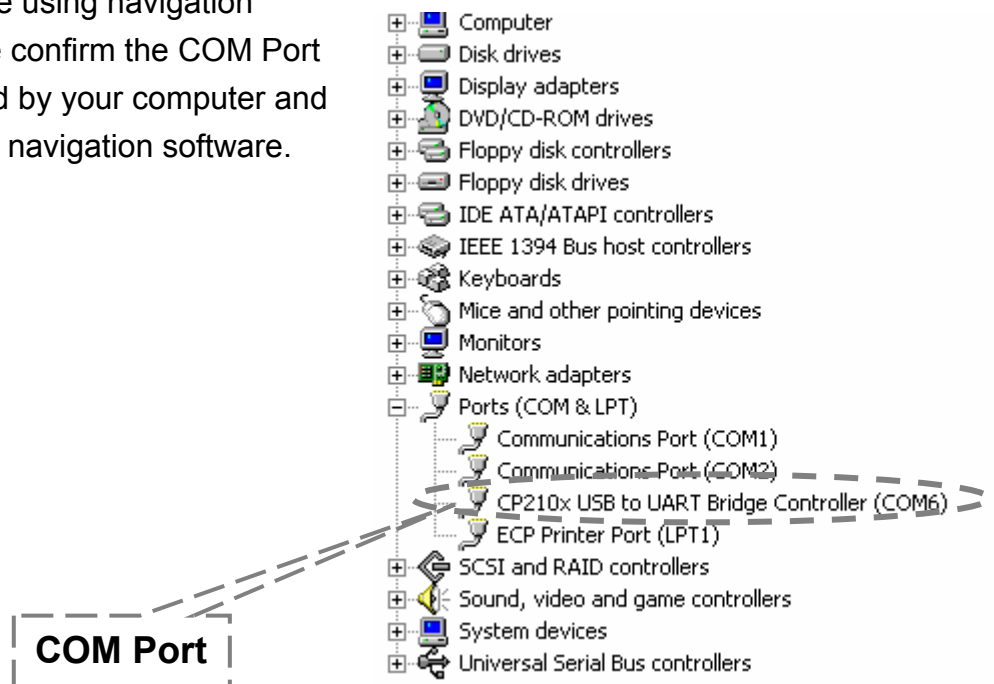
M-241 support 2 kinds of connection to PC, through USB cable or Bluetooth.

Install USB driver

1. Power On the device.
2. Connect the device to a computer with the USB cable provided in the package.
3. Install the USB driver "CP210x_VCP_Win2K_XP.exe" from the CD provided in the package.
4. Click **<Start>** menu, select → **<Setting>**, then enter → **<Controller>** and select **<System>** Select **<Device Manager>** Find the **< Connector (COM & LPT)>** and check the "CP210xUSB to UART Bridge Controller" message.



Please note that the virtual COM port number might be different on every computer. Before using navigation software, please confirm the COM Port numbers created by your computer and provided to your navigation software.



Using Bluetooth

Turn On the device, and connect the device to a computer with the Bluetooth interface.(Please refer to P. 29 of the user manual.)

9. Download Log Data to PC

1. User can use Holux application software ” **HoluxUtility.exe**” to download the log data to the PC after connecting the device to the PC, and easily export the log data to “**Google Earth**” or “**locr GPS Photo**”.
2. For information on “**Google Earth**” and ” **locr GPS Photo**”. Please visit Google Earth website <http://earth.google.com> or Locr website <http://www.locr.com>.
3. The download time takes about 4 min if the full memory usage.

Holux Logger Utility

“Holux Logger Utility” allows the user to adjust Track Log Setting and Track Log Format Conversion and Track Log Photo Link.

Utility main screen includes four sub pages:

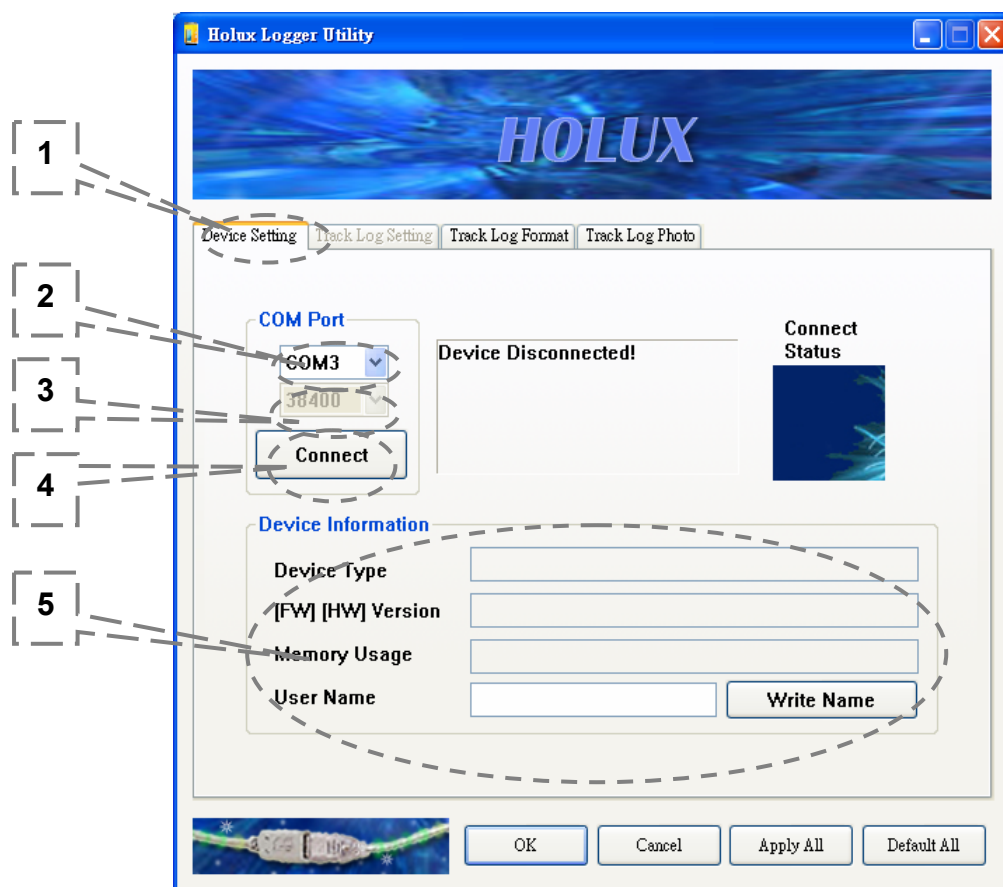
Page 1: Device Setting

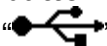
Page 2: Track Log Setting

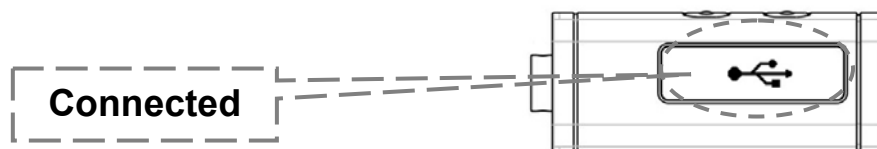
Page 3: Track Log Format

Page 4: Track Log Photo

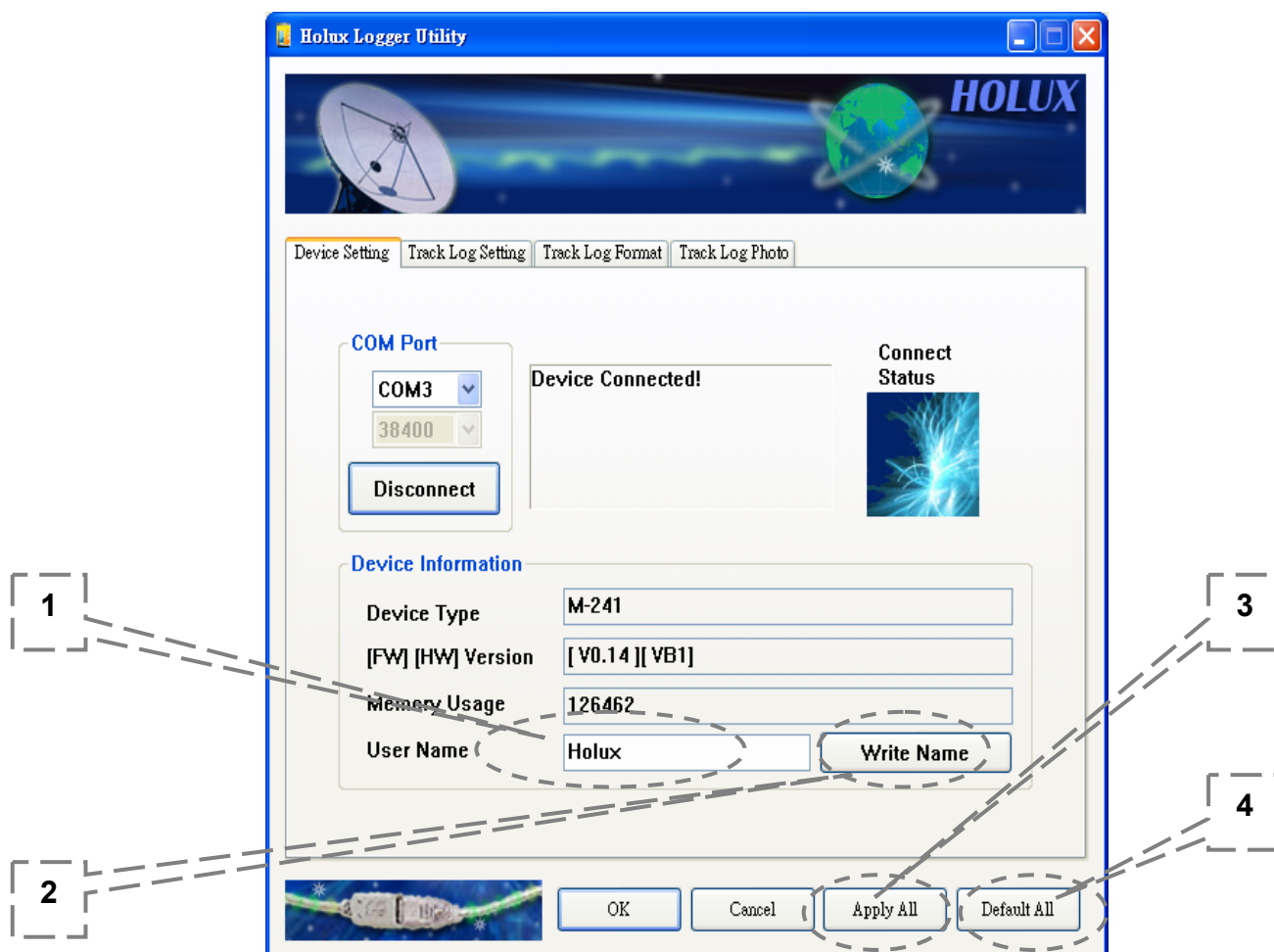
Device Setting



1. Page : Device setting page.
2. COM Port : Select COM Port.
3. Baud rate : Select Baud rate. (Default: 38400)
4. Connect : Connect the Holux Logger Utility to device.
5. Device Information : If the device connected to Holux Logger Utility, the **device information** will show a descriptive message and the **Connect button will change to Disconnect**. The device LCD will show an  icon.

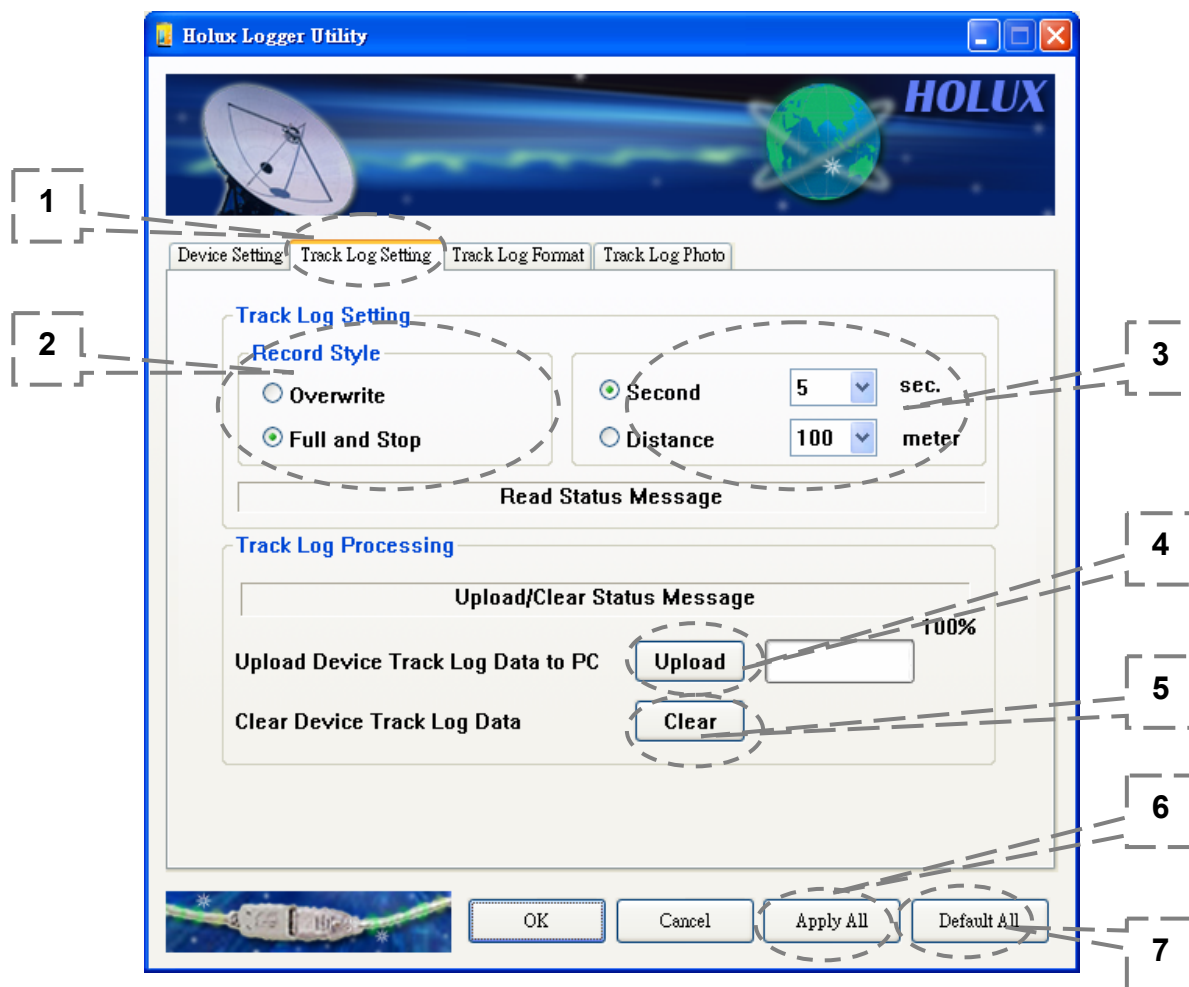


Connected



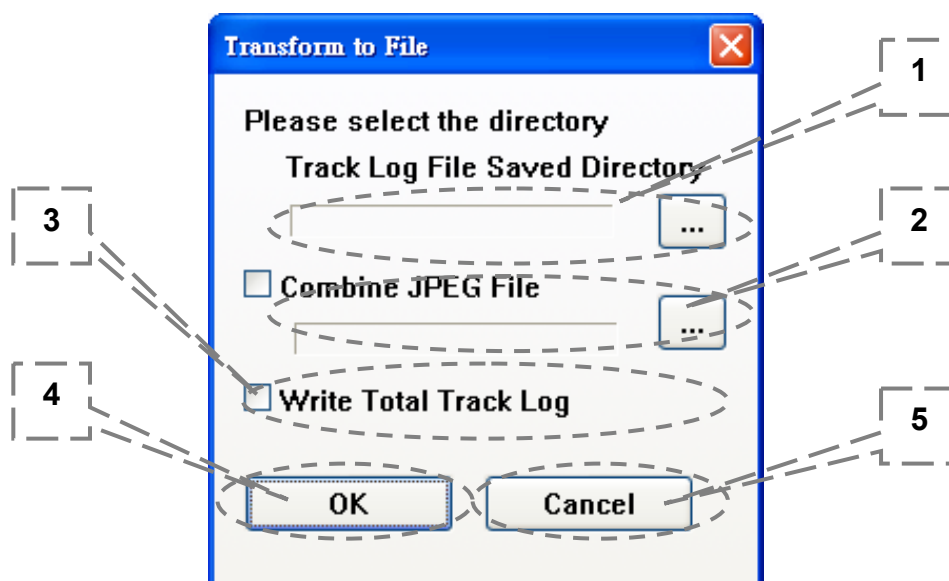
1. User Name : User can input user name here.
 - a. Maximum input for user name : 16 characters
 - b. Input user name must be ASCII characters.
 - c. Cannot input “*” or spaces.
2. Write Name : Send the user name setting to the device and save it.
3. Apply All : Set “Track Log Setting” and save these settings in the device.
4. Default All : Update all settings to default. (if the user wants to save “Track Log Setting” in the device, please click the “Apply All” button)

Track Log Setting



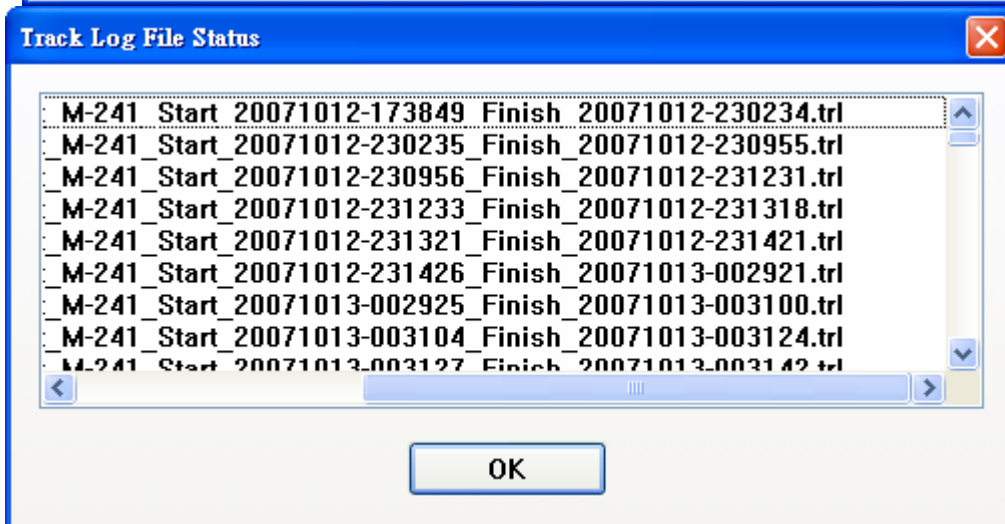
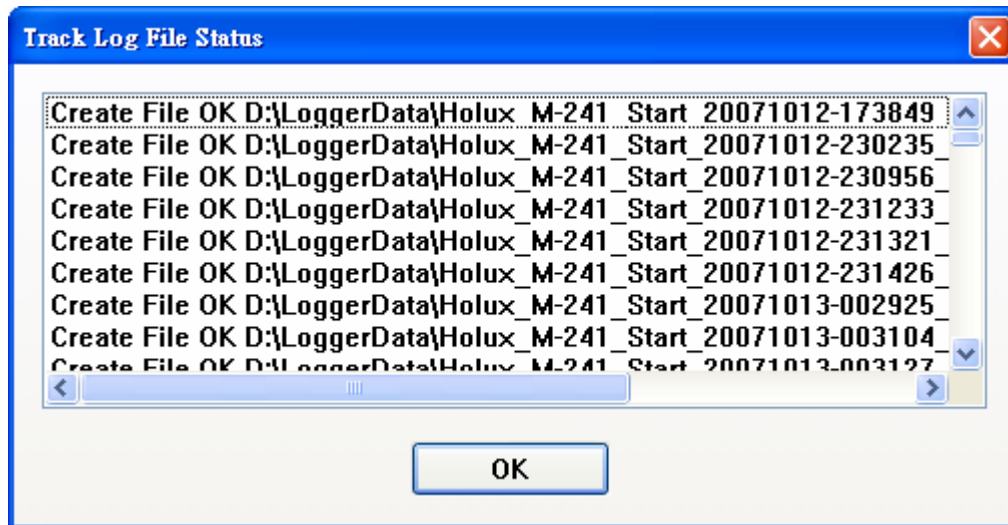
1. Page : Track Log Setting Page.
2. Record Style : Select Record Style.
3. Log Argument : Select Log Argument.
4. Upload : Go to upload Track Log Data from Device to PC.
5. Clear : Clear All Data of Device.
6. Apply All : Set "Track Log Setting" and save these settings in device.
7. Default All : Update all setting to default. (if the user wants to save "Track Log Setting" in the device, please click the "Apply All" button)

Upload



1. Directory : Select the directory for saving.
2. Directory : If the user has Image files for Track Log Data, please go to select the image directory after the "Combine JPG file" item has been selected.
3. Write Total Track Log : If the "Write Total Track Log" is selected, Utility will save total log data to another file (*.trl) and "*.kml" file.
4. OK : Upload log data to "*.trl" files on the selected directory. If the user executes step 2, it will combine the image files and log data to a "*.kml" files else it will create "*.kml" files without image combined.
5. Cancel : Do nothing, and exit.

Track Log File Status

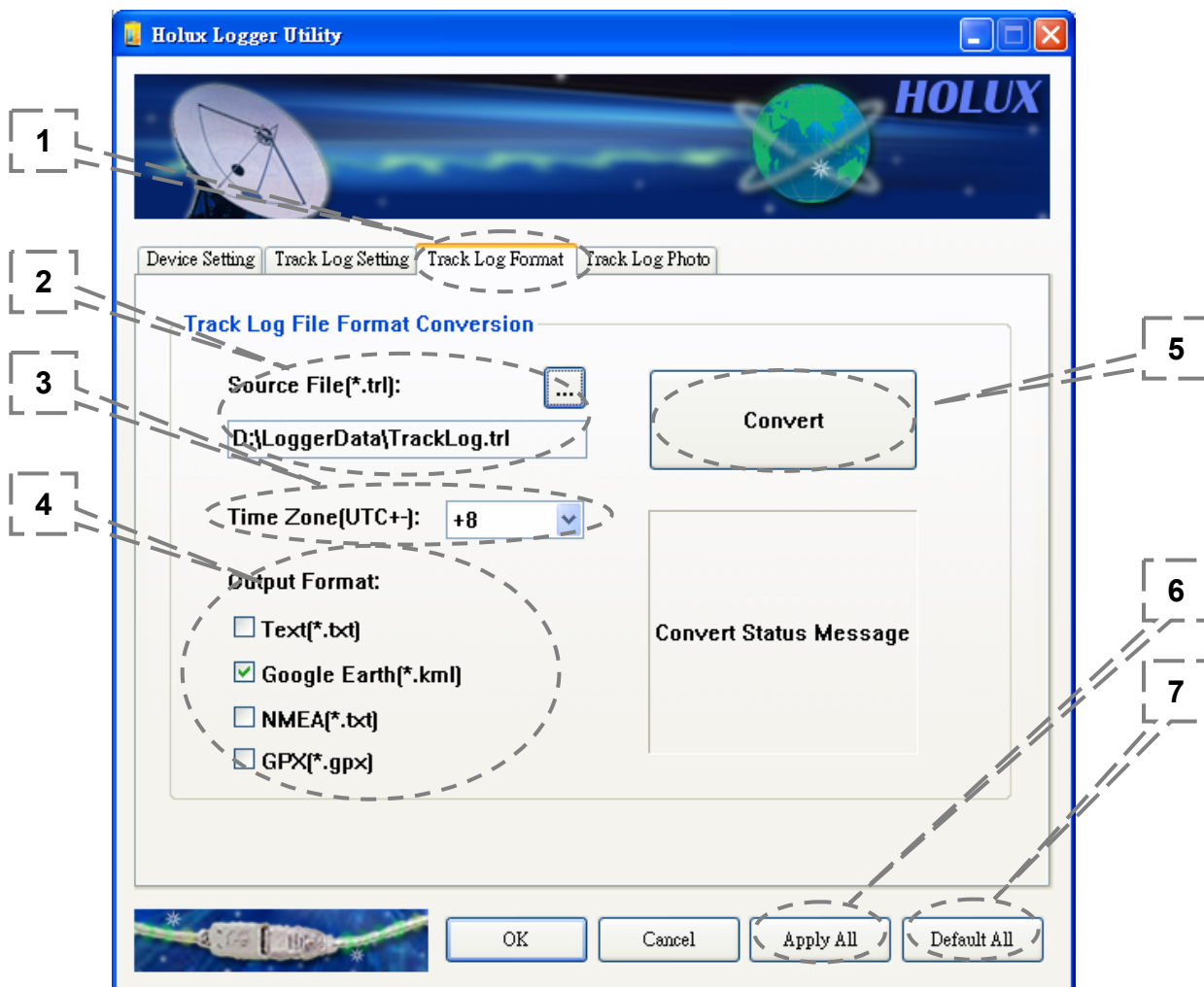


During the uploading of the track log, the track log files (*.trl) and (*.kml) will be generated. If the user has logged multiple tracks (Note: when the user press the “Log Start” on the Track Logger and then press the “Log Stop”, a new track log will be generated.) Each segment of the main track log file will be named under the convention: User

Name_Start_YYYYMMDD-HHMMSS_Finish_YYYYMMDD-HHMMSS, which means that the segment of the track log is logged from the date-time right after the “Start” to the date-time date-time right after the “Finish”.

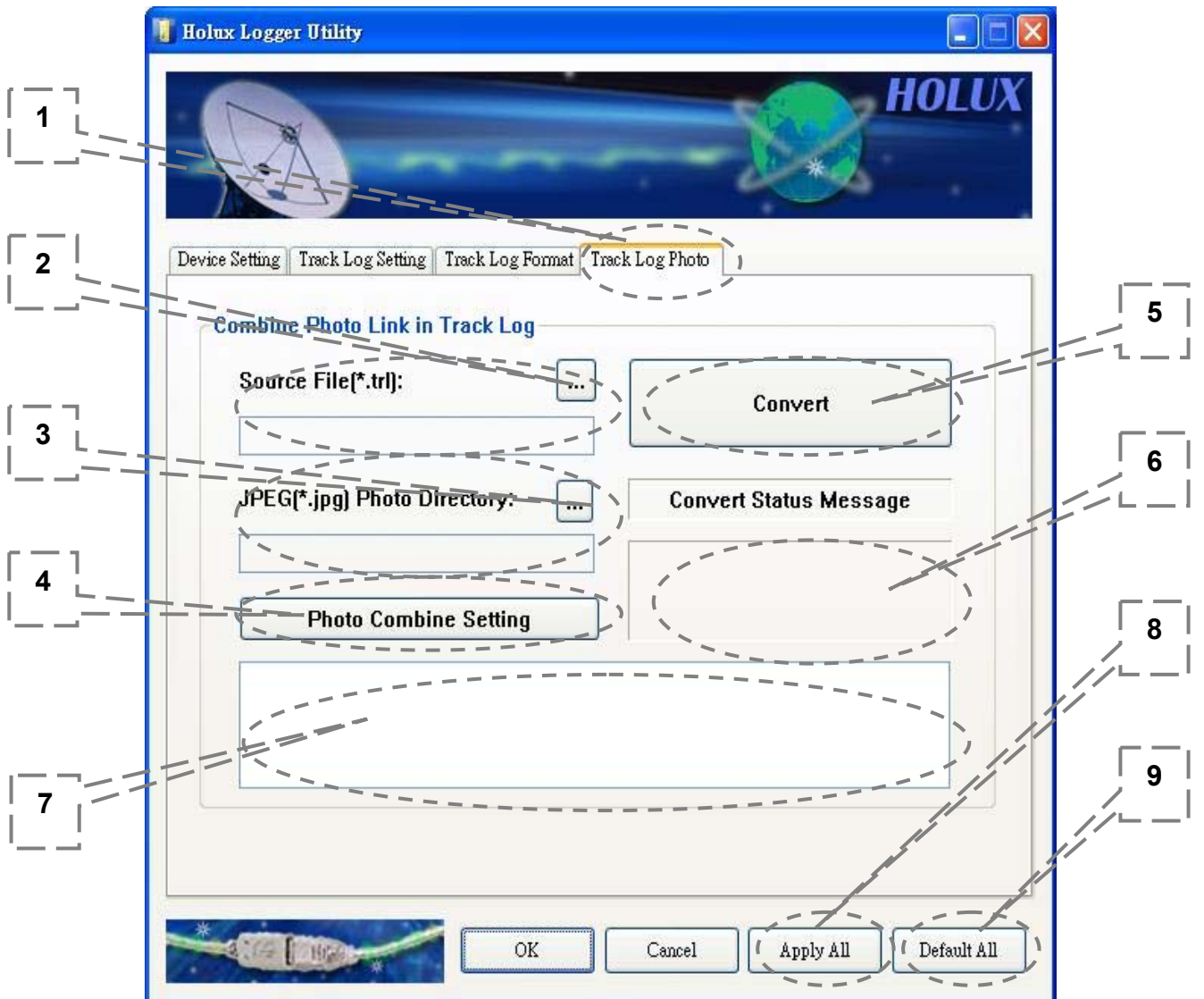
(YYYYMMDD-HHMMSS: year/month/day-hour/minute/second). The filename extension is (*.trl) or (*.kml). If the user select “Save all the tracks into the same file” in the Track Upload Options, there will be an additional track log file: User Name_Total_Start_YYYYMMDD-HHMMSS_Finish_YYYYMMDD-HHMMSS, which covers all the segments of the track log files.

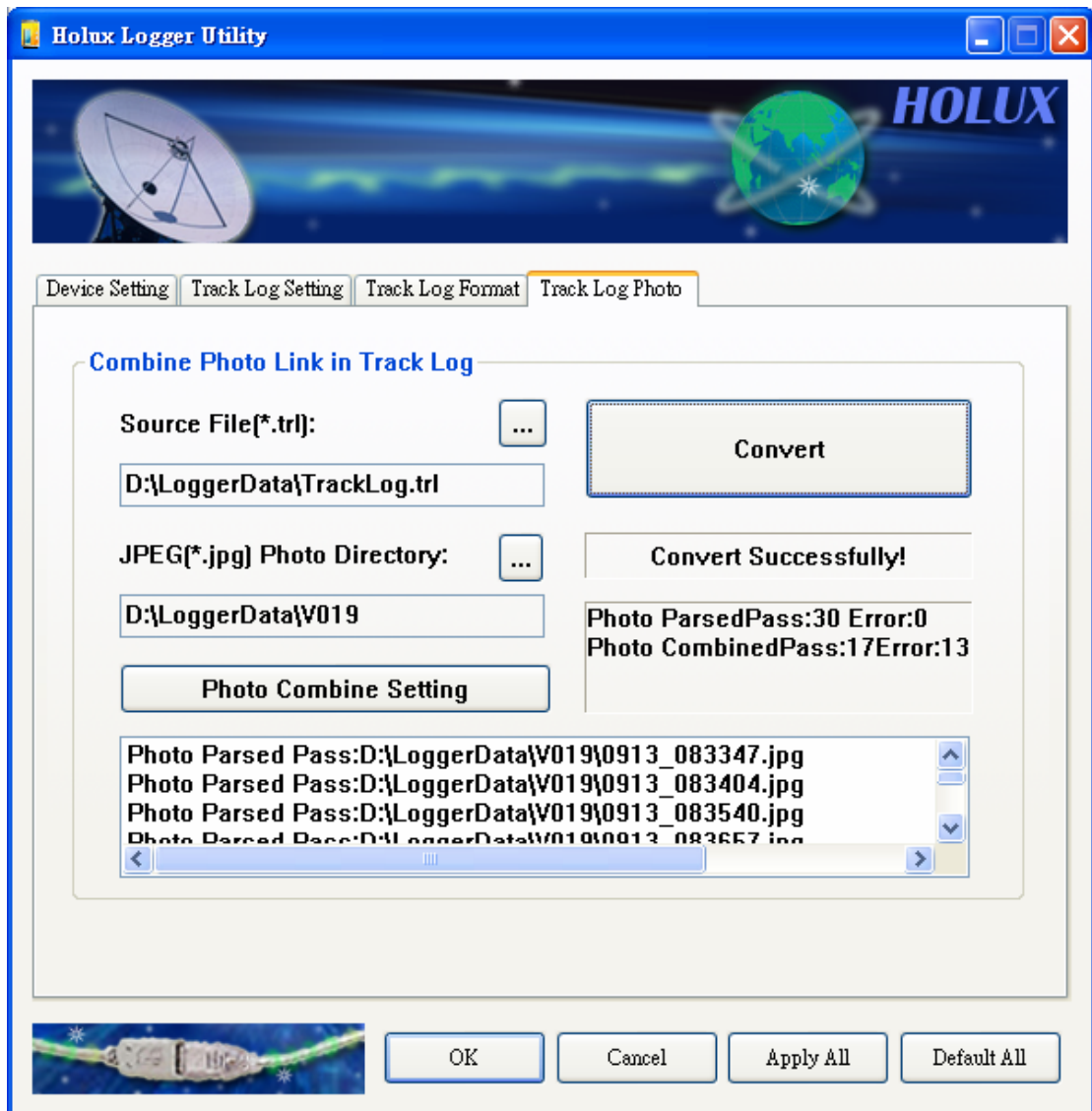
Track Log Format



1. Page : Track Log Format Page.
2. Directory : Select the track log source file (*.trl) that you are uploading.
3. Time Zone (UTC+-) : Select the time zone as device time zone (UTC).
4. Output Format : Select the output file format that you want to convert.
5. Convert : Convert the source file (*.trl) to the selected file format.
6. Apply All : Set "Track Log Setting" and save these settings in the device.
7. Default All : Update all settings to default. (if the user wants to save "Track Log Setting" in the device, please click the "Apply All" button)

Track Log Photo

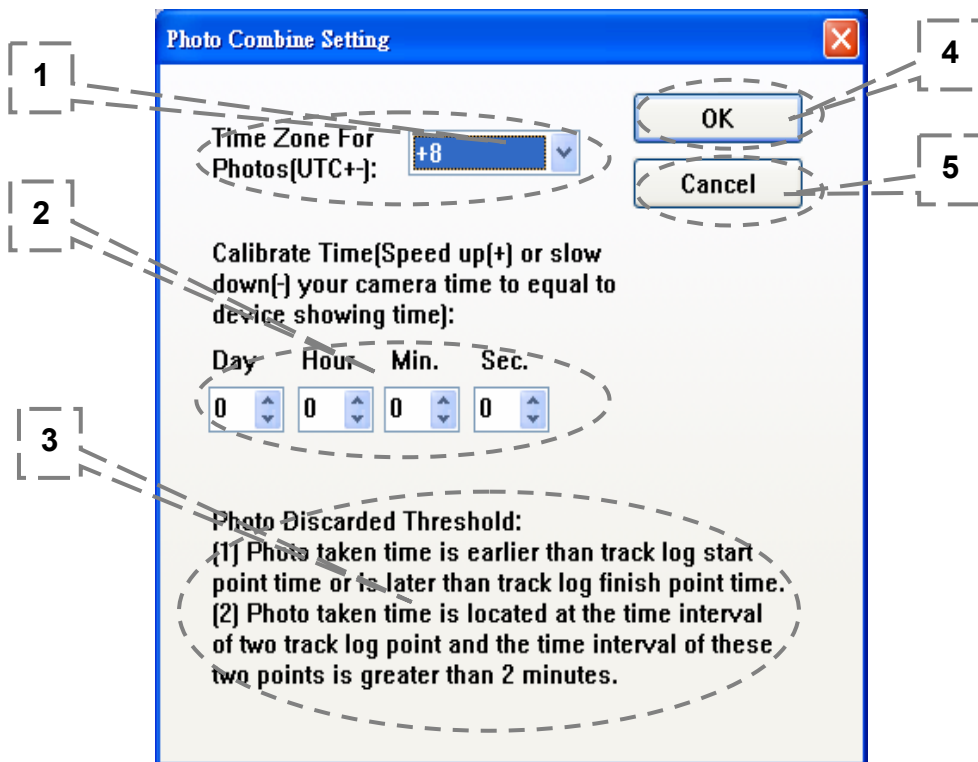




1. Page : Track Log Photo Page.
2. Directory : Select the track log source file (*.trl) that you are uploading.
3. Directory : Select the image directory that you want to combine.
4. Photo Combine Setting : Calibrate Photo Time.
5. Convert : Combine the image files and log data to a “.kml ” file.
6. Photo Processing Statistics: Show photo processing statistics information including numbers of parsing photo and combining photo successfully and failed. (Reference Top Figure)
7. Photo Processing Detailed Status: Show each photo processing detailed status including error message.(Note: The error message: “No mapping any track log point.” means the photo is in the range of photo discarded threshold. See next section: Photo Combine Setting: Photo Discarded Threshold) (Reference Front Figure)
8. Apply All : Set “Track Log Setting” and save these settings in the device.
9. Default All : Update all settings to default. (if the user wants to sa ve

“Track Log Setting” in the device, please click the “Apply All” button)

Photo Combine Setting



1. Time Zone For Photo (UTC+-) : Select the time zone as device time zone (UTC).
2. Calibrate Time : Calibrate camera photo time to match the device showing time.
3. Photo Discarded Threshold: Describe the threshold that photo is discarded. (Note: In second threshold, the 2 minutes is maximum log argument time in Track Log Setting page.)
4. OK : Set the selected item.
5. Cancel : Do nothing, and exit.

10. Bluetooth device connection installation

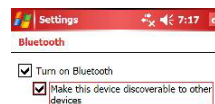
The following software installation steps instruct the user how to setup Bluetooth Manager on PDA, DELL AXIM x51v . For other PDA or laptop devices, the steps might vary.

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

Note: The setting may vary in other Pocket PCs or Smartphones, please check the manual or consult technical service respectively.



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



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



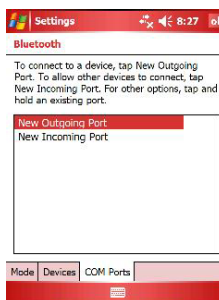
4. Choose the Bluetooth device “HOLUX_M-241” and tap “Next”



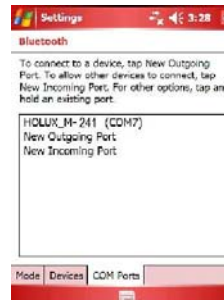
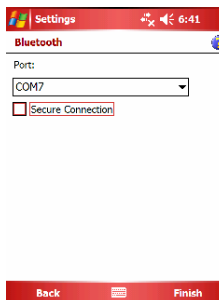
5. Connect to “Serial port” or “SPP Slave”, then tap “Finish”



6. Go to the “COM ports” panel to tap “New Outgoing Port”, choose “HOLUX_M-241” device and tap “Next”.



7. Select the COM port, then tap finish, it will show as a figure on the right, and tap “OK” to finish the Bluetooth set up. “Secure Connection” is not recommended as it may cause an unstable connection.



8. Now you can enable your navigation map program to enjoy the GPS function.

11. Installation of Mini GPS Viewer program

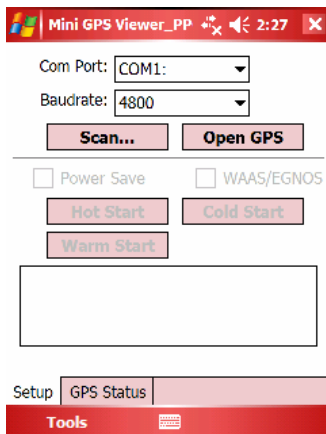
We provide the program "Mini GPS viewer.exe" for end users to watch the satellite signal receiving status on laptop or PDA devices.

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

For Microsoft Pocket PC, please copy "Mini GPS viewer_PPC" to the SD card or device, and then execute "Mini GPS viewer_PPC".

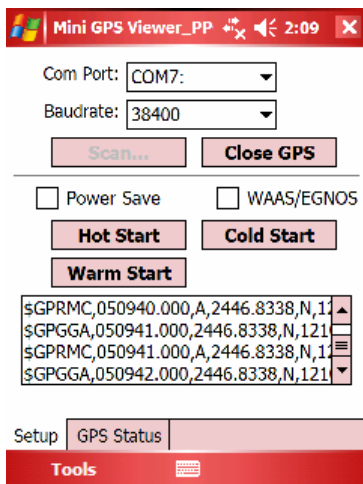
12. Execute the Mini GPS Viewer program

1. The following window is shown after executing Mini GPS Viewer_PPC, (see Fig. 1). The Windows 2000/XP version is has a slightly different display.



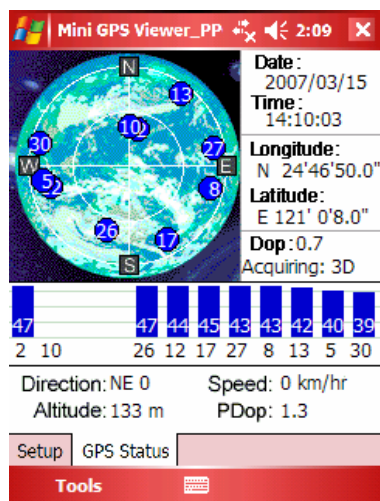
(Fig. 1)

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



(Fig. 2)

3. Select "GPS Status" panel to observe the GPS information status, see Fig. 3.



(Fig. 3)

4. In the "setup" panel you can see "Hot Start"、"Warm Start"、"Cold Start", which allow you to re-acquisition the Ephemeris and Almanac. Basically, the satellites are always moving in the sky, if Ephemeris and Almanac data in the GPS Logger can't meet real satellites status or if the GPS Logger has been powered off for over 0.5 hours but you are no longer in the previous position, then it will take more time for the GPS Logger to obtain a GPS position fix. We suggest that you click "Cold Start" or "Warm start" to re-acquisition. Or you can remove the battery for 120 seconds and reinsert it; this operation is the same as "Cold Start".

13. Power

1. M-241 is powered by the AA size battery, the alkaline battery is recommended for the environmental protection and a longer working time. The following table shows the reference working time for different battery types. When M-241 is operated under an environment at a low temperate, the working time of the battery will be shorter than that in the room temperature.

When battery low, the icon "🔋" will flash from the battery low warning to shut down that depends on different types as about 60~ 90minutes.

2. The reference working time for different battery types.

Condition Type	Room Temperature	Low Temperature	High Temperature
Alkaline Battery	12 hours	2 hours	10 hours
Ordinary Battery	4 hours	NA	NA
Rechargeable Battery(1700mA)	10 hours	NA	NA

3. M-241 can be powered by the Car Charger or the USB Cable to continue the operation of the M-241 without any battery. However, it does not equip with the charging function. It can not perform the charging operation even if the rechargeable battery is used.

14. Warranty

The **M-241** is guaranteed 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 repaired at no charge to the customers.

15. Troubleshooting

Problems	Possible Reasons	Methods
No GPS output but GPS timer is counting	Weak or no GPS signal at the place of M-241	Test under an open sky at a fixed location and run the Mini GPS Viewer "Cold start" function.
	The ephemeris and almanac data in the GPS memory are no longer valid after an extended period of nonuse.	Remove the Battery for 120 seconds and re-insert, then power on to test again. This operation is the same as "Cold Start".
Bluetooth execute fail	Bluetooth function unstable	Power On/Off M-241. Re-Start PDA or PC and refer to section 10 "Bluetooth device connection installation" to re-connect.
Cannot 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.
No display	Battery low	Please check battery.
Logger function on, but no POI recorded	No acquisition	Please move to open sky to reacquisition.
	Log mode is by distance, so it won't record if no movement.	Change log mode to "by time"
	log mode is by long interval	Ensure you interval setting meet your situation.
Velocity and position shifting when static	Because the satellite signal may be shifted easily due to the interference when the moving speed is less than 10 km/hr or under the environment with tall buildings that the satellite signal is not good,	It's a GPS character , just move to open sky area to get better GPS signal.
Logger function can't work	When device is suddenly shut down in flash memory erase process, the initial process of flash will be failed.	Power on again to erase.

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 Logger.
- Connect the equipment into an outlet on a circuit different from that to which the Logger is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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 must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure

compliance.

This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.