

# MAINNAV International Corp.

11F, 293-1, Sec. 1, Zhongshan Rd., Banqiao City, Taipei 220, Taiwan, R.O.C. Tel: +886 2 8953-6616  
Web: [www.mainnav.com](http://www.mainnav.com) E-mail: [info@mainnav.com](mailto:info@mainnav.com) Fax: +886 2 8951-8531

## MG-950d Sport GPS



# MAINNAV International Corp.

11F, 293-1, Sec. 1, Zhongshan Rd., Banqiao City, Taipei 220, Taiwan, R.O.C. Tel: +886 2 8953-6616  
Web: [www.mainnav.com](http://www.mainnav.com) E-mail: [info@mainnav.com](mailto:info@mainnav.com) Fax: +886 2 8951-8531

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## A.Quick use

### 1. Standard package

- ◆ Rechargeable battery, 850mAh
- ◆ Car charger: Mini USB , IP:12~24V, OP:5V 500mA
- ◆ Software
- ◆ Bike mounting
- ◆ USB cable
- ◆ Warranty card
- ◆ Travel charger

### 2. 8 hours full charge is required before using (recommendation)

Fully charge the battery for at least 8 hours before using can last for 8 hours continuously operation facilitating the low power consumption design at 66 mA .

### 3. GPS Start to get GPS signal --- when power on , the unit will automatically search GPS signal . About 42 seconds , the GPS fixed the signal

### 4. Found a shortcut automatically in Bluetooth Manager window

**When unit is on, the Bluetooth is on too.**

The system will automatically set up quick connect device, Mainnav in Bluetooth Manager. Further step, click the device to connect Bluetooth receiver.

### 5. Check the Serial Port in Bluetooth Setting and Set up correct Serial Port in your map software

Click Serial Port to confirm the COM port after pairing with the receiver. Using PDA / PC to pair the receiver. Start your map function and choose the right serial port and select "Outbound COM port ". The pass word for paring is "0000".

### 6. GPS data logger

Turn on the **MG-950d** and press Power button then enter data logger recorded system, start to record your journey. Stop the data logger function, press "Power" button, it will turn off.

Check the GPS data—Using USB cable connect **MG-950d** to your PC (please install Mainnav software application), then you could view recorded data on Google Maps. For detail instruction , **please check CD ( software instruction)**

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## 7. Others

Car charger --

**Make sure use Mainnav car charge or it could not transmit GPS data in car  
When charge the device , the unit could not turn on ( protect circuit )**

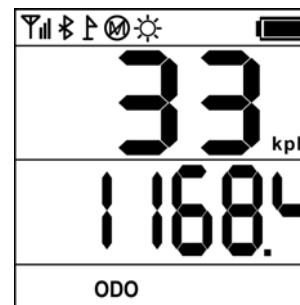
## 8. LCD display



Current Speed/Elevation



Speed/time



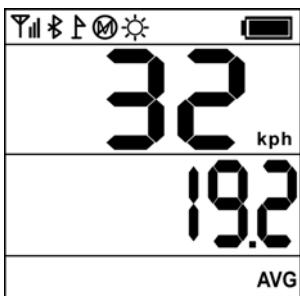
Speed/total mileage



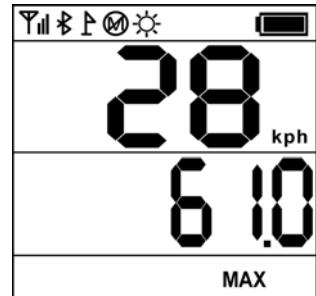
Speed/ trip time



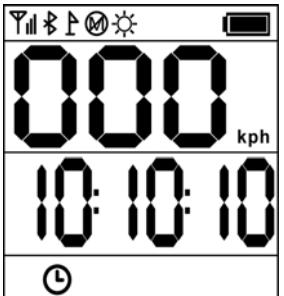
Speed/moved distance



Speed/average Speed



Speed/ Maximum speed



Clear the data



GPS signal



Bluetooth on



Data logger on



Memory full



backlight on



Power

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## 9. Button intro

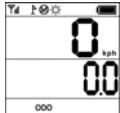


## 10. Function switch

Operation	display	Definition
Press Power button around 3 seconds	Power on	Stay on - GPS and Bluetooth is on too
When you see this mark , that means GPS is fixed	GPS	GPS fixed
When Power on , press power button 3 seconds----- the data logger is on , you will see the flag on the top of screen	Flag	Data logger is on
Press power button 3 seconds again----the data logger will off.		Data logger is off (no flag mark)
Press back-lighted button 3 seconds --- Back-lighted is on	Light	Back-lighted is on
Press 3 second again---- Back-lighted is off		Back-lighted is off
When unit on ,press back-lighted button 12		Clear all data (except time)

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seconds		
Press back-lighted button 12 seconds----Total mileage turns zero		Total mileage turns Zero(ODO)
When Power on, press two buttons together ----- switch to metric and imperial(mph)/(kph)		
Adjust time Zone When Power off , press 2 buttons together 3seconds ---- Adjust time zone by Power button, setting by backlight button.		Adjust time Zone
Touch pad-Touch , it could scan to each function		Touch -Move to next page and show different data
Press this button 5 seconds		Auto scan for each page
When power is low, the battery will be flash. This mean battery still have one hour left		Flashing --One hour left
Bluetooth – When pairing your device, the top of screen will show BT mark.		When Unit is on, BT is on , too.
Log time—when move the logger, it records tracks in every 1 second. If did not move, the tracks will be record in every 1 minute.		Move – logging every 1 second moveless—logging every 1 min
When see this mark , the memory is full		

## B. Introduction

**MG-950d** is marvelous Sport GPS with data logger. The chip designed based on SiRF Star III LP which provides the high sensitivity for personal navigation and the wireless Bluetooth transmission in the world.

This new gadget with LCD monitor is ideal for biking, driving and long journey. User could easy to view the screen while workout such as total mileage/kilometer, moved time, elevation and speed. This new device is compact and easy to carry.

**MG-950d** is a small, robust unit that records NMEA position data from a GPS. It is really

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convenient, economical alternative to using a laptop computer especially on long road. Simply connect the logger to a GPS during your trip then download the track data to a PC. Also, our photo map part is one of brilliant function, User could match photo in certain waypoint by their own which show on Google earth.

## C. Feature

Store up to 260,000 waypoints  
LCD display and Touch pad  
Automatically change to next page  
Absolutely cycle computer upgrading  
SiRF Star III Hot start 6 sec, warm start 38sec, cold start 42 sec  
Calculates precise speed and distance while you biking  
Record track-logs of vehicle movement  
User can select among Google earth, Satellite or Hybrid to show the track  
Built-in GPS application software, could save as KMZ, CSV, GPX and NMEA  
Integrated Photo with Mainnav Software  
Transmission data via USB and Bluetooth  
Weather Proof IPX6  
Bluetooth—pair PDA or smart phone for navigation.  
Replay the recorded routes/ time/ speed... point by point  
Lightweight and compact --suitable for biking, hiking and traveling.

## D. Specification

### **Physical Dimension**

Size: 73(L)X49(W)x21 (H) (mm)

LCM: 33(mm)X 33(mm)

Weight: 70g

### **Environmental Characteristics**

1. Working temperature: -20°C to +75°C (internal temperature).
2. storage temperature: -55°C to +90°C.
3. input voltage: 5.5 ± 0.5VDC
4. Backup power: 3.7V Rechargeable Li-ion Battery 850mAh,

### **GPS**

- 1) Acquisition: 20 channel parallel
- 2) Tracking: up to 12 satellites
- 3) Update rate: 1 second
- 4) Acquisition time

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Reacquisition	0.1 sec, averaged
Snap start	3 sec, averaged
Hot start	6 sec, averaged
Warm start	38 sec, averaged
Cold start	42 sec, averaged

## ***Bluetooth***

- 1) Transmits up to 10 meters.
- 2) Version V2.0

## ***Position accuracy:***

### 1. Non DGPS (Differential GPS)

Position: <10 M at 2D RMS

Velocity: 0.1 meters/second, with SA off

Time: 1 microsecond synchronized GPS time

### 2. DGPS (Differential GPS) or WAAS / EGNOS ON (Built by demand)

Position: 1 ~ 5 meter, typical

Velocity: 0.05 meters/second, typical

### 3. Dynamic Conditions:

Altitude: 18,000 meters (60,000 feet) max

Velocity: 515 meters / second (1000 knots) max

Jerk: 20 meters/second, max

Acceleration: 4 G, max

## ***Interfaces***

### 1) USB 2.0 Bluetooth 2.0

### 2) NMEA 0183 Version 2.2 ASCII output (GPGGA, GPGLL, GPGSA, GPGSV, GPRMC, GPVTG).

### 3) Real-time Differential Correction input (RTCM SC-104 message types 1, 5 and 9). (Optional model)

SiRF protocol. (optional)

## ***Baud rate 9600***

## ***Connector***

Battery recharging connector: Mini USB

## ***Battery***

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Capacity: 850mAh.

Type: Li-ion rechargeable

Normal use: 12 hours

## CAUTION

**RISK OF EXPLOSION IF BATTERY IS REPLACED  
BY AN INCORRECT TYPE.**

**DISPOSE OF USED BATTERIES ACCORDING  
TO THE INSTRUCTIONS**

## **Accessory**

1. Rechargeable battery, 850mAh
2. Car charger: Mini USB , IP:12~24V, OP:5V 500mA
3. Software
4. bike mounting
5. USB cable
6. Warranty card
7. Travel charger

## **Certification:**

RoHs

CE&FCC

## **§Federal Communications Commission (FCC) Statement**

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

15.105(b)

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 or more of the following measures:

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- 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.

**Operation is subject to the following two conditions:**

- 1) this device may not cause interference and
- 2) this device must accept any interference, including interference that may cause undesired operation of the device.

**FCC RF Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

**Warranty**

All of our GPS products have the one-year warranty and repair policy from the day of purchase.

The MG-950d is warranted to be free from defects in material and function for one year from the date of purchase. Any fault product within this period under normal conditions will be replaced without any charge.

## E. Operational characteristics

**Initialization**

Once the initial self-test is complete, MG-950d start the process of satellite acquisition and tracking automatically. MG-950D takes about 45 seconds to achieve a position fix in normal circumstances. After a position fix has been calculated, valid position, velocity and time is transmitted over the output channel.

Also, our MG-950d records NMEA position data from a GPS. It is really convenient, economical alternative to using a laptop computer, especially on long road. Simply connect the logger to a GPS during your trip then download the track data to a PC.

**Data logger**

1. LCD screen which shows speed altitude/latitude

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- 2. Reads NMEA data from GPS
- 3. Compact size and lightweight
- 4. Store up to 260,000 waypoints
- 5. User friendly Windows based Mainnav software
- 6. Weather proof IPX6
- 7. With user friendly Windows based Google earth software
- 8. Replay the recorded routes/ time/ speed... point by point

## ***Navigation***

With the acquisition process is completed, the MG-950d sends valid navigation information over output channels. The data include:

- 1) Velocity
- 2) Error estimates
- 3) Date/time
- 4) Latitude/longitude/altitude
- 5) Satellite and receiver status

## **F. Safety Statement**

### **R&TTE / CE**

This device complies with ETSI EN 300 328-1, ETSI EN 301 489-1 / 17, EN60950.

### **FCC**

This device complies with Part 15C, Part 15B and ID Application of the FCC rules.

Operation is subject to the following two conditions:

- 1. This device may not cause harmful interference.
- 2. This device must accept any interference received, including interference that may cause undesired operation.

### **RoHS**

## **G. Earth Datums &output setting**

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## **NMEA Transmitted Messages Output Messages NMEA Sentence**

GPGGA: Global positioning system fixed data

GPGLL: Geographic position latitude \ longitude

GPGSA: GNSS DOP and active satellites

GPGSV: GNSS satellites in view.

GPRMC: Recommended minimum specific GNSS data

GPVTG: Course over ground and ground speed

### **Global Positioning System Fix Data**

\$GPGGA,161229.487,3723.2475,N,12158.3416,W,1,07,1.0,9.0,M, , ,0000\*18

Name	Example	Units	Description
Message ID	\$GPGGA		GGA protocol header
UTC Time	161229.487		Hhmmss.sss
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.3416		dddmm.mmmm
E/W Indicator	W		E=east or W=west
Position Fix Indicator	1		See Table 5-3
Satellites Used	07		Range 0 to 12
HDOP	1.0		Horizontal Dilution of Precision
MSL Altitude	9.0	Meters	
Units	M	Meters	
Geoid Separation		Meters	
Units	M	Meters	
Age of Diff. Corr.		second	Null fields when DGPS is not used
Diff. Ref. Station ID	0000		
Checksum	*18		
<CR> <LF>			End of message termination

### **Position Fix Indicator**

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Value	Description
0	Fix not available or invalid
1	GPS SPS Mode, fix valid
2	Differential GPS, SPS mode, Fix valid
3	GPS PPS Mode, Fix valid

## GNSS Satellites in View

(GSV)\$GPGSV,2,1,07,07,79,048,42,02,51,062,43,26,36,256,42,27,27,138,42\*71  
 \$GPGSV,2,2,07,09,23,313,42,04,19,159,41,15,12,041,42\*41

Name	Example	Units	Description
Message ID	\$GPGSV		GSV protocol header
Number of Messages	2		Range 1 to 3
Message Number	1		Range 1 to 3
Satellites in View	07		Range 1 to 12
Satellite ID	07		Channel 1 (Range 1 to 32)
Elevation	79	degrees	Channel 1 (Maximum 90)
Azimuth	048	degrees	Channel 1 (True, Range 0 to 359)
SNR (C/No)	42	dBHz	Range 0 to 99, null when not tracking
Satellite ID	27		Channel 4 (Range 1 to 32)
Elevation	27	degrees	Channel 4 (Maximum 90)
Azimuth	138	degrees	Channel 4 (True, Range 0 to 359)
SNR (C/No)	42	dBHz	Range 0 to 99, null when not tracking
Checksum	*71		
<CR> <LF>			End of message termination

## Recommended Minimum Specific GNSS Data (RMC)

\$GPRMC, 161229.487,A,3723.2475,N,12158.3416,W,0.13,309.62,120598, ,\*10

Name	Example	Unit	Description
Message ID	\$GPRMC		RMC protocol header
UTC Time	161229.487		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.3416		dddmm.mmmm

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E/W Indicator	W		E=east or W=west
Speed Over Ground	0.13	Knots	
Course Over Ground	309.62	Degrees	True
Date	120598		ddmmyy
Magnetic Variation (1)		Degrees	E=east or W=west
Checksum	*10		
<CR> <LF>			End of message termination

## H. World GMT Time zone setting

**MG-950d time zone setting is from 1~24 hour but in GMT time zone is from +1~+12 and -1~-12. For Mainnav device, time zone from -1~-12 will be deducted from 24 hours. Example : USA –New York GMT is -4 , on MG-950d need to set 20. After setting time zone, the GPS will record correct time.**

### North America

Country	Time zone	GMT
Canada	Newfoundland(NST)	-3:30
	(St. Johns)	-2:30
	UTC-4 AST	-4
	(Goose Bay)	-3
	EST	-5
	Toronto	-4
	CST	-6
	Winnipeg	-5
	MST	-7
	Calgary	-6
	PST	-8
	Vancouver	-7
Nicaragua		-6
Guatemala		-6
Honduras		-6
U.S.A.	EST	-5
	New York	-4

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	CST	-6
	Chicago	-5
	MST	-7
	Salt Lake City	-6
	PST	-8
	Los Angeles	-7
	AKST	-9
	Anchorage	-8
	HST	-10
	Honolulu	-9
Costa Rica		-6
El Salvador		-6

## Oceania Area

Country	Time zone	GMT time zone
New Zealand		12
		13 ( October ~ March is daylight saving time )
(Australia)	AEST	10
	Sydney	10
		11 (from Apr to Oct , from Oct to March is daylight saving time )
	ACST	+9:30
	Adelaide	+10:30
	WST	8
	Perth	9
	Guam	10

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## European Country

Country	GMT time zone
(Denmark)	1
	2(Mar to Sep is daylight saving)
Belgium)	1
	2(Mar to Sep is daylight saving)
(Iceland)	0
(Hungary)	1
	2(Mar to Sep is daylight saving)
(Spain)	1
	2(Mar to Sep is daylight saving)
Greece	1
	2(Mar to Sep is daylight saving)
Poland	1
	2(Mar to Sep is daylight saving)
France	1
	2(Mar to Sep is daylight saving)
Finland	2
	3(Apr to Oct is daylight saving)
Great Britain GMT	0
	1 (Mar to Oct is daylight saving time )
Norway	1
	2 (Mar to Sep is daylight saving time )
Czech	1
	2(Mar to Sep is daylight saving time)
Vatican	1
	2(3-9 is daylight saving time)
Netherlands	1
	2(3-9 is daylight saving time)
Slovak	1
	2(3-9 is daylight saving time)
Austria	1

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	2(3-9 is daylight saving time)
Switzerland	1
	2(3-9 is daylight saving time)
Sweden	1
	2(3-9 is daylight saving time)
Italy	1
	2(3-9 is daylight saving time)
Germany	1
	2(3-9 is daylight saving time)
Monaco	1
	2(3-9 is daylight saving time)
Luxembourg	1
	2(3-9 is daylight saving time)

## Asia Area

Country	GMT time zone
Turkey	2
	3 (5-10 is daylight saving time)
China	8
Japan	9
Nepal	+5:45
Indonesia	8
Thailand	7
Malaysia	8
Philippines	8
Singapore	8

## Africa

Country	GMT Time zone
South Africa	2
Egypt	2

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## Attachment for Bike mount

1 find a position to fix on Handle bar



2 Using screw Combine these two together



3. Fix the rubber under the holder



4. put string through the holder



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## 5. Fix on the handle bar – circle on the handle bar



## 6. Tighten on the handle bar and cut the over string part



## 7. Put the device on bike mount and finish attachment

