

# **R120**

## **Bluetooth GPS Receiver**



# **User Guide**

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**Rev.A**

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Dear customer,

Thank you very much for purchasing the NCSNavi "Bluetooth GPS Receiver". This user guide is for R120 Bluetooth GPS Receiver. Please read through this guide carefully before installation so you can use this product quickly and safely.

Moreover, it is suggested that you check the accessories that come along with the product before installation; retain this user guide and warranty card after installation for future reference.

★ Safety Instructions — Please read carefully before use.

The design and make of the product meet the strictest quality and safety standards; however, users should take note of the followings:

1. Read through the instructions — You should read through all safety and operation instructions before operating R120.
2. Retain the instructions — Safety and operation instruction documents should be retained for contingent use.
3. Notice the warnings — All warnings marked on the operation instruction should be kept in mind.
4. Follow the instructions — All operation and use instructions should be followed.
5. Water and moisture — Never use the product near water, such as bath tubs, pools, kitchen sinks, washing machines, damp basements or swimming pools.
6. Crutch — The product must set upon manufacture's recommended crutches only.
7. Ventilation — The product should be stored in a well ventilated area.
  - Hidden installation on a bookshelf or cellar is not allowed because it will obstruct airflow from the ventilator.
8. Heat — The product should be set far away from heating devices, like heaters, radiators, ovens, or other heating appliances.
9. Power — The product must use power only as described in the user guide or marked on the product.
10. Protect power cables — The wiring of power cables should not obstruct people from walking or clip on other objects. Make sure the outlet is suitable for the power cable and the plug.
11. Clean — The product should be cleaned according to the manufacturer's instruction.
12. Liquid — No liquid should be spilled into the sealed cabinet through the openings.
13. Damages that require repair — The product should be repaired by qualified personnel when:
  - The power cable or plug is damaged; or
  - The object falls down or liquid flows into the cabinet; or
  - it is caught in the rain; or
  - it can not operate normally or shows apparent changes in performance; or
  - it falls on the ground or the sealed part is damaged.
14. Repair — In addition to the parts described in this user guide, users must not try to repair the product themselves. All repairs should be performed by qualified personnel.

## **1. Overview**



(Fig.1)

**NCSNAVI R120 Bluetooth GPS Receiver** (Fig. 1) is a total solution GPS receiver with Bluetooth and built-in rechargeable battery for high sensitivity to tracking signal. **R120** design is based on MediaTek Inc.(MTK) GPS solution-MT3318 low power architecture.

**R120 Bluetooth GPS Receiver** transmits satellite information on to the PDA, mobile phone or Notebook by its Bluetooth interfaces.

**R120** meets the requirement of field application, such as car navigation, mapping, agriculture surveying and security use under clear view of sky. **R120** 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, **R120** can track up to 51 satellites simultaneously, re-acquires satellite signals in 0.1 microsecond and updates position data per second.

## **2. Packing List**

Thank you for purchasing the R120 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 *NCSNavi* dealer or distributor.

◆ R120 Bluetooth GPS Receiver	1 Set
◆ Car Cigarette adapter	1 Set
◆ Mini USB cable	1 Set
◆ User guide and Driver CD	1 Pc
◆ <b>R120</b> Quick Start Guide	1 Pc
◆ Warranty card	1 Pc

### **3. Main features**

- Built in MTK MT3318 Low power consumption GPS chipset.
- 51 parallel satellite-tracking channels for fast acquisition and reacquisition.
- Superior sensitivity up to -159 dBm.
- Built-in WAAS/EGNOS Demodulator without any additional hardware.
- Compatible with Bluetooth Serial Port Profile (SPP) completely.
- Low power consumption. Built-in rechargeable and changeable Lithium-ion battery, the working time can last 15 hours maximum.
- Support NMEA0183 V 3.01 data protocol
- 3 color-LEDs indicate the status of the device.
- 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 : 51 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 / second<sup>3</sup>, max

### **4.5. Power Supply**

- External Voltage: 5V DC +/-5%
- Batteries :  
Main Power: Built-in rechargeable Lithium-ion for system power.
- Working voltage: 40~50mA (Normal mode).  
35mA (Power Saving).
- Auto Power Saving mode.
- Circuit protection on **R120** when over-temperature condition 50°C 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/1 sec.), GPGSV (1time /1 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).

## **4.7. Physical**

- Size : 74 × 40 × 9.3 mm
- Weight : < 30 g
- Operating Temperature : -10°C to + 60°C (under the un-charging condition);  
Charging Temperature : 0°C to + 45°C
- Storage Temperature : -20°C to + 60°C
- Operating humidity : 5% to 95%. No condensing

## **4.8. Other Functions**

- Bluetooth frequency: 2.4~ 2.4835GHz
- 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

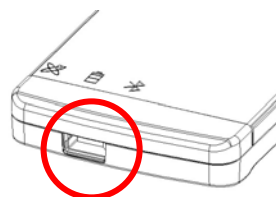


## 5. Getting Started

### STEP 1. Charge Battery

Please charge battery till LED off for the first time.

**Power cable plug in** connect the Power cable to the power socket



**Charge Battery**

Battery indicator light:

**Power too low** ----- Red LED

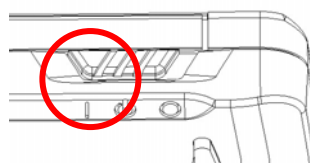
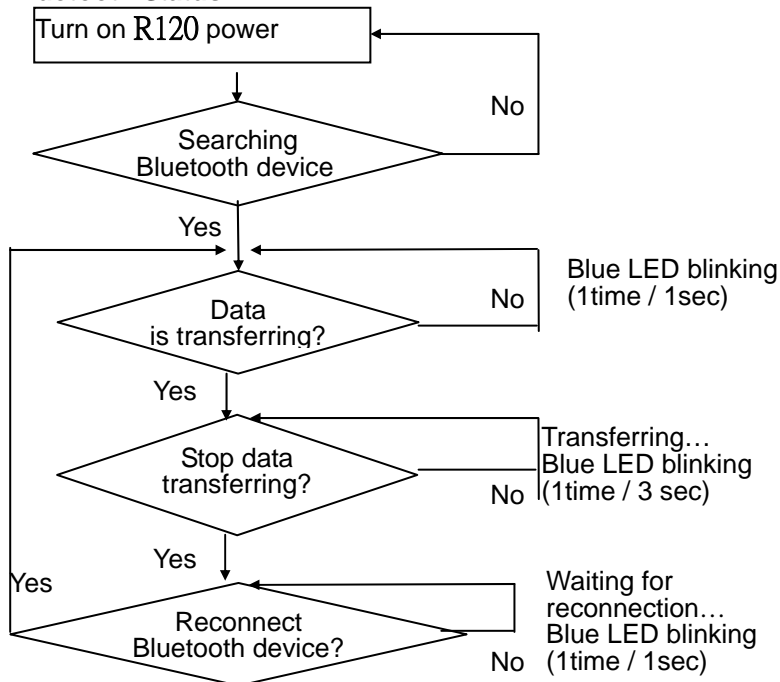
**Charging** ----- Green LED

**Full or Not in charging** -- LED off

Mini USB socket

### STEP 2. Turn on the power

**Bluetooth Status –**

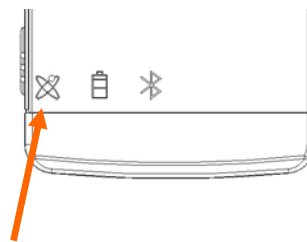
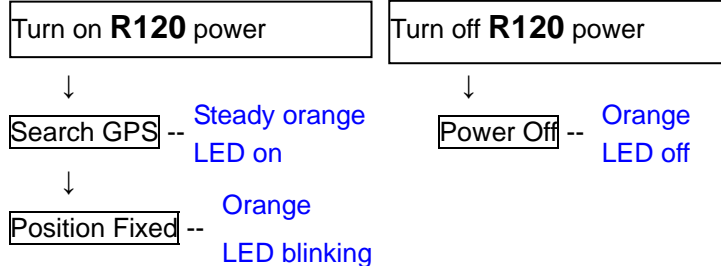


Power Switch

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

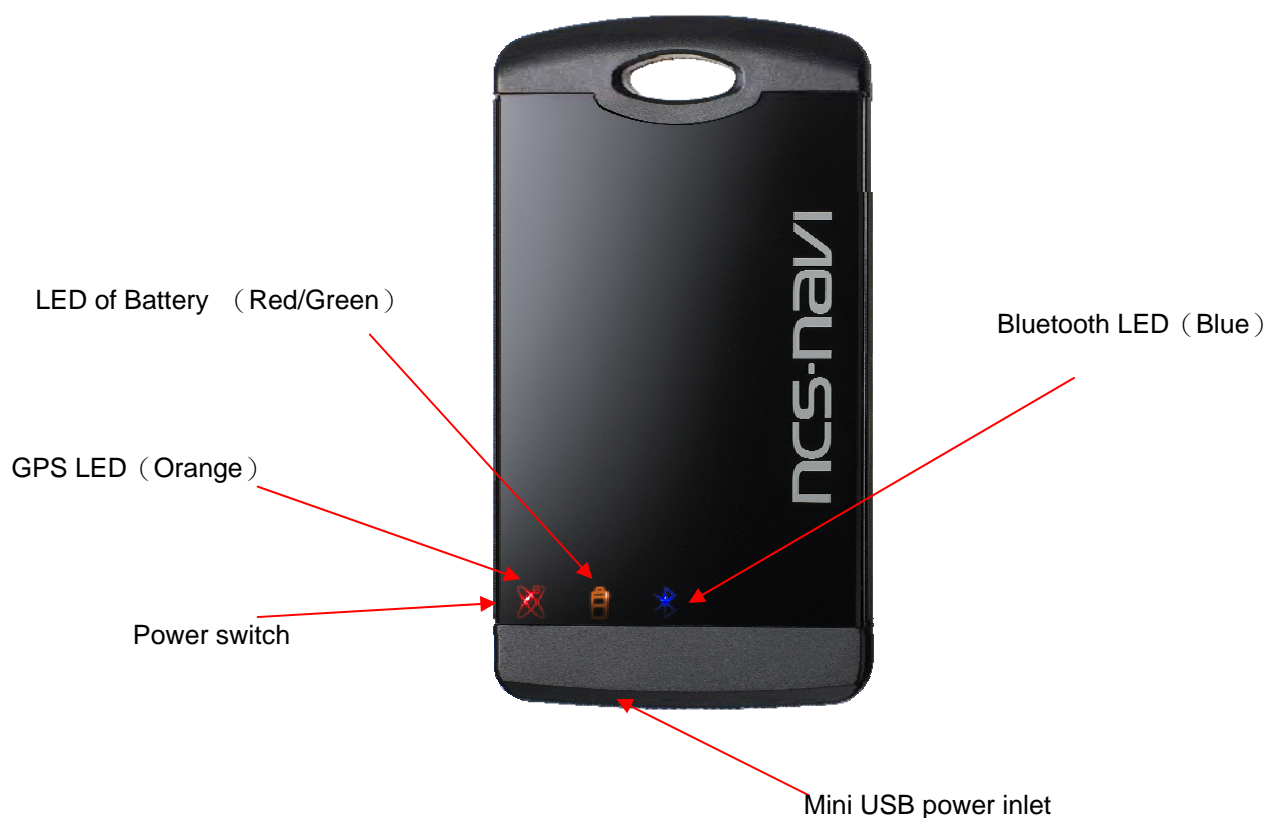
### GPS Status ---

Put **R120** in clear view of the sky without any obstruction for better satellite acquiring.






## 5.1. Hardware Description

1). **R120** 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.

## 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.



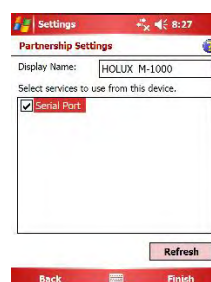
3. In “Devices” panel, tap “New partnership” to search Bluetooth devices nearby. If the result is not found, tap “Refresh” to research again.



4. Choose the Bluetooth device “GPS\_NCSNavi\_R120” and tap “Next”

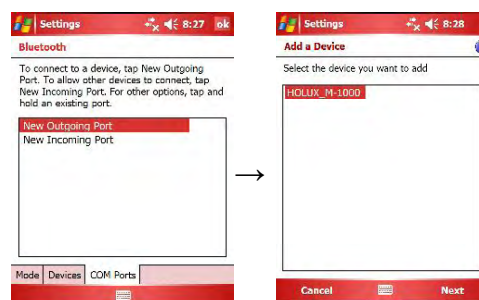


5. Connect to “Serial port” or “SPP Slave”, then tap “Finish”



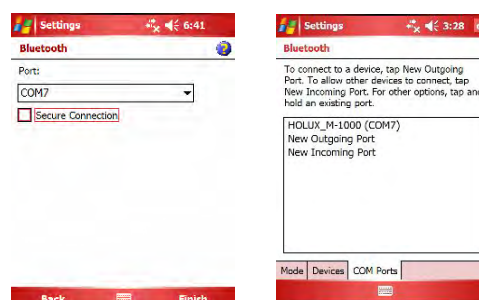
6. Go to the “COM ports” panel to tap  
“New Outgoing Port”, choose  
“GPS\_NCSNavi\_R120” device and tap  
“Next”.

Note: Only for Mobile Phone



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.

Note: Only for Mobile Phone



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

### 5.3. Installation of NCSNavi Mini GPS Viewer program

We provide a program “NCSNavi 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 “NCSNavi Mini GPS viewer” directly.

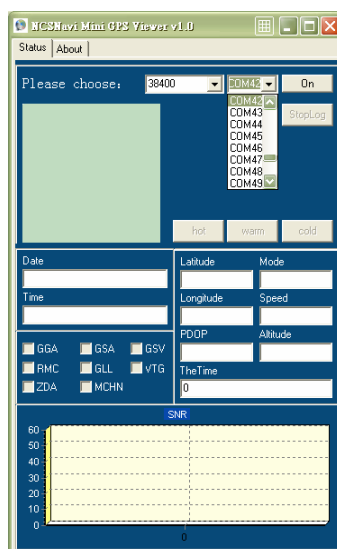
### 5.4. Execute the NCSNavi Mini GPS Viewer program

- 1) The following window is shown after executing Mini GPS Viewer, ( see Fig. 3).

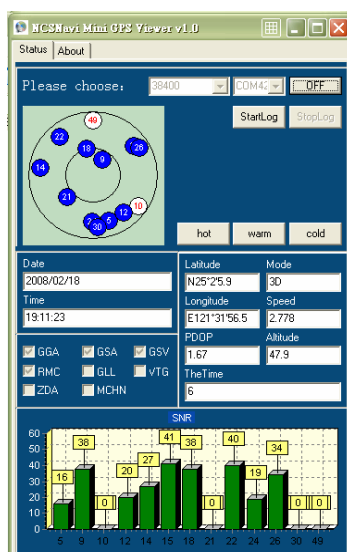


(Fig. 3)

- 2) Setup the Baud rate : 38400, then tap “Scan” button to scan your COM Port. Select your COM Port respectively, then tap “ON” button (see Fig.4). Checking GPS status(see Fig.5)



(Fig. 4)



(Fig. 5)

- 4) In “Status” panel you can see “Hot” , “Warm ” and “Cold ” three different start ways, which will allow you to reacquire Ephemeris. Basically the satellites are always moving in the sky, if Ephemeris 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” to re-acquisition.

## 6. Warranty

The **R120** 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 repaired at no charge to the customers.

- **The warranty period for the accessory is six months.**
- **R120 has built Li-battery inside, please avoid closing to high temperature environment or sunshine directly for a long time.**

## 7. Troubleshooting

Problems	Possible Reasons	Methods
GPS Acquisition Failed	Weak or no GPS signal at the place of <b>R120</b>	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.	
Execute fail	Bluetooth function unstable	Power On/Off R120. 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 <b>R120</b>	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 device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.