Plug and Play Wireless CPU®

Fastrack GO User Guide

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002
August 4, 2009

SIERRA WIRELESS
HEART OF THE WIRELESS MACHINE®

Important Notice

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the Sierra Wireless modem are used in a normal manner with a well-constructed network, the Sierra Wireless modem should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Sierra Wireless accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the Sierra Wireless modem, or for failure of the Sierra Wireless modem to transmit or receive such data.

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1. Overview

Fastrack GO is a cellular Plug & Play Wireless CPU® offering state-of-the-art GSM/GPRS connectivity for machine to machine applications.

Thanks to Fastrack GO, you can connect your wired or disconnected devices together to transfer collect data or control your equipment remotely. . Fastrack GO with its stylish, ergonomic and attractive design comes in two different connecting interfaces RS232 and USB.

Fully certified, the quad band 850/900/1800/1900 MHz Fastrack GO offers GPRS Class 10 capability.

Fastrack GO is controlled by firmware through a set of AT commands.

Fastrack GO is suitable for wide voltage range and low power consumption type of applications.

Fastrack GO offers the easiest integration and upgrading and above all the quickest time to market: turn on the power and off you go!

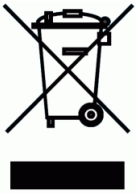
This document describes the Fastrack GO and gives information on the following topics :

- general information,
- functional description,
- basic services available,
- technical characteristics,
- installing and using the Fastrack GO,
- user-level troubleshooting,
- Recommended accessories to be used with the product.

RoHS Directive

The Fastrack GO is compliant with RoHS Directive 2002/95/EC, which sets limits for the use of certain restricted hazardous substances. This directive states that "from 1st July 2006, new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE)".

Plug & Plays which are compliant with this directive are identified by the RoHS logo on their label.	RoHS COMPLIANT 2002/95/EC

Disposing of the product This electronic product is subject to the EU Directive 2002/96/EC for Waste Electrical and Electronic Equipment (WEEE). As such, this product must not be disposed off at a municipal waste collection point. Please refer to local regulations for directions on how to dispose off this product in an environmental friendly manner.	

2. Packaging

Contents of Fastrack Go version RS232 and USB

The complete package content of the Fastrack GO version RS232 or Fastrack Go USB consists of (see):

- one packaging box (**A**),
- one Fastrack GO (**B**),
- one Antenna (**C**),
- one power supply (only for Fastrack Go RS232)(**D**)

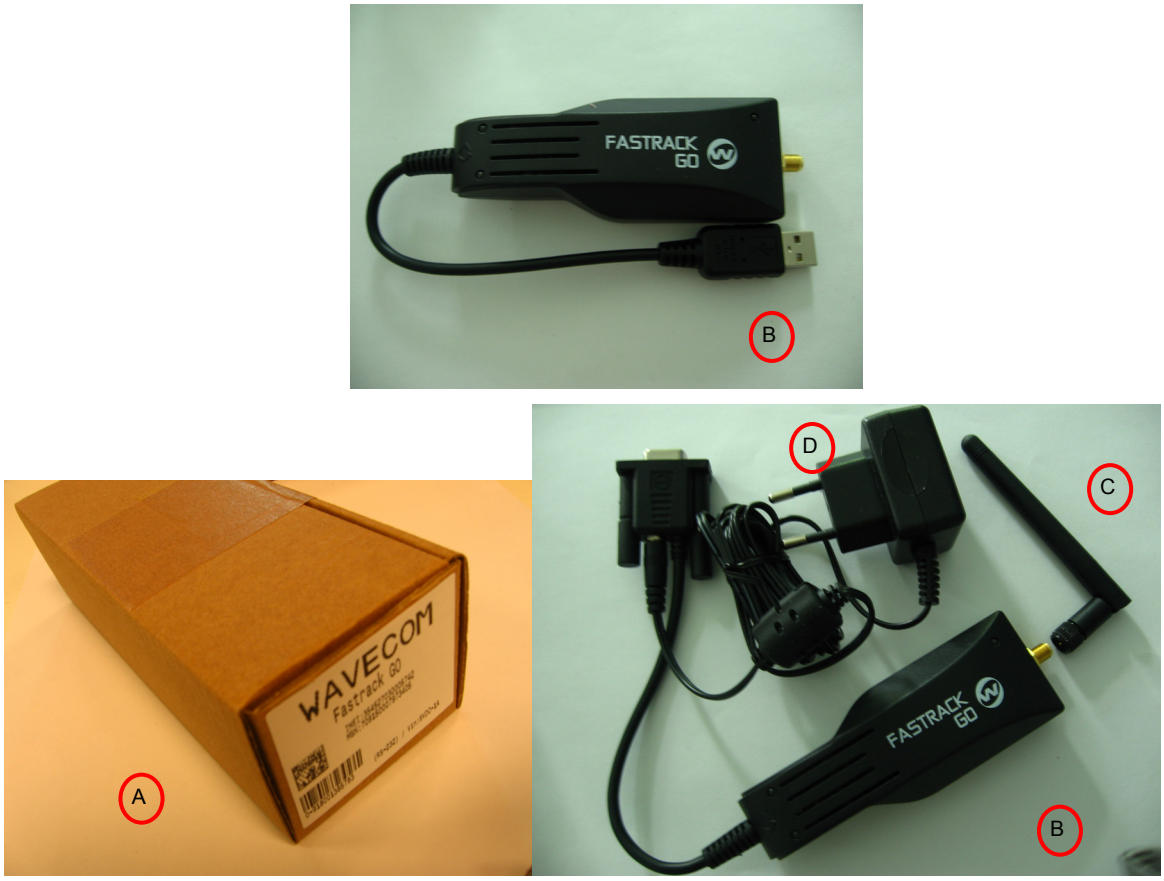


Figure 1. Complete package contents

Packaging Box

The packaging box is a carton box (see) with the following external dimensions:

- width: 55mm
- height: 70mm
- length: 160mm

A packaging label is slicked on the packaging box cover and supports the:

- WAVECOM logo
- Product reference (Fastrack GO)
- IMEI code
- MSN code
- ICCID code (when requested)
- Bar code (bundling the 3 codes)
- Serial number
- CE and WEE logos
- Voltage and current (for Fastrack GO version RS232 only)

Figure 2. Packaging Labels for Fastrack GO

The packaging label dimensions are:

- height: 40 mm
- length: 50 mm

Note: Power supply (for Fastrack GO version RS232) are provided in individual boxes and put in the outer box together with the Fastrack GO..

Product customization

Fastrack GO writing together with w logo are silk-stamped on the plastic casing at the top of the Fastrack GO (see Figure 4).

Figure 3. Top casing

WEE logo and CE logo are burnt on the plastic molding.

Product labeling

A production label (see Figure 6) located at the Fastrack GO back side gives the following information:

- product reference (**Fastrack GO**),
- IMEI code
- MSN code
- ICCID code (when requested)
- Bar code (bundling the 3 codes)
- Voltage and current (for Fastrack GO version RS232 only)

Figure 4. Production Label

The production label dimensions are:

- height: 15 mm,
- length: 34 mm.

3. General Description

Fastrack GO versions RS232

The Fastrack GO version RS232 description is given in the figure below.

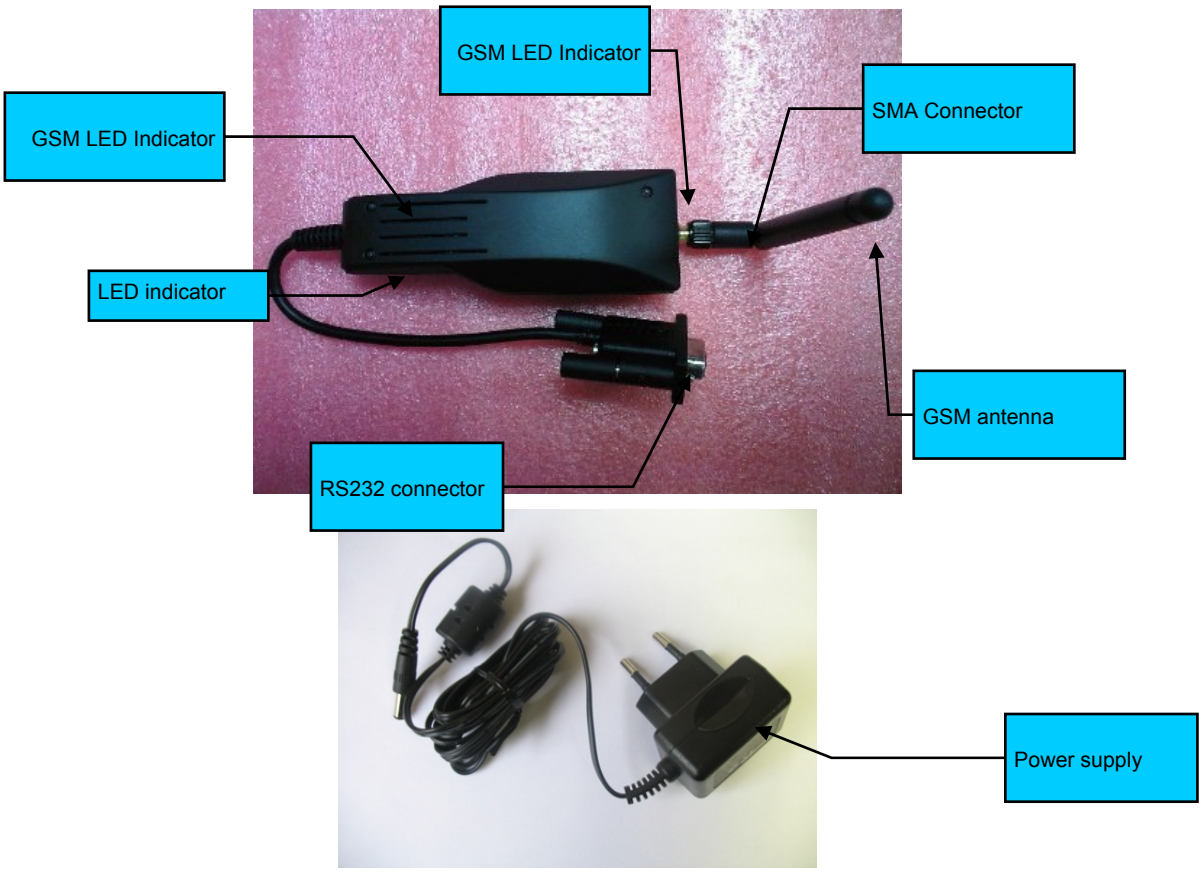


Figure 5. Fastrack GO version RS232 general vciew

Fastrack GO version USB

The Fastrack GO version USB description is given in the figure below.

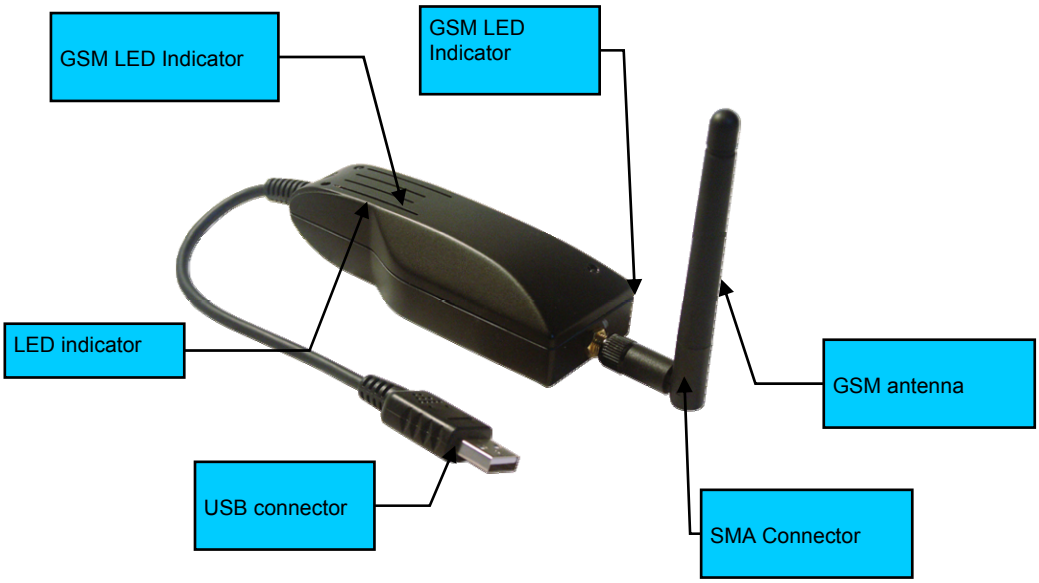


Figure 6. Fastrack GO version USB general view

4. Features and Services

Basic features of the Fastrack GO and available services are summarized in the table below.

Table 1. Basic features of the Fastrack GO

Features	Fastrack GO version RS232	Fastrack GO version USB
Standard	850MHz / 900 MHz. E-GSM compliant. Output power: class 4 (2W). Fully compliant with ETSI GSM phase 2 + small MS. 1800 MHz / 1900 MHz Output power: class 1 (1W). Fully compliant with ETSI GSM phase 2 + small MS	
GPRS	Class 10. PBCCH support. Coding schemes: CS1 to CS4. Compliant with SMG31bis. Embedded TCP/IP stack.	
Interfaces	RS232 (V.24/V.28) Serial interface supporting: Baud rate (bits/s): 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800 and 921600. Autobauding (bits/s): from 1200 to 921600. 1.8 V / 3 V SIM interface. AT command set based on V.25ter and GSM 07.05 & 07.07.	USB 2.0 interface (full speed 12Mbps) USB CDC ACM Supporting custom baud rates (programmable) VCP drivers provided 1.8 V / 3 V SIM interface. AT command set based on V.25ter and GSM 07.05 & 07.07.
SMS	Text & PDU. Point to point (MT/MO). Cell broadcast.	
Data	Data circuit asynchronous. Transparent and Non Transparent modes. Up to 14.400 bits/s. MNP Class 2 error correction. V42.bis data compression.	
Fax	Automatic fax group 3 (class 1 and Class 2).	
Other	DC power supply Plastic complete shielding	USB powered Plastic complete shielding

5. Using the Fastrack GO

Getting Started

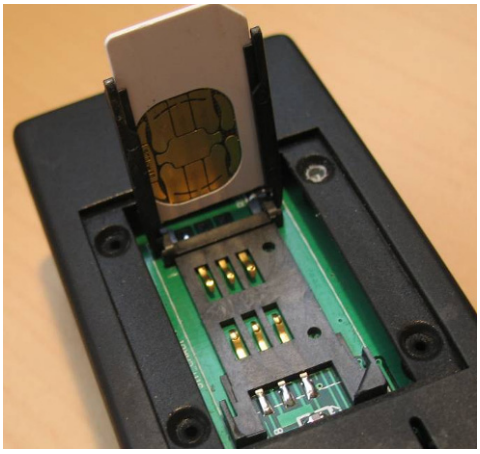
Mount the Fastrack GO

To mount the Fastrack GO on its support and fix it, use the adhesive band.

Insert/extract the SIM card to/from the Fastrack GO

The SIM card is not reachable from the outside. Please follow the procedure below described in the figure below

Step 1 : Unscrew the plastic cover



Step 2: Slide in the SIM card inside the SIM holder.

Figure 7. Procedure for SIM card insertion

Set up the Fastrack GO

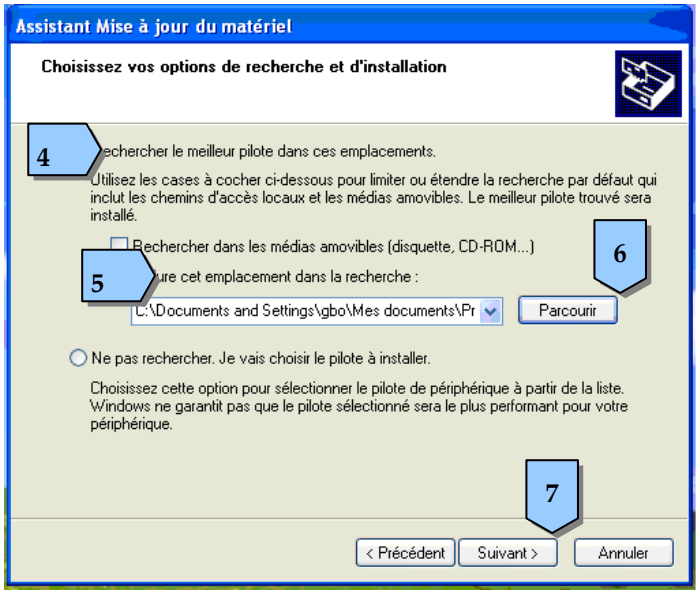
To set up the Fastrack GO, perform the following operations:

- Insert the SIM card into the SIM card holder of the Fastrack GO.
- Connect the antenna to the SMA connector.
- Connect the serial cable to your machine (for FAstrack GO version RS232 only)
- Connect the USB cable to your machine (for FAstrack GO version USB only)
- Connect the external power supply to Fastrack Go version RS232 only
- The Fastrack GO is ready to work.

Activating USB communication (for Fastrack GO version USB only)

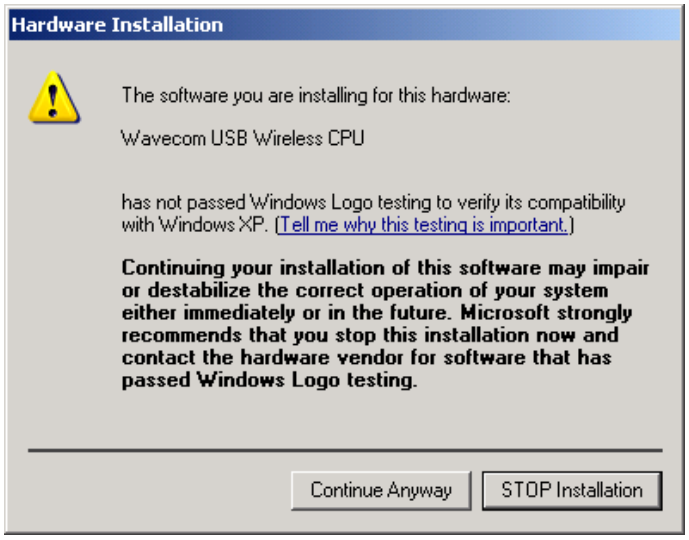
Activating USB

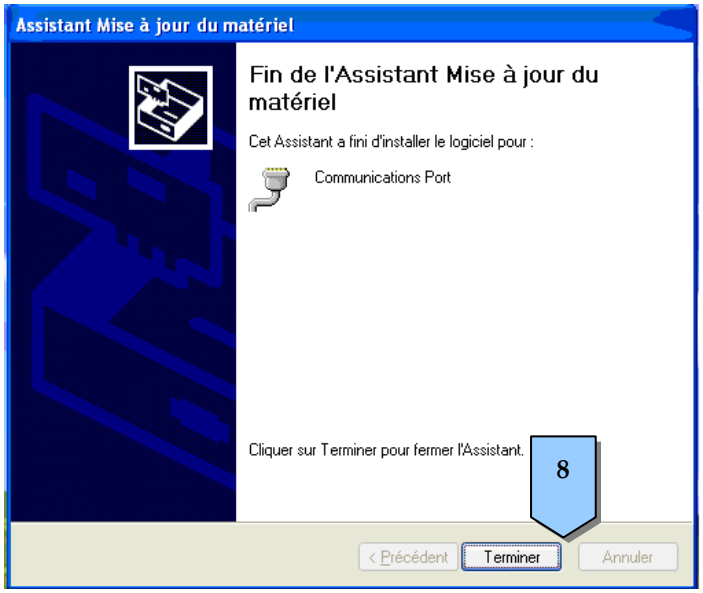
1. "Found New Hardware Wizard" window appears
2. Select "Yes, this time only"
3. Click "Next"



Activating USB

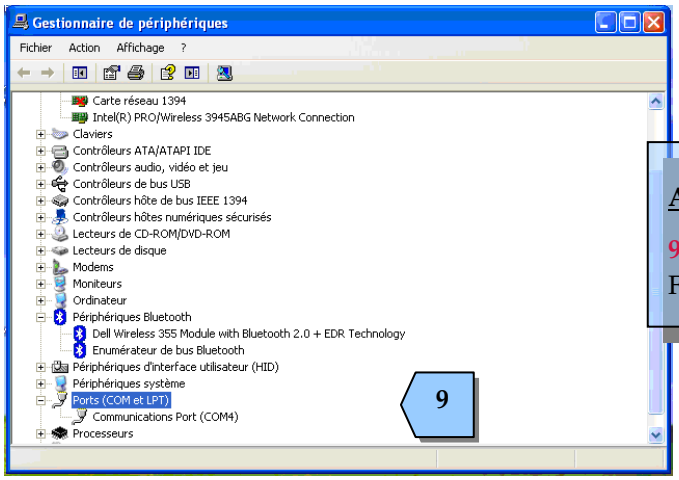
4. "Select "Search for the best driver in these locations
5. " Select "Include these location in the search
6. "Browse" (to the driver location)
7. Press "Next"





Activating USB

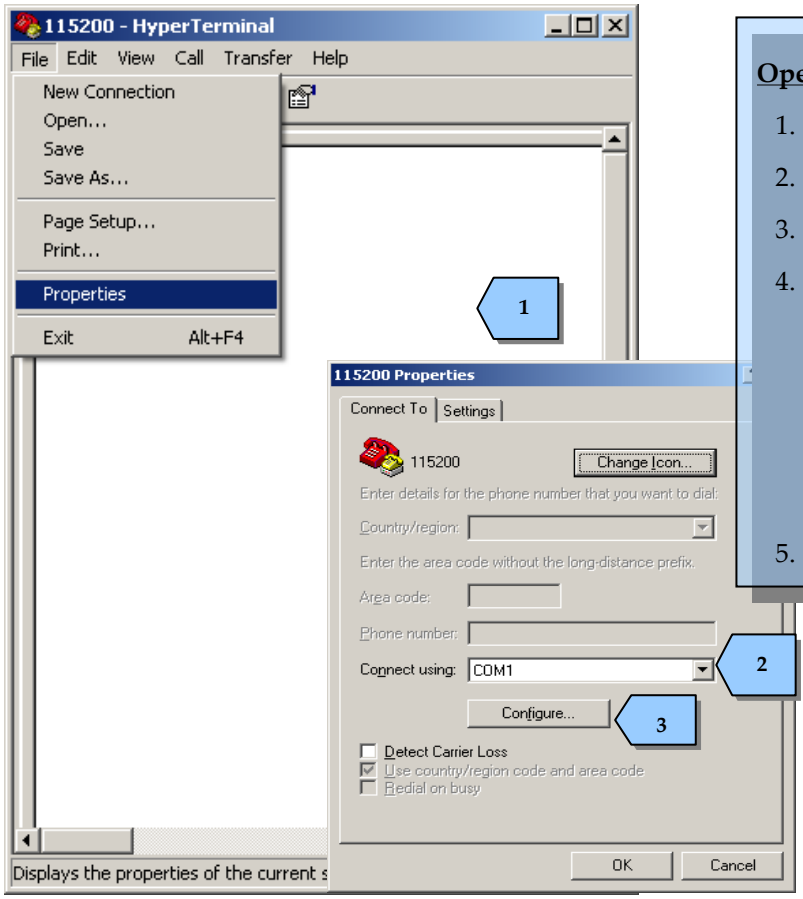
8. Press "Finish" to end the driver installation



Activating USB

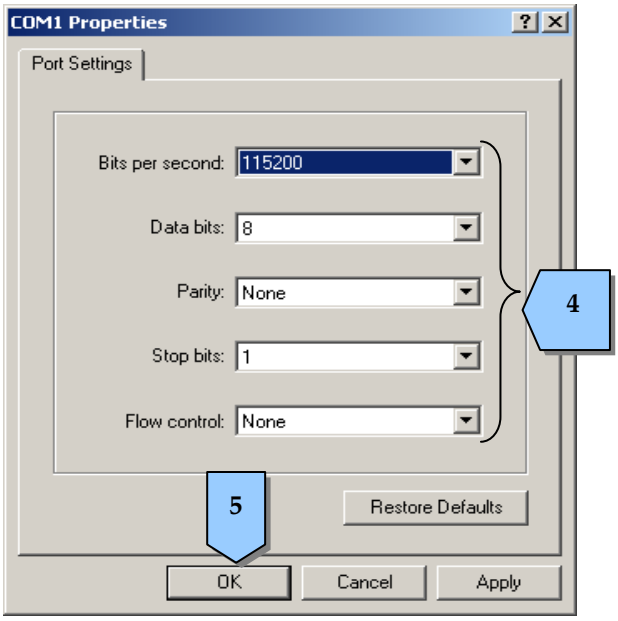
9. Check which COM port is allocated for Fastrack GO version USB

Set up serial communication software

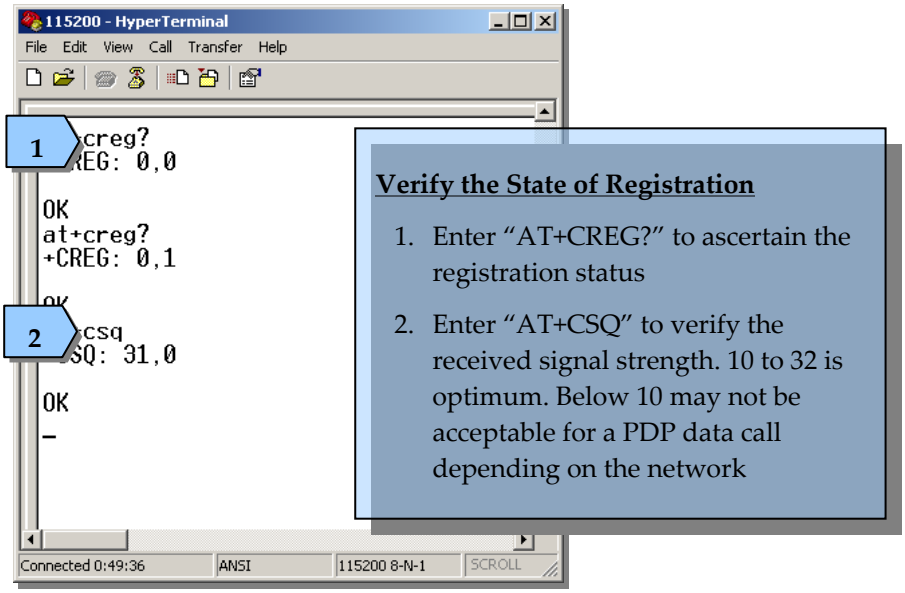


Open Hyperterminal

1. Select "Properties"
2. Select the appropriate COM port
3. Press "Configure"
4. Set the following;
   - Bits per second: 115200
   - Data bits: 8
   - Parity : None
   - Stop bits: 1
   - Flow controls: None
5. Press "OK"



Verify the Fastrack GO Network Registration



Returned Value (*) +CREG: <mode>,<stat>	Network registration
+CREG: 0,0	No (not registered)
+CREG: 0,1	Yes (registered, home network)
+CREG: 0,5	Yes (registered, roaming)

If the Fastrack GO is not registered, perform the following procedure:

1. Check your SIM card installation and make sure the account is valid for voice and data.
2. Check your antenna connections and your serial connections.
3. Check your Network Band with "AT+WMBS?", the default setting is at GSM900/DCS1800.

Returned Value (*) +WMBS: <Band>,<ResetFlag>	Network registration
+WMBS: 5,0	Dual Band mode 900E (extended)/1800 MHz
+WMBS: 4,0	Dual Band mode 850/1900 MHz

(*) For further information on the other return values and their meaning, refer to "AT Commands Interface Guide";.

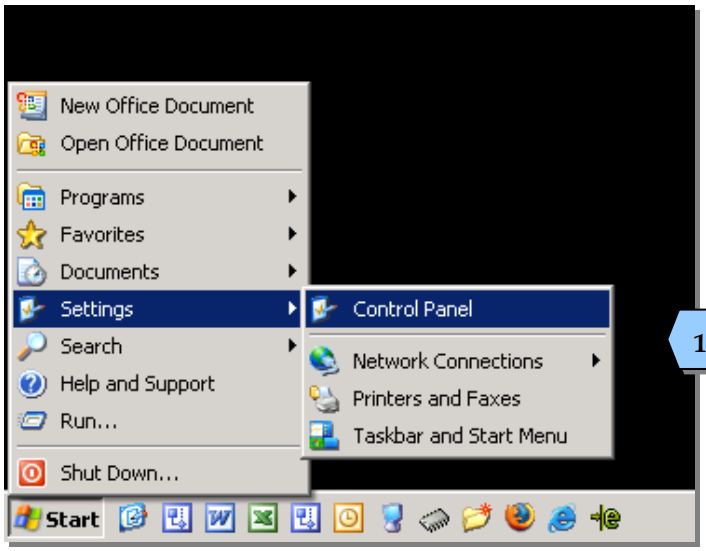
To set to the desired GSM Band enter the appropriate AT Command.

AT Command	Network registration
AT+WMBS=5	Sets to Dual Band mode 900E (extended)/1800 MHz
AT+WMBS=4	Sets to Dual Band mode 850/1900 MHz

For further information, refer to “AT Commands Interface Guide” at this path

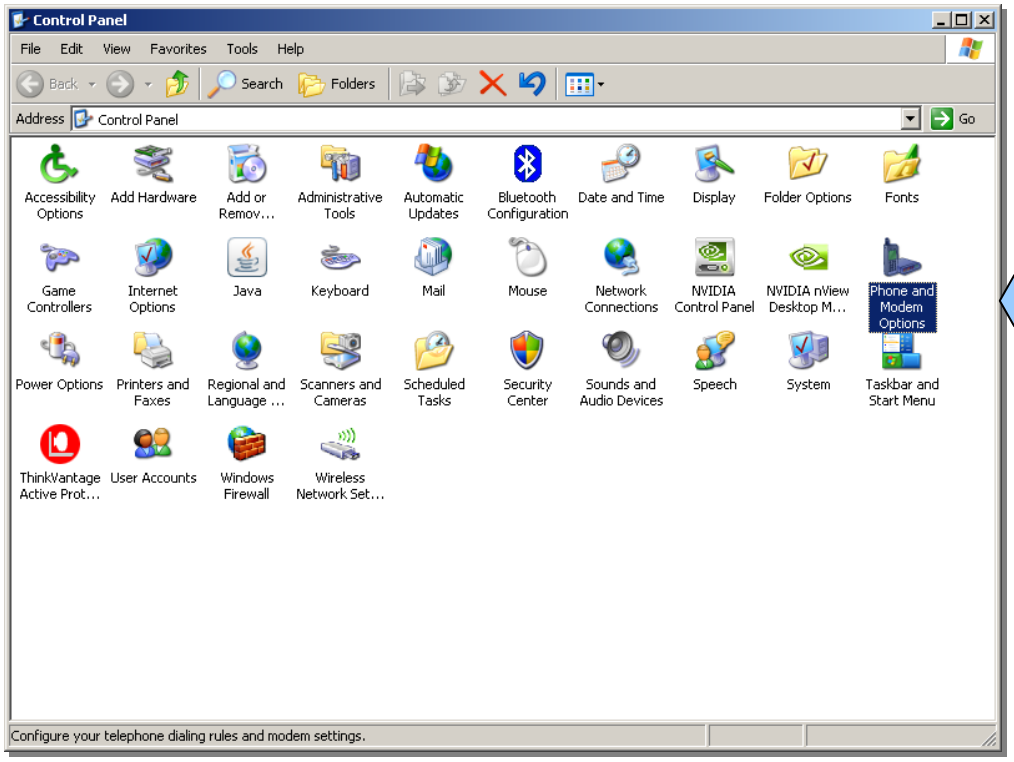
Configuring Modem on PC

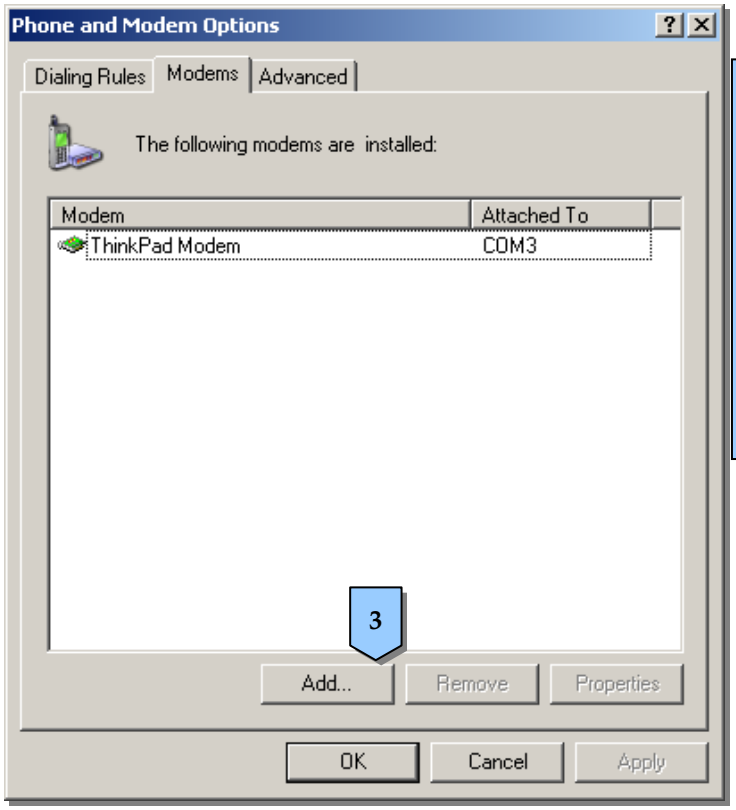
Open the control panel on the PC



Configuring Modem on PC

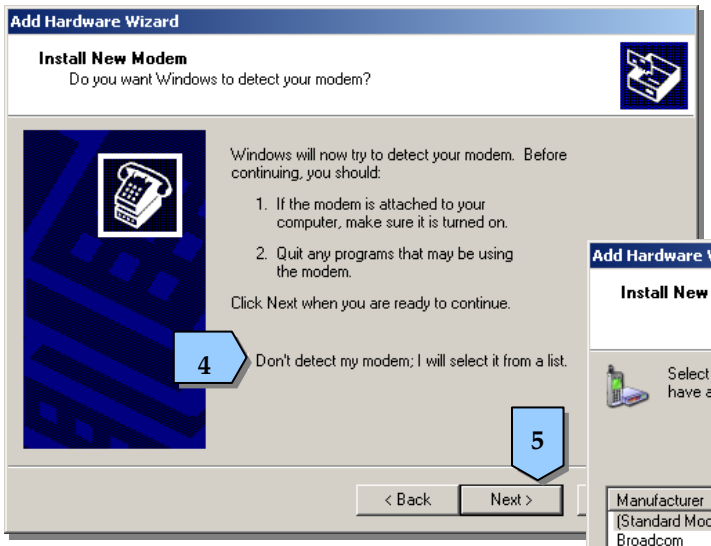
1. Open the control panel on the PC.
2. On the control panel window select “Phone and Modem Options”

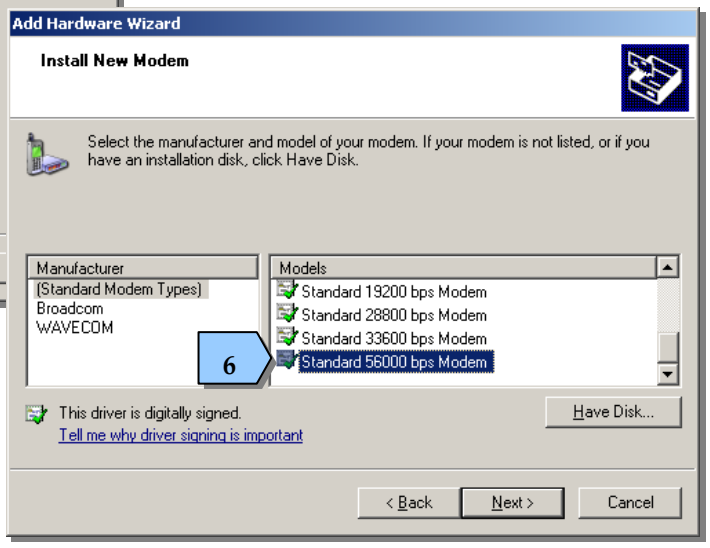


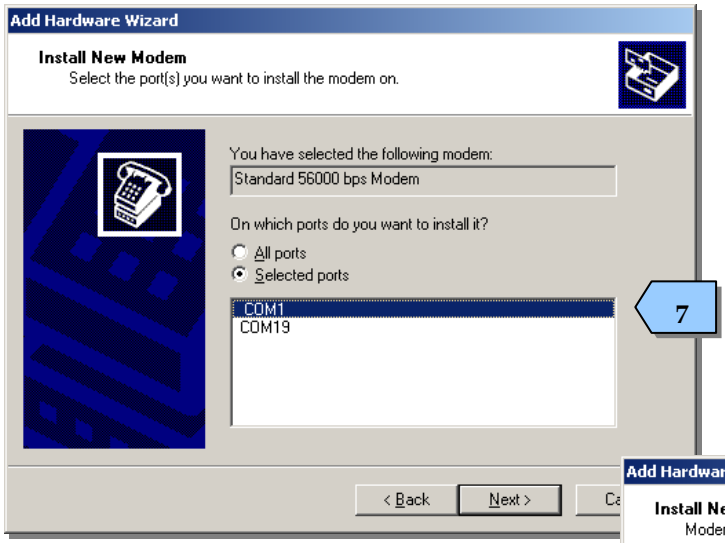


Configuring Modem on PC

3. Select "Add"
4. Select " Don't detect my modem, I select it from a list"
5. Select "Next"
6. On the standard modem types, select "Standard 56000 bps Modem"

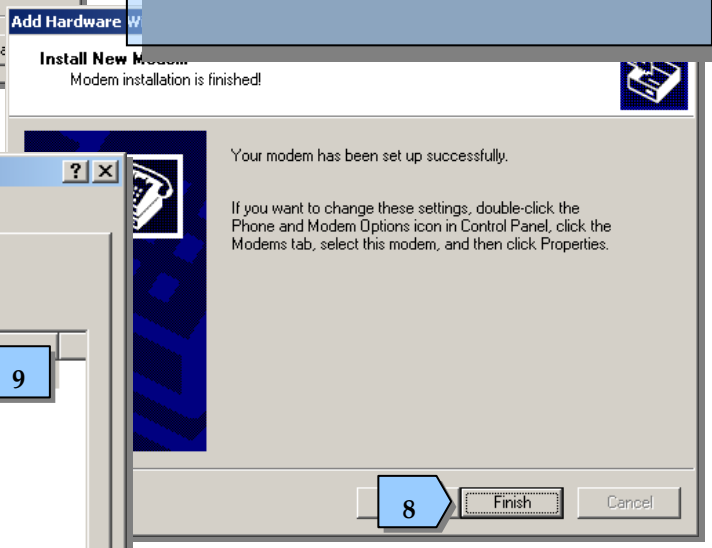


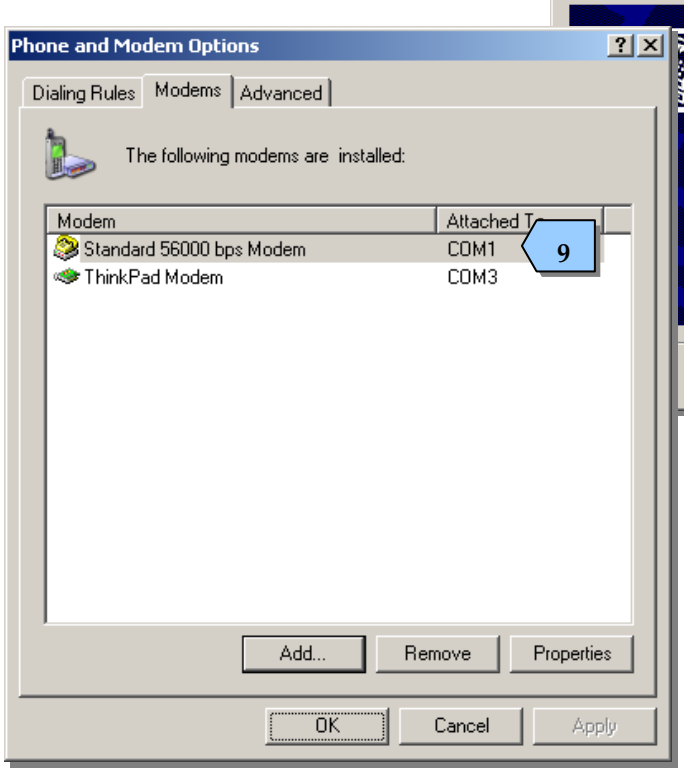




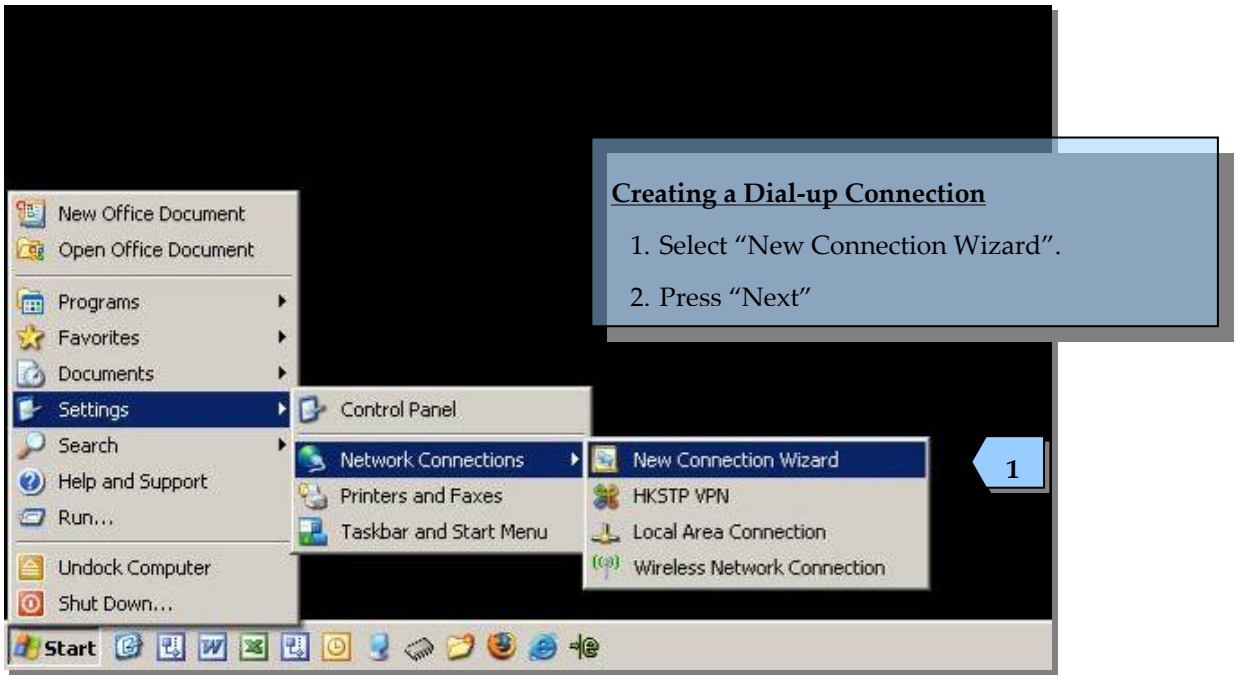
Configuring Modem on PC

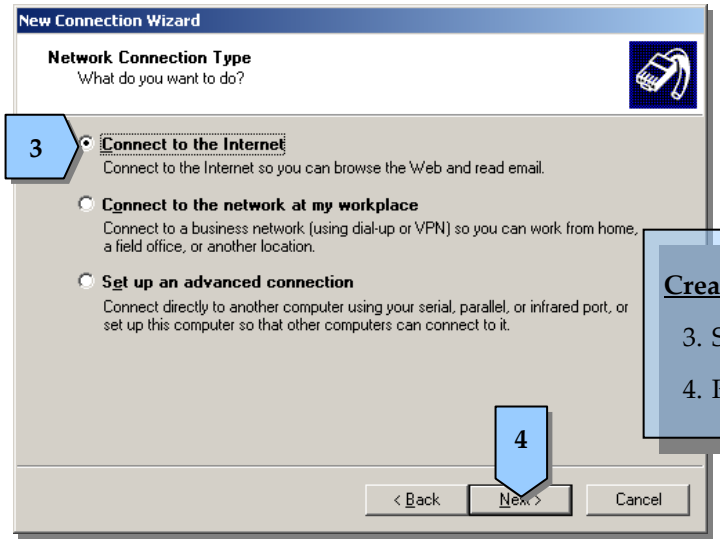
7. Select which port the modem will use (hyperterminal tool shall be closed before).
8. Select "Finish" to complete the configuration.
9. On the "Phone and Modem Options pop-up window will show the new added modem





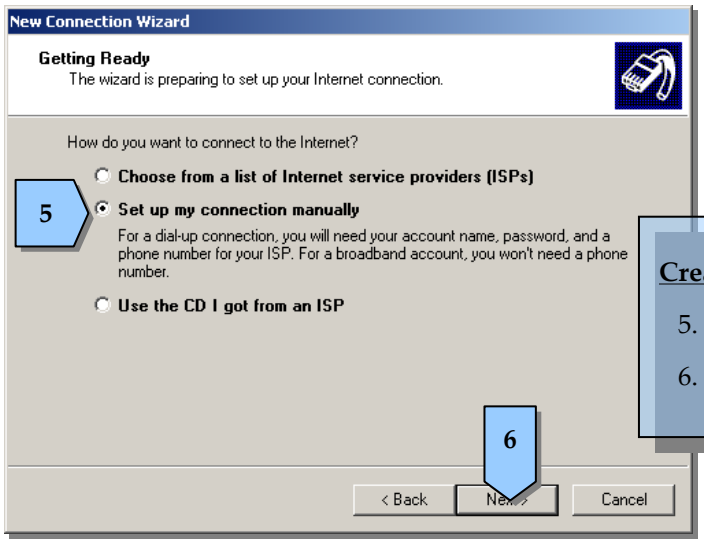
Creating a New Network Connection on PC





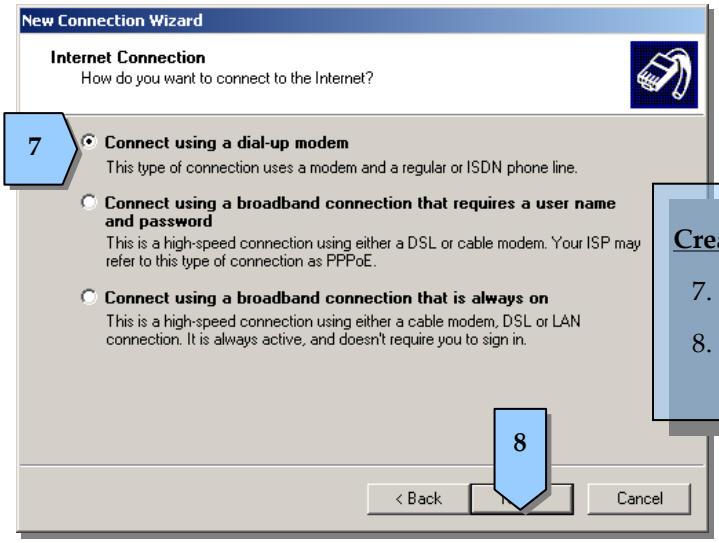
Creating a Dial-up Connection

3. Select "Connect to the Internet"
4. Press "Next"



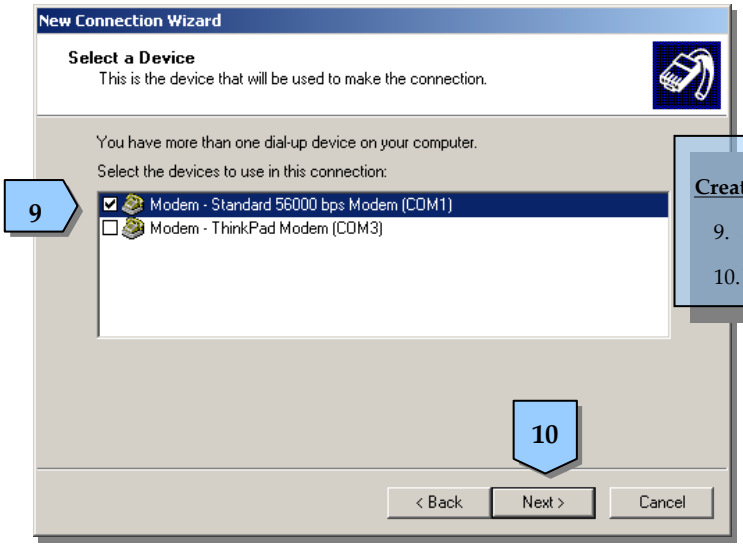
Creating a Dial-up Connection

5. Select "Connect to the Internet"
6. Press "Next"



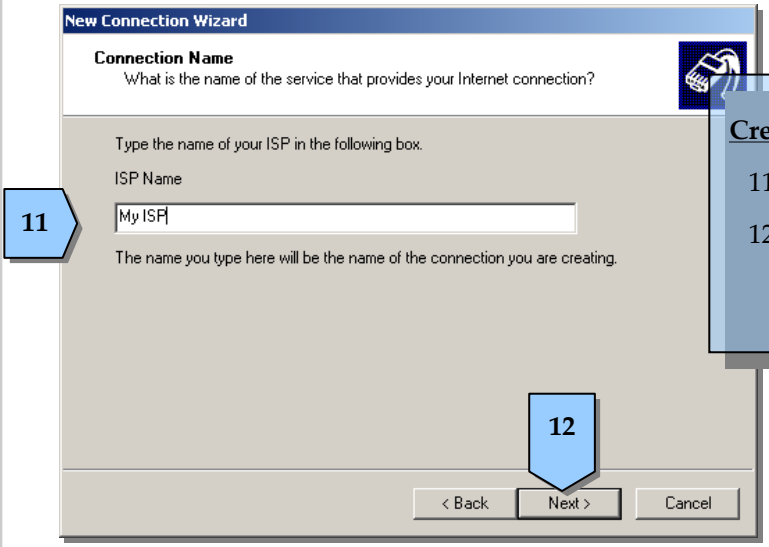
Creating a Dial-up Connection

7. Select "Connect to the Internet"
8. Press "Next"



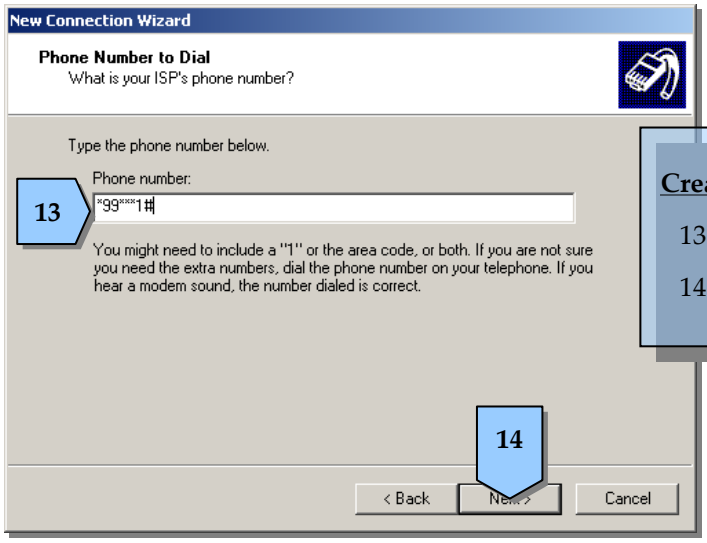
Creating a Dial-up Connection

9. Select the previously created modem device
10. Press "Next"



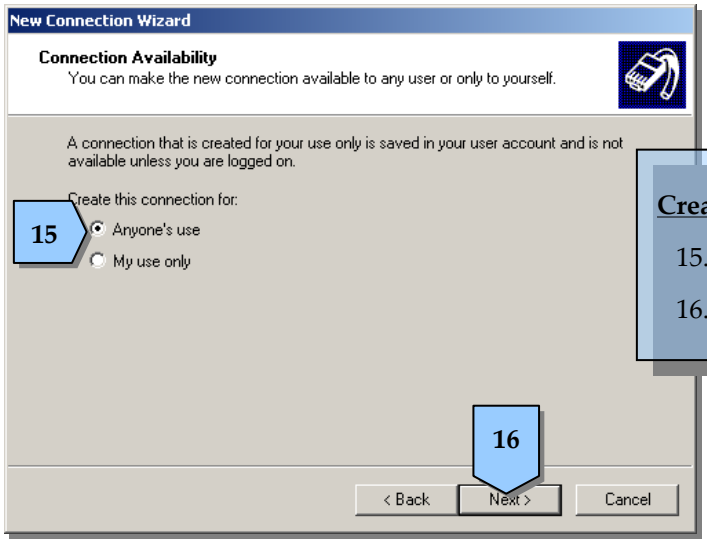
Creating a Dial-up Connection

11. Enter your preferred ISP name
12. Press "Next"



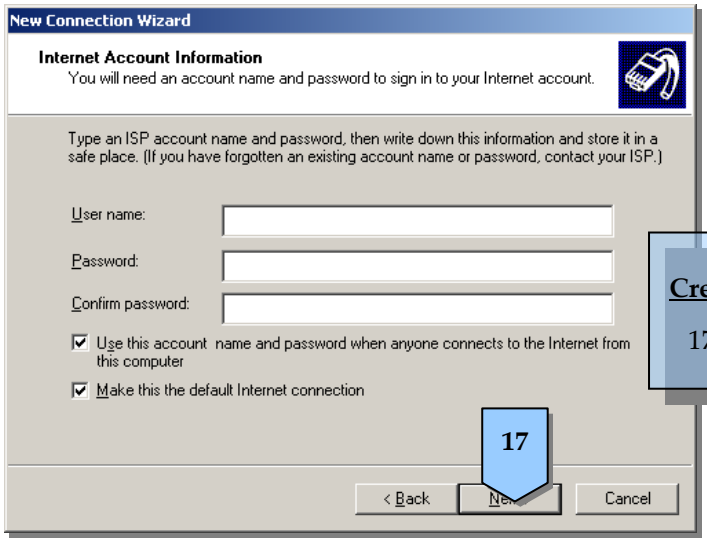
Creating a Dial-up Connection

13. Enter "*99***1#"
14. Press "Next"



Creating a Dial-up Connection

15. Select "Anyone's use"
16. Press "Next"



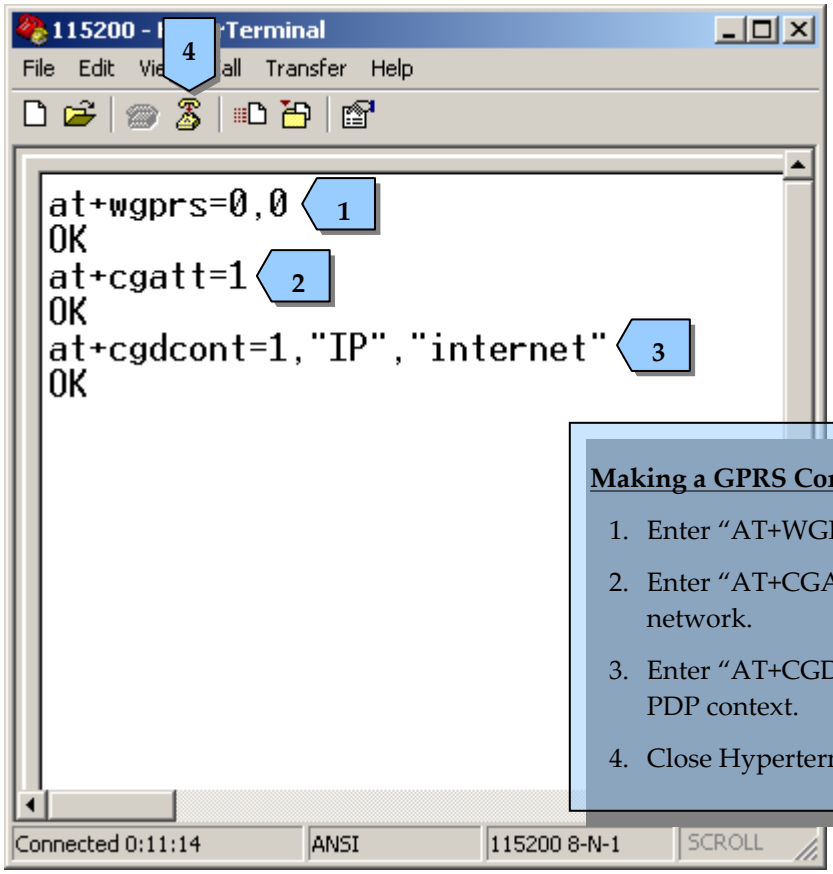
Creating a Dial-up Connection

17. Press "Next"

Creating a Dial-up Connection

18. Select "Add a shortcut to this connection to my desktop"
19. Press "Finish" to end the configuration

Making a GPRS Connection

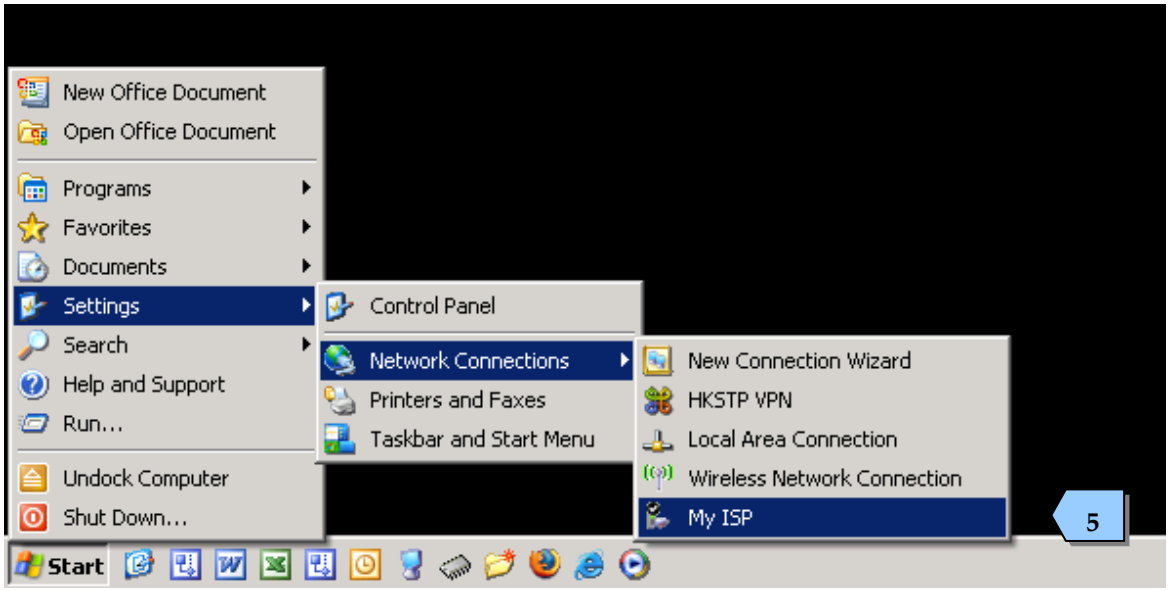


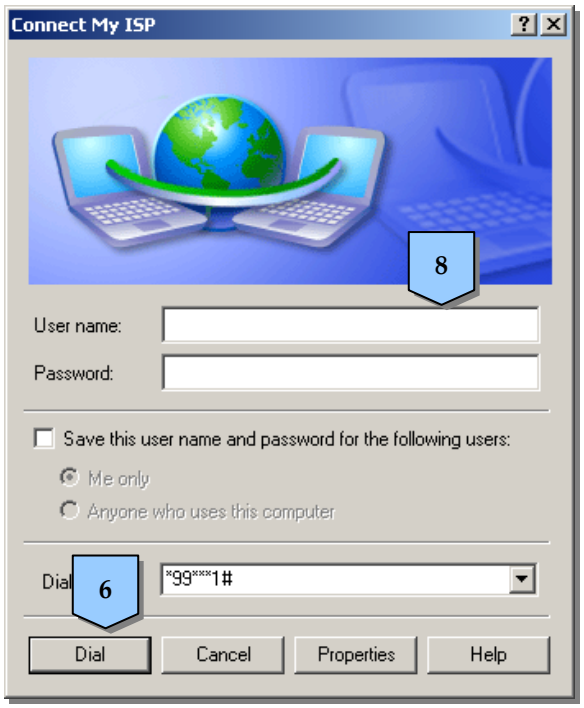
Making a GPRS Connection

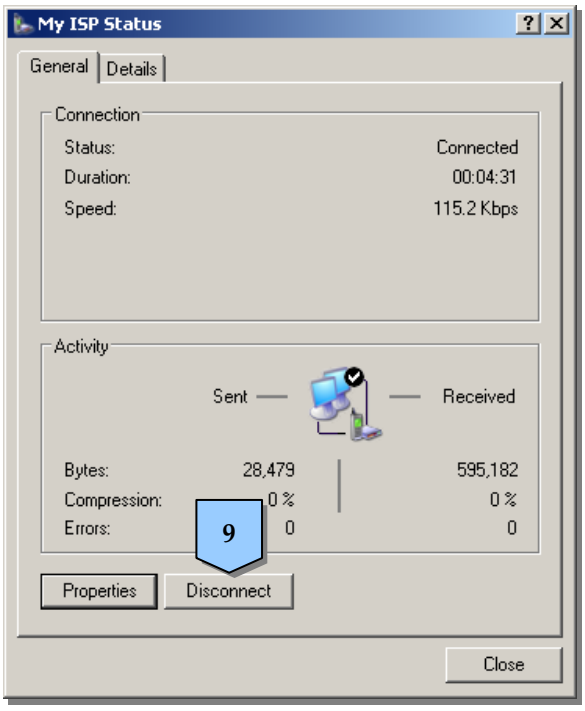
1. Enter "AT+WGPRS=0,0
2. Enter "AT+CGATT=1", to manually attach to network.
3. Enter "AT+CGDCONT=1,"IP","internet", sets the PDP context.
4. Close Hyperterminal

Making a GPRS Connection

6. To initiate connection, press "Dial"
7. Open the Internet Browser
8. To verify the connection, press the network connection icon at the lower right corner of the screen. The connection pop-up window will show the connection status.
9. Press "Disconnect" if wishes to terminate the network connection


New Office Document
Open Office Document
Programs
Favorites
Documents
Settings
Search
Help and Support
Run...
Undock Computer
Shut Down...
Control Panel
Network Connections
Printers and Faxes
Taskbar and Start Menu
New Connection Wizard
HKSTP VPN
Local Area Connection
Wireless Network Connection
My ISP
5
Start


Connect My ISP
8
User name:
Password:
Save this user name and password for the following users:
Me only
Anyone who uses this computer
Dial
6
*99***1#
Dial
Cancel
Properties
Help


My ISP Status
General
Details
Connection
Status: Connected
Duration: 00:04:31
Speed: 115.2 Kbps
Activity
Sent
Received
Bytes: 28,479 595,182
Compression: 0 % 0 %
Errors: 0 0
9
Properties
Disconnect
Close

Fastrack GO Operational Status

The Fastrack GO operational status is given by the 3 LEDs located at the top of Fastrack GO.

The table below gives the meaning of the various status available.

Table 2. Fastrack GO operational status

LED light activity	LED light activity	Fastrack GO status
Green LED	LED ON permanent	Power ON
	LED OFF	Power disconnected
Red LED	LED ON permanent	Power ON
	LED OFF	Power Disconnected
Blue LED	LED ON permanent	Connected to network
	LED OFF	Unconnected to network

6. Technical Characteristics

Mechanical Characteristics

Table 3. Mechanical characteristics

	Fastrack GO (version RS232)	Fastrack GO (version USB)
Dimensions	109 x 40 x 30 mm (excluding connectors)	109 x 40 x 30 mm (excluding connectors)
Weight	≈ 163g	≈ 74g
Housing	Plastic moulding	Plastic moulding

Figure 8. Dimensioning diagram

Electrical Characteristics

Power Supply (For Fastrack GO version RS232 only)

The Fastrack GO is supplied by an external DC voltage (V+BATTERY) from +7 V to +25 V at 2.2 A.

Correct operation of the Fastrack GO in communication mode is not guaranteed if input voltage (V+BATTERY) falls below 7V.

Table 4. Input characteristics

Input element	Value
Rated input voltage	AC100V-240V
Vibration input Voltage Range	AC90V-255VAC
Frequency Rated	50-60Hz
Frequency vibration	47-63Hz
Input Rated Current	200mA RMS max
Inrush Current	15A Max at 115vac cool start
	30A Max at 230vac cool start
Leakage current	<0.25mA
Efficiency	65% Min

Table 5. Output characteristics

Output element	Value
Output Voltage	7.5VDC
Average output Current	0.65A
Line Regulation	±1%
Load Regulation	±5%
Over Voltage Protection	8.6V to 9.6V DC (output shut down)
Short Circuit Protection	Output shutdown and auto restart
Ripple Voltage	150mV

SIM Interface

Table 6. SIM card characteristics

SIM card	1.8V / 3 V

RS232 Serial interface (For Fastrack GO version RS232 only)

The RS232 interface performs the voltage level adaptation between Fastrack GO (DCE) and the external world (DTE).

RS232 interface has been designed to allow flexibility in the use of the serial interface signals. However, the use of TX, RX, CTS and RTS signals is mandatory, which is not the case for DTR, DSR, DCD and RI signals which can be not used.

The DB9 female connector pinout is described in the figure below (See Figure 12)

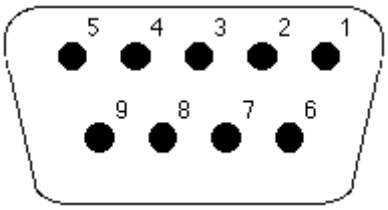


Figure 9. DB9 Female connector

Table 7. DB9 pin description

Signal	Sub HD connector Pin number	I/O	I/O type RS232 STANDARD	Description
CTXD	3	I	TX	Transmit serial data
CRXD	2	O	RX	Receive serial data
CRTS	7	I	RTS	Request To Send
CCTS	8	O	CTS	Clear To Send
CDSR	6	O	DSR	Data Set Ready
CDTR	4	I	DTR	Data Terminal Ready
CDCD	1	O	DCD	Data Carrier Detect
CRI	9	O	RI	Ring Indicator
GND	5		GND	Ground

USB interface (For Fastrack GO version USB only)

The Fastrack GO is compliant with the Universal Serial Bus Communication Device Class Abstract Control Model (USB CDC ACM) specification.

This is a generic driver which creates a Virtual COM port on your application.

USB Function Controller:

- USB 2.0 compliant, full-speed (12 Mbps)
- User programmable custom Baud rates
- Integrated transceiver
- Integrated precision clock
- Supports USB suspend states
- On-chip voltage regulator
- VCP drivers provided

Frequency Ranges

Table 8. Frequency ranges

Characteristic	GSM 850	E-GSM 900	DCS 1800	PCS 1900
Frequency TX	824 to 849 MHz	880 to 915 MHz	1710 to 1785 MHz	1850 to 1910 MHz
Frequency RX	869 to 894 MHz	925 to 960 MHz	1805 to 1880 MHz	1930 to 1990 MHz

RF Performances

RF performances are compliant with the ETSI recommendation GSM 05.05.

The RF performances for receiver and transmitter are given in the table below.

Table 9. Receiver RF performances

Receiver	
E-GSM900/GSM850 Reference Sensitivity	-104 dBm Static & TUHigh
DCS1800/PCS1900 Reference Sensitivity	-102 dBm Static & TUHigh
Selectivity @ 200 kHz	> +9 dBc
Selectivity @ 400 kHz	> +41 dBc
Linear dynamic range	63 dB
Co-channel rejection	>= 9 dBc

Table 10. Transmitter RF performances

Transmitter	
Maximum output power (E-GSM 900/GSM850) at ambient temperature	33 dBm +/- 2 dB
Maximum output power (DCS1800/PCS1900) at ambient temperature	30 dBm +/- 2 dB
Minimum output power (E-GSM 900/GSM850) at ambient temperature	5 dBm +/- 5 dB
Minimum output power (DCS1800/PCS1900) at ambient temperature	0 dBm +/- 5 dB

External Antenna

The external antenna is connected to the Fastrack GO via the SMA connector.

The external antenna must fulfill the characteristics listed in the table below.

Table 11. External antenna characteristics

Characteristic	Value
Antenna frequency range	Quad-band GSM850/GSM900/DCS1800/PCS1900 MHz
Impedance	50 Ohms nominal
DC impedance	0 Ohm
Gain (antenna + cable)	0 dBi
VSWR (antenna + cable)	2

Environmental Characteristics

The Fastrack GO Plug & Play is compliant with the following operating class. To ensure the proper operation of the Fastrack GO, the temperature of the environment must be within a specific range as described in the table below.

Table 12. Ranges of temperature

No IESM Current Drain	
Conditions	**Temperature Range**
Operating / Class A	-20°C ~ +55°C
Operating / Class B Note1	-20°C ~ +70°C
Storage Note1	-40°C ~ +85°C

Function Status Classification

Class A:

The Fastrack GO remains fully functional, meeting GSM performance criteria in accordance with ETSI requirements, across the specified temperature range.

Class B:

The Fastrack GO remains fully functional, across the specified temperature range. Some GSM parameters may occasionally deviate from the ETSI/PTCRB specified requirements and this deviation does not affect the ability of the Fastrack GO to connect to the cellular network and function fully, as it does within the Class A range.

Conformity

The complete product complies with the essential requirements of article 3 of R&TTE 1999/5/EC Directive and satisfied the following standards.

Table 13. Standards Conformity List

Domain	Applicable standard
Safety standard	EN 60950 (ed.1999)
Efficient use of the radio frequency spectrum	EN 301 419-(v 4.1.1) EN 301 511 (V 9.0.2)
EMC	EN 301 489–1 (edition 2002) EN 301 489-7 (edition 2002)
Global Certification Forum – Certification Criteria	GCF-CC V3.26.0
PTCRB	NAPRD.03 V3.11.0
FCC	FCC Part 15 FCC Part 22, 24
IC	RSS-132 Issue 2 RSS-133 Issue 3

7. Safety Recommendations

General Safety

It is important to follow any special regulations regarding the use of radio equipment due in particular to the possibility of radio frequency (RF) interference. Please follow the safety advice given below carefully.

Switch OFF your Wireless CPU®:

- When in an aircraft. The use of cellular telephones in an aircraft may endanger the operation of the aircraft, disrupt the cellular network and is illegal. Failure to observe this instruction may lead to suspension or denial of cellular telephone services to the offender, or legal action or both,
- When at a refueling point,
- When in any area with a potentially explosive atmosphere which could cause an explosion or fire,
- In hospitals and any other place where medical equipment may be in use.

Respect restrictions on the use of radio equipment in:

- Fuel depots,
- Chemical plants,
- Places where blasting operations are in progress,
- Any other area where signalization reminds that the use of cellular telephone is forbidden or dangerous.
- Any other area where you would normally be advised to turn off your vehicle engine.

There may be a hazard associated with the operation of your Fastrack GO Plug & Play close to inadequately protected personal medical devices such as hearing aids and pacemakers. Consult the manufacturers of the medical device to determine if it is adequately protected.

Operation of your Fastrack GO Plug & Play close to other electronic equipment may also cause interference if the equipment is inadequately protected. Observe any warning signs and manufacturers' recommendations.

The Fastrack GO Plug & Play is designed for and intended to be used in "***fixed***" and "***mobile***" applications:

- "***Fixed***" means that the device is physically secured at one location and is not able to be easily moved to another location.
- "***Mobile***" means that the device is designed to be used in other than fixed locations and generally in such a way that a separation distance of at least 20 cm (8 inches) is normally maintained between the transmitter's antenna and the body of the user or nearby persons.

The Fastrack GO Plug & Play is not designed for and intended to be used in portable applications (within 20 cm or 8 inches of the body of the user) and such uses are strictly prohibited.

Vehicle Safety

Do not use your Fastrack GO Plug & Play while driving, unless equipped with a correctly installed vehicle kit allowing 'Hands-Free' Operation.

Respect national regulations on the use of cellular telephones in vehicles. Road safety always comes first.

If incorrectly installed in a vehicle, the operation of Fastrack GO Plug & Play telephone could interfere with the correct functioning of vehicle electronics. To avoid such problems, make sure that the installation has been performed by a qualified personnel. Verification of the protection of vehicle electronics should form part of the installation.

The use of an alert device to operate a vehicle's lights or horn on public roads is not permitted.

Care and Maintenance

Your Fastrack GO Plug & Play is the product of advanced engineering, design and craftsmanship and should be treated with care. The suggestion below will help you to enjoy this product for many years.

Do not expose the Fastrack GO Plug & Play to any extreme environment where the temperature or humidity is high.

Do not use or store the Fastrack GO Plug & Play in dusty or dirty areas. Its moving parts (SIM holder for example) can be damaged.

Do not attempt to disassemble the Wireless CPU®. There are no user serviceable parts inside.

Do not expose the Fastrack GO Plug & Play to water, rain or spilt beverages. It is not waterproof.

Do not abuse your Fastrack GO Plug & Play by dropping, knocking, or violently shaking it. Rough handling can damage it.

Do not place the Fastrack GO Plug & Play alongside computer discs, credit or travel cards or other magnetic media. The information contained on discs or cards may be affected by the Wireless CPU®.

The use of third party equipment or accessories, not made or authorized by Sierra Wireless may invalidate the warranty of the Wireless CPU®.

Do contact an authorized Service Center in the unlikely event of a fault in the Wireless CPU®.

Your Responsibility

This Fastrack GO Plug & Play is under your responsibility. Please treat it with care respecting all local regulations. It is not a toy. Therefore, keep it in a safe place at all times and out of the reach of children.

Try to remember your Unlock and PIN codes. Become familiar with and use the security features to block unauthorized use and theft.

8. Online Support

Sierra Wireless provides an extensive range on online support which includes the following areas of our wireless expertise:

- the latest version of this document
- new versions of our Operating System user guides
- comprehensive support for Open AT®
- regulatory certifications
- carrier certifications
- application notes

To gain access to this support, simply visit our web site at http://www.wavecom.com/fastrackGO or click on the desired link in Page. Privileged access via user login is provided to Sierra Wireless/Wavecom authorized distributors.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