

# G-Rays™ 2

## WBT-201

## USER'S MANUAL



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# Part 1 Product introduction

## Overview



### GPS LED:

- Red color :GPS status indicator, Solid light shows location fixing incomplete .Blink light shows location fixing completed.
- Green color: Track Button press indicator

### Bluetooth LED:

- Light turns off when Bluetooth connection is off.
- Blue light solid on when Bluetooth is functioning.
- Blue light blinks if Bluetooth connection succeeds.

### Power LED:

- Red light blinks if battery power is low.
- Red light solid on while charging.
- Green light solid on after fully charged.

### Track Button:

- Temporarily press to mark point in current track when log function is enable.
- Press and hold this to re-start new track when log function is enable.

### Power Button:

- Temporarily press this to turn on/off Bluetooth. (Power on while power off)
- Press and hold this to turn power off.

## Part 2 Features

G-RAYS 2 is the Bluetooth GPS receiver with internal antenna. u-blox used in its core is high-tech component and included function of auto-log record of journey, which are useful in navigation, security tracking purpose, topography and other agricultural needs. USB connector and Bluetooth interface ensures easy linking with other electronic devices .The GPS acquisition status, the last record of time and position can all be stored in non-volatile memory. It has 16 GPS channels and its low power-consumption can last continuous 10 hours of operation. G-RAYS 2 can boast of its smallest size ever with fullest features in the world.

- G-RAYS 2 contains u-blox GPS IC and the high-performance CPU.
- Maximum 16 channels can be acquisitioned quickly.
- Highest tracking sensitivity: -158 dBm
- Internal decode "SBAS" is used excluding the need for external hardware in receiving SBAS signal.
- System supports NMEA0183 2.3 (GPRMC, GPGGA, GPGSA, GPGSV) for data transfer.
- Data-logging acts like the in-flight black box and can record of position, date and time as long as power source is maintained.
- For down-load of log-data and programming of G-RAYS 2, provided software tool "Time Machine X" can simplify usage.
- It is designed to be water-proof.
- Data link can be done thru Bluetooth within 10 meter range.
- Versatile design aimed for car/personal navigation, fleet management, AVL, tracking and topography purpose.

## Part 3 Safety notes

- GPS (Global Positioning System) is provided by the United States government. Its accuracy may vary depending on special conditions (area at war or if it is blocked). Any control by USA will affect this system and its accuracy.
- If installed on the transportation device, driver must not operate this while driving.
- GPS performance is affected when satellite coverage is degraded as near a high-rise building, in the tunnel or under a cover.
- Personal replacement of components and re-structuring of this is prohibited and may result in loss of legal usage.
- Operation of this device is strictly prohibited in highly explosive environment such as mining, in-flight or other unauthorized area against use of this.
- Avoid exposing this at places of high temperature and humidity.
- Return to original dealer immediately if it emits strange smell or fume.

## Part 4 Quick user's guide

- Package: G-RAYS 2 (Bluetooth GPS with logger)+USB cable+ sticker + car cigarette lighter adapter + power adapter , installation Disk, Quick user's guide.
- G-RAYS 2 Operation:
  - Temporarily press power button to power on it. The Bluetooth and GPS status LED will glow to confirm it is in GPS mode and GPS start acquisition.
  - GPS LED glows red to show GPS acquisition is done (1 Hz). But if this LED is solid on, the GPS acquisition fails.
  - Temporarily press on power button. Bluetooth will turn off after Bluetooth LED goes off. Another press on power button can turn Bluetooth on after its LED glows again.
  - After power on, press and hold power button to turn the power off.
  - If Power LED (glows red) starts to blink, the power is low and needs recharging. Power LED stays solid while charging .It snuff out red LED and glows green LED solid on after it is fully charged.
  - Temporarily press "TRACK" button (GPS LED flash green light) to mark point in current track when log function is enable.
  - Press and hold "TRACK" button (GPS LED glows green and snuff out after 1.5 sec) to re-start new track when log function is enable.
- When the USB is used as interface:
  - USB driver must be installed first.
  - After connection to USB port of computer, place the G-RAYS 2 at suitable area where it can best receive GPS signal for acquisition.

- Power it (or switch its power on).
- G-RAYS 2 will start acquisition.
- When the Bluetooth is used as interface:
  - Ahead of Bluetooth connection, make sure the target device to pair can support Bluetooth SPP master.
  - After pairing with G-RAYS 2, place it at suitable area where it can best receive GPS signal for acquisition.
  - Activate the application software of paired device. G-RAYS 2 starts to provide GPS data.
- Battery charging:
  - Connect G-RAYS 2 with USB cable and turn on power source.
  - Charging can be done by USB cable connected to computer, power adapter or car cigarette lighter adapter.
  - Charging is in process even during G-ray is operating.

## Part 5 Operation notes

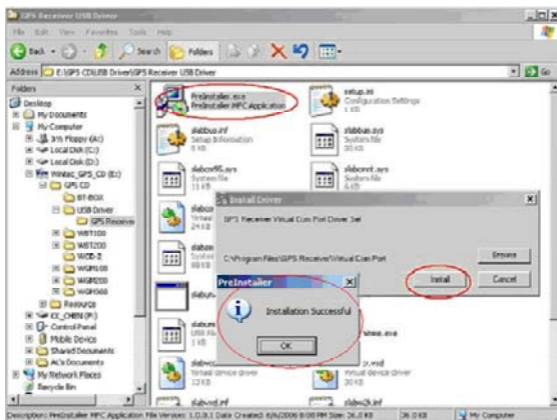
- G-RAYS 2 will do self-check once it is powered. Bluetooth and GPS start to work when both Bluetooth LED (glows blue) and GPS LED (glows red) turns on. GPS automatically starts acquisition and auto-logs. If sky is clear overhead, it requires only 34 sec for acquisition. (If the data in its memory is still valid, it needs only 4~33 sec). After acquisition, G-RAYS 2 starts output data of position, speed and time in NMEA0183 format.
- For the first time if it is placed at the area well exposed to the satellite signal, this device requires approx 13 min (theoretically 12.5 min) to receive or update Almanac. Refer to trouble shooting guide when signal is not received well.
- If G-RAYS 2 formatting the internal data is not correct, or if satellite data has been deleted, it takes longer time to position. But under the following conditions, it can take even longer time to get cold start.
  - If it is not in use for over 3 months (the almanac is old-dated).
  - If the last recorded position data is over 500 km.
- After positioning, G-RAYS 2 transfers navigation data thru export interface as below:
  - Latitude
  - Longitude
  - Altitude
  - Speed
  - Date
  - Time(UTC time)
  - Estimated error
  - Satellite status



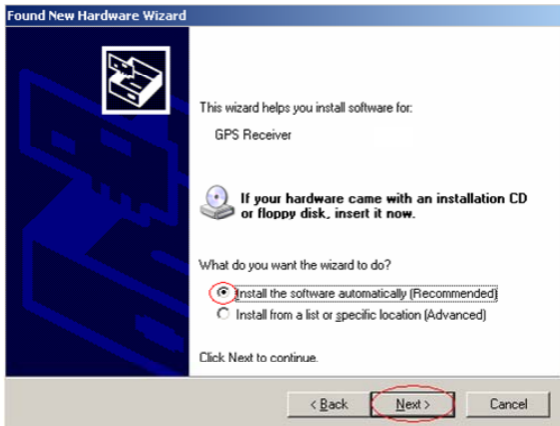
- Receiving status
  
- After positioning, if auto-log function is activated, G-RAYS 2 begins to auto-log the following way.
  - Maximum data up to 131072 Points.
  - Recording in a circular way.
  - Auto-logging goes on without the need of any device.
  - Log-data can be read out by way of the "Time Machine X" software included.
  - Data can be read out thru USB or Bluetooth.
  - Data includes latitude, longitude, altitude and time in year-month-date-hour-min-sec.
  - After successful positioning, it wills auto-log GPS data into its internal memory chip. It recorded in a rotational order. The earliest (oldest) data will replaced by the latest (newest) one when memory space is full (when data excesses 131072 maximum).
  - Auto-log will continue even the Bluetooth is switched off.
  - When auto-log function is disabling and the Bluetooth is switched off, its power will be turned off after 10 minutes (that interval can be set by yourself). It will not shut down while auto-log function is activated.



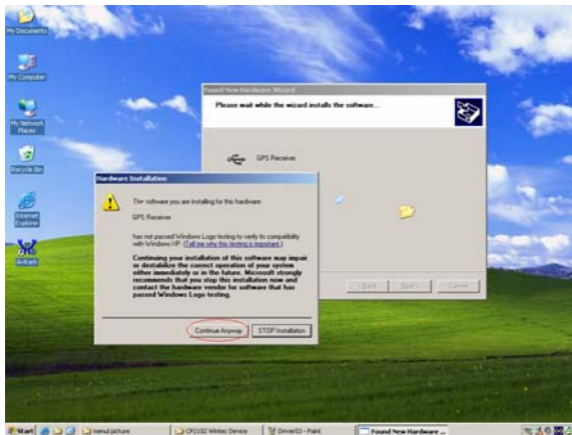
2、 Installation is done when this screen displays.



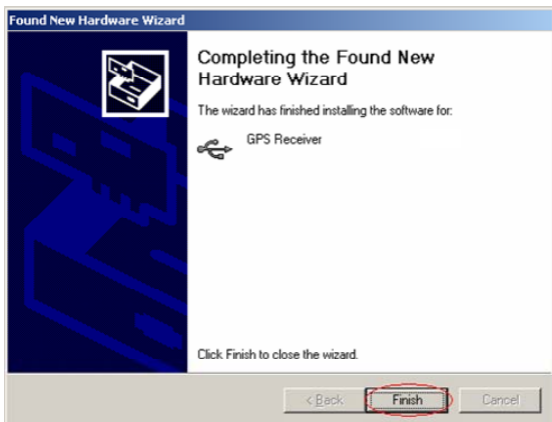
- 3、 Use USB cord to connect G-RAYS 2 to the USB port of computer. Computer will automatically check it and seek driver software by itself. If PC asks for “device manager” for adding the new USB device following USB device connection, take the procedure below. Click “next”.



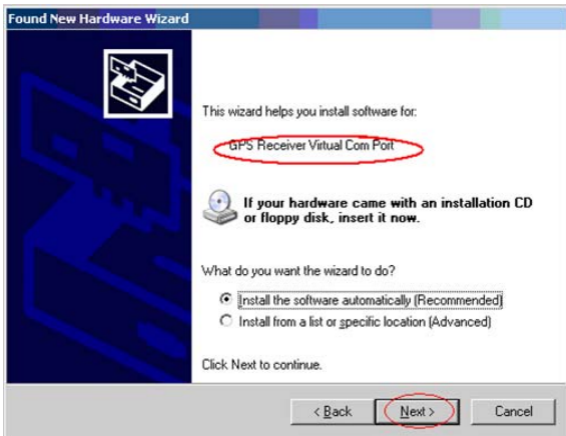
4. If the screen display as below. Click “continue anyway”.



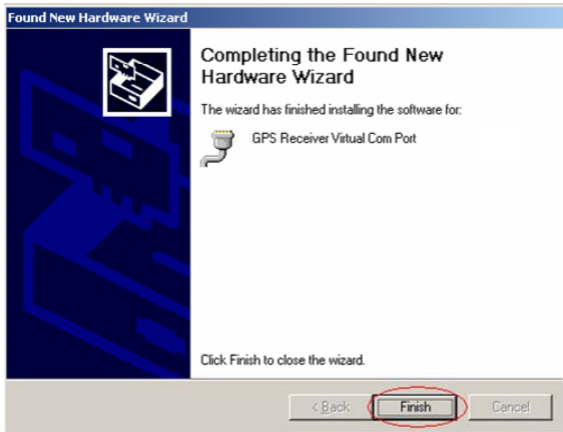
5、 Installation completed.



- 6、 Immediately afterwards, PC will ask again to install “GPS Receiver Virtual Com Port” driver. Click “ next ”.

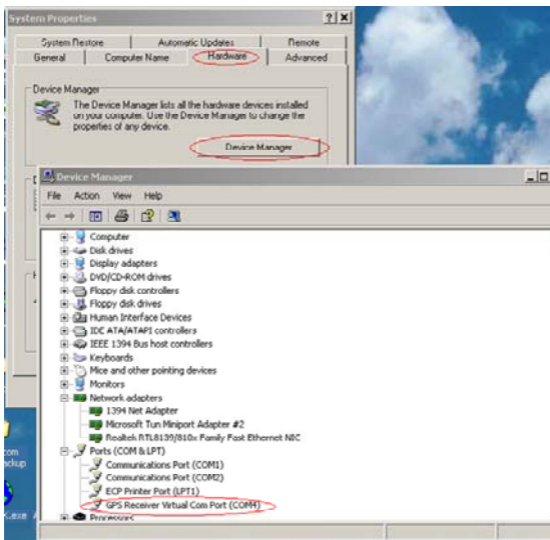


7、 Installation completed.





8. To check the installation status, go to the “device manager” . As in the illustration (marked in red circle), the USB driver is correctly installed to PC. The illustration also shows USB being transferred to Com Port assigned as COM4. In the future, whenever the USB device is connected to USB port on the computer, the COM 4 acts as the interface for data communication.



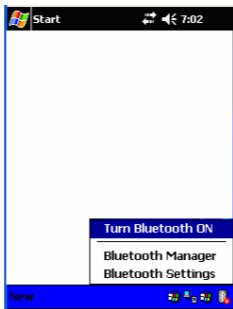
## Part 7 Connecting with Pocket PC

Use of this with Pocket PC for location check.

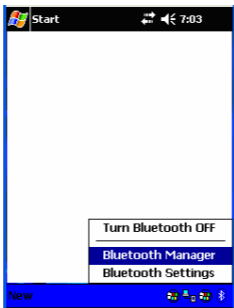
Turn G-RAYS 2 Bluetooth device Power on and then create Bluetooth connection with Pocket PC.

Bluetooth connection to Pocket PC.

- 1、 Tap the Bluetooth icon on Pocket PC's taskbar to view the Bluetooth menu. Tap the " Turn Bluetooth ON" to enable Bluetooth.



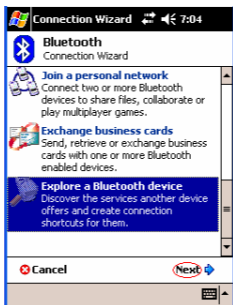
2、 Tap the Bluetooth icon again and select the "Bluetooth Manager".



3、 From Bluetooth Manager toolbar, tap "New" to search for any other Bluetooth devices in its vicinity.



- 4、 Tap “Explore a Bluetooth device” to view Bluetooth devices services and create a shortcut to them. Click “Next” to continue.



- 5、 Tap “G-Rays 2” icon to view the device services.



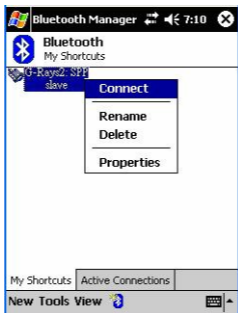
6. Select “SPP slave” services and tap “Next” to create a shortcut to it.



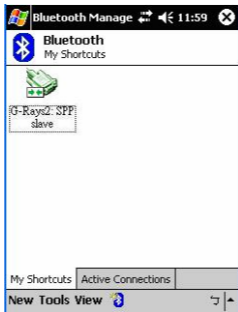
7. Tap “Finish” to complete procedure.



- 8、 From the “My Shortcuts” tab, tap the “G-Rays2: SPP slave” icon and select the “Connect” option to connect to it.



- 9、 When a connection is successfully established, the shortcut icon will turn to green color..



## Part 8 Trouble shooting

- The GPS signal will become weak under the following conditions.
- If the vehicle enters the tunnel. The GPS signal transmits linearly down to earth and its signal is blocked out in this situation.
- GPS satellite coverage gets poor because of high-rise building or thick forest. Even though G-RAYS 2 can receive reflected weak GPS signal, the data might be less accurate.
- The sun shade in the vehicle can partially block out GPS signal and effect good reception. The GPS satellite is under control of USA and the accuracy might vary depending on some special purpose (especially when manipulated by USA).
- It is a normal situation when GPS data displayed by the receiver device shows a big difference from real position because of unstable atmospheric condition which causes GPS axis to drift from actual map axis occasionally.
- Some navigation software can only decode latitude/longitude from NMEA0183 provided by logger. No altitude information is available and therefore it cannot define vehicle's position whether that is over or under the bridge.
- After successful positioning of G-RAYS 2, if it is moved to another area of 500 km away it cannot be easily re-positioned. This is because the firstly recorded data (position, time and number of satellites acquisitioned) is different from the new area. It will need longer time for re-positioning.
- When the power LED flashes red, the battery is critically low and needs re-charging. If it is not recharged within 30~100 min, G-RAYS 2 will stop to work to prevent total exhaust of power.

- PIN code will be requested after Bluetooth connection initiates between GPS and Pocket PC. Enter code as **0000**.
- Avoid placing 2 GPS devices too close during positioning.
- Bluetooth connection takes 5 seconds for self-check. Each time the device is switched on; it needs 5 seconds before connection.
- It is normal if the Bluetooth coverage might become short sometimes due to environmental interferences.
- USB driver must be installed first before connecting the device to the USB port of computer. Make sure of the right Com Port being used.
- If disconnection between Pocket PC and GPS is done in a abnormal way, Pocket PC will halt. Try to disconnect Bluetooth connection in a standard method.
- If the G-RAYS 2 is found to work abnormally because of wrong procedure, reset it by taking off the battery. It will have factory default without effecting pre-set program. At the factory default, GPS reception begins in a warm start mode and its position may take longer time.
- If G-RAYS 2 is used for navigation but found unworkable after connection is done. Make sure the format of NMEA0183 that the software used match up G-RAYS 2 export format.