MG-910D

BT GPS data logger
A. Quick Use

B. Introduction

C. Feature

D. Specification

   Physical Dimension

   Environmental Characteristics

   GPS

   LED Status

   Bluetooth

   Position accuracy

   Interfaces

   Connector

   Battery

   Accessory

   Certification:

   FM Transmitter

   Warranty

E. Operational characteristics

F. Safety Statement

G. Software Interface

H. Earth Datums & Output Setting

I. Mainnav GPS software application
A. Quick use

1. Standard package
   GPS Unit + Car charger + Li-ion Rechargeable Battery + Document CD + Warranty Card + Quick Use + lanyard

2. 10 hours full charge is required before using (recommendation)
   Fully charge the battery for at least 10 hours before using can last for 8 hours continuously operation facilitating the low power consumption design at 66 mA.

3. Turn on the Bluetooth function in your PDA or PC
   Start up MG-910D receiver for pairing before set off Bluetooth function in PDA or PC. Moreover, check the device is equipped with Bluetooth function. If not, you may need to acquire an optional CF or SD Bluetooth card.

4. Found a shortcut automatically in Bluetooth Manager window
   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. Switch off the Bluetooth function
   Switch off the Bluetooth function before you turn off your PDA/PC, and Switch off receiver disconnect the GPS function.

7. GPS data logger
   Turn on the MG-910D 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-910D to your PC (please install Mainnav software application), then you could Show recorded data on Google Maps. For detail instruction, please check CD file (software instruction)
B. Introduction

**MG-910D** is marvelous Bluetooth GPS receiver. 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. Our MG-910D is ideal for long journey and commercial tracking. This new device is compact and easy to carry.

Our **MG-910D** is a small, robust unit that records NMEA position data from a GPS. It is really convenient, economical alternative to using a laptop computer or PDA, especially on long road. Simply connect the logger to a GPS during your trip then download the track data to a PC.

C. Feature

- Store up to 120,000 waypoints
- SiRF Star III Hot start 6 sec, warm start 38sec, cold start 42 sec
- Bluetooth 2.0
- Record track-logs of vehicle movement
- User can select among Google Map, Satellite or Hybrid to show the track
- Reads NMEA data from GPS
- USB interface
- Trendy looking and compact size
- Replay the recorded routes/ time/ speed... point by point
- Lightweight and compact --suitable for hiking, biking and walking

D. Specification

**Physical Dimension**

Size: 59(W) x 44(D) x 21(H) (mm)

Weight:50g

**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 700mAh,

**GPS**

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

**LED indicate**

<table>
<thead>
<tr>
<th>LED light</th>
<th>Blue</th>
<th>Indicate</th>
<th>Green</th>
<th>Indicate</th>
<th>Red</th>
<th>Indicate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stay on</td>
<td>●</td>
<td>Power is on, not pairing</td>
<td>●</td>
<td>GPS position fixed</td>
<td>●</td>
<td>Charging</td>
</tr>
<tr>
<td>Keep flashing</td>
<td>●</td>
<td>Paired, data is recording</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slow flashing</td>
<td>●</td>
<td>Bluetooth is paired (data logger is not recorded)</td>
<td>●</td>
<td>GPS not fixed</td>
<td>●</td>
<td>Lower power (need charge)</td>
</tr>
<tr>
<td>Snap flashing</td>
<td>●</td>
<td>Data logger keep record (Bluetooth not paring)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>off</td>
<td>●</td>
<td>Power off</td>
<td>●</td>
<td>Power off</td>
<td>fully charged</td>
<td></td>
</tr>
</tbody>
</table>

**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)
4) SiRF protocol. (optional)

**Connector**
Battery recharging connector: Mini USB

**Battery**
Capacity: 700mAh.
Type: Li-ion rechargeable
Normal use: 12.5 hours

**Accessory**
1. Rechargeable battery, 700mAh
2. Car charger: Mini USB, IP:10~30V, OP:5V 500mA
3. CD
4. Lanyard

**Certification:**
RoHs
CE&FCC

**Warranty**
All of our GPS products have the one-year warranty and repair policy from the day of purchase.
The MG-910D 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-910D start the process of satellite acquisition and tracking automatically. MG-910D 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.

The MG-910D utilizes initial data, such as last stored position, date, time and satellite orbital data, to achieve maximum acquisition performance.

**Navigation**
With the acquisition process is completed, the MG-910D 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.

**BQB**
## G. Software Interface

**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

<table>
<thead>
<tr>
<th>Global Positioning System Fix Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message ID</td>
</tr>
<tr>
<td>$GPGGA</td>
</tr>
<tr>
<td>UTC Time</td>
</tr>
<tr>
<td>Latitude</td>
</tr>
<tr>
<td>N/S Indicator</td>
</tr>
<tr>
<td>Longitude</td>
</tr>
<tr>
<td>Satellites Used</td>
</tr>
<tr>
<td>HDOP</td>
</tr>
<tr>
<td>MSL Altitude</td>
</tr>
<tr>
<td>Units</td>
</tr>
<tr>
<td>Checksum</td>
</tr>
</tbody>
</table>
Position Fix Indicator

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Fix not available or invalid</td>
</tr>
<tr>
<td>1</td>
<td>GPS SPS Mode, fix valid</td>
</tr>
<tr>
<td>2</td>
<td>Differential GPS, SPS mode, Fix valid</td>
</tr>
<tr>
<td>3</td>
<td>GPS PPS Mode, Fix valid</td>
</tr>
</tbody>
</table>

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

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

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  | A=data valid or V=data not valid
UTC Time                     | 161229.487  | hhmmss.sss            | A=data valid or V=data not valid
Status                       | A          | ddmm.mmmm             | A=data valid or V=data not valid
Latitude                     | 3723.2475  | ddmm.mmmm             | ddmm.mmmm
N/S Indicator                | N          | N=north or S=south    | N=north or S=south
Longitude                    | 12158.3416 | dddmm.mmmm            | dddmm.mmmm
E/W Indicator                | W          | E=east or W=west      | E=east or W=west
Speed Over Ground            | 0.13       | Knots                 | ddmm.mmmm
Course Over Ground           | 309.62     | Degrees True          | ddmm.mmmm
Date                         | 120598     | ddmm.mmmm             | ddmm.mmmm
Magnetic Variation (1)       | 120598     | ddmm.mmmm             | ddmm.mmmm
Checksum                     | *10        | End of message termination | *10

#### H. Earth Datums & Output Setting

*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  | A=data valid or V=data not valid
UTC Time                     | 161229.487  | hhmmss.sss            | A=data valid or V=data not valid
Status                       | A          | ddmm.mmmm             | A=data valid or V=data not valid
Latitude                     | 3723.2475  | ddmm.mmmm             | ddmm.mmmm
N/S Indicator                | N          | N=north or S=south    | N=north or S=south
Longitude                    | 12158.3416 | dddmm.mmmm            | dddmm.mmmm
E/W Indicator                | W          | E=east or W=west      | E=east or W=west
Speed Over Ground            | 0.13       | Knots                 | ddmm.mmmm
Course Over Ground           | 309.62     | Degrees True          | ddmm.mmmm
Date                         | 120598     | ddmm.mmmm             | ddmm.mmmm
Magnetic Variation (1)       | 120598     | ddmm.mmmm             | ddmm.mmmm
Checksum                     | *10        | End of message termination | *10

<CR> <LF> End of message termination