

# User Manual

## GeoTrack - Speedy

*(Automatic Vehicle Locator Terminal)*

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Hardware Version: 0.81



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0.1A	Mar, 2007	Geonchul, Lee	Initial Draft

## Table of Contents

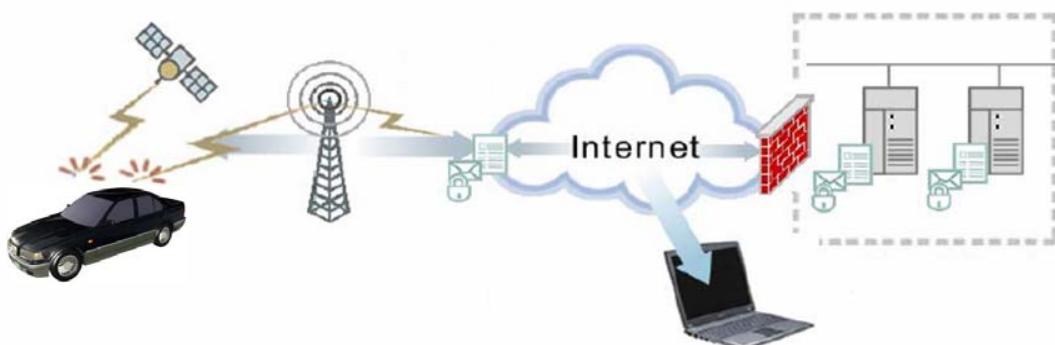
<b>1. Introduction.....</b>	<b>5</b>
<b>2. External Appearance and Interface .....</b>	<b>6</b>
2.1 Front View .....	6
2.2 Side View .....	6
2.3 POWER / GSM / GPS LEDs.....	7
2.4 Power Connector Interface .....	7
2.5 SIM Card Interface .....	7
2.6 MIC(Microphone) Interface .....	7
2.7 DM/GPS(JTAG/External GPS) Interface.....	8
2.8 OPTION(UDM/AddMe) Interface .....	8
<b>3. Specification .....</b>	<b>10</b>
3.1 General Specification .....	10
3.2 GSM/GPRS General Specification.....	10
3.3 GSM/GPRS Air Interface Specification (Test Temperature: 25°C) .....	11
3.4 GPS General Specification .....	12
3.5 GPS AC Characteristics Specification (Test Temperature: 25°C).....	12
<b>4. Package .....</b>	<b>13</b>
<b>5. Installation.....</b>	<b>14</b>
5.1 Hardware Installation .....	14

## 1. Introduction

This manual contains important technical information and instructions for the safe and reliable use of GeoTrack Speedy. Please be sure to read this manual before installing and starting up the device.

GeoTrack Speedy is a compact AVL (Automatic Vehicle Locator) terminal with GPS and GSM integrated in one unit. It enables you to remotely track the position of your vehicle in real time from your computer or cell phone via GPRS or SMS. The details on its features are described further in this manual.

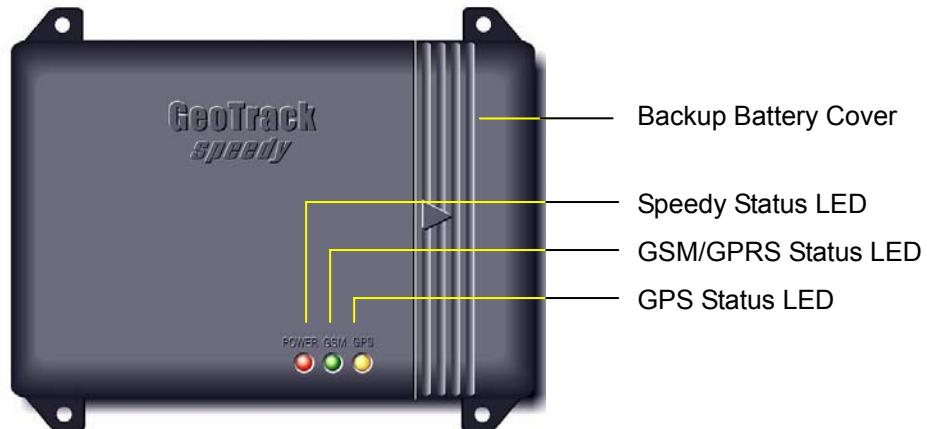
Hardware installation is simple three steps; GeoTrack does not have external GPS or GSM antenna attachments. Once it is installed, you do not need to collect the device for recharging the battery or changing configurations. Most of the functions can be performed over the air such as turning the GPS on / off and GPS cold start.



[Figure 1-1] System Configuration and Data Flow

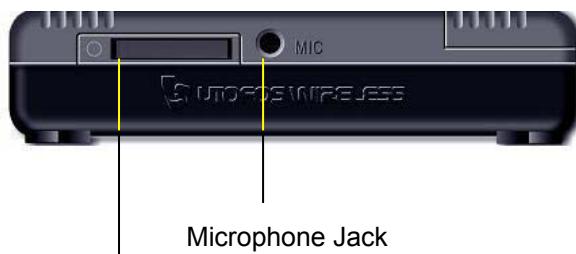
## 2. External Appearance and Interface

### 2.1 Front View

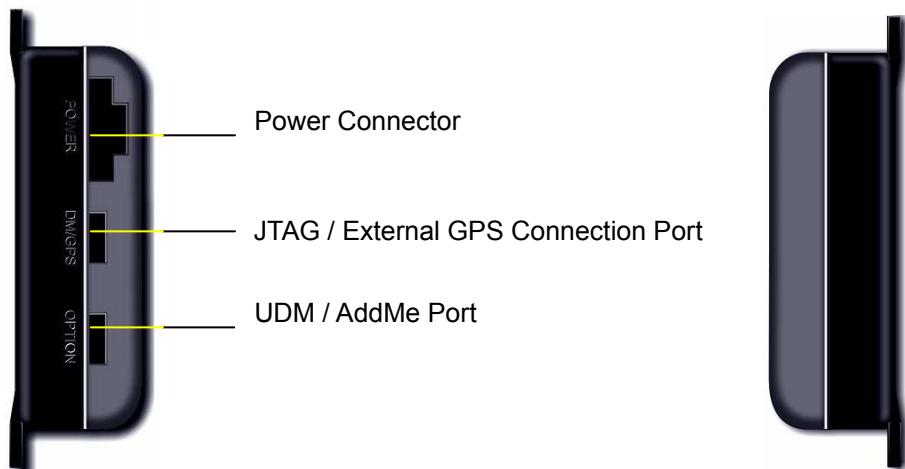


[Figure 2-1] Speedy Front View

### 2.2 Side View



SIM Card Holder



[Figure 2-2] Speedy Side View

### 2.3 POWER / GSM / GPS LEDs

Speedy provides 3 LEDs to allow the user/administrator to see how the speedy operates.

For more details on the LEDs, please see the following [Table 2-1].

LED	Color	Status	Explanation
POWER	Red	0.1sec on / 0.9sec off	Normal operation
		0.1sec on / 0.1sec off	Error detected through self-diagnosis and speedy in operation
GSM	Green	0.6sec on / 0.6sec off	No SIM card inserted or PIN entered, network search in progress, user authentication in progress, or network login in progress
		75msec on / 3sec off	Logged to GSM network
		75msec on / 75msec off	GPRS contexts activated
		75msec on / 3sec off	(Gateway packet communication)
		Permanently On	Voice call
GPS	Yellow	0.1sec on / 0.1sec off	Position Fix - Not available or invalid
		0.1sec on / 0.9sec off	Position Fix - Valid
		Permanently Off	GPS off

[Table 2-1] Speedy LEDs

### 2.4 Power Connector Interface

Refer to Chapter 6. Installation - Step.3

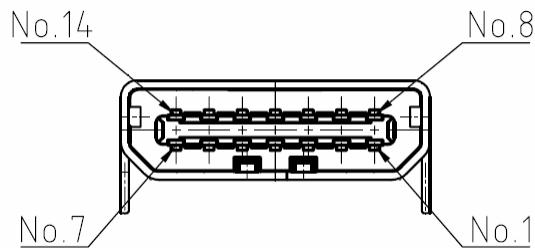
### 2.5 SIM Card Interface

Refer to Chapter 6. Installation - Step.1

### 2.6 MIC(Microphone) Interface

Φ2.6, Mono audio 3 pole microphone input

## 2.7 DM/GPS(JTAG/External GPS) Interface

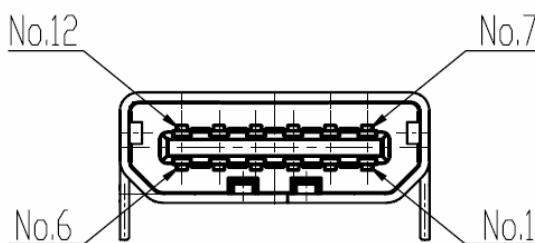


[Figure 2-3] DM/GPS Interface Connector

Pin	Signal Name	Input/Output	Function
1	JTAG_TDO	O	JTAG Serial data out
2	JTAG_TDI	I	JTAG Serial data in
3	NC	-	Not used
4	JTAG_TCK	I	JTAG Clock
5	NC	-	Not used
6	GPS_ENB	O	GPS Enable
7	VDD	-	+5VDC
8	GPS_TXD	I	GPS Serial data out
9	GPS_RXD	O	GPS Serial data in
10	GND	-	Ground
11	GPS_BOOT	O	GPS Boot select
12	JTAG_TMS	I	JTAG Mode select
13	RESET	I	Reset
14	BOOT	I	Boot Select

[Table 2-2] DM/GPS Interface

## 2.8 OPTION(UDM/AddMe) Interface



[Figure 2-4] OPTION Interface Connector

Pin	Signal Name	Input/Output	Function
1	GND	-	Ground
2	DOOR_LOCK	O	Door lock control
3	DOOR_UNLOCK	O	Door unlock control
4	FUEL_CUT	O	Fuel-cut control
5	HORN	O	Horn control
6	EMER_LAMP	O	Emergency lamp control
7	NC	-	Not used
8	UDM_SEL	I	UDM Select
9	UDM_RXD	O	UDM Serial data in
10	UDM_TXD	I	UDM Serial data out
11	VDD	-	+5VDC
12	VDD	-	+5VDC

[Table 2-3] OPTION Interface

### 3. Specification

#### 3.1 General Specification

Item	Description	Comments
Wireless Network (GSM/GPRS)	900/1800/1900: GSM 900 / 1800 / 1900MHz 850/1800/1900: GSM 850 / 1800 / 1900MHz	
GPS	SiRF III – 20CH, L1 Freq, C/A Code	
Panic Receiver	315MHz, FSK, > -100 dBm	Optional
Operating Voltage	+10 ~ +36VDC	
Backup Battery	4.2V(Maximum) / 700mAh Li-ion	Optional
UDM Port	RS-232 Cable	Optional
Operating Temperature	-20 °C ~ +55 °C	
Storage Temperature	-40 °C ~ +85 °C	
Size	91.0mm X 62.0mm X 20.5mm	
Weight	g g	w/o Battery w/ Battery
GSM/GPRS Antenna	Intenna Type(Within)	
GPS Antenna	Ceramic Patch Type(Within)	
Approvals		
RoHS	All hardware components are fully compliant with the EU RoHS Directive	

#### 3.2 GSM/GPRS General Specification

Item	Specification
Frequency Bands	900/1800/1900: EGSM 900, GSM 1800, GSM 1900MHz 850/1800/1900: GSM 850, GSM 1800, GSM 1900MHz Compliant to GSM phase 2/2+
GSM Class	Small GSM
Transmit Power	Class 4 (2W) at GSM 850 and EGSM 900 Class 1 (1W) at GSM 1800 and GSM 1900
GPRS Connectivity	GPRS multi-slot class 10 GPRS mobile station class B
Data – GPRS	GPRS data downlink transfer: max. 85.6kbps GPRS data uplink transfer: max. 42.8kbps Coding scheme CS-1, CS-2, CS-3 and CS-4 PBCCH support

Item	Specification
Data – CSD	Transmission rates: 2.4, 4.8, 9.6, 14.4kbps, V.110 USSD support
SMS	Point-to-point MT and MO SMS Cell broadcast Text and PDU mode
FAX	Group 3: Class 1, Class 2
SIM interface	Support SIM card: 3V
Audio	Triple rate codec for HR, FR and EFR Adaptive multi-rate AMR Echo cancellation Noise reduction

### 3.3 GSM/GPRS Air Interface Specification (Test Temperature: 25 °C)

Item		Min	Typ	Max	Unit
Frequency Range Uplink (MS -> BTS)	GSM 850 <sup>3)</sup>	824		849	MHz
	EGSM 900 <sup>4)</sup>	880		915	MHz
	GSM 1800	1710		1785	MHz
	GSM 1900	1850		1910	MHz
Frequency Range Downlink (BTS -> MS)	GSM 850 <sup>3)</sup>	869		894	MHz
	EGSM 900 <sup>4)</sup>	925		960	MHz
	GSM 1800	1805		1880	MHz
	GSM 1900	1930		1990	MHz
RF Power @ ARP with 50Ω Load	GSM 850 <sup>3)</sup>	31	33	35	dBm
	EGSM 900 <sup>1) 4)</sup>	31	33	35	dBm
	GSM 1800 <sup>2)</sup>	28	30	32	dBm
	GSM 1900	28	30	32	dBm
Number of Carries	GSM 850 <sup>3)</sup>		124		
	EGSM 900 <sup>4)</sup>		174		
	GSM 1800		374		
	GSM 1900		299		
Duplex Spacing	GSM 850 <sup>3)</sup>		45		MHz
	EGSM 900 <sup>4)</sup>		45		MHz
	GSM 1800		95		MHz
	GSM 1900		80		MHz
Carries Spacing			200		KHz
Multiplex, Duplex			TDMA/FDMA, FDD		

Item	Min	Typ	Max	Unit
Time Slots per TDMA Frame		8		
Frame Duration		4.615		ms
Time Slot Duration		577		us
Modulation	GMSK			
Receiver Input Sensitivity @ ARP	GSM 850 <sup>3)</sup> EGSM 900 <sup>4)</sup>	-102	-107	dBm
BER Class II < 2.4%	GSM 1800 GSM 1900	-102	-106	dBm
		-102	-105.5	dBm

<sup>1)</sup> Power Control Level PCL 5, <sup>2)</sup> Power Control Level PCL 0, <sup>3)</sup> 850 Only, <sup>4)</sup> 900 Only

### 3.4 GPS General Specification

Item	Specification	Comments
Receiver Type	L1 Frequency, C/A Code, 20-Channel	
Max. up-date rate	1 sec	
Accuracy (SA off)	Position < 10m 3DRMS	-126 dBm
3D Tracking Sensitivity	-156dBm at receiver input(typical)	
Operational Limits	Altitude < 18,000m (60,000ft) Velocity < 515m/s (1,000knots)	
Time To First Fix	Cold start : 60sec(typical) Warm start : 38sec(typical) Hot start : < 8 sec(typical)	-126 dBm -126 dBm -126 dBm
Protocols	UTOFOS, 9600bps	

### 3.5 GPS AC Characteristics Specification (Test Temperature: 25 °C)

Parameter	Condition	Typ	Unit
Tracking Sensitivity (C/N)	3D (C/N avg. 13dBHz)	-156	dBm
Re-acquisition Sensitivity (C/N)	3D (C/N avg. 16dBHz)	-153	dBm
Cold start Sensitivity (C/N)	3D (SV 9EA in view)	-135	dBm
Cold start time (TTFF)	-126 dBm(2D) (SV 9EA)	60	sec
Hot start time	-126 dBm(2D) (SV 9EA)	1	sec
Re-acquisition time (5 sec)	-126 dBm(2D) (SV 9EA)	3	sec
Re-acquisition time (60 sec)	-126 dBm(2D) (SV 9EA)	3	sec
Position error (Latitude, Longitude)	-126 dBm (SV 9EA in view)	15	m
Position error (Elevation)	-126 dBm (SV 9EA in view)	50	m

## 4. Package

This product consists of:

Main unit, Power cable, Microphone (Optional), RS-232C Serial Cable (Optional), Backup battery (Optional)



[Figure 4-1] Main Unit

## 5. Installation

### 5.1 Hardware Installation

#### Step 1.

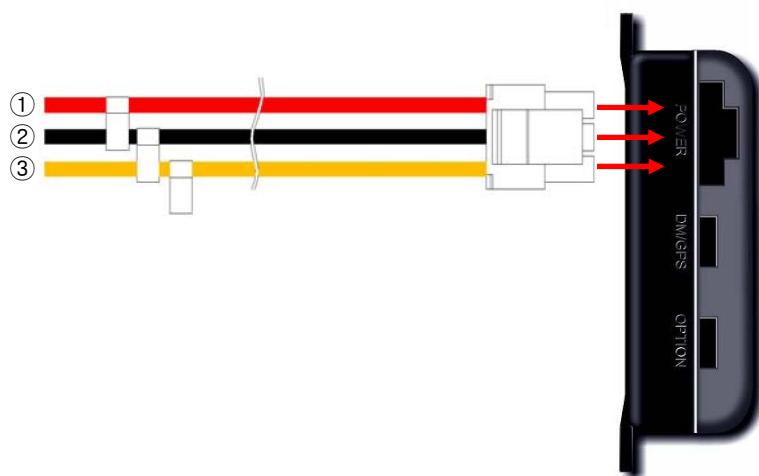
1. Eject the SIM holder by pushing the eject button with a pointed object.
2. Place the SIM card on the SIM holder.
3. Insert the SIM holder back into the SIM socket.

#### Step 2.

1. Open the battery cover by pressing down the triangle mark on the cover and pushing to the direction the triangle is pointing.
2. Insert the battery and fix the connector into the slot.

#### Step 3.

1. Plug the 3-pin-connector of the main power cable into the Power Socket on GeoTrack. (See figure below)
2. The power cable consists of 3 wires. Connect the red wire to the car battery +, black wire to car battery -, and orange wire to ignition switch.



[Figure 5-1] Power Cable Connection

Pin	Color	Description	Function
1	RED	Power +	+10 ~ +36VDC
2	BLACK	Ground -	Ground
3	ORANGE	Ignition Power	Ignition Switch (Engine On Signal)

[Table 6-1] Power Interface

**Attention:**

- The SIM card PIN code should be disabled before inserting the card.
- The SIM card must be inserted prior to power connection.
- When mounting, make sure the top & bottom are installed as pictured below. The GPS antenna is mounted on the TOP side of GeoTrack Speedy, so the device must be kept upright to receive clear signal from the sky.
- GeoTrack starts operation when either the backup battery or the main car battery is connected. Either one of the power sources may be enough for the unit to operate. If both batteries are connected, the car battery will be used as the main power source and the portable battery will be kept charged for backup usage. When the device loses connection with the main battery, the backup battery will serve as an alternative power supply.



[Figure 5-2] Mounting Direction