



GM-R900

GPS Receiver User's Manual



EverMore Technology Inc.



GM-R900 User's Manual

Manual Revision History

Revision	Date	Update Summary
Issue 1.0	March 2006	Initial release

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1. Introduction

1.1 Overview

EverMore GM-R900 series is a high sensitivity GPS receiver, This product is based on SiRF starIII chipset in 20 channel GPS receivers solution. The GPS module receiver will track up to 20 satellites at a time while providing fast time-to-first-fix and 1Hz navigation updates. It is far reaching capability meets the sensitivity & accuracy requirements of car navigation as well as other location-based applications, such as AVL system. PDA, Notebook operated navigation system.

The GM-R900 design utilizes the latest surface mount technology and high level circuit integration to achieve superior performance while minimizing dimension and power consumption. This hardware capability combined with software intelligence makes the board easy to be integrated and used in all kinds of navigation applications or products. The module communicates with application system via RS-232 level with NMEA-0183 protocol.



1.2 Features

The GM-R900 GPS engine board offers following features:

- SiRF starIII Chipset 20 Channels all in view tracking
- High Sensitivity -159dBm
- Reacquisition Time: 0.1 second
- Support Standard NMEA-0183 at 4800 bps baud rate
- On-board rechargeable battery sustained real-time clock and memory for fast satellite acquisition during power-up
- Dimension/Weight: 56mmx53mmx22.5mm/96g

1.3 Applications

- Land/Marine Navigation
- Telematics
- Fleet Management
- Asset Tracking
- Timing Reference

1.4 Start-up Modes

Definitions	DESCRIPTION
<p>Cold Start</p>	<p>The Cold Start takes the longest startup time among EMT GPS receivers. In this scenario, the receiver has no acknowledgment on the last position, time, and satellite constellation. The receiver is initiated to search blindly for satellite signals in the cold start mode.</p> <p>Another situation is that when no backup battery is connected, the GPS receiver will be in the cold start mode and there is no data stored in SRAM.</p> <p>Execute cold start of the test tool when first use. By this way can speed up position fix time.</p>
<p>Warm Start</p>	<p>In this scenario, the receiver was off less than one week but more than 2-hour time.</p> <p>The receiver knows its last position, time and almanac because it has a backup battery to keep current almanac, position and time stored in SRAM. In the warm start mode, the receiver can quickly acquire satellites and get a position fix faster than it does in the cold start mode.</p>
<p>Hot Start</p>	<p>In this scenario, the receiver was off less than 2-hour time. With the back up battery connected and the current almanac, position, time and ephemeris stored in SRAM, the receiver applies its last ephemeris data to calculate and get a position fix.</p>
<p>Reacquisition</p>	<p>In the reacquisition mode, the receiver takes time to lock on satellites if buildings or obstacles are blocking the signals for a short while.</p> <p>This is very common in urban areas, but please be noted that reacquisition time has nothing to do with the time-to-first-fix (TTFF).</p>



2. Technical Specifications

2.1 Electrical Characteristics

2.1.1 General

Frequency	L1, 1575.42 MHz
C/A code	1.023 MHz chip rate
Channels	20

2.1.2 Sensitivity

Tracking	-159dBm type
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2.1.3 Accuracy

Position	<15 meters CEP (95%) horizontal, SA off.
Velocity	0.1 meters/second
Time	±100 ns synchronized to GPS time

2.1.4 Datum

Default	WGS-84
Other	Support different datum by request

2.1.5 Acquisition Rate

Hot start	1 sec, average
Warm start	38 sec, average
Cold start	42 sec, average

2.1.6 Dynamic Conditions

Altitude	18,000 meters max
Velocity	515 meters/second (1000 knots) , max.
Acceleration	4g, max
Jerk	20 meters/second ³ , max.



2.1.7 Power

Main power input	5V ± 0.5Vp-p DC input.
Supply Current	Max. 80 mA

2.1.8 Serial Port

Electrical interface	LVTTL and RS-232 interface
Protocol message	NMEA-0183, Version 2.2
Default NMEA	GGA, GSA, GSV, RMC 4800 baud rate, 8 bits data, 1 star , 1 stop, no parity. (Option baud rate: 9600, 19200, 38400)

2.2 Environmental Characteristics

Operating temperature range	-40 °C to +80 °C
Storage temperature range	-45 °C to +85 °C
Operating humidity range	5% to 90% non-condensing

2.3 Physical Characteristics

Dimension:	56mm x 53mm x 22.5mm (2.20"x2.08"x0.88")
Weight:	96g (3.38oz)
Interface standard connector:	PS/2 female connector
Interface optional connector:	USB cable or car charger for PDA

3. Hardware Interface

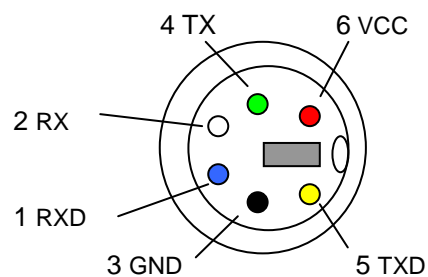
3.1 GM-R900 PS/2 Female Connector (standard type)

PS/2 female connector (standard type)



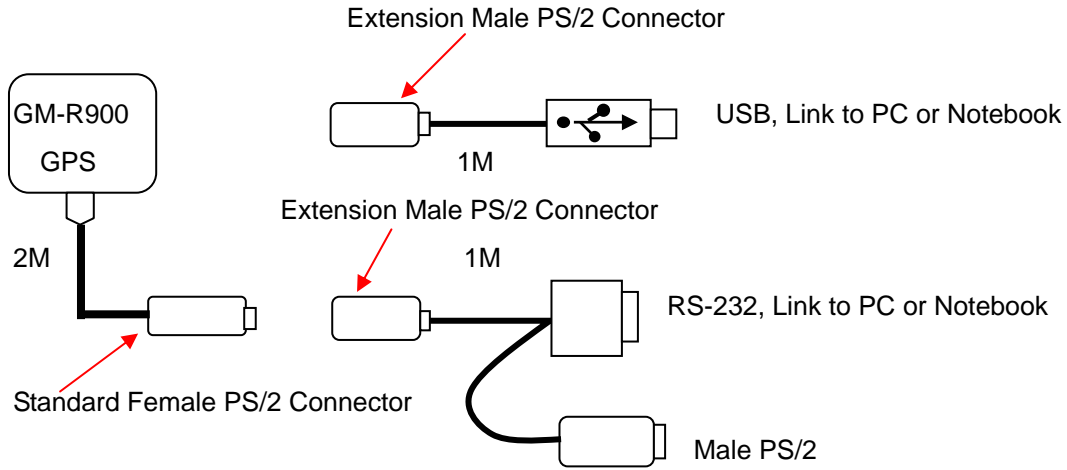
PS/2 Female Connector Pin Assignment

Pin	Function	Input/Output	Level
1	RXD	Input	3.3V, LVTTTL
2	RX	Input	12V, RS-232
3	GND		
4	TX	Output	12V, RS-232
5	TXD	Output	3.3V, LVTTTL
6	VCC	Power Supply	5V

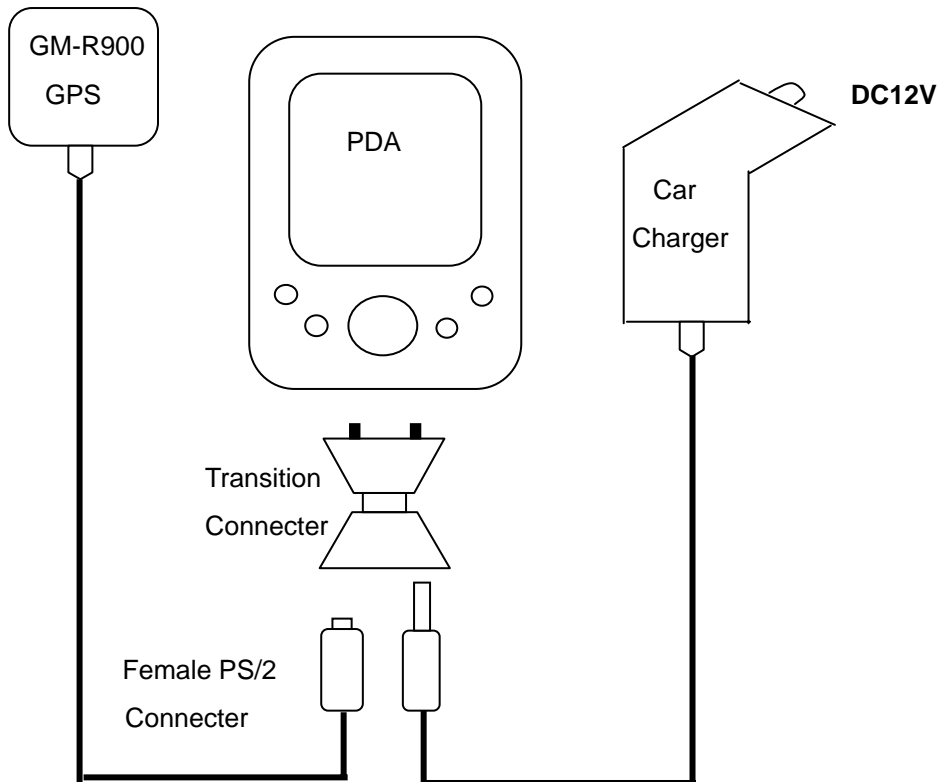


PS/2 (Female)
at the GM-R900

3.2 GM-R900 Female PS/2 Connector Interface



GM-R900 Link to Host Device Diagram



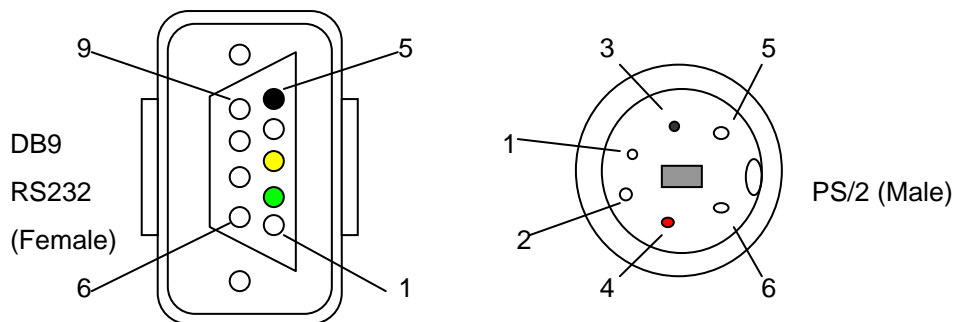
GM-R900 Link to PDA Diagram

3.3 GM-R900 Accessories

3.3.1 DB9 9 Pins Female and PS/2 Male Connector

DB9 Connector (Female)

Pin	Function	Input/Output	Level
1	NC		
2	TX	Output	RS-232
3	RX	Input	RS-232
4	NC		
5	GND	Ground	0V
6	NC		
7	NC		
8	NC		
9	NC		



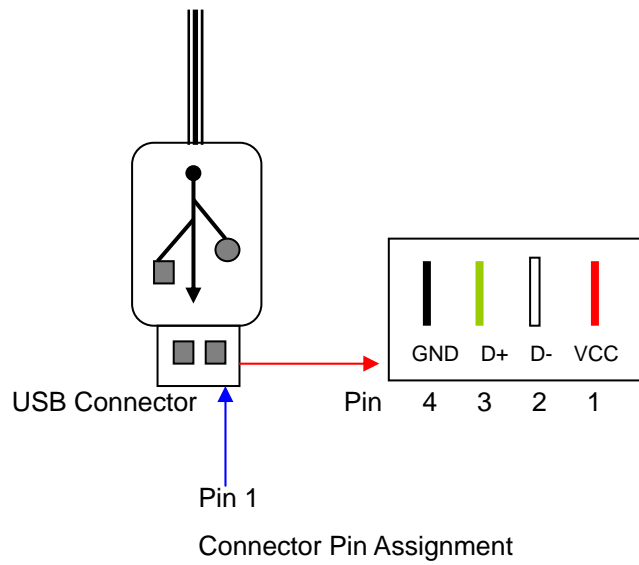
Connector Pin Assignment

PS/2 Connector (Male)

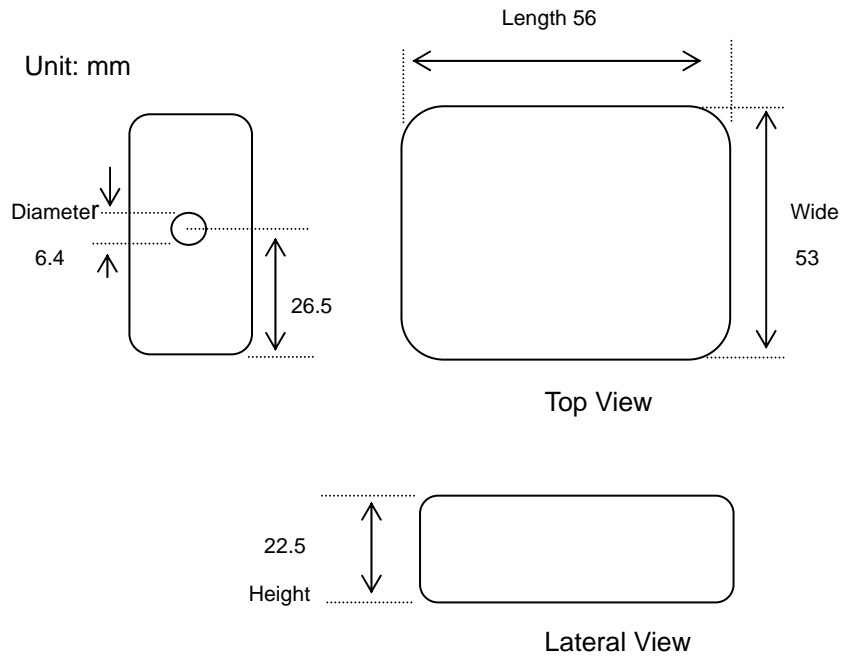
Pin	Function	Pin	Function	Pin	Function
1	NC	3	GND	5	NC
2	NC	4	VCC	6	NC

3.3.2 USB Connector

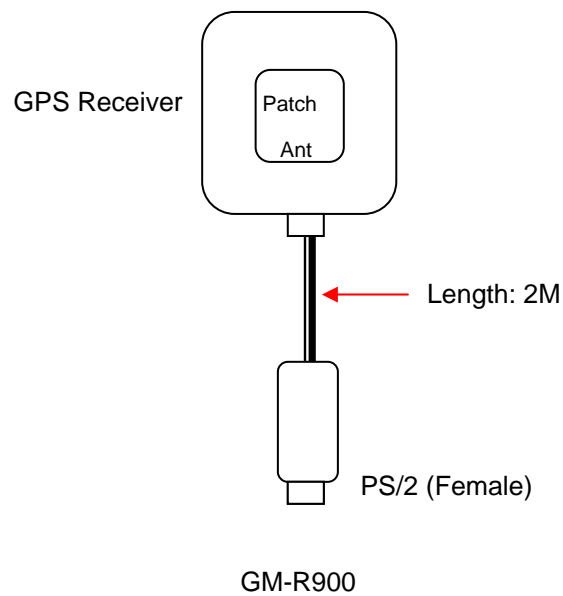
Pin	Function	Color
1	VCC, 5V	Red
2	D-	White
3	D+	Green
4	GND	Black



3.4 GM-R900 Dimensions



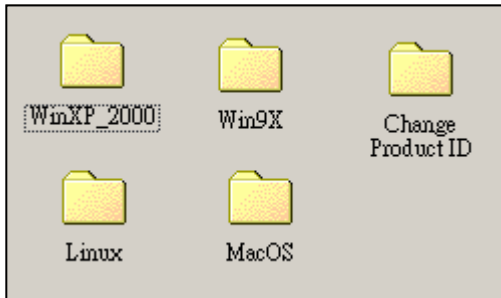
3.5 GM-R900 Appearance Diagram



4 GM-R900 USB Driver Installation

Following is the brief indication of USB driver installation. We enclose a CD for detailed USB driver installation “GPS USB Driver Setup.pdf ” with products.

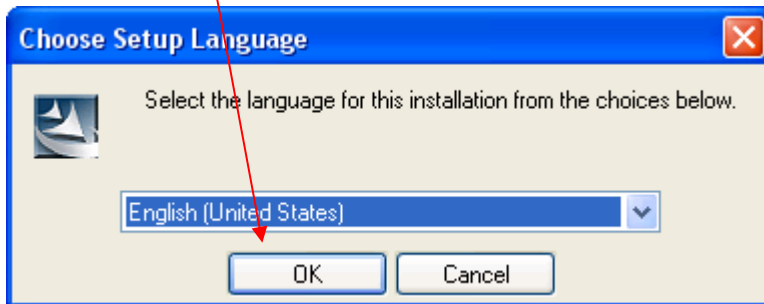
Step 1: Copy entire USB driver folders from CD to hard disk



Step 2: Double click the “ USB_CP2102_XP_2000 ” icon



Step 3: Press “OK” button



Step 4: Following the instructions

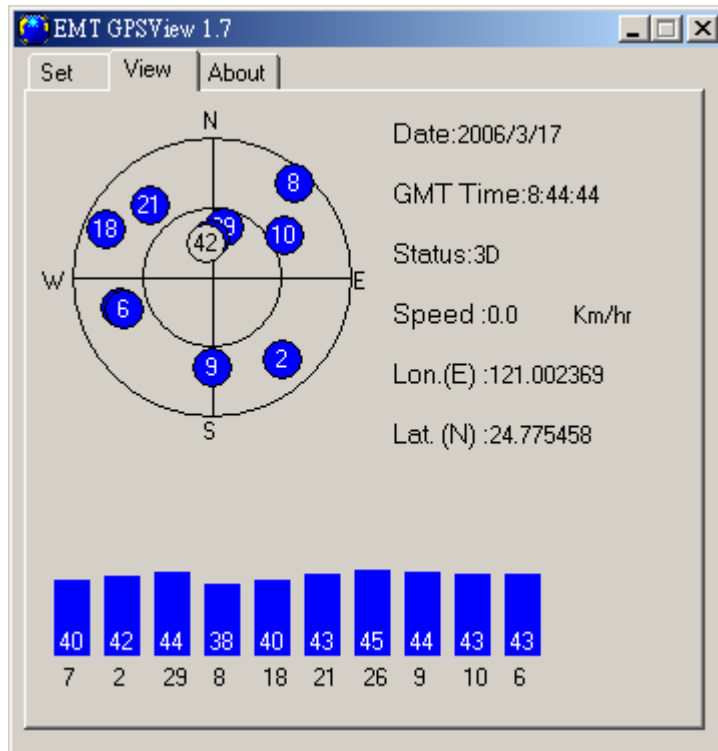
Step 5: Plug-in GPS to PC USB port

Step 6: Check enables COM port number

Step 7: To test GM-R900-R by testing tool

5. GPS Testing

The customers can test GM-R900 by testing tool.





6. Limited Warranty

The GM-R900 is warranted to be free from defects in material and functions for one year from the date of purchase. Any failure of this product within this period under normal conditions will be replaced at no charge to the customers

7. Appendix

EverMore Website

Welcome to EverMore website at <http://www.emt.com.tw> or <http://www.globalsources.com/gpsevermore.co> for updated product information and drivers download.

8. Ordering Information

8.1 Optional Types Cable

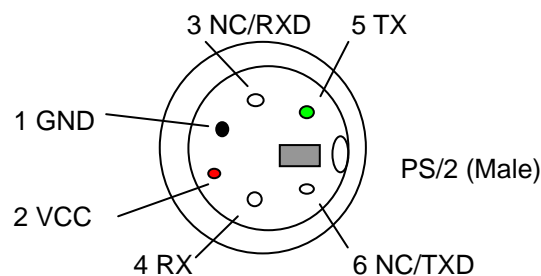
8.1.1 Male PS/2 Cable

For all kind definition



PS/2 Connector (Male)

Pin	Function	Input/Output	Level
1	GND	Ground	0V
2	VCC	Power Supply	5V
3	NC/RXD	Input	3.3V, LVTTTL
4	RX	Input	RS-232
5	TX	Output	RS-232
6	NC/TXD	Output	3.3V, LVTTTL



Male PS/2 Connectors Pin Assignment

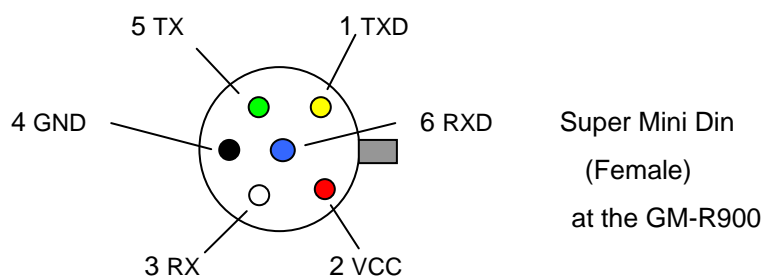
8.1.2 SP6P Cable

For all kind definition



SP6P Connector (Female)

Pin	Color	Function	Input/Output	Level
1	Yellow	TXD	Output	3.3V, LVTTTL
2	Red	VCC	Power Supply	5V
3	White	RX	Input	12V, RS-232
4	Black	GND		0V, Ground
5	Green	TX	Output	12V, RS-232
6	Blue	RXD	Input	3.3V, LVTTTL



Connectors Pin Assignment

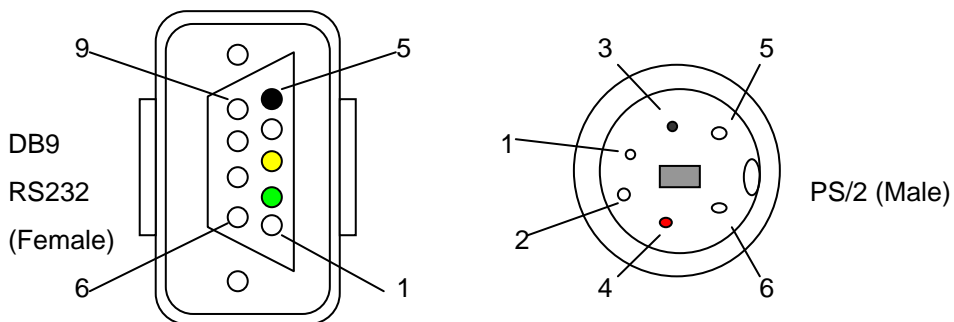
8.1.3 RS-232 Cable (DB9 9 Pins Female + PS/2 Male)

For all kind definition



DB9 Connector (Female)

Pin	Function	Input/Output	Level
1	NC		
2	TX	Output	RS-232
3	RX	Input	RS-232
4	NC		
5	GND	Ground	0V
6	NC		
7	NC		
8	NC		
9	NC		



Connector Pin Assignment

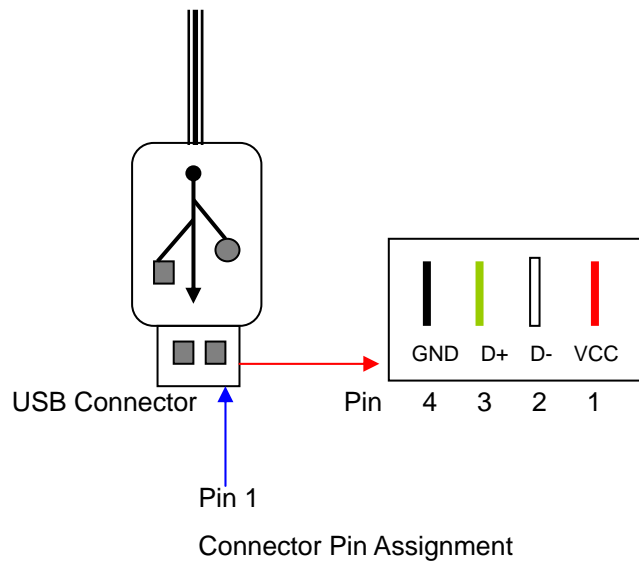
PS/2 Connector (Male)

Pin	Function	Pin	Function	Pin	Function
1	NC	3	GND	5	NC
2	NC	4	VCC	6	NC

8.1.4 USB Cable (With USB Bridge Controller IC)



Pin	Function	Color
1	VCC, 5V	Red
2	D-	White
3	D+	Green
4	GND	Black



8.2 Car Charger List

Input voltage: DC12V~24V, Output: 5V/2A

ITEM	Description
1	Car charger for ACER N20
2	Car charger for ACER S60
3	Car charger for ASUS A600
4	Car charger for ASUS A620 / A620BT
5	Car charger for CASIO E115
6	Car charger for CASIO E125/EM500
7	Car charger for CASIO E200
8	Car charger for DELL AXIM X3
9	Car charger for DELL AXIM X5
10	Car charger for Eten P300 / M500
11	Car charger for HP Jonada
12	Car charger for IPAQ iPAQ 38xx/39xx/22xx/4x/5x/Rx/RZ/Hx serial
13	Car charger for IPAQ 36XX/37XX
14	Car charger for Mitac Mio 338/528/558
15	Car charger for NEC
16	Car charger for PALM 500/505/T3
17	Car charger for PALM Vx
18	Car charger for Siemens Loox
19	Car charger for SONY Nxx Series
20	Car charger for SONY Txx
21	Car charger for Toshiba E330/E740
22	Car charger for Toshiba E400
23	Car charger for Toshiba E570
24	Car charger for Toshiba E800
25	Car charger for XDA/T-Mobile MDA
26	Car charger for XDA-II/T-Mobile MDA
27	Car charger for Yakumo Delta 300
28	Car charger for Yakumo Omnikron
29	Car charger for Anex TEK SP230
30	Car charger for Acer N30/N35/N50
31	Car charger for Dell Axim X50V/X50
32	Car charger for ASUS A716 / A730 / A730W / P505
33	Car charger for Palm T5 / Treo 650/Tungsten E2



9. Series Products Information

- **300 Series for EverMore BBP1202 Chipset:**

- 1: GM-307 (USB G-Mouse)

- **500 Series for EverMore BBP1202 Chipset:**

- 1: BT-R500 (Bluetooth GPS)

- 2: GM-R500 (G-MOUSE)

- 3: CF-R500 (CF Card GPS)

- 4: CM-M500 (GPS Module)

- 5: DL-200 (Data logger)

- **700 Series for Nemerix NJ1030 Chipset:**

- 1: EB-N700 (Engine Board, with patch antenna)

- 2: EB-N701 (Engine Board, without patch antenna)

- 3: BT-R700 (Bluetooth GPS Type I)

- 4: BT-R710 (Bluetooth GPS Type II)

- 5: CF-R700 (CF Card GPS)

- **900 Series for SiRF StarIII Chipset:**

- 1: BT-R900 (Bluetooth GPS)

- 2: GM-R900 (G-Mouse)