

GTM601/609 Development Kit User Guide



Ultra-thin 3G WWAN
Module in LGA package



VERSION HISTORY

Date	Version	Author	Revision	Approval
03/11/2010	V001int	F. Arboleda		
15/11/2010	V002ext	F. Arboleda	P. Vandeneede S. Han	Review

OVERVIEW AND PURPOSE

This document describes the GTM60x Module Development Kit hardware, software and installation instructions. This user guide is applicable for the following products:

Commercial Name	Product Number	WIFI	2G Bands	WCDMA Bands	EVDO Bands
GTM601W	MO6012	No	All models support 2G quad band:	800-850/900/1900/2100	No
GTM601E	MO6011	No		900/2100	No
GTM609W	MO6092	No	850Mhz 900Mhz 1800Mhz 1900Mhz	800-850/900/1900/2100	800/1900
GTM609U	MO6093	No		800-850/1900	800/1900



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CONTENTS

1	WELCOME	7
2	FEATURES	9
3	GTM60x PACKAGE CONTENT	10
4	HARDWARE INSTALLATION	11
4.1	<i>Hardware description</i>	11
4.1.1	<i>Detailed description</i>	14
4.1.1.1	<i>Controlling Switch</i>	14
4.1.1.2	<i>J14, J15 and J16</i>	15
4.2	<i>Installation</i>	18
5	DRIVER INSTALLATION	21
5.1	<i>Driver installation on Windows XP</i>	21
5.1.1	<i>General info: Driver set</i>	21
5.1.2	<i>Installation procedure</i>	22
5.1.2.1	<i>Automatic installation</i>	22
5.1.2.2	<i>Manual installation</i>	23
5.2	<i>Driver installation on Windows Vista</i>	29
5.2.1	<i>General info: Driver set</i>	29
5.2.2	<i>Installation procedure</i>	30
5.2.2.1	<i>Automatic installation</i>	31
5.2.2.2	<i>Manual installation</i>	33
5.3	<i>Driver installation on Windows 7</i>	39
5.3.1	<i>General info: Driver set</i>	39
5.3.2	<i>Installation procedure</i>	40
5.3.2.1	<i>Automatic installation</i>	40
5.3.2.2	<i>Manual installation</i>	41
6	FIRMWARE UPGRADE	48

7	HOW TO SEND AT COMMANDS	51
8	GTM60x CONFIGURATION	61
8.1	<i>Radio ON/OFF</i>	61
8.2	<i>RRC security</i>	62
8.3	<i>Preferred system</i>	62
8.4	<i>Access Point Name</i>	62
8.5	<i>SIM control</i>	63
8.6	<i>Registration</i>	64
9	SETTING UP A PACKET SWITCHED DATA CALL	65
9.1	<i>Using Modem interface (Dial-up)</i>	65
9.1.1	<i>On Windows XP</i>	66
9.1.2	<i>On Windows Vista</i>	79
9.1.3	<i>On Windows 7</i>	88
9.2	<i>Using NDIS interface</i>	92
9.2.1	<i>On Windows XP/Vista (Applet)</i>	92
9.2.2	<i>On Windows 7 (Mobile Broadband)</i>	94
10	SET UP A GSM/UMTS VOICE CALL	98
11	GPS FEATURES	102
11.1	<i>General</i>	102
11.2	<i>Set up a GPS connection</i>	104
11.2.1	<i>Enabling GPS positioning</i>	105
11.2.2	<i>Using the GPS in Google Earth</i>	106
	APPENDIX A: LIMITED WARRANTY	109

1 WELCOME

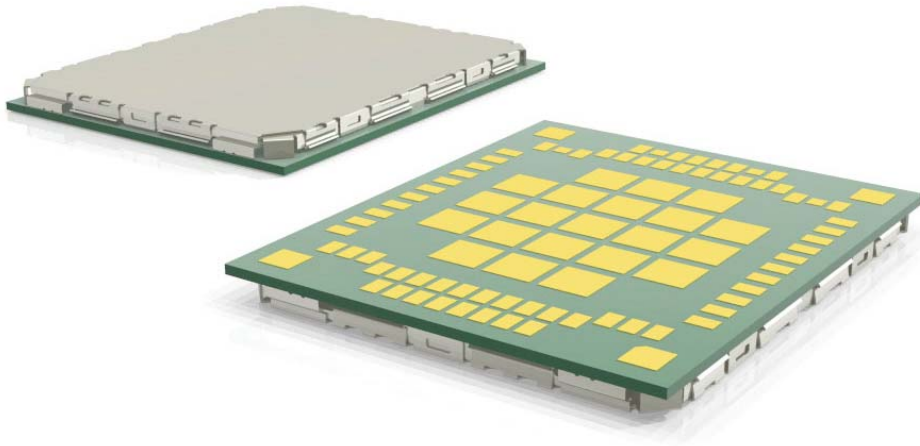


Figure 1: The GTM60x in LGA package

This GTM60x WWAN modem is the perfect solution for embedding 2G, 3G and EVDO technology in small consumer electronics devices or broadband M2M applications.

The GTM60x is capable of supporting HSDPA data rates of up to 14.4 Mbps in downlink and up to 5.76 Mbps in uplink. The higher uplink speed is particularly suitable for applications like video surveillance and file uploads. It is also backward compatible.

The GTM609 is also capable of supporting EV-DO RevA data rates up to 3.1 Mbps in downlink and up to 1.8 Mbps in uplink.

For evaluation purposes the GTM60x modules are housed on an evaluation board, offering a convenient evaluation and development platform. This document describes the Module Development Kit hardware and software installation, and basic usage instructions for Windows® XP, Vista and 7.

Design specific information for the modules is outside the scope of this document and can be found in the GTM60x integration package.

To make a successful connection to the internet, the following prerequisites are assumed:

- GTM60x Development Kit EVB R1.
- Live Network connection.
- Activated (U)SIM for the available network.
- Host platform with an USB host controller (e.g. laptop or PC desktop).

2 FEATURES

Due to its ultra-thin form factor and excellent heat dissipation characteristics this is the perfect module for integration in small consumer electronics devices or broadband M2M applications. The GPS and voice capabilities give this module a unique position. The new and improved footprint facilitates soldering.

The Development Kit consists of a main evaluation board (cradle) which provides a standard USB interface, a SIM card holder, an external power supply and the on board GTM60x module. With this board it is possible to connect the GTM60x module package to any standard USB host controller.

To get your module working correctly, please follow the installation instructions carefully in the correct order, starting with sections 4 and 5, after which you can proceed with the following sections.

3 GTM60x PACKAGE CONTENT

Your Module Development Kit comes with the following items:

- Evaluation board containing the GTM60x module.
- USB cable.
- Power adaptor (5VDC / 2A @ 100-240V).

The module will have the latest firmware which was available during the assembly of this development kit. Please check with your Option point of contact for the latest available firmware. Drivers and the dashboard applet will be available via your Option point of contact.

To set up a successful data connection to the internet you will need to have mobile network coverage and an activated SIM card from your local operator.

4 HARDWARE INSTALLATION

4.1 *Hardware description*

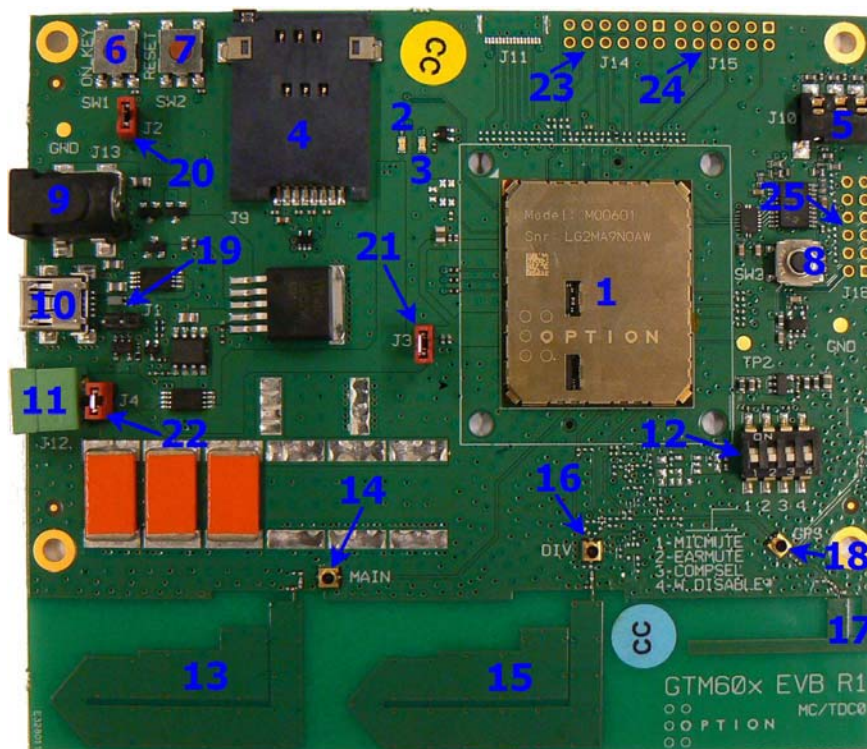


Figure 2: Evaluation board

Points of interest (See Figure 2):

- 1) GTM60x Module.
- 2) Power LED: Indicates that GTM60x is powered.
- 3) Registration and USB activity LED: This LED indicates that the module has registered to the mobile network when it is on continuously. Also indicates USB communication activity when the LED is blinking.
- 4) SIM card holder.
- 5) 2.5mm Audio jack and headset (for voice enabled modules).
- 6) SW1: On key. Acts as a power on/off button. See J2 (20).
- 7) SW2: Reset button.
- 8) SW3: Audio CODEC chip reset button.
- 9) Power plug.
- 10) Mini USB connector (male).
- 11) Battery plug.
- 12) Controlling Switch.**
- 13) Main antenna.
- 14) External antenna connector for main antenna.*
- 15) Secondary/Diversity antenna.
- 16) External antenna connector for secondary antenna.*
- 17) GPS antenna.
- 18) External antenna connector for GPS antenna.*

- 19) J1: Jumper to enable or disable the power circuits next to the mini USB connector. By default the power circuits are enabled (no jumper cap). The power circuit should be disabled when using the battery connector to power de GTM60x by short circuiting the jumper.
- 20) J2: Jumper to automatically power the modem when connected to any of the three possible means (9, 10 or 11). If this jumper is not short circuited the GTM60x will be only powered when the “On key” (7) is pressed.
- 21) J3: Jumper for current measurements. If no measurement is need this jumper needs to be short circuited in order to power the GTM60x.
- 22) J4: Jumper to enable to bulk capacitors (orange capacitors). These bulk capacitors are needed when the GTM60x is powered by USB or by the power plug; in this case the jumper has to be short circuited. If batteries are used, the bulk capacitors should be disabled by removing the jumper cap (this jumper cap can be use on J1 to disable the power circuits).
- 23) J14: Connection to access GSBI port 3.**
- 24) J15: Connection to access GSBI ports 0 and 4.**
- 25) J16: Connection to add an external PCM codec (GSBI port 1).**

* When using this external antenna connector the printed antenna will be automatically disabled.

**See detailed description.

4.1.1 Detailed description

4.1.1.1 Controlling Switch

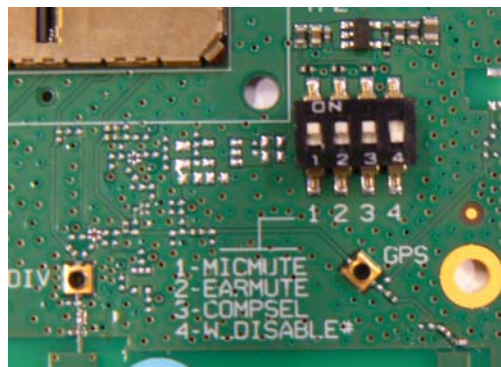


Figure 3: Controlling Switch

Switches:

- (1) **MICMUTE**: Switch to mute the microphone on the audio jack. Default value: ON.
- (2) **EARMUTE**: Switch to mute the ear piece on the audio jack. Default value: ON.
- (3) **COMPSEL**: Selection of bit format. Default value: ON.
- (4) **W.DISABLE**: Turn ON/OFF the radio on the module. Default value: OFF.

4.1.1.2 J14, J15 and J16

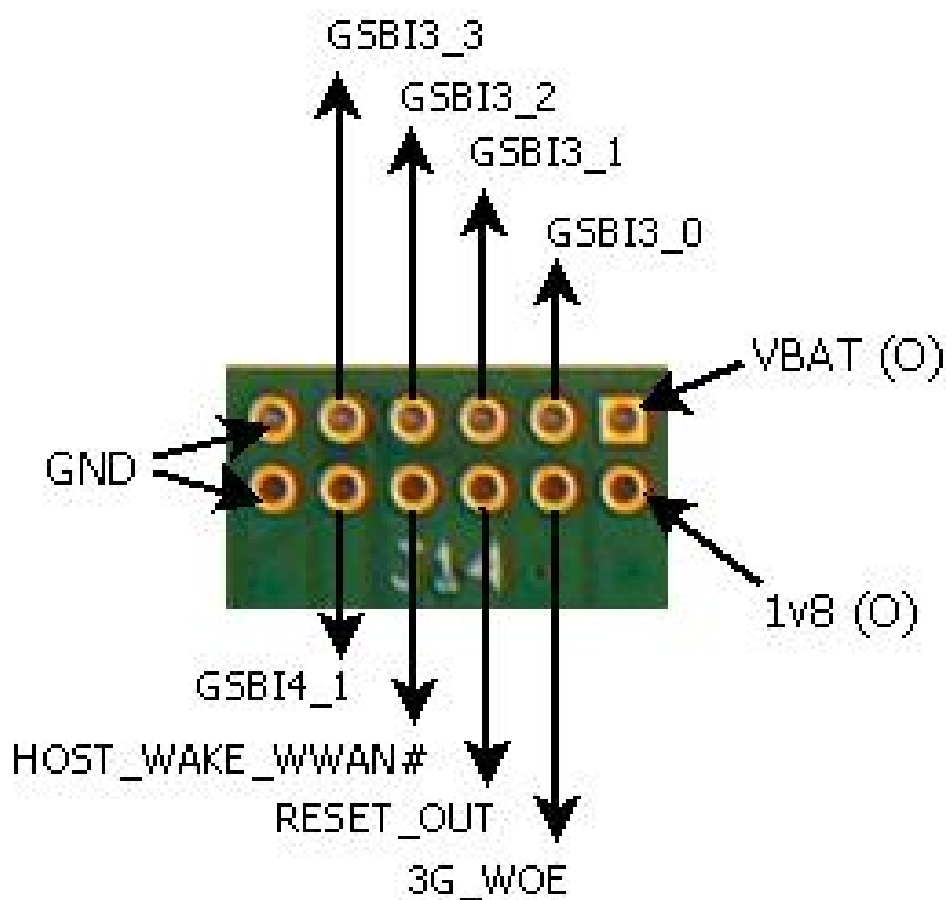


Figure 4: J14 Specification

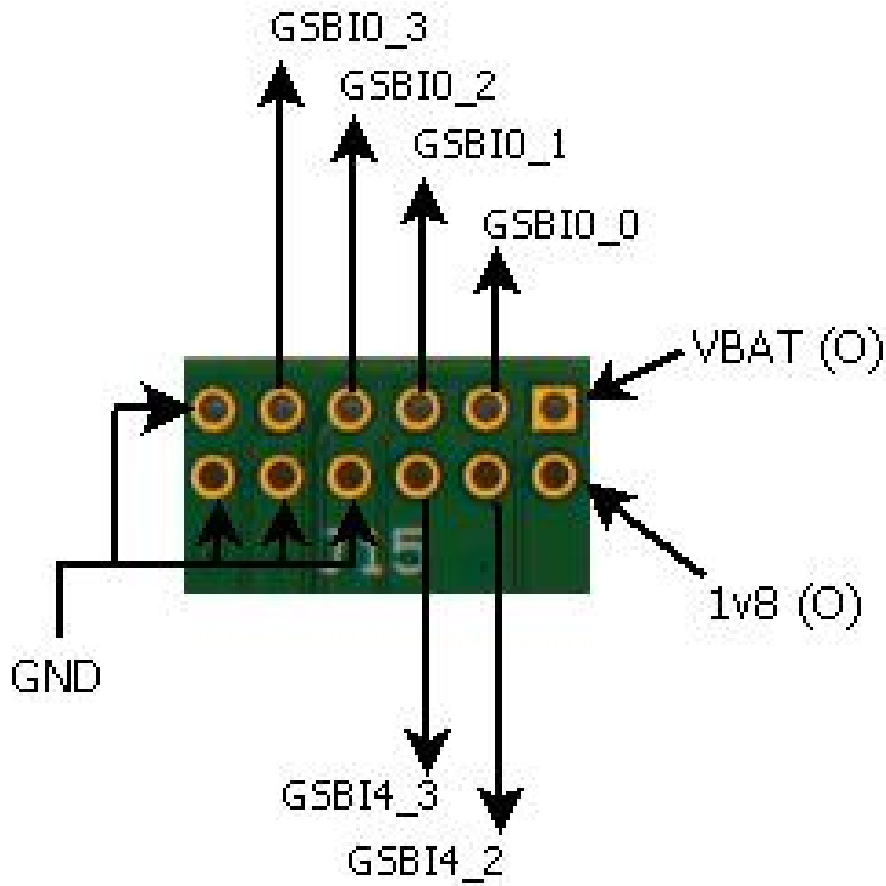


Figure 5: J15 Specification

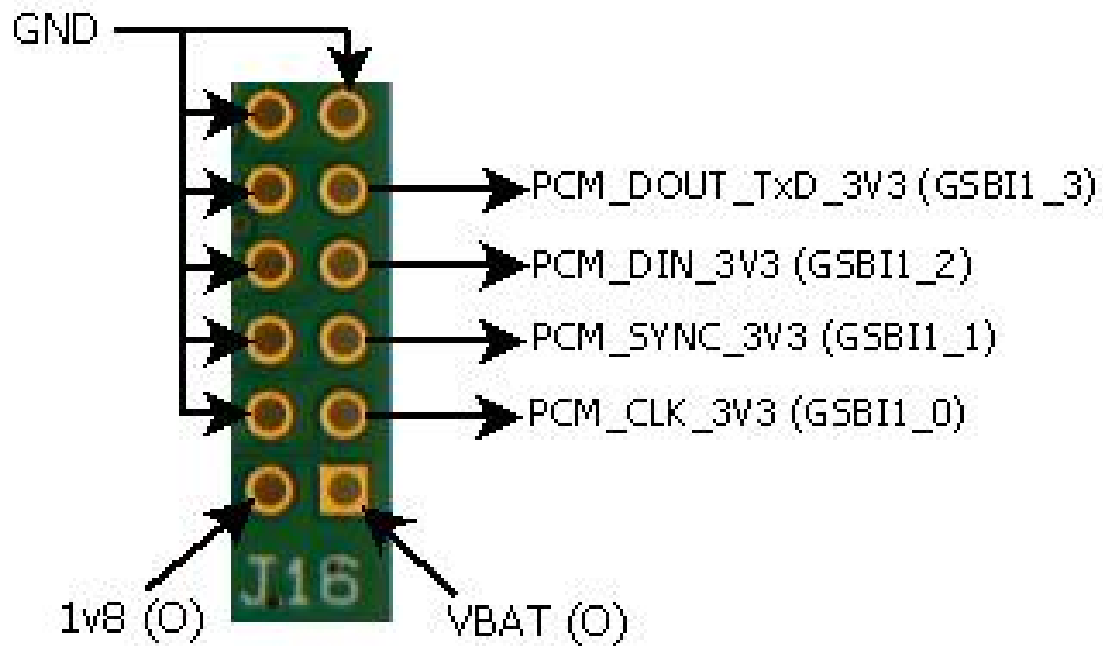


Figure 6: J16 Specification.

NOTE: 3v3 will be transformed into 1v8 by an on board level translator. This level translator is located on the development board and not on the GTM60x.

4.2 *Installation*

Start by carefully inserting your SIM card in the SIM card holder (4). Do this by pushing the SIM card in the cardholder until it clicks into place.



Figure 7: SIM card holder.

Next, connect the power adaptor to the power plug (9). After this, connect the mini USB connector to the USB plug (10) on the evaluation board. Connect the other end of the USB cable into your computer. If voice is necessary, insert your headset on the audio jack (5).

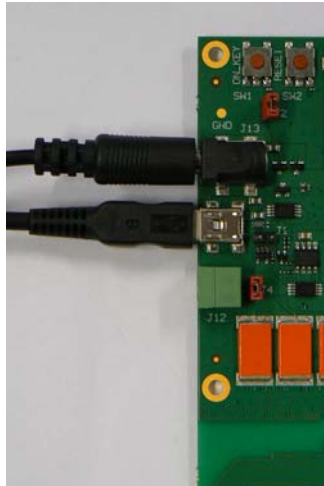


Figure 8: Power and USB connectors.



Figure 9: Audio jack and Headset.

Be sure the W. Disable switch on the controlling switch (12) is on the OFF position to have the radio ON. If Jumper J2 (20) is not short circuited, press the on key (6). At this point the host PC should detect your module.



Figure 10: Switch 4 (W. Disable) is in OFF position.



Figure 11: J2 and ON key

You can now proceed with section 5 for driver installation instructions.

5 DRIVER INSTALLATION

5.1 *Driver installation on Windows XP*

We currently provide one set of drivers for Windows XP/Vista and one set for Windows 7. These driver sets contain drivers that control the module. The driver set described in this section supports, Windows XP 32/64 bit edition and Windows Vista 32/64 bit edition. The driver name should be 5.2.x.x.

5.1.1 *General info: Driver set*

On successful installation of all drivers, the device manager will show the following installed devices. Please configure the device manager by selecting “View”, “Devices by connection”. Expand the tree to show the USB devices. Be aware that the list of devices may differ depending on the module configuration.

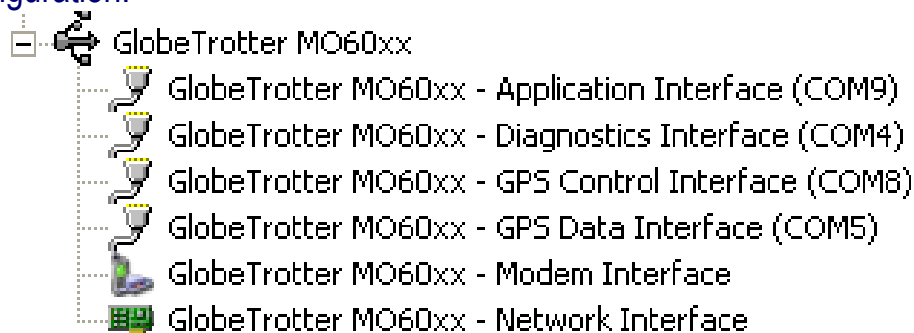


Figure 12: Ports occupied by the GTM60x

5.1.2 Installation procedure

Make sure you have a clean system before proceeding with the installation procedure. At this point you should copy the driver folder to a known location on your hard disk drive.

NOTE: At the time of this writing the latest driver version was version 5.2.1.0. Check with your Option contact to acquire the latest driver version. You can now proceed with the manual installation.

5.1.2.1 Automatic installation

(1) The automatic driver installation is very similar in Windows XP, Windows Vista and Windows 7. Without the cradle being connected, run the driver installer “setup.exe” provided by your Option contact. The setup application runs until completion. This process can take up to two or three minutes.

To be certain that the setup has finished, you can double-check in Task Manager if it is still running. Task Manager can be started up by pressing control-alt-delete and selecting “Start Task Manager”. Your list should not display “setup.exe”.

(2) Connect the GTM60x to the laptop as described in section 4. The installation of the drivers runs automatically. No user interaction is required.

You can verify if the device is installed by opening Device Manager. Please configure it in the menu via “View”, “Devices by connection”. Expand the tree until you see the GlobeTrotter® module as shown in Figure 12.

5.1.2.2 *Manual installation*

(1) If you have not already done so, install and connect the cradle as described in section 4. The unit is connected correctly only if the “*Found New Hardware*” balloon and subsequently the “*Welcome to the Found New Hardware Wizard*” appear.



Figure 13: Balloon message “Found New Hardware”

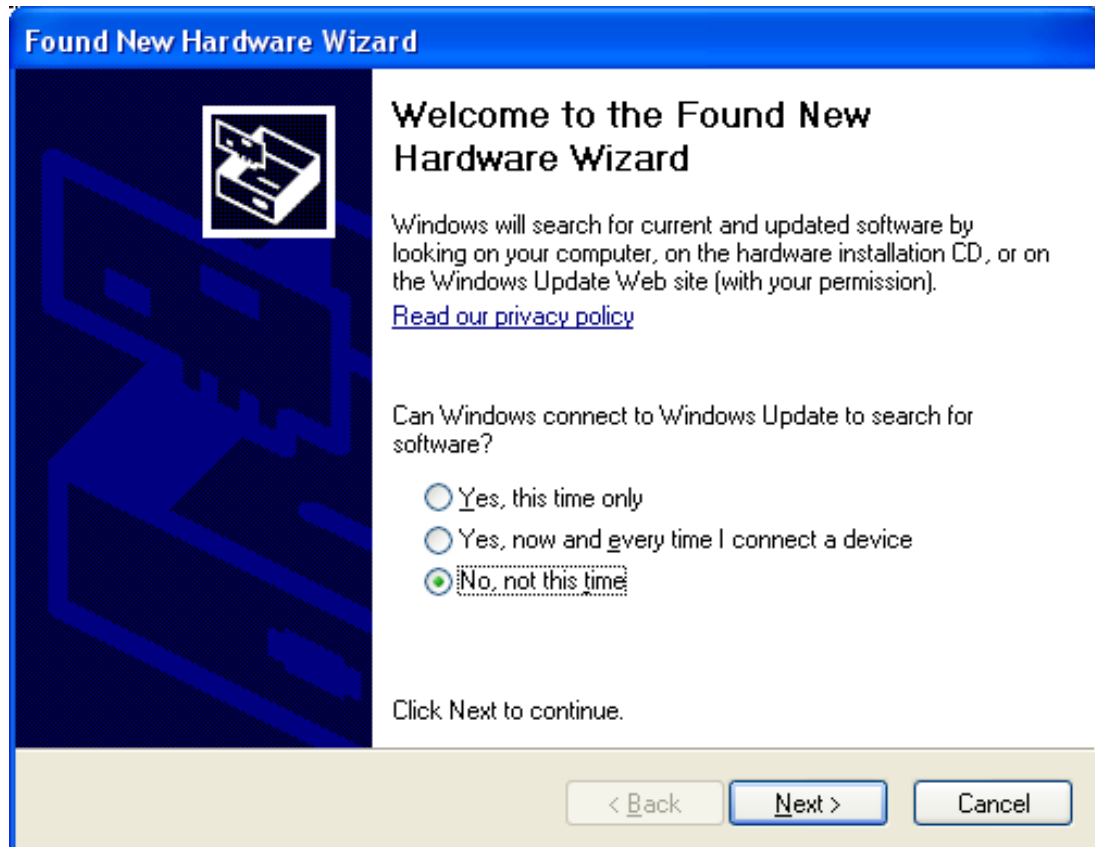


Figure 14: Welcome to the Found New Hardware Wizard

(2) In the first dialog (“*Can Windows connect to Windows Update to search for software?*”), select “*No, not this time*”

(3) In the next dialog, select “*Install software automatically (Recommended)*”. At this point make sure the CD-ROM with drivers is inserted in your optical drive.

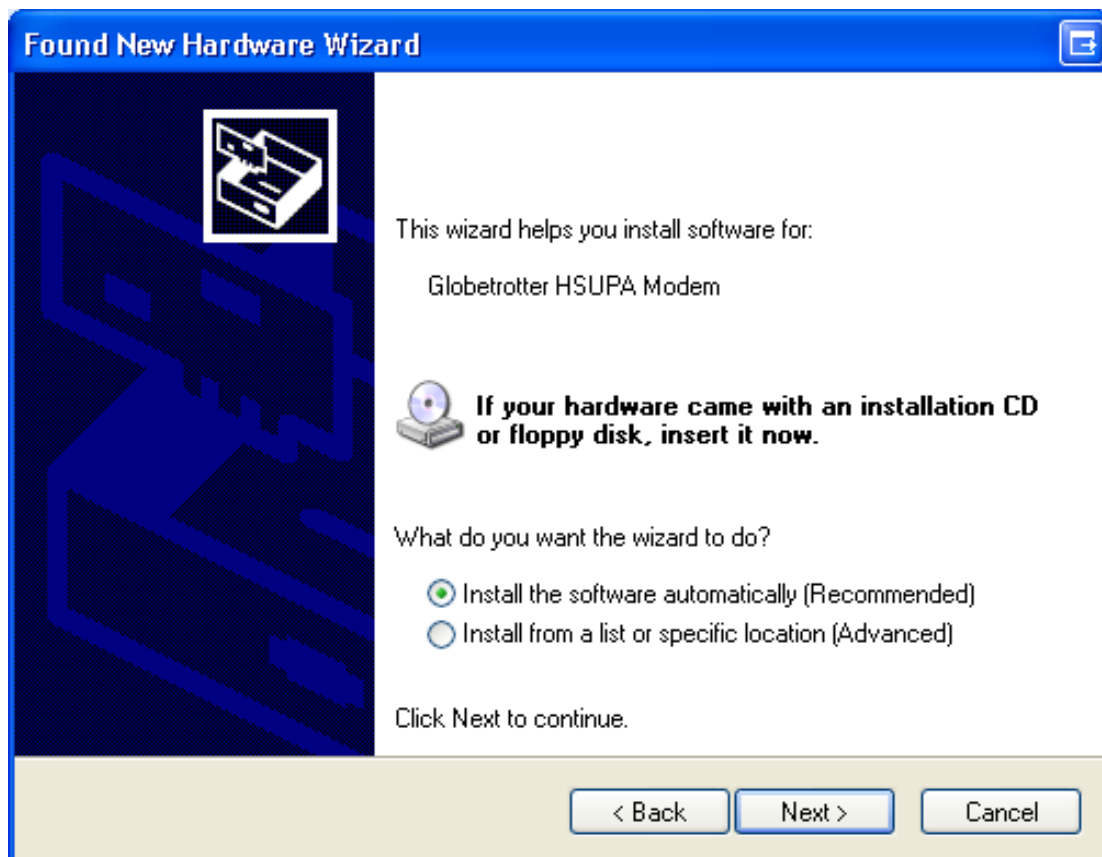


Figure 15: Install the software automatically (Recommended)

If you know where the drivers are located, you can select “*Install from a list or specific location (Advanced)*”. In this case ensure you select the option “*Include this location in the search:*” in the next screen, and enter the correct path to your drivers.

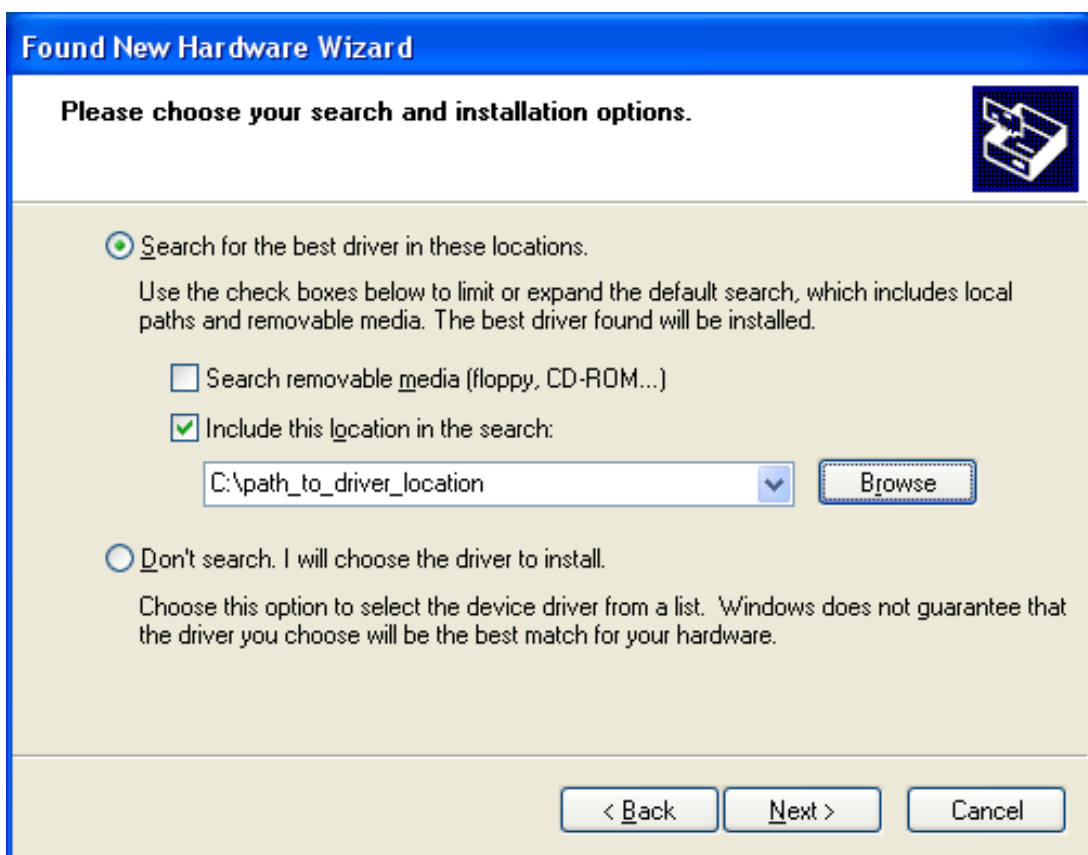


Figure 16: Install from a list or specific location (Advanced)

(4) Click “*Finish*” in the next screen “*Completing the Found New Hardware Wizard*”.

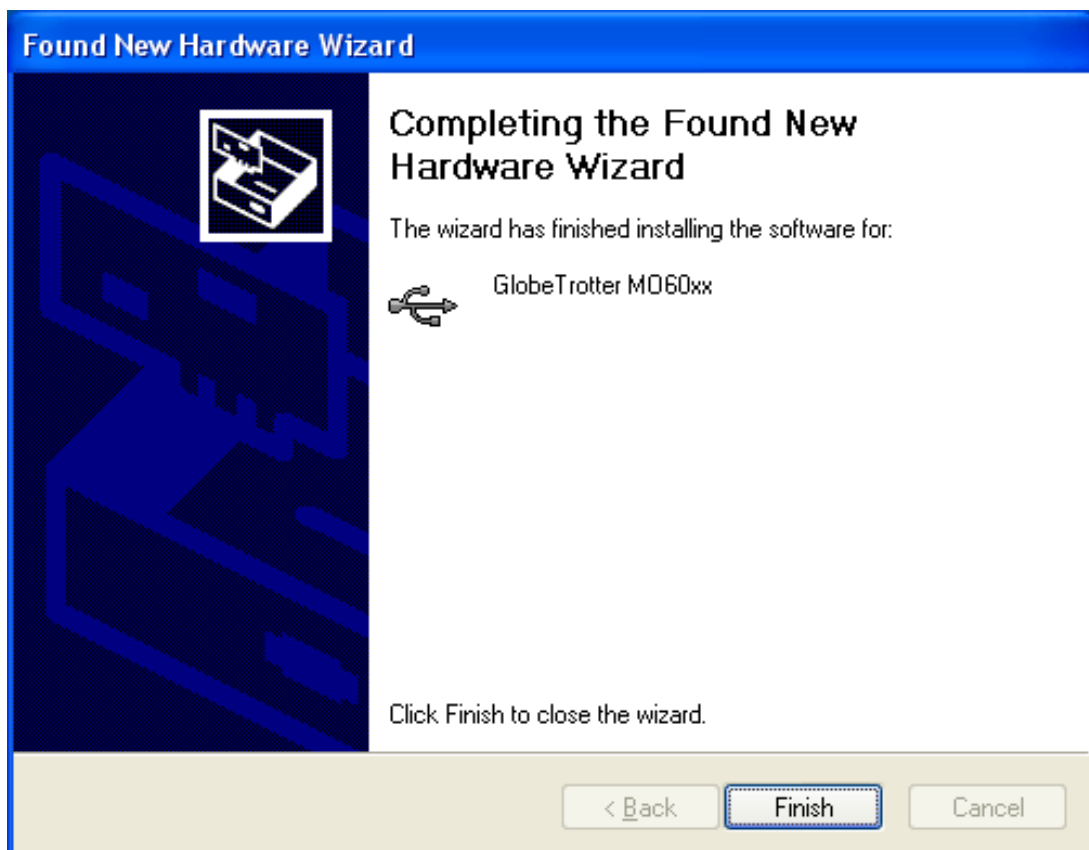


Figure 17: Completing the Found New Hardware Wizard



(5) Repeat steps 3 to 4 for all drivers. Windows will start a wizard for each interface.

(6) On successful installation of all drivers, the device manager will show the following typical installed devices. Please configure the device manager by selecting “*View*”, “*Devices by connection*” (See Figure 12).

5.2 Driver installation on Windows Vista

We currently provide one set of drivers for Windows XP/Vista and one set for Windows 7. These driver sets contain drivers that control the module. The driver set described in this section supports, Windows XP 32/64 bit edition and Windows Vista 32/64 bit edition. The driver name should be 5.2.x.x.

5.2.1 General info: Driver set

On successful installation of all drivers, the device manager will show the following installed devices. Please configure the device manager by selecting “View”, “Devices by connection”. Expand the tree to show the USB devices.

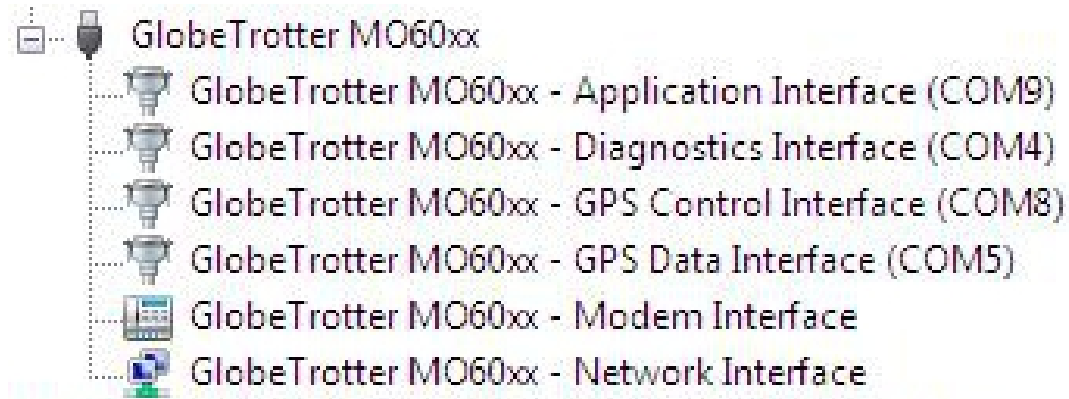


Figure 18: Ports occupied by the GTM60x

5.2.2 *Installation procedure*

Make sure you have a clean system before proceeding with the installation procedure. At this point you should copy the driver folder to a known location on your hard disk drive.

NOTE: At the time of this writing the latest driver version was version 5.2.1.0. Check with your Option contact to acquire the latest driver version. You can now proceed with the manual installation.

5.2.2.1 *Automatic installation*

(1) Without the cradle being connected, run the driver installer “setup.exe” provided by your Option contact. The setup application runs until completion. This process can take up to two or three minutes.

Starting the setup application will pop up the User Account Control security feature of Windows Vista. Allow the program to run (Option: Allow. I trust this program. I know where it’s from or I’ve used it before.)

The setup application runs until completion. To be certain that setup has finished, you can double-check in Task Manager if it is still running. Task Manager can be started up by pressing control-alt-delete and selecting “Start Task Manager”. Your list should not display “setup.exe”.

(2) Connect the GTM60x to the laptop as described in section 4. Windows Vista will recognize the device and start installing drivers. No user interaction is required.



Figure 19: The device is recognized.

Clicking on this popup will show the progress of the installation. When all the drivers are installed, Vista will inform you that your devices are ready to use.

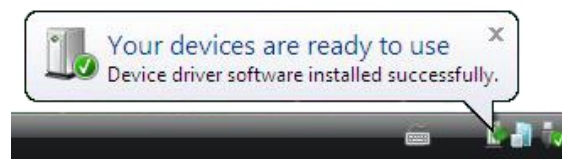


Figure 20: The devices are ready to be used.

You can verify if the device is installed by opening Device Manager. Please configure it in the menu via "View", "Devices by connection". Expand the tree until you see the GlobeTrotter® module as shown in Figure 18.

5.2.2.2 Manual installation

(1) If you have not already done so, install and connect the cradle as described in section 4. The unit is connected correctly only if the “*Found New Hardware*” screen appears.

(2) Choose “*Locate and install driver software (recommended)*” to install the driver manually.

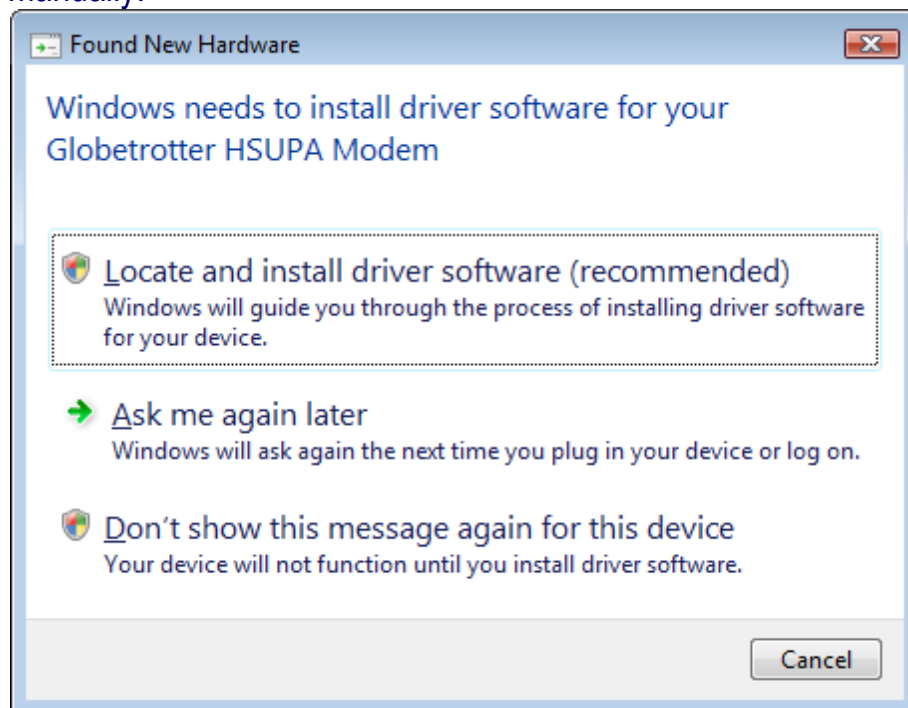


Figure 21: Windows needs to install driver software

(3) Next, select *“I don't have the disc. Show me other options.”*.

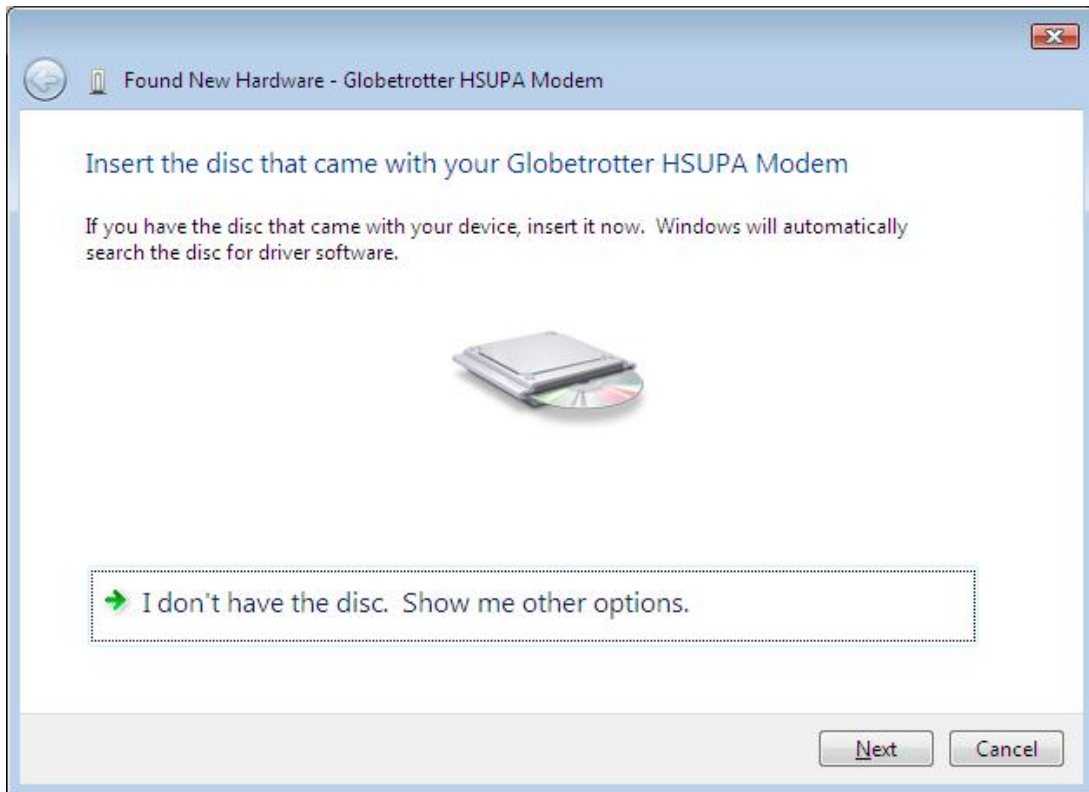


Figure 22: More installation options.

(4) Select “*Browse my computer for driver software (advanced).*”

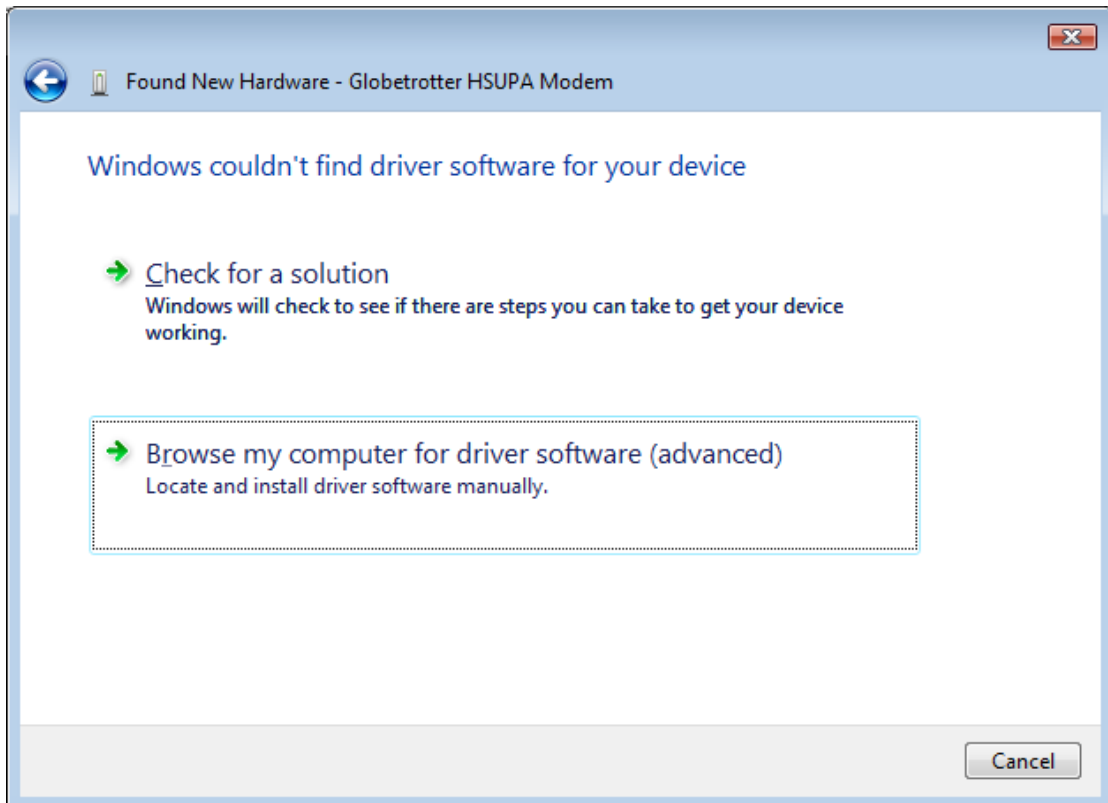


Figure 23: Browse my computer for driver software (advanced)

(5) You can now enter the path where the driver software is located. Press “*Browse*” to find the appropriate driver.

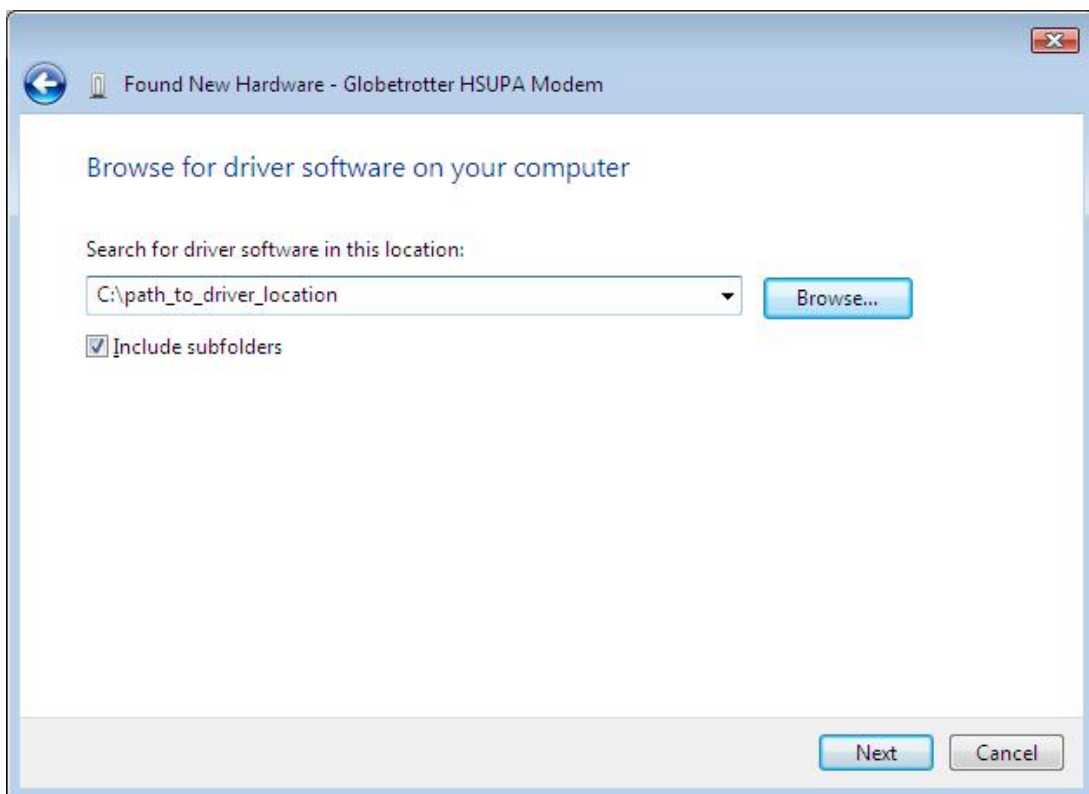


Figure 24: Browse for driver software on your computer

(6) Windows will now start with the installation of driver software.

(7) The wizard will notify you when the installation is successful.

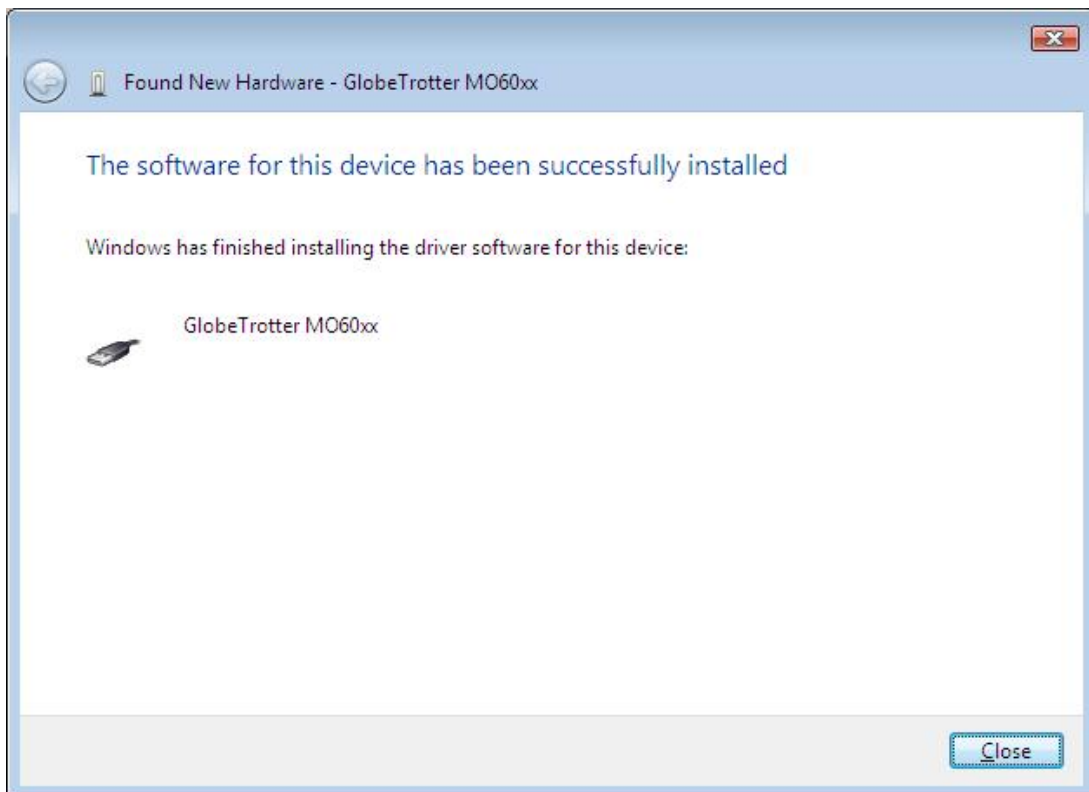


Figure 25: The software for this device has been successfully installed.

(8) Repeat steps 2 to 7 for all drivers. Windows will start a wizard for each interface.



(9) On successful installation of all drivers, the device manager will show the following typical installed devices. Please configure the device manager by selecting “*View*”, “*Devices by connection*”. Expand the tree to show the USB devices (See Figure 18).

5.3 *Driver installation on Windows 7*

We currently provide one set of drivers for Windows XP/Vista and one set for Windows 7. These driver sets contain drivers that control the module. The driver set described in this section supports, Windows 7 32/64 bit edition. The driver name should be 5.1.x.x.

5.3.1 *General info: Driver set*

On successful installation of all drivers, the device manager will show the following installed devices. Please configure the device manager by selecting “View”, “Devices by connection”. Expand the tree to show the USB devices.

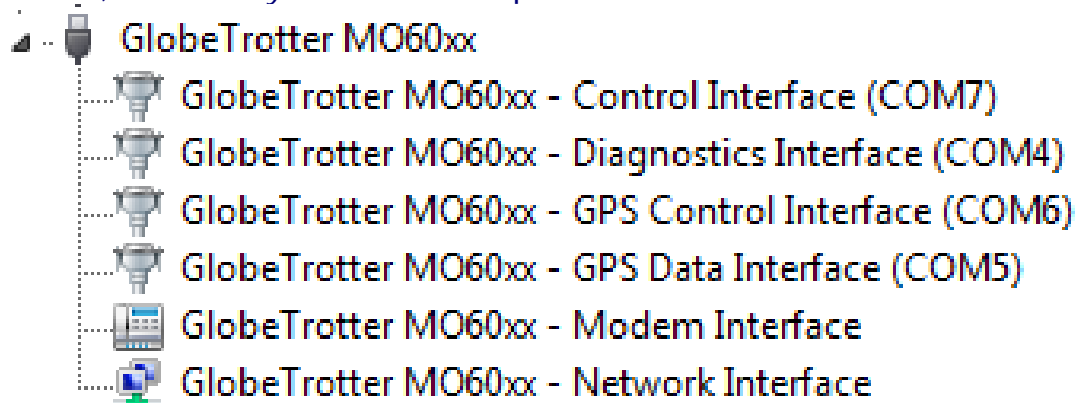


Figure 26: Ports occupied by the GTM60x

5.3.2 Installation procedure

Make sure you have a clean system before proceeding with the installation procedure. At this point you should copy the driver folder to a known location on your hard disk drive.

NOTE: At the time of this writing the latest driver version was version 5.1.38.0 (Unsigned). Check with your Option contact to acquire the latest driver version. You can now proceed with the manual installation.

5.3.2.1 Automatic installation

(1) Without the cradle being connected, run the driver installer “setup.exe” provided by your Option contact. The setup application runs until completion. This process can take up to two or three minutes.

Starting the setup application will pop up the User Account Control security feature of Windows 7. Allow the program to run (Option: Allow. I trust this program. I know where it’s from or I’ve used it before.)

The setup application runs until completion. To be certain that setup has finished, you can double-check in Task Manager if it is still running. Task Manager can be started up by pressing control-alt-delete and selecting “Start Task Manager”. Your list should not display “setup.exe”.

(2) Connect the GTM60x to the laptop as described in section 4. Windows Vista will recognize the device and start installing drivers. No user interaction is required.

5.3.2.2 *Manual installation*

(1) If you have not already done so, install and connect the cradle as described in section 4. Windows will detect new hardware.



Figure 27: Installing device driver software.

(2) Windows will fail to install the correct drivers

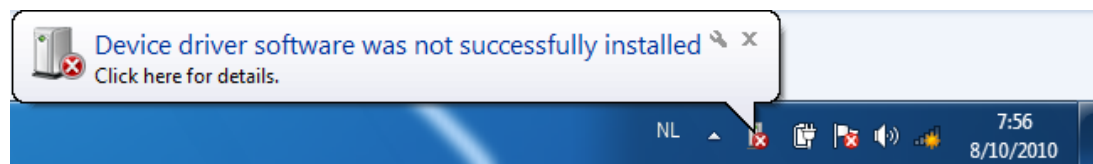


Figure 28: Failing installing the correct drivers.

(3) Open the device manager by searching for it in the start menu search field and clicking on it.

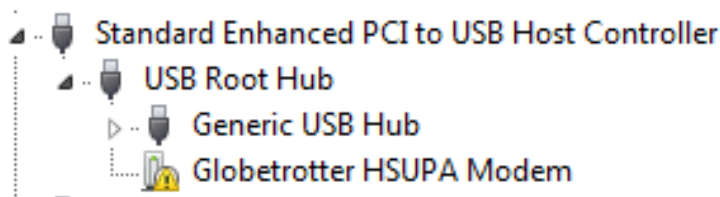


Figure 29: Device drivers not installed

(4) Right click "Globetrotter HSUPA Modem" and choose "Update Driver Software".

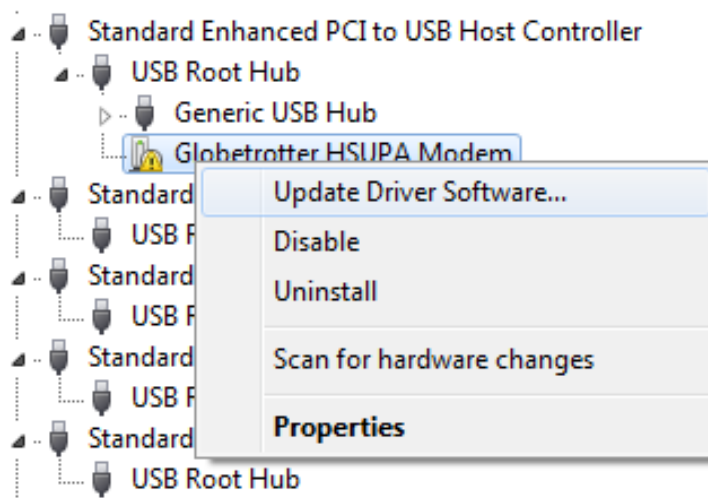


Figure 30: Update Driver Software.

(5) Choose *"Browse my computer for driver software"*.

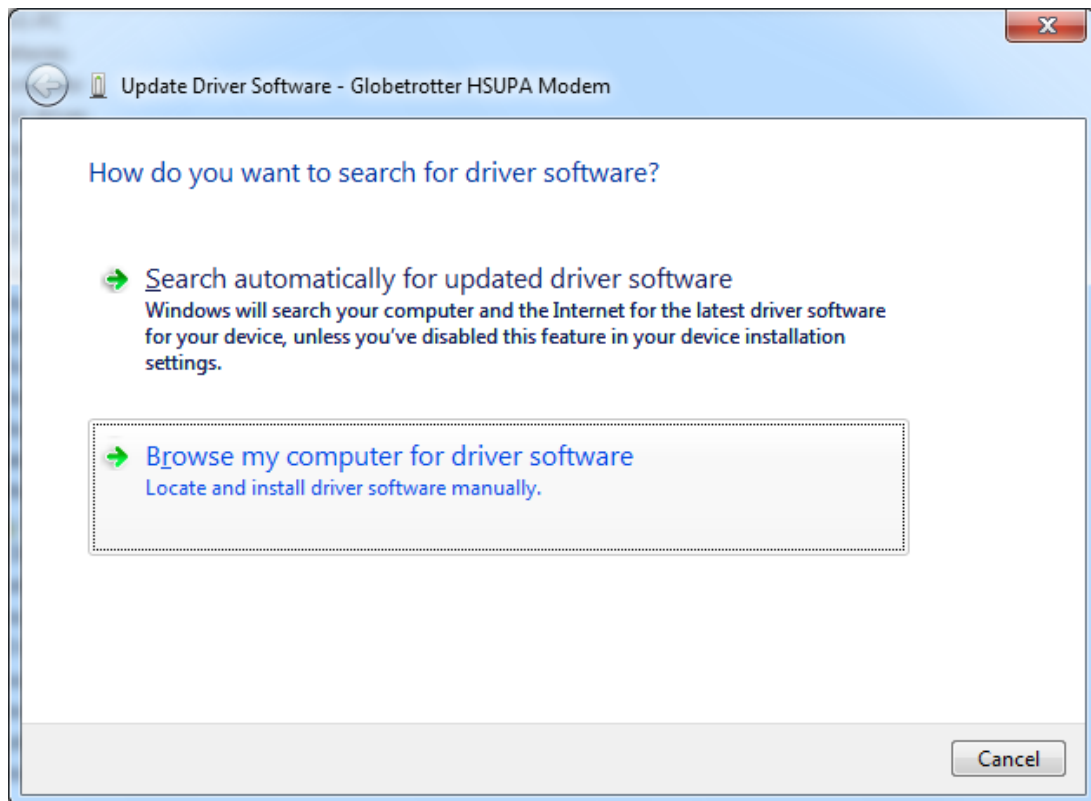


Figure 31: Browse my computer for driver software.

(6) Browse to the location you copied the drivers to and click next.

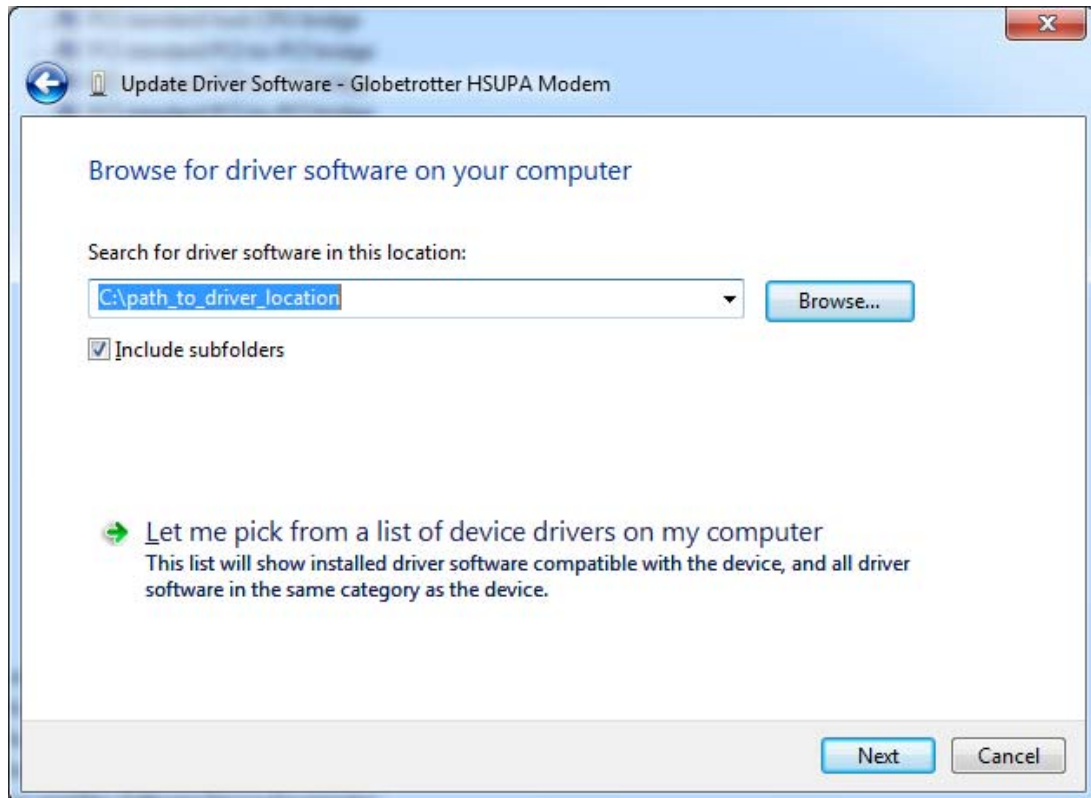


Figure 32: Browse for driver software on your computer

(7) If the drivers are not signed, Windows will request authorization to install the new drivers. At this moment click on “Install this driver software anyway”.

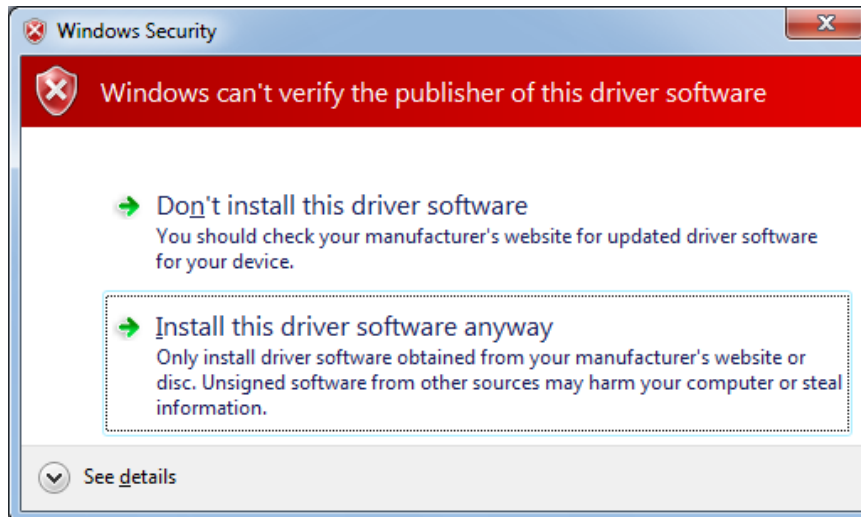


Figure 33: Windows Security to install unsigned drivers.

(8) The drivers will be installed. When the installation is finished, click on close.

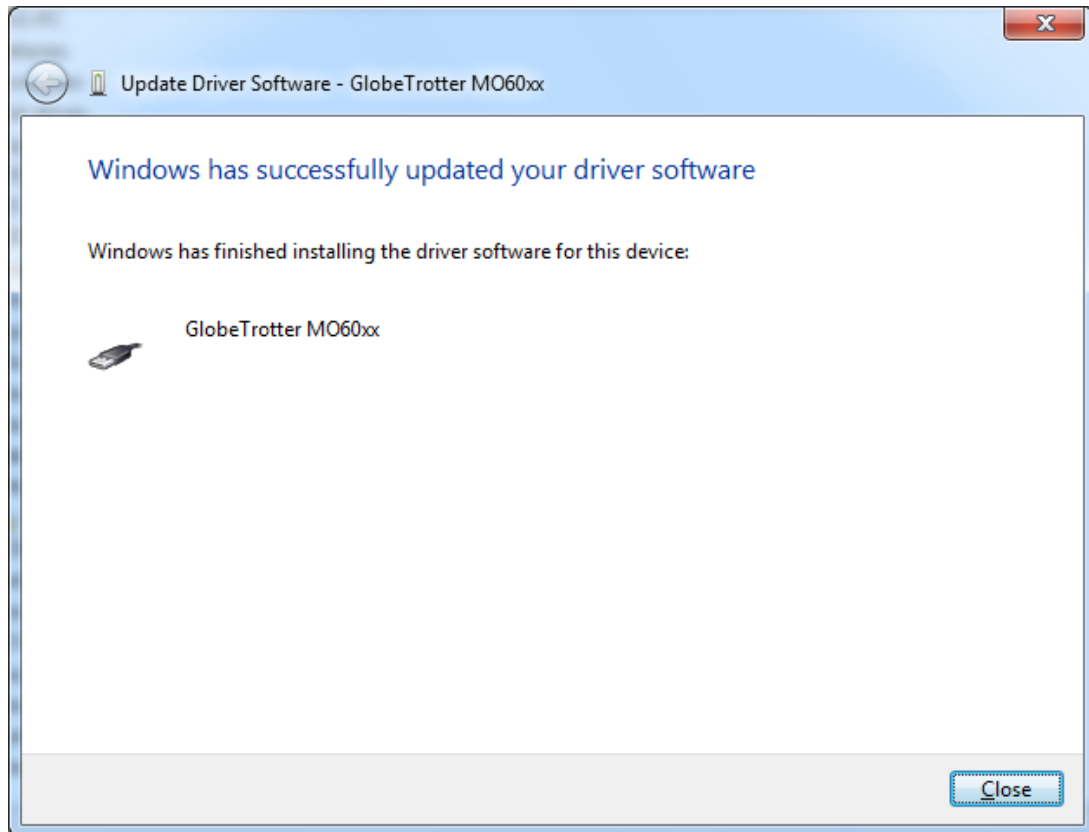


Figure 34: The software for this device has been successfully installed.

(9) Repeat the process starting from 4 to 8 for all other remaining unknown devices.

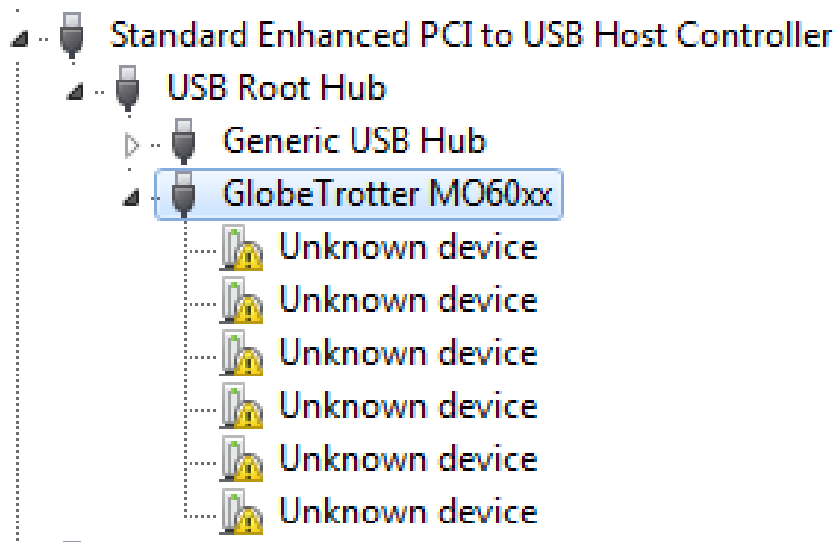


Figure 35: Remaining unknown devices

(10) On successful installation of all drivers, the device manager will show the following typical installed devices. Please configure the device manager by selecting “View”, “Devices by connection”. Expand the tree to show the USB devices (See Figure 26).

6 FIRMWARE UPGRADE

NOTE: This section describes the upgrade to the latest firmware version of the GTM60x. At the time of this writing this was version 1.2.0.0. Check with your Option contact to acquire the latest firmware version.

- (1) Copy the latest firmware version to a known location.
- (2) Double click the compressed folder to open it.
- (3) Extract the two files contained in this compressed folder.
- (4) Browse to the folder where you extracted the firmware to.
- (5) Double click on the executable file "*Blacktip_NYOS_fw_v[new_firmware_version].exe*". A window will open like in the screenshot below.

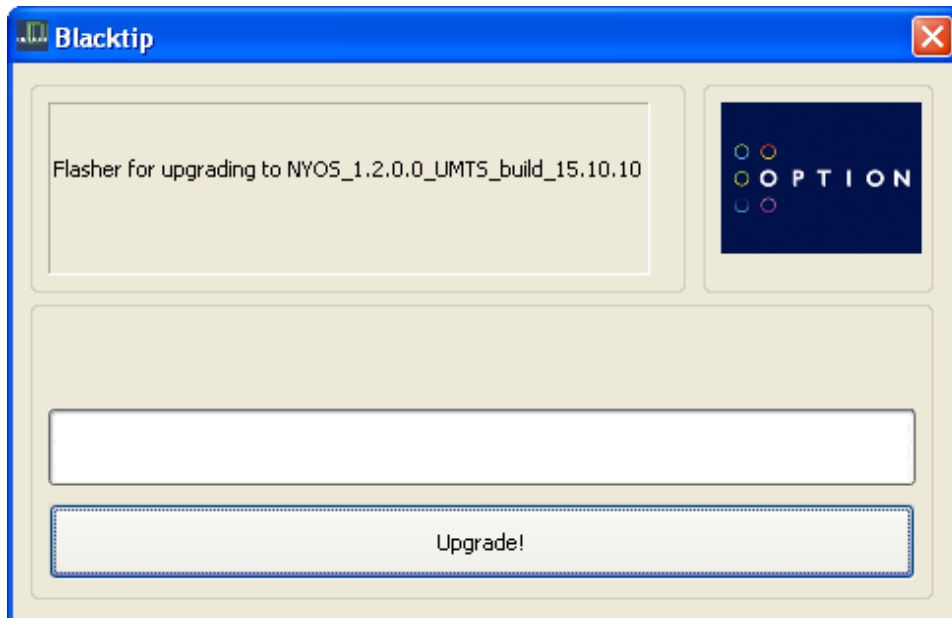


Figure 36: The Blacktip upgrader

(6) Press the “Upgrade!” button. This process will take a few minutes. Do not disconnect the device during this time. Wait 10 seconds after the process is finished before disconnecting the device.

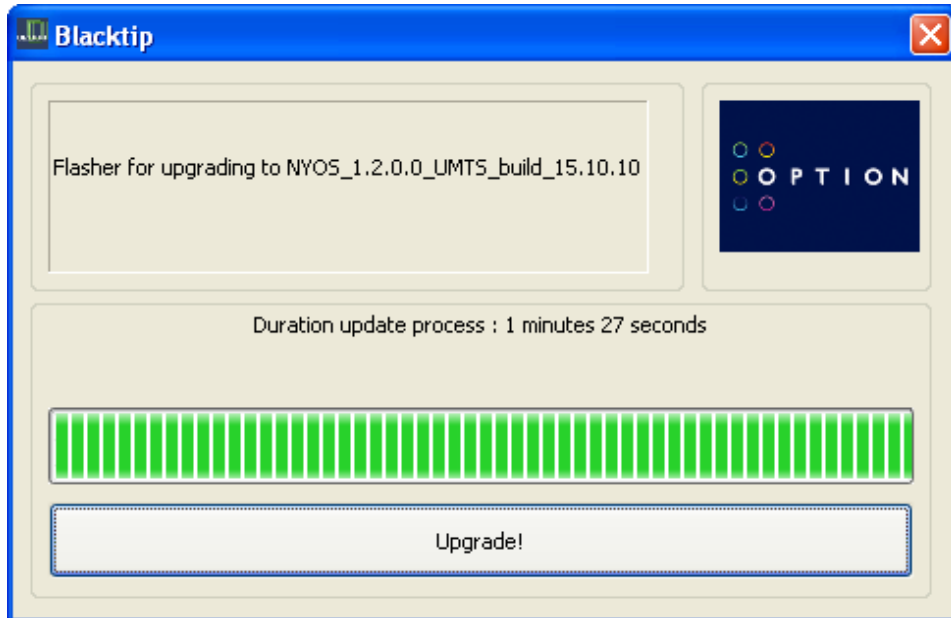


Figure 37: Module firmware upgrade completed.

7 HOW TO SEND AT COMMANDS

This section briefly describes how to send AT commands using HyperTerminal to communicate with the GTM60x.

HyperTerminal is included in Windows XP but not in Windows Vista or Windows 7. However, it can be downloaded free for personal use from its creator's website: <http://www.hilgraeve.com/>.

This section assumes that Vista and 7 users have downloaded and correctly installed this program. The instructions on the usage may differ slightly. To start HyperTerminal, make sure you run it as administrator. You can do this by right-clicking on the application and selecting "*Run as Administrator*".

(1) First start device manager. You can do this by going to “*Start*” menu and selecting “*Run*”. Type “*devmgmt.msc*” in the next dialogue box as displayed below:

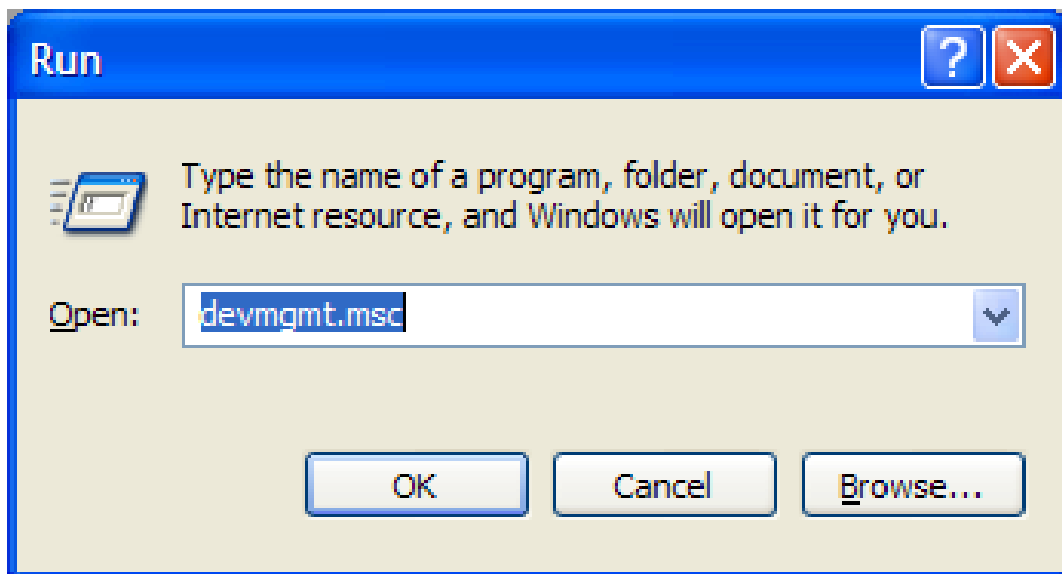


Figure 38: Run device manager

(2) Check the port used by the application interface. In this example, the application port is COM6. NOTE: In Windows 7 the application interface is called the Control Interface.

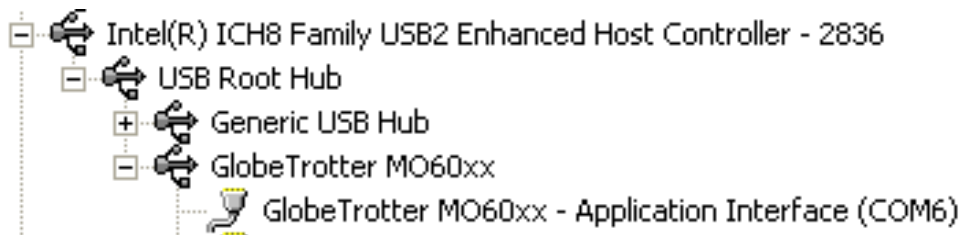


Figure 39: Application interface on COM6.

(3) Open HyperTerminal via the “Start” menu in Windows:
Start → All Programs → Accessories → Communication → HyperTerminal

Normally, you only have to perform the following two steps once. If you have already done this in the past you can skip these steps. If not, pick a country and an area code of your choice.



Figure 40: Location information.

(4) Just click “OK” on the “*Phone and Modem Options*” screen.

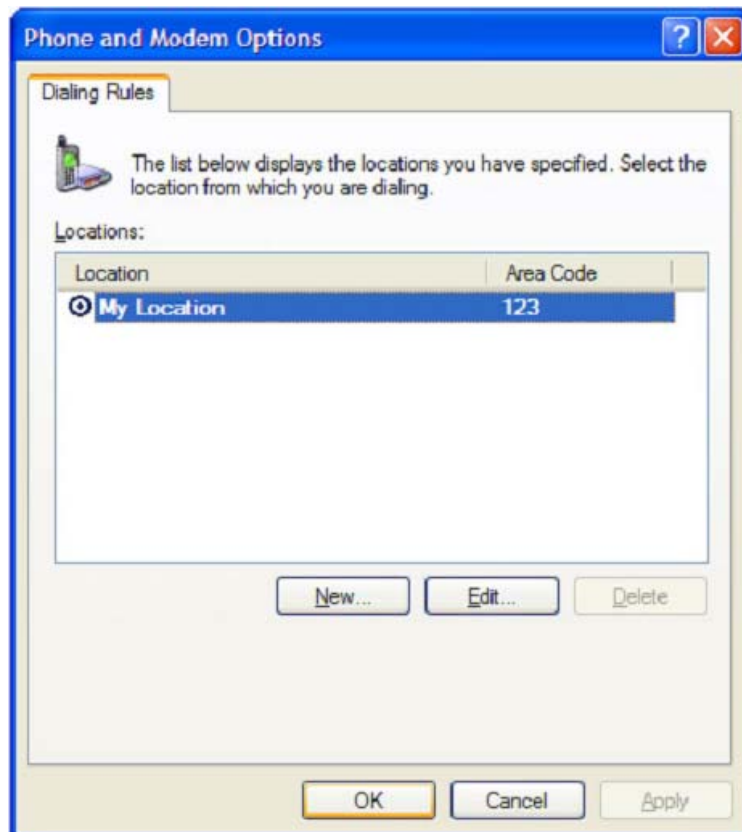


Figure 41: Location information.

(5) Enter a name for your HyperTerminal connection and press OK.

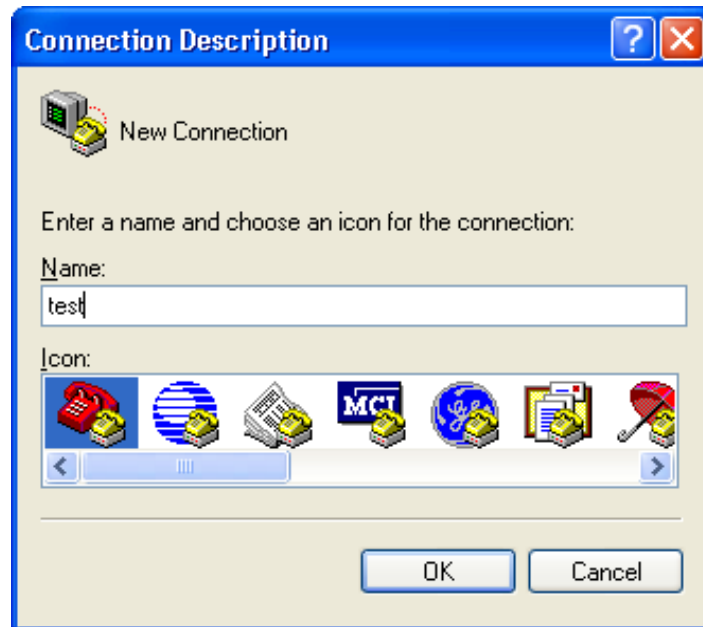


Figure 42: Connection Description

(6) In the next window, change the “*Connect using:*” field to the application port you checked under (2). Click OK.

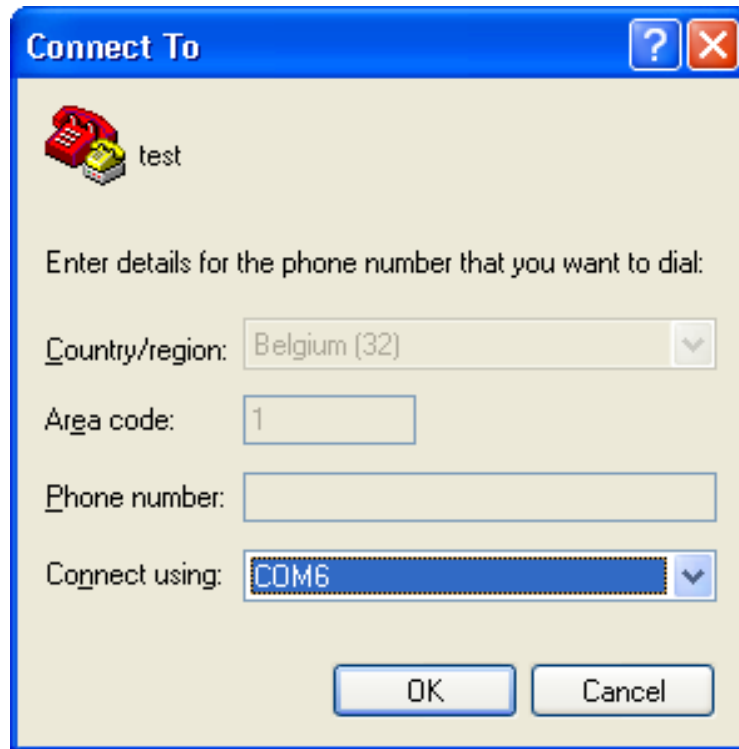


Figure 43: Connect To

(7) Now the next window will appear. Modify the “*Bits per second*” field to 115200 and click OK.

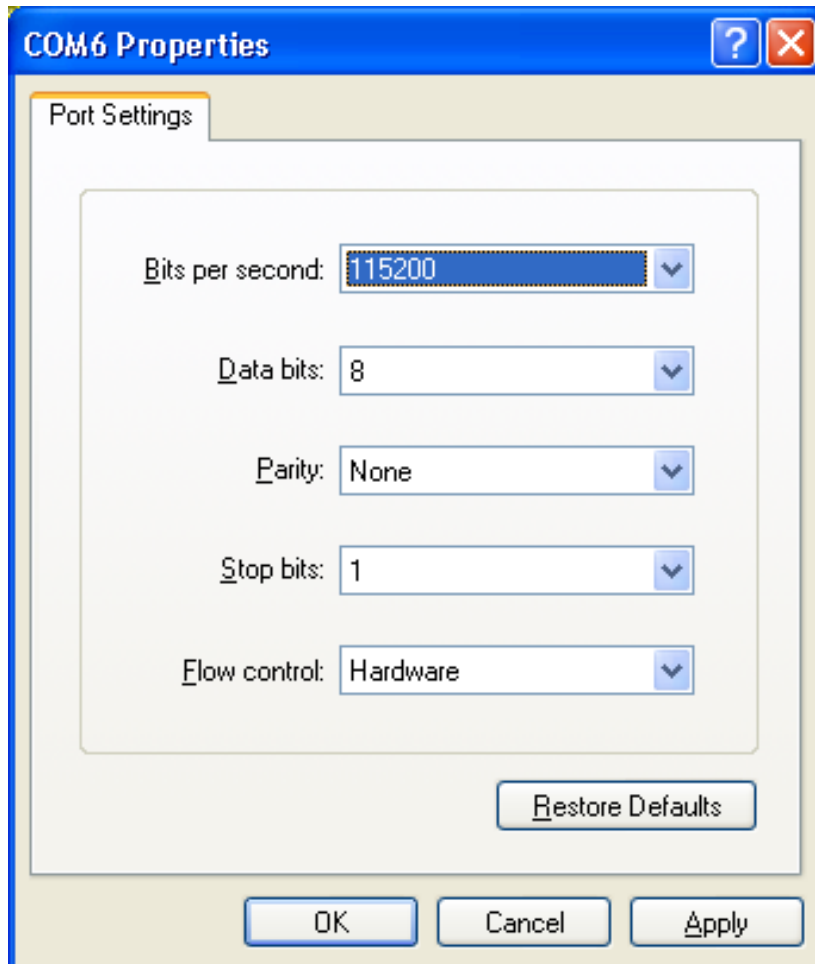
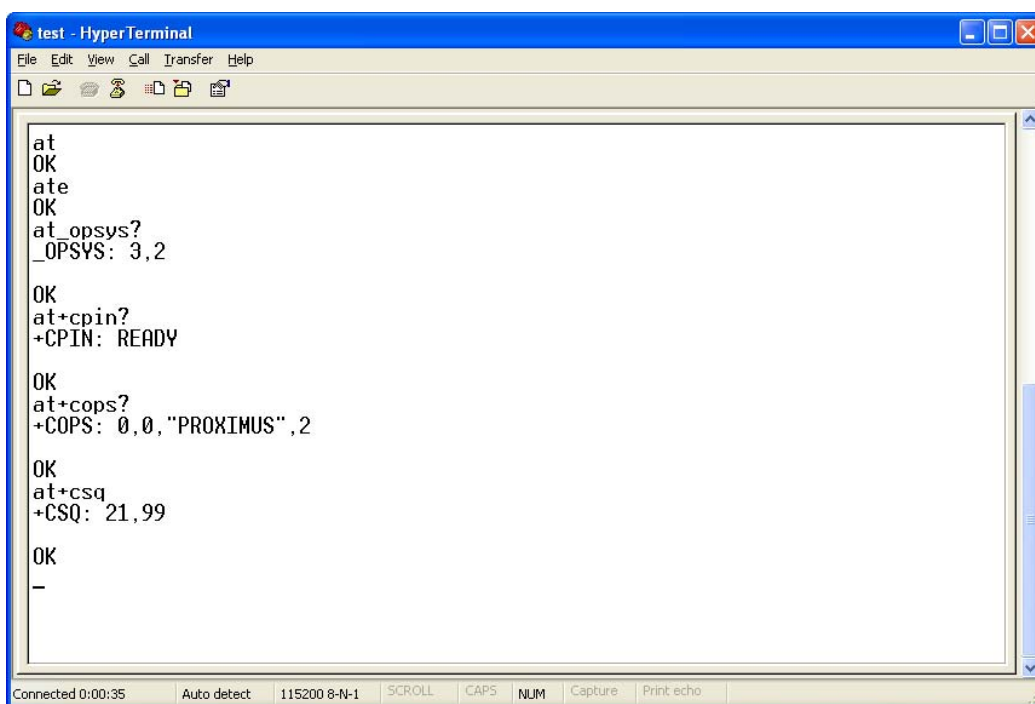


Figure 44: Connection Properties

HyperTerminal is now configured and you are ready to issue AT commands to the module. The figure below shows a typical HyperTerminal session. If you don't have visual feedback of what you are typing, you need to turn echo on by typing ATE, as shown in the example below.



```
test - HyperTerminal
File Edit View Call Transfer Help
[at]
OK
ate
OK
at_opsys?
_OPSYS: 3,2

OK
at+cpin?
+CPIN: READY

OK
at+cops?
+COPS: 0,0,"PROXIMUS",2

OK
at+csq
+CSQ: 21,99

OK
-
```

Connected 0:00:35 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

Figure 45: Typical HyperTerminal session



When you close HyperTerminal, you have the opportunity to save your HyperTerminal profile. Saved profiles can be found under HyperTerminal in the “*Start*” menu.

Start → Programs → accessories → Communication → HyperTerminal.

8 GTM60x CONFIGURATION

Before you set up a data connection, you should configure the module.

Configuring the GTM60x is done by sending AT commands to the application interface (Windows 7: control interface). You can use HyperTerminal (explained on the previous section) or another serial communication program connected to this interface.

This section describes some of the more useful AT commands that can be sent to the GTM60x. Finally a connection to the internet is made.

8.1 *Radio ON/OFF*

The GTM60x development kit has a hardware switch to enable or disable the radio.

You can test if the radio is enabled by using the following AT command:

AT+CFUN?

The expected return should be ***+CFUN=1*** (Radio ON). If the response is not as expected, check if the radio switch is in the active position. If the response from the command still is incorrect, type:

AT+CFUN=1

8.2 *RRC security*

To be able to register on a real network, security should be set to “*Integrity and ciphering*”. This can be done by entering the following AT command:

AT_OSEC=4

To register on a simulator such as an Agilent, security should be set to “*Fake security*”. This can be done by entering the following AT command:

AT_OSEC=3

8.3 *Preferred system*

Make sure the “*preferred system*” settings are “*WCDMA preferred*” and “*Acquire both circuit-switched and packet switched systems*” by entering:

AT_OP SYS=3,2

8.4 *Access Point Name*

To set the APN for the Data connection, it is necessary to enter the following command:

AT+CGDCONT=1,"IP", "xxx"

In which xxx is the APN provided by your network operator.

8.5 *SIM control*

The GTM60x requires a SIM to be fitted in order to access a network (if working in UMTS mode). Some people use SIMs with PIN code protection. Some operators mandate the use of PIN codes as this provides protection in the event of SIM theft.

Before proceeding; the SIM state should be checked:

AT+CPIN?

+CPIN: READY

This means that no pin is required and you can continue:

+CPIN: SIM PIN

This means that a pin number is needed.

If a pin is needed enter it by using the next command:

AT+CPIN="xxxx"

The "xxxx" field indicates where the 4 digit PIN for the SIM should be entered. If a PIN hasn't been defined, the GTM60x will not register until the correct PIN is entered.

8.6 Registration

SMS and data connections are only possible if the GTM60x is registered on a network.

An *AT* command is used to return the registration state and operator name or code:

```
AT+COPS?
```

```
+COPS: 0,0,"OPERATOR",2
```

```
OK
```

The "OPERATOR" field indicates the field where the name of your operator will be written. The number "2" at the end of the response string means you are registered to the network.

You can now proceed with the next section: Setting up a data call.

9 *SETTING UP A PACKET SWITCHED DATA CALL*

Make sure you have configured the module properly (refer to section 8).

Before attempting the Data connection, ensure you are registered to the network. Check that the registration LED in Figure 2 is on. Also, the APN for your operator should be set correctly in the module. This can be done with the following AT command:

AT+CGDCONT=1,IP,"your APN here"

You have to set this command only once for each module as this setting is stored in the non-volatile memory of the module. Use the explanation in section 7 on how to use HyperTerminal to send AT commands.

To verify the APN setting just type: ***AT+CGDCONT?***

9.1 Using Modem interface (Dial-up)

It is possible to set up a data call using Windows RAS dial-up networking. This section explains how to set up a RAS dial-up connection.

9.1.1 On Windows XP

(1) Go to Start → Control Panel → Network Connections and click on the icon “New Connection Wizard”. The next screen will appear:



Figure 46: New connection Wizard.

(2) Click “Next” and following figure will appear. Select “Connect to the Internet” and click “Next” again.

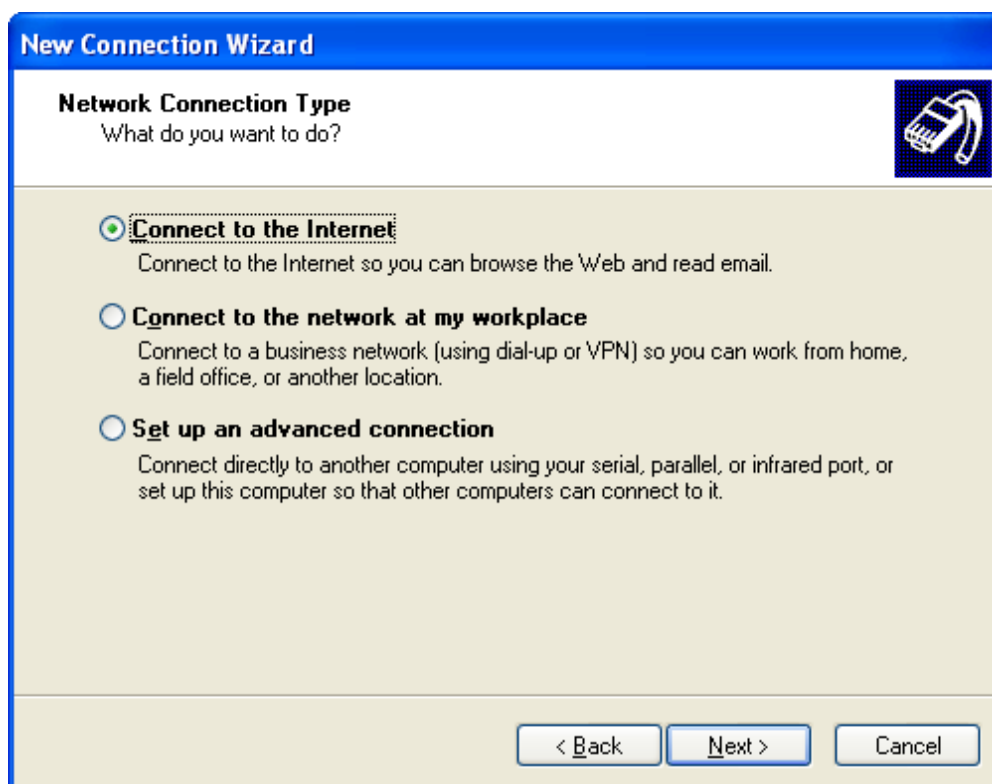


Figure 47: Connect to the Internet.

(3) Select “Set up the connection manually”, and click the “Next” button.

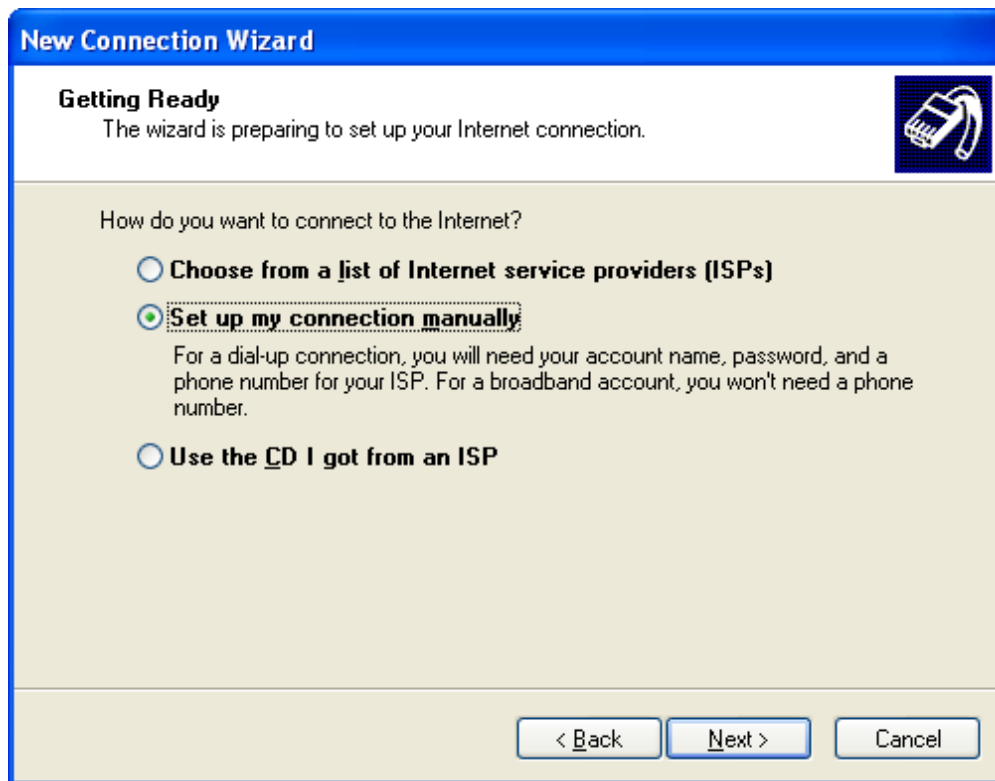


Figure 48: Manual connection setup.

(4) Choose the “Connect using a dial-up modem” option, and click the “Next” button.

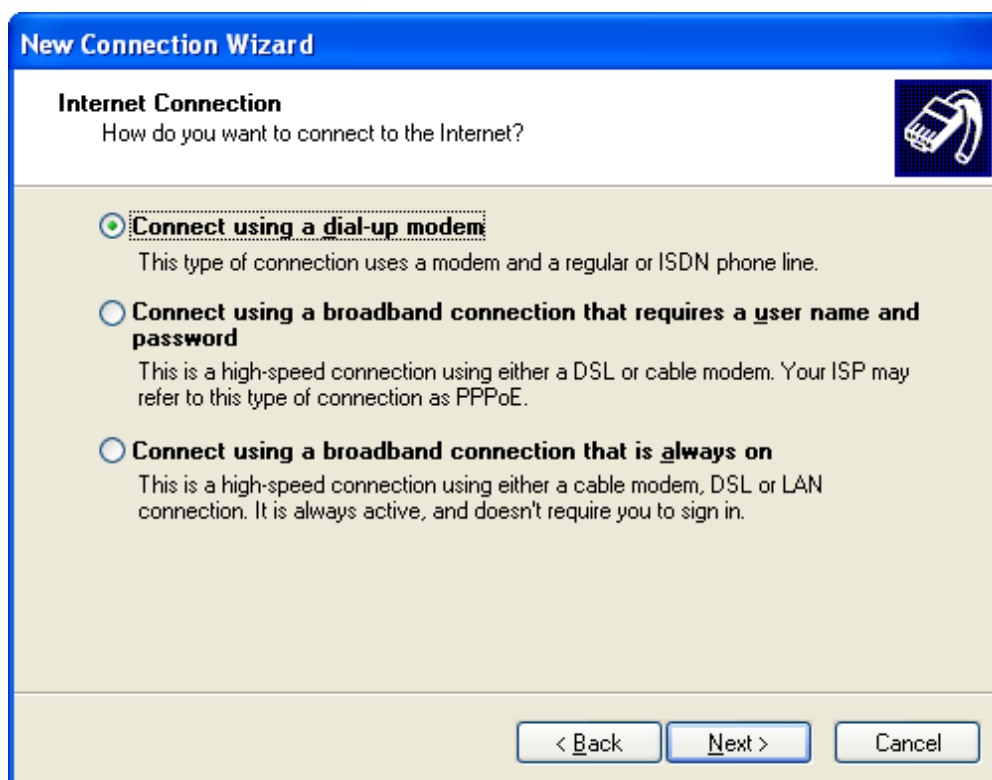


Figure 49: Connection with dial-up modem.

(5) Select the correct RAS modem (Modem - GlobeTrotter MO40X modem interface), and click the “Next” button.

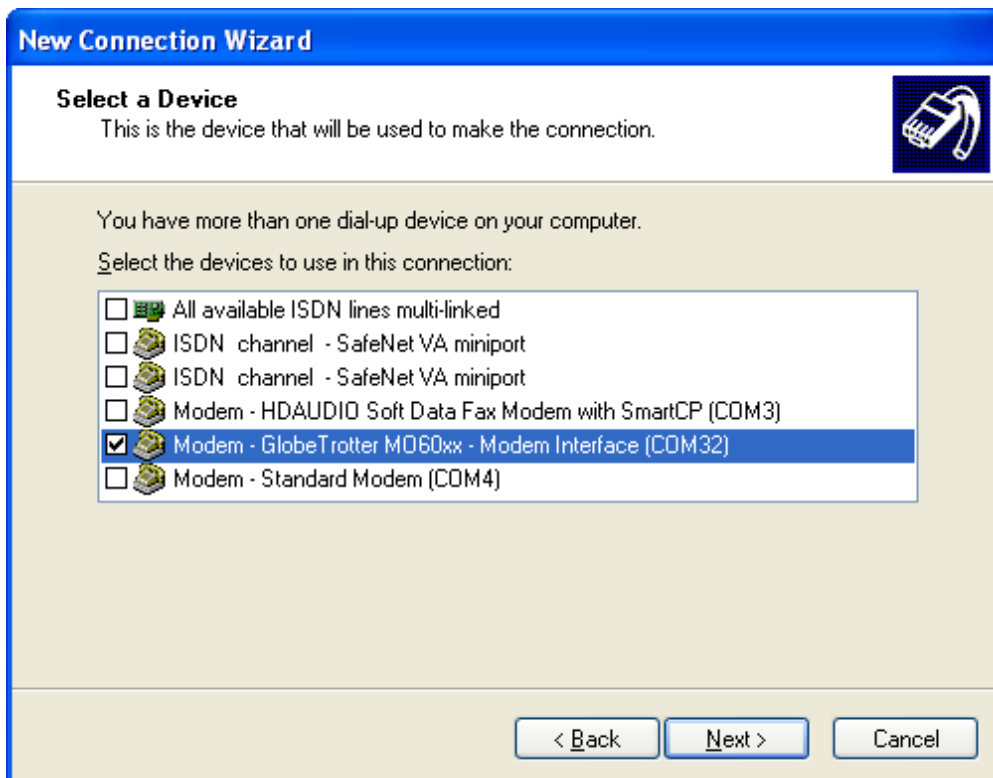


Figure 50: Select Modem.

(6) Type a name for the connection that you should select the next time you need this dial-up connection, and click the “Next” button.

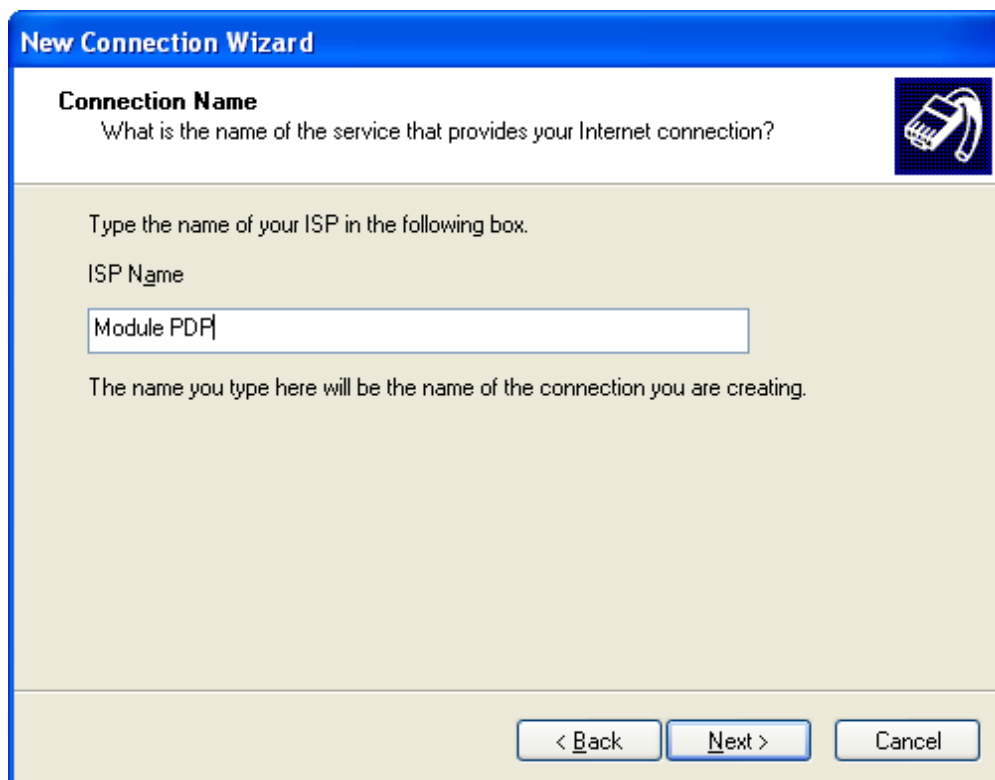


Figure 51: Connection Name.

(7) Type in *99# for the telephone number to dial and click the “Next” button.

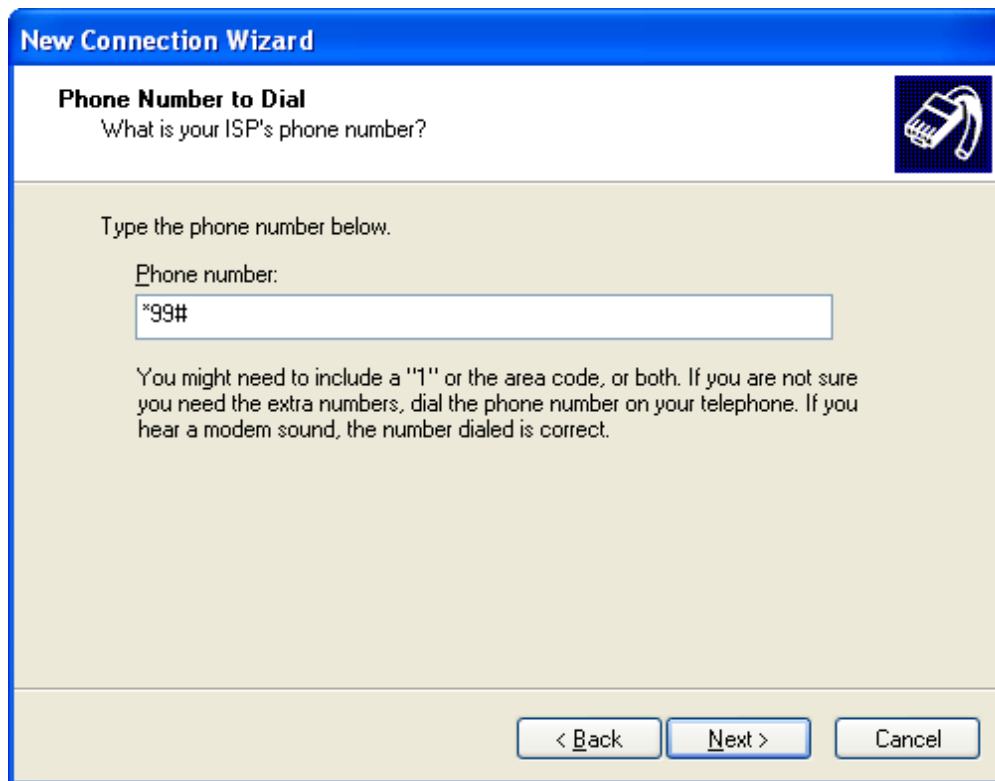


Figure 52: Number to dial.

(8) Choose the option you like, and then click the “Next” button.

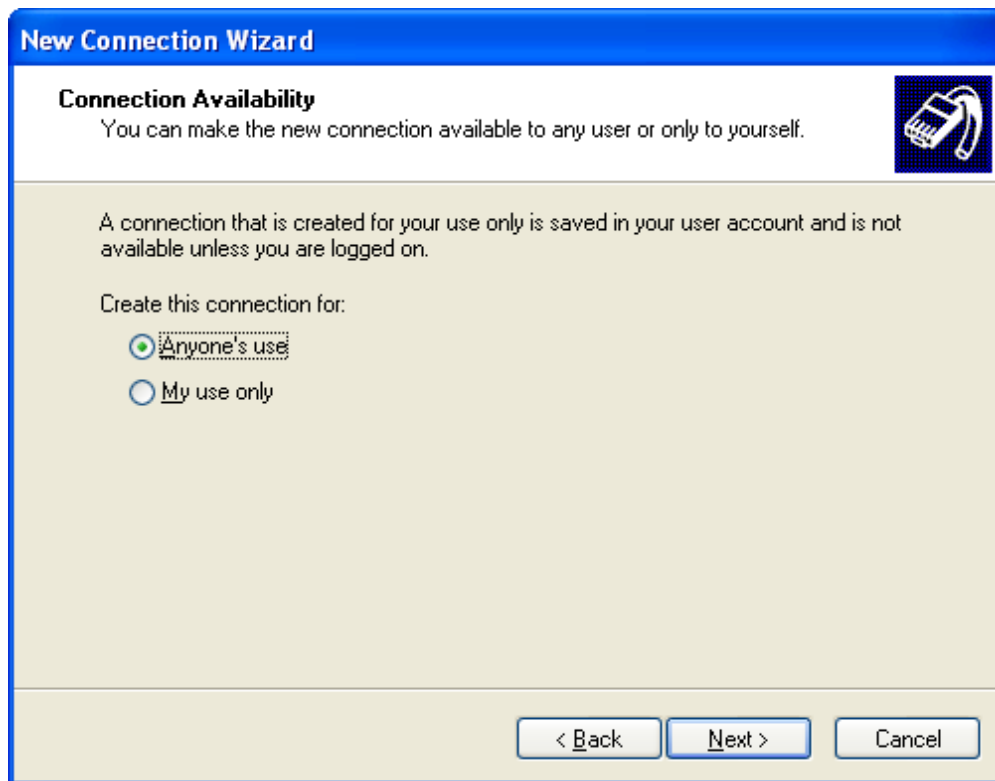


Figure 53: Connection Availability.

(9) If your service provider requires you to enter your username and password to set up a PS data call connection, please enter them using the screen below.



The screenshot shows a 'New Connection Wizard' dialog box with a blue title bar. The main content area has a light beige background. At the top, it says 'Internet Account Information' in bold, followed by the instruction: 'You will need an account name and password to sign in to your Internet account.' To the right of this text is a small icon of a mobile phone. Below the instruction, there is a paragraph: 'Type an ISP account name and password, then write down this information and store it in a safe place. (If you have forgotten an existing account name or password, contact your ISP.)' There are three text input fields: 'User name:', 'Password:', and 'Confirm password:'. Below these fields are two checkboxes: the first is 'Use this account name and password when anyone connects to the Internet from this computer' and the second is 'Make this the default Internet connection'. At the bottom of the dialog box, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Figure 54: Internet Account Information.

(10) The connection is set up and ready to use. Click the “Finish” button to close the wizard. This window also offers the possibility to add the connection into the Desktop by checking the available check box.

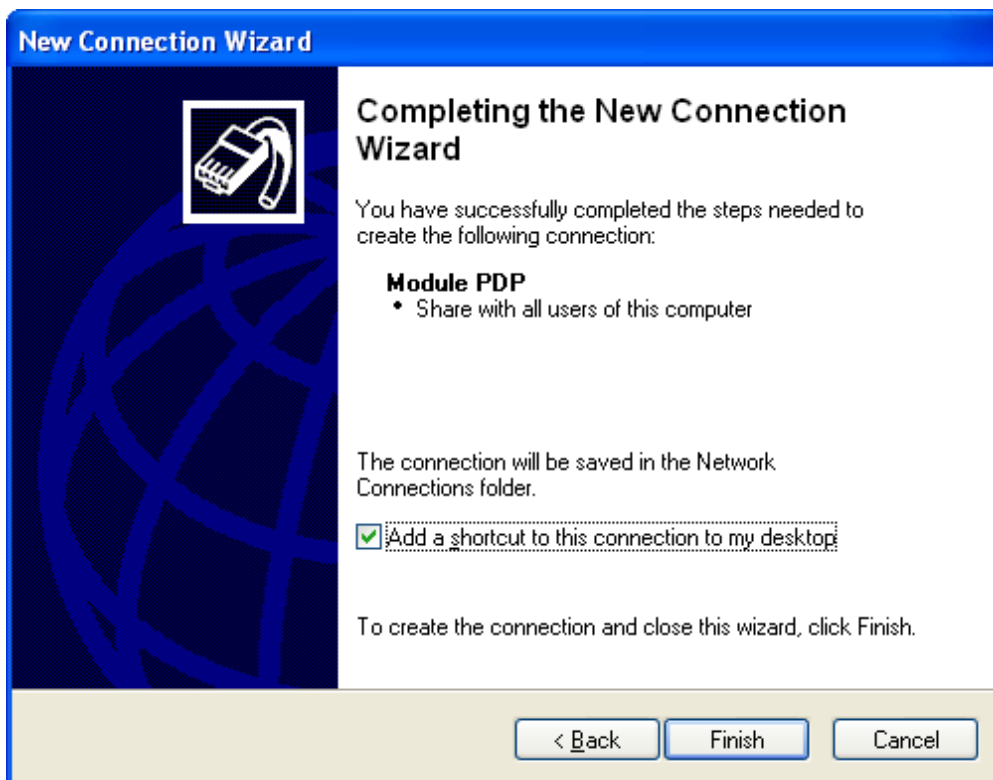


Figure 55: Connection complete.

(11) Then, if your module is registered on the network, you can use the configured dial-up connection to activate a PDP context and make an Internet connection.

Go to Start → Connect to → “Module PDP” and select it.

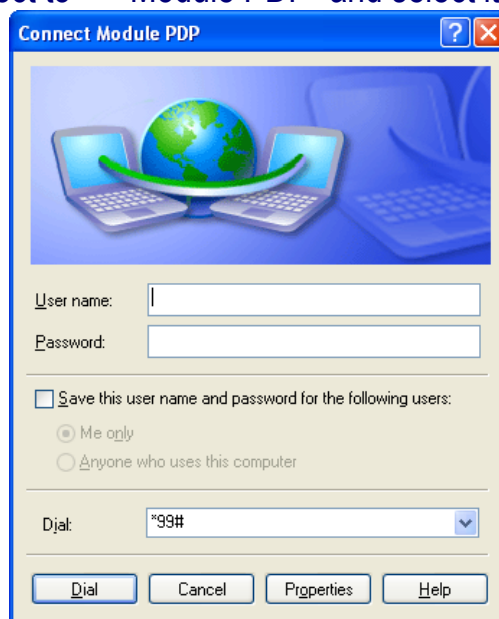


Figure 56: Connect Module PDP.

(12) Click the dial button. After a while, a connection to the Internet is made.

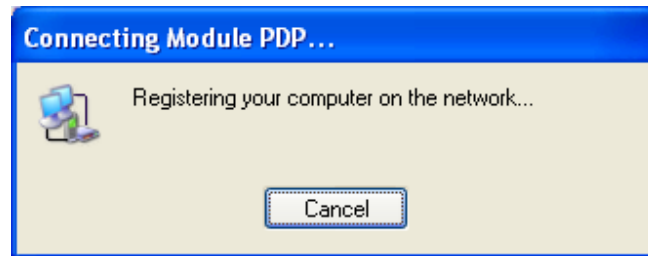


Figure 57: Connecting Module PDP.

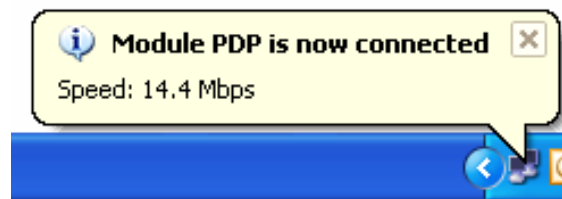


Figure 58: Module PDP is now connected.

(13) To disconnect, go to the appropriate network systray icon and select “Disconnect” from the context menu (via right mouse button).

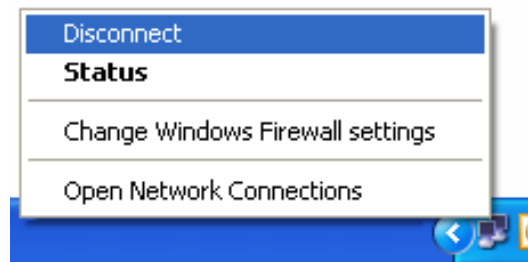


Figure 59: Disconnecting Module PDP.

9.1.2 *On Windows Vista*

(1) Go to Start→ Control Panel→ Network and Internet check the option “Connect to the Internet”. Choose Dial-up connection as connection method. If there is already an existing connection, select “No, create a new connection” and then choose Dial-up connection as connection method.

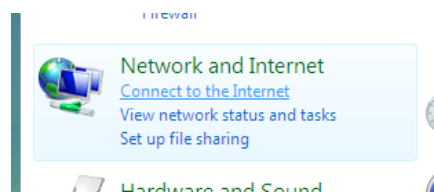


Figure 60: Connect to the Internet.

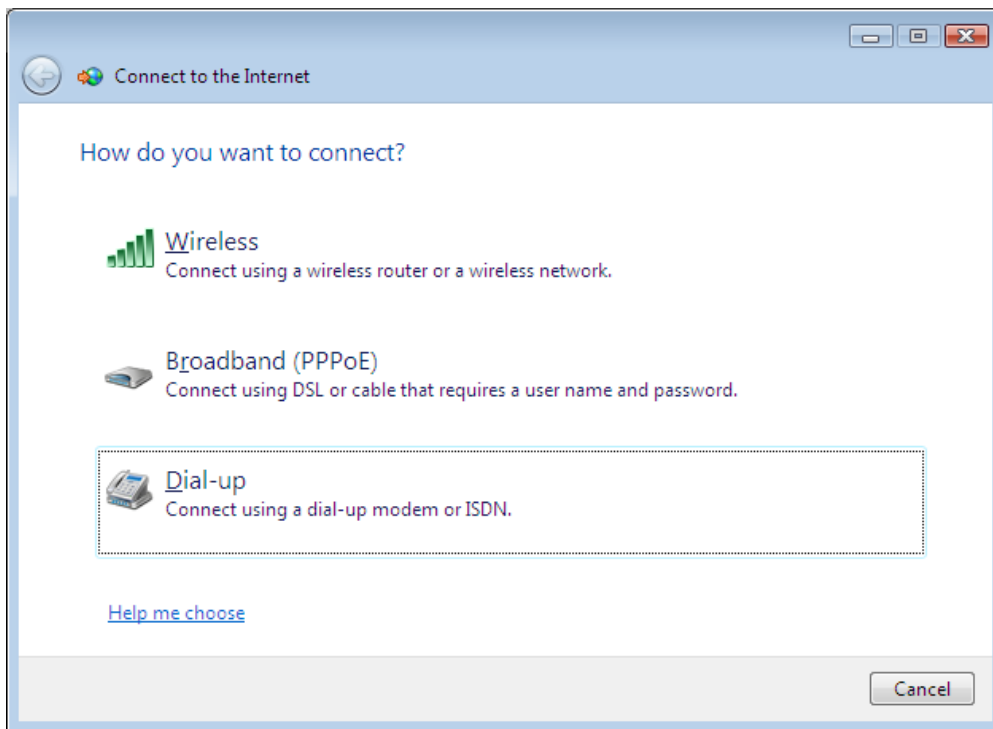


Figure 61: Select a Dial-up connection.

(2) The next dialog will ask for the modem to be use. Select the GlobeTrotter® modem:

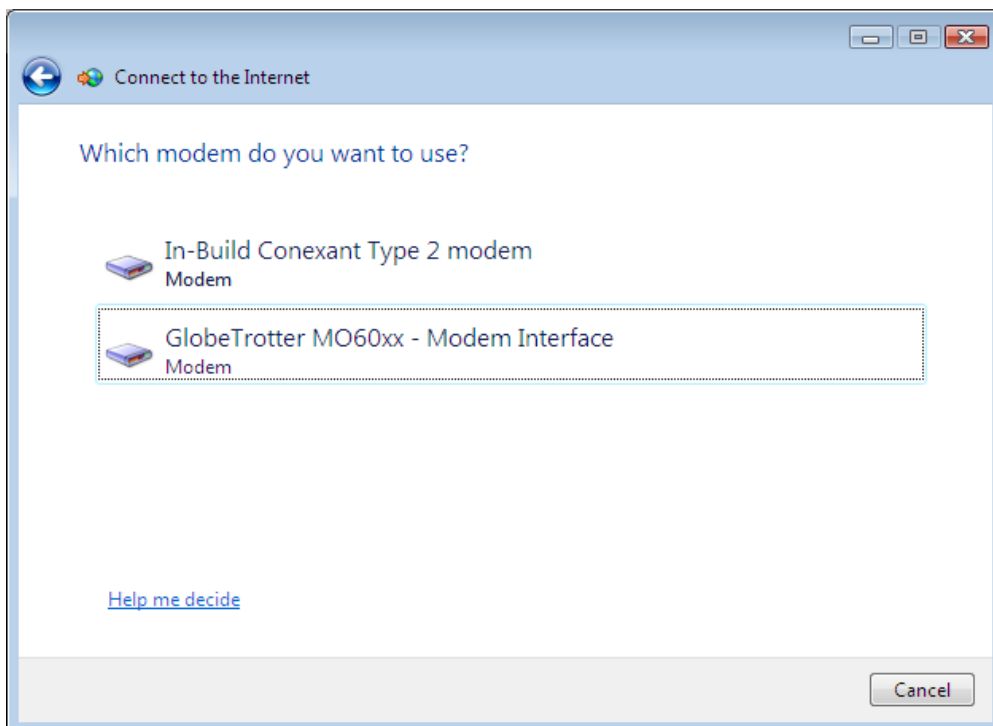


Figure 62: Select the GlobeTrotter® modem.

(3) Next, Windows needs your ISP information. Enter the telephone number *99# and click “Connect”.

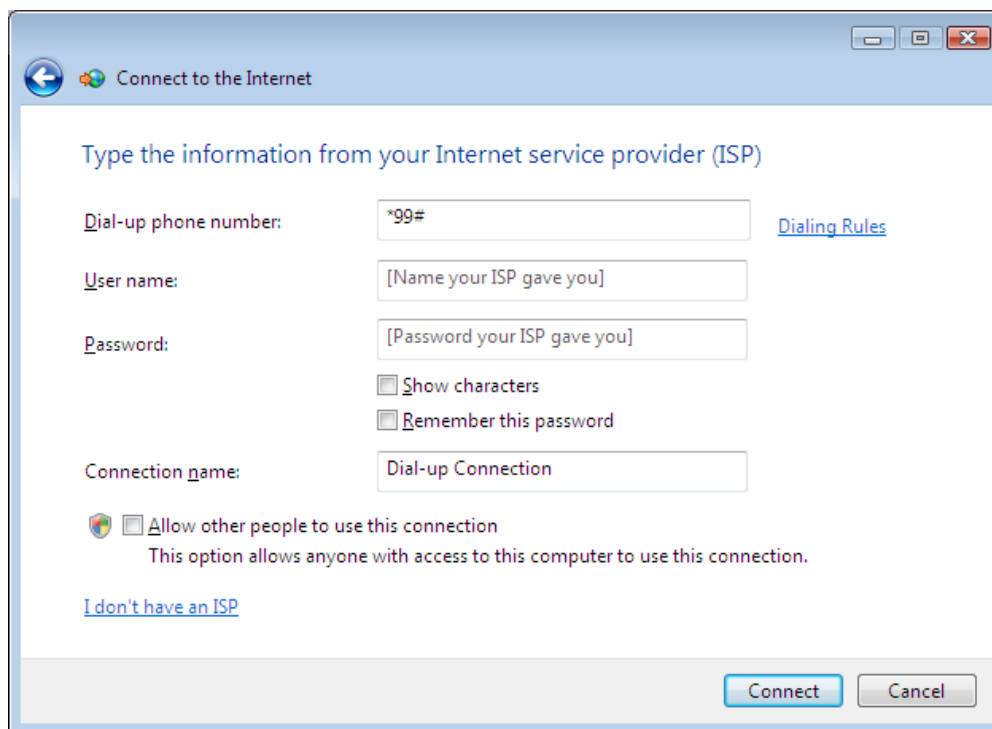


Figure 63: Settings for Dial-up connection.

(4) In the following screens, you can monitor the progress as Windows sets up the connection:

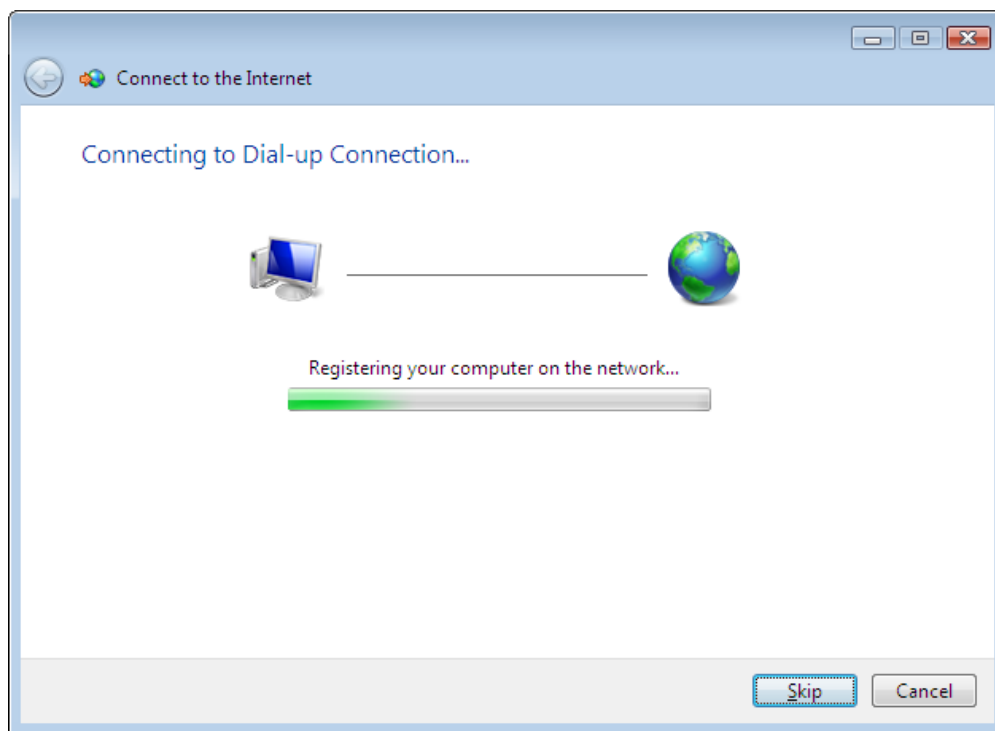


Figure 64: Connecting...

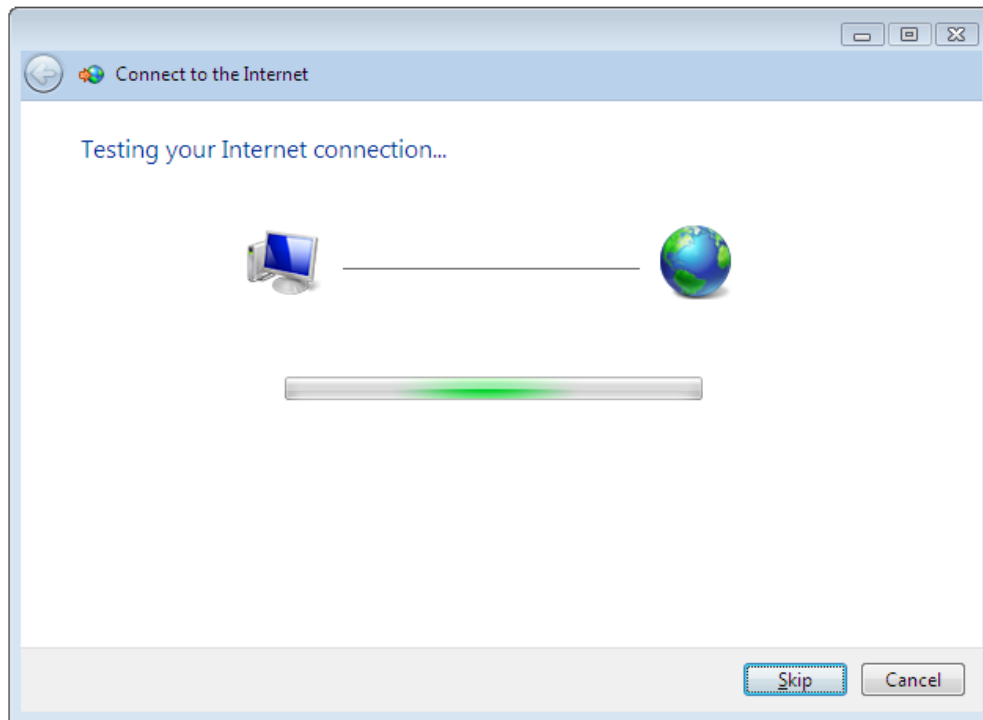


Figure 65: Testing... (This step can be skipped)

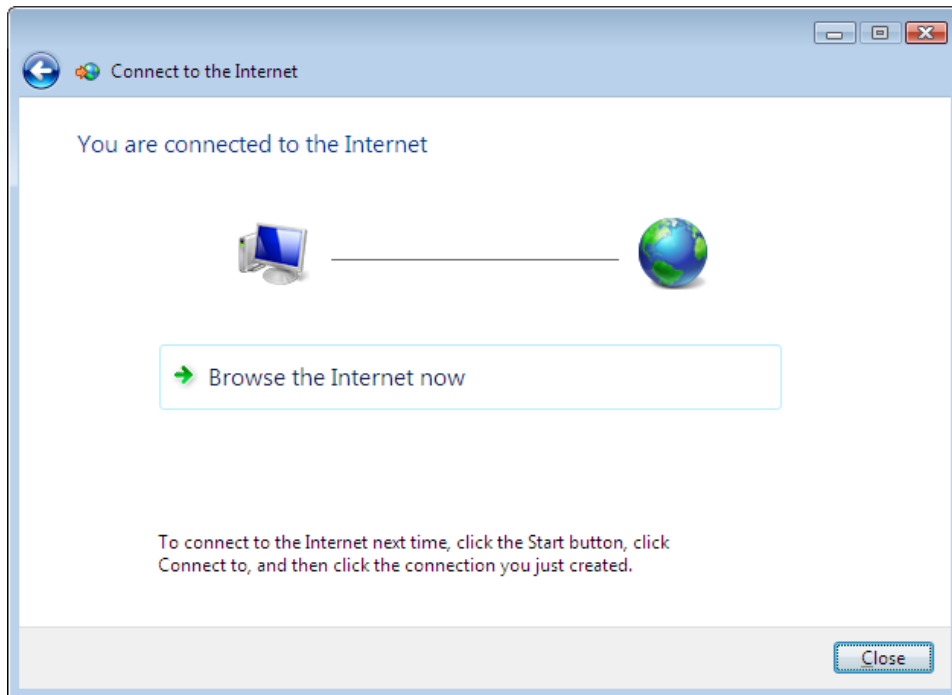


Figure 66: Connected.

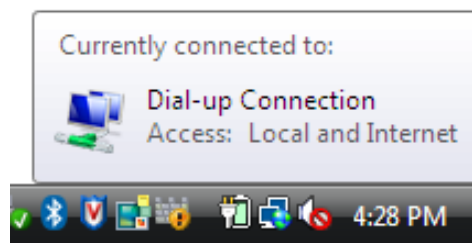


Figure 67: Connected.

(5) To disconnect, go to the appropriate network systray icon and select “Disconnect” from the context menu (via right mouse button).

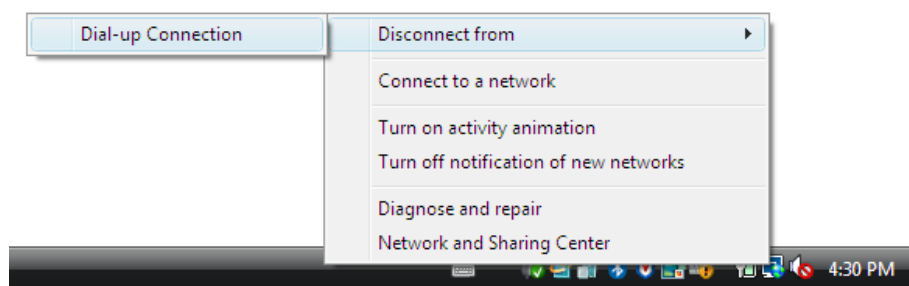


Figure 68: Disconnecting.

(6) From now on, to redial using the GlobeTrotter®, go back to Start→Control Panel. Under “Network and Internet”, click the option “Connect to the Internet”. Windows will show you a list of connections that you have defined before. Select the one that you have set up in this section.

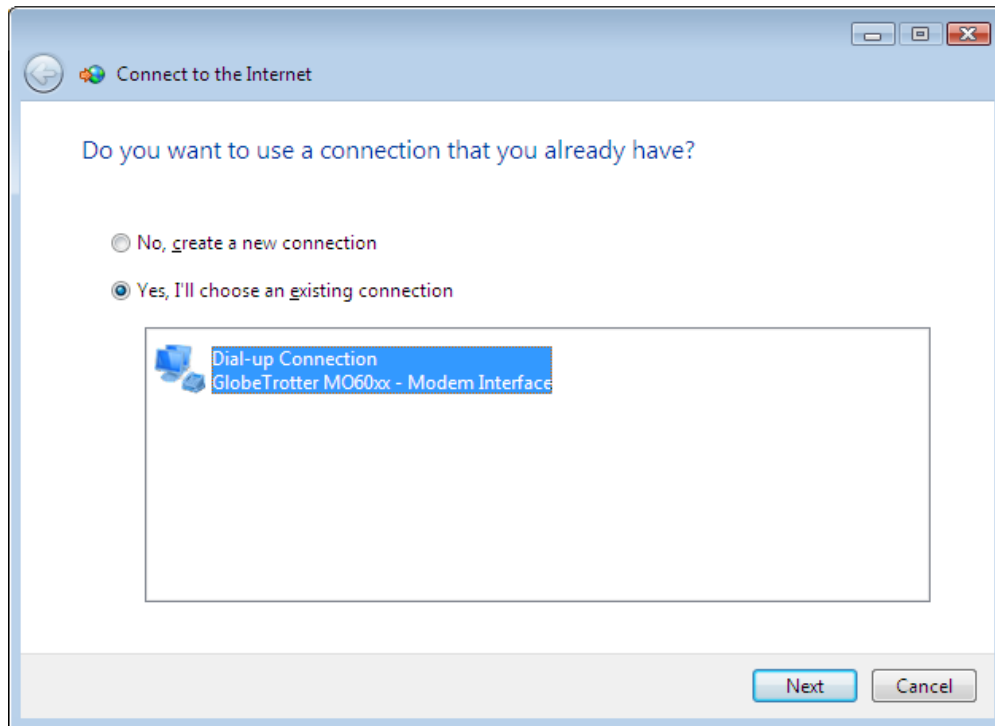


Figure 69: Select your connection.

9.1.3 *On Windows 7*

To setup a Dial-up connection on windows 7, steps 1 to 4 from section 9.1.2 can be followed.

(1) After pressing the connect button on step 3, the device will start the connection and test it once it is ready.

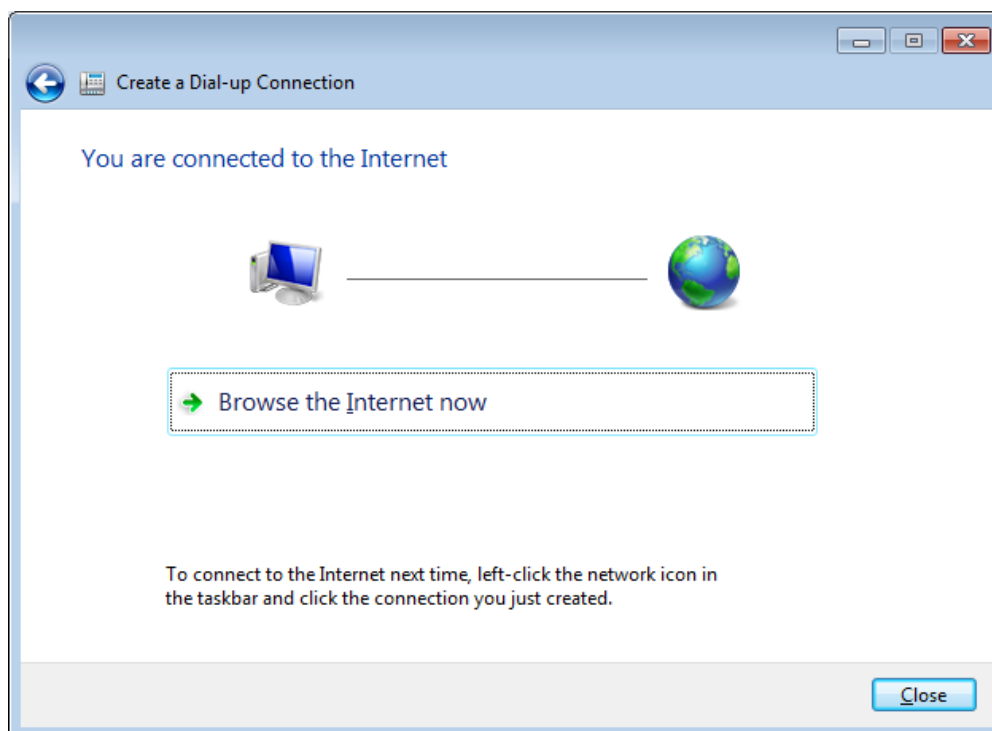


Figure 70: Connected.

(2) The connection can be also checked on the appropriate network systray icon:



Figure 71: Connected on systray.

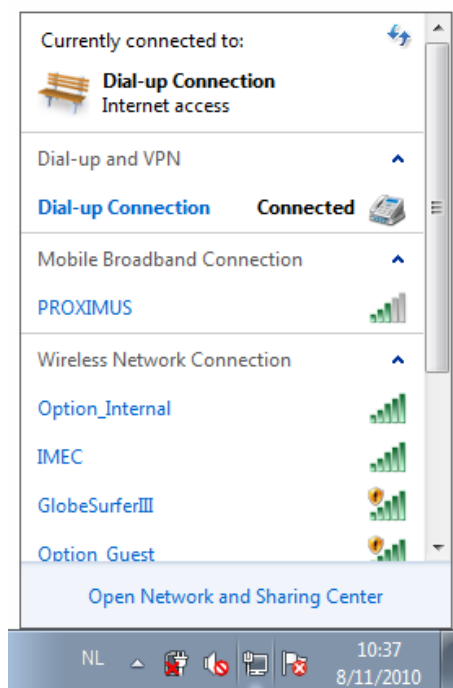


Figure 72: Connected.

(3) To disconnect, go to the appropriate network systray icon and open the available connections (via left mouse button). Select the Dial-up connection and left click on it. Press the “Disconnect” button from menu.

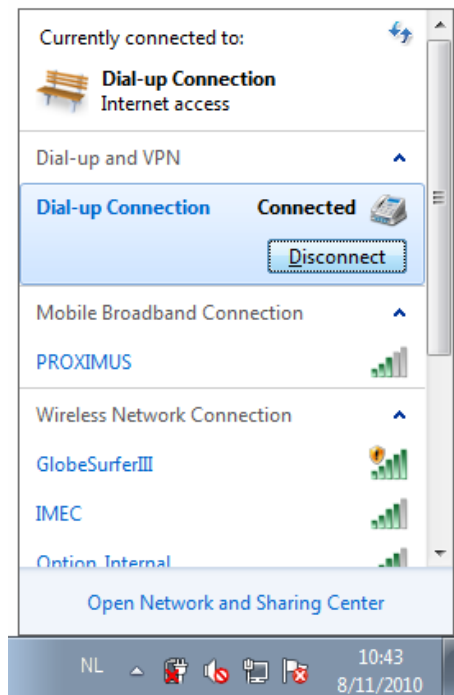


Figure 73: Disconnecting.

(4) From now on, to redial using the GlobeTrotter®, go to the appropriate network systray icon and open the available connections (via left mouse button). Select the Dial-up connection and left click on it. Press the “Connect” button from menu.

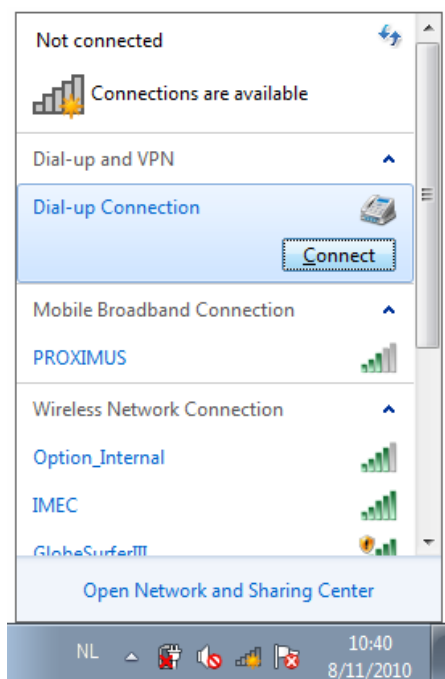


Figure 74: Reconnect using the Dial-up connection.

9.2 Using NDIS interface

9.2.1 On Windows XP/Vista (Applet)

- (1) Locate the executable file: Your Option contact has provided you with a ".cpl" file. This is the dashboard applet.
- (2) Double click on the file appropriate for your operating system. If you have a 32 bit OS choose the filename ending with 32, if you have a 64 bit OS choose the filename ending with 64.

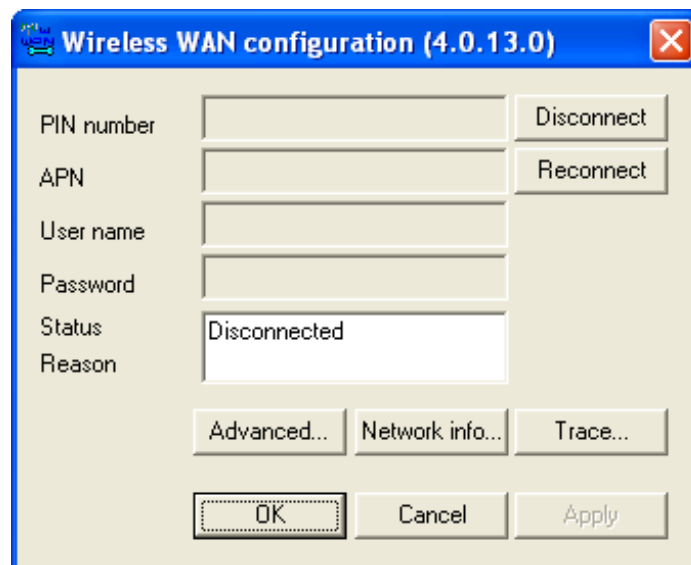


Figure 75: Dashboard Applet.

(3) In the Wireless WAN configuration window press on the *“Reconnect”* button. When a connection is made the status text field will display *“Connected”*.

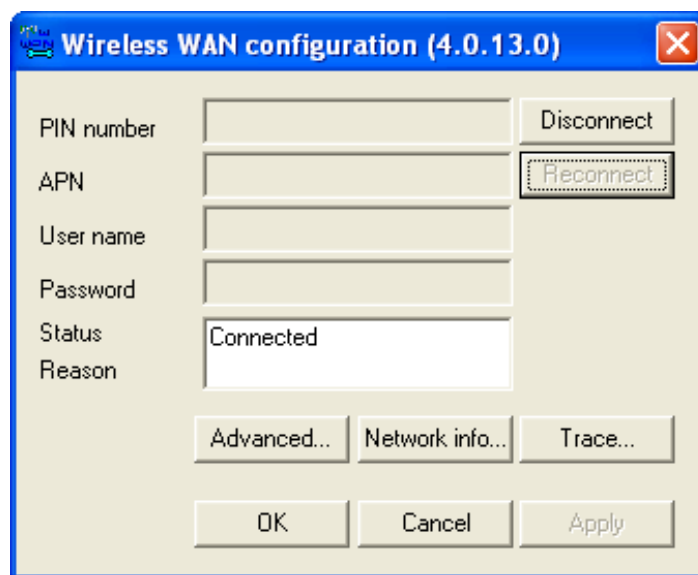


Figure 76: Connected.

(4) To disconnect, simply press on the *“Disconnect”* button. When the device is disconnected the status text field will display *“Disconnected”*.

9.2.2 On Windows 7 (Mobile Broadband)

(1) Go to the appropriate network systray icon and open the available connections (via left mouse button). Select the correct Mobile Broadband Connection (Service Provider name) and left click on it. Press the “Connect” button from menu.

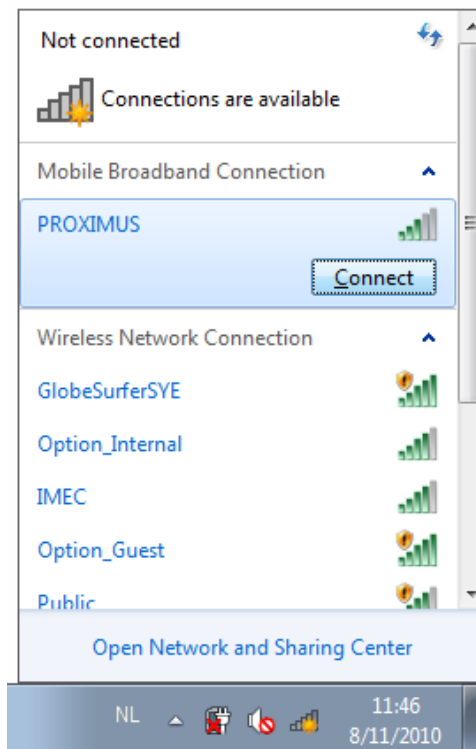


Figure 77: Mobile Broadband connection.

(2) The first time, Mobile Broadband will request the Subscription details to be use for the new connection. Type your subscription settings here and press “Continue”.

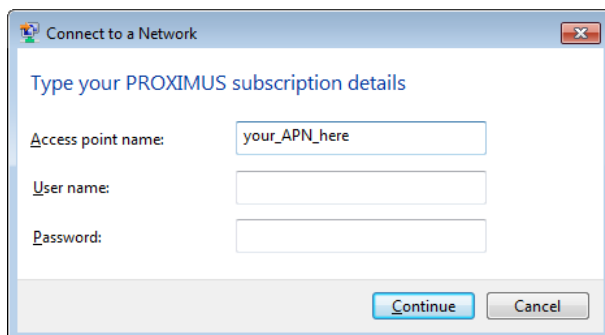


Figure 78: Subscription settings.

(3) Select an option for the “Autoconnect settings”.

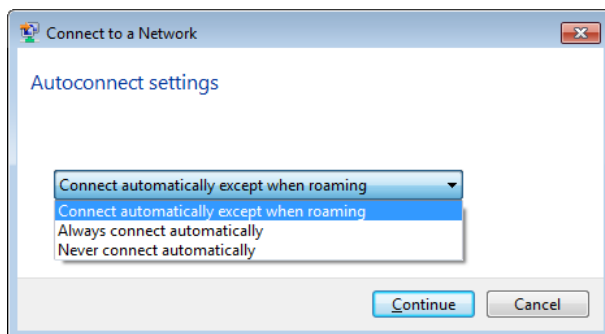


Figure 79: Autoconnect settings.

(4) The Internet connection should be active now. The connection status should be connected.

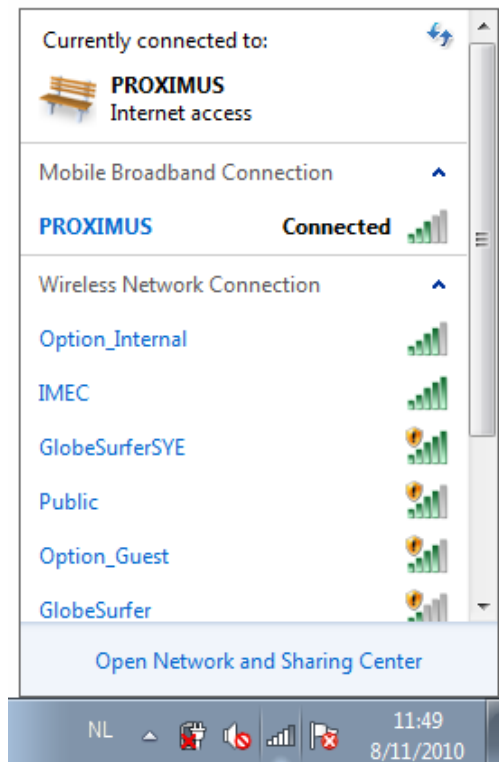


Figure 80: Active Mobile Broadband connection.

(5) To disconnect, go to the appropriate network systray icon and open the available connections (via left mouse button). Select the Mobile Broadband Connection and left click on it. Press the “Disconnect” button from menu.

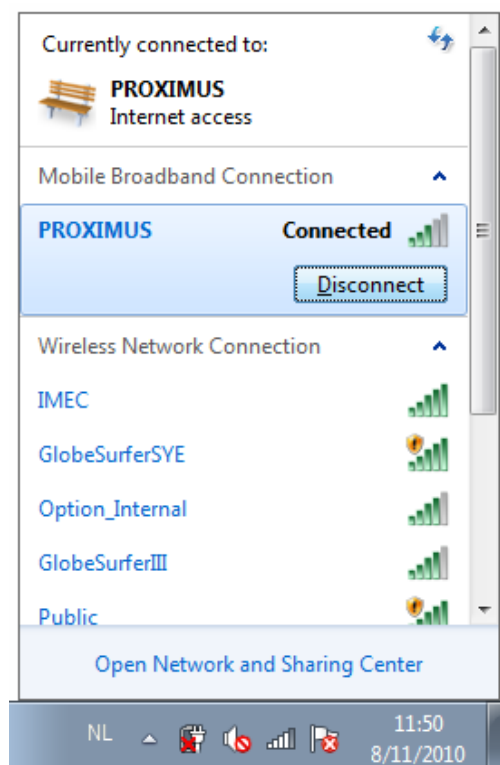


Figure 81: Disconnecting.

10 SET UP A GSM/UMTS VOICE CALL

To be able to make a call, a minimum configuration is needed on the module. For this, a Terminal connection to the application port is needed. Please, refer to section 7 for this matter.

- (1) First of all, be sure that the device is configured as explained in section 8.
- (2) Set switches 1, 2 and 3 to ON state on the Controlling Switch (see section 8) as shown in the following figure:

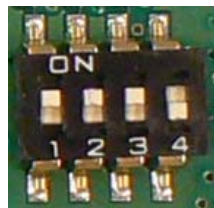


Figure 82: Controlling Switch configuration for voice calls.

NOTE: This configuration is applicable on Evaluation Board Revision 1 (EVB R1). In future Evaluation board, these settings may change.

- (3) Enable the circuit switched data transfer on the modem. This setting is stored in non-volatile memory of the module.

AT_ODO=0

The response to this AT command should be: **OK**

(4) By default, the voice part of the firmware is disabled. This setting needs to be enabled in order to have voice capabilities. This setting is stored in non-volatile memory of the module.

AT_OPCMENABLE=1

The response to this AT command should be: **OK**

(5) A PCM audio profile needs to be configured using the following AT command:

AT_OPMPROF=<value>

Defined values:

- 0 Handset
- 1 Headset
- 2 Speakerphone
- 3 Bluetooth Headset

This setting is stored in non-volatile memory of the module.

The response to this AT command should be: **OK**

(6) To set up a call, you must use the ATD command followed by a telephone number.

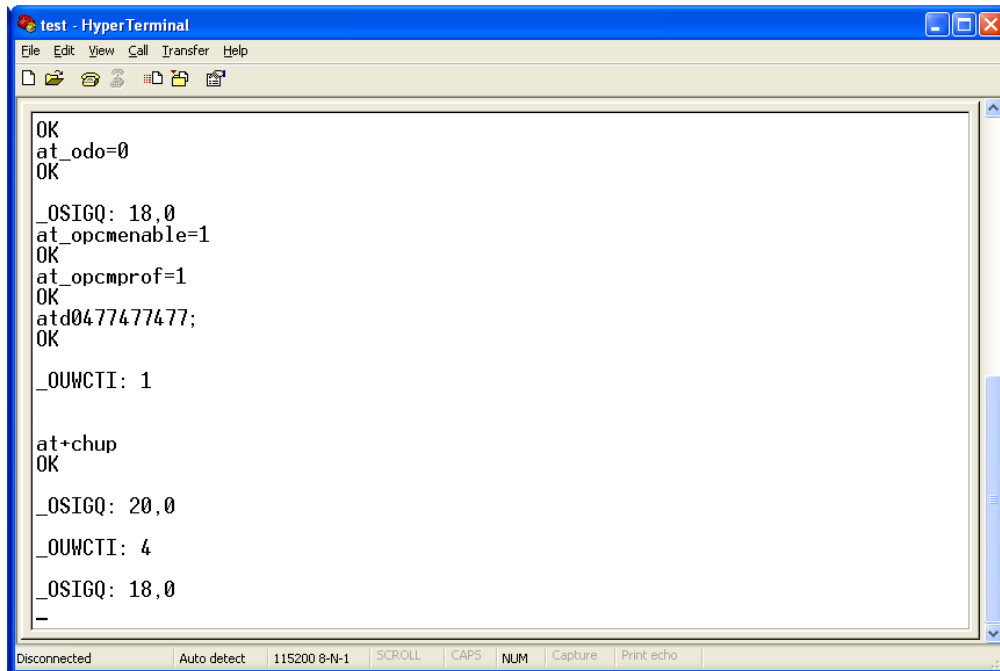
ATD<phone number>;

NOTE: Do not forget the semicolon (;) at the end of the AT command!

The response to this AT command should be: **OK**

Attention! You need to plug in the headset in the specified 2,5” audio connector on the Development kit.

Now the telephone on the other side should answer the paging, and a voice conversation can be made. To stop the conversation, the other side can simply hang-up the. If you want to end the call from your side you can type **AT+CHUP** (The answer to this command should be **OK**). The next figure shows an example voice call setup and termination.



```
test - HyperTerminal
File Edit View Call Transfer Help
OK
at_odo=0
OK
_OSIGQ: 18,0
at_opcmenable=1
OK
at_opcmprof=1
OK
atd0477477477;
OK
_OUWCTI: 1

at+chup
OK
_OSIGQ: 20,0
_OUWCTI: 4
_OSIGQ: 18,0
-
```

Disconnected | Auto detect | 115200 8-N-1 | SCROLL | CAPS | NUM | Capture | Print echo

Figure 83: Voice call example.

11 GPS FEATURES

11.1 *General*

The GTM60x module has built-in support for A-GPS (Assisted GPS) and S-GPS (Standalone GPS) signal processing.

In mobile-assisted GPS (A-GPS) mode, when a request for position location is issued, available network information is provided to the location server (e.g., cell-ID) and assistance is requested from the location server. The location server sends the assistance information to the handset. The handset/mobile unit measures the GPS observables and provides the GPS measurements along with available network data (that is appropriate for the given air interface technology) to the location server. The location server then calculates the position location and returns results to the requesting entity.

In standalone (autonomous) GPS mode (S-GPS), the handset demodulates the data directly from the GPS satellites. This mode has some reduced cold-start sensitivity, and a longer time to first fix compared to the assisted modes. However, it requires no server interaction and works out of network coverage.

This combination of GPS measurements and available network information provides:



- A high-sensitivity solution that works in all terrains: indoor, outdoor, urban and rural.
- High availability that is enabled by using both satellite and network information.

These two GPS solutions on the module provide optimal time to fix, accuracy, sensitivity, availability and reduced network utilization in both these environments, depending on the conditions.

11.2 Set up a GPS connection

The data of the GPS positioning can be monitored from the GPS data interface. Open the Device Manager and check the Interfaces on the module.

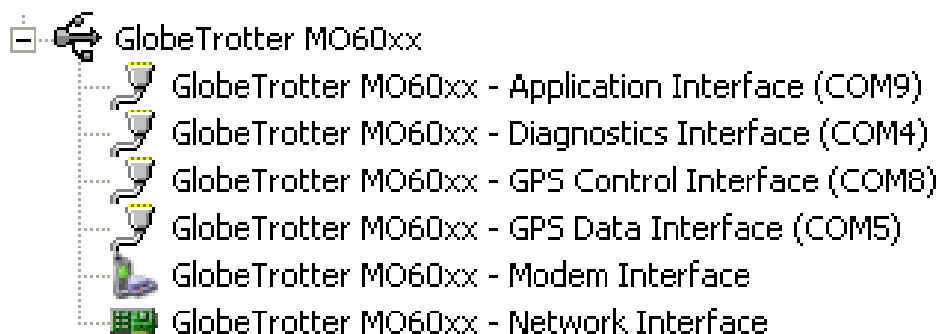


Figure 84: Interfaces on GTM60x

Take note of the GPS data Interface COM port.

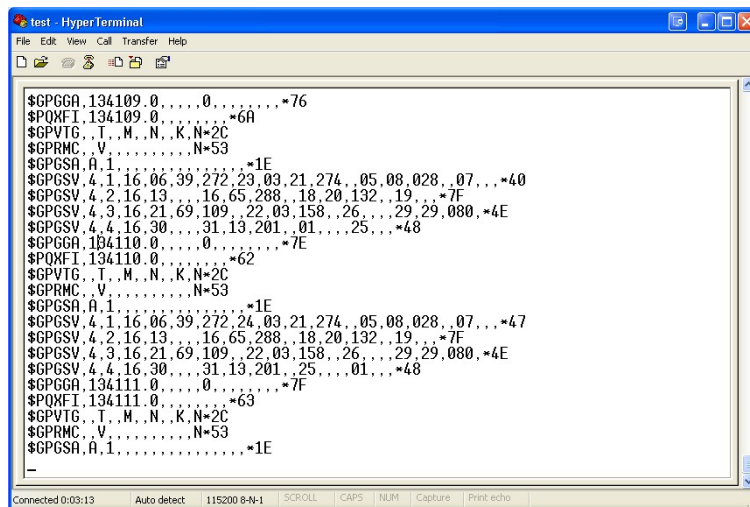
Please, refer to your Option point of contact if the GPS interfaces are not available on your GTM60x.

11.2.1 Enabling GPS positioning

By default, GPS positioning is disabled. To enable, connect to the application port via HyperTerminal and use the command below. The response to this AT command should be OK.

`AT_+OGPS=2`

The next step is connecting to the GPS Data Interface using HyperTerminal. Use the COM port you made note on 11.2. This HyperTerminal should display a series of messages like in the screenshot below.

The screenshot shows a HyperTerminal window titled "test - HyperTerminal" with a menu bar (File, Edit, View, Call, Transfer, Help). The window contains several lines of AT commands and their corresponding responses. The commands include \$GPGGA, \$PQXFI, \$GPVTG, \$GPRMC, \$GPGSA, \$GPGSV, and \$GPRMC. The responses provide various GPS data points such as time of day, position coordinates, and status information. The status bar at the bottom of the window indicates "Connected 0:03:13", "Auto detect", "115200 8-N-1", and other settings like "SCROLL", "CAPS", "NUM", "Capture", and "Print echo".

```
test - HyperTerminal
File Edit View Call Transfer Help
$GPGGA,134109.0,,,0,,,,,*76
$PQXFI,134109.0,,,,*6A
$GPVTG,T,,M,N,K,N*2C
$GPRMC,V,,,,,N*53
$GPGSA,A,1,,,,,*1E
$GPGSV,4,1,16,06,39,272,23,03,21,274,,05,08,028,,07,,,*40
$GPGSV,4,2,16,13,,,16,65,288,,18,20,132,,19,,,*7F
$GPGSV,4,3,16,21,69,109,,22,03,158,,26,,,29,29,080,*4E
$GPGSV,4,4,16,30,,,31,13,201,,01,,,25,,,*48
$GPGGA,134110.0,,,0,,,,,*7E
$PQXFI,134110.0,,,,*62
$GPVTG,T,,M,N,K,N*2C
$GPRMC,V,,,,,N*53
$GPGSA,A,1,,,,,*1E
$GPGSV,4,1,16,06,39,272,24,03,21,274,,05,08,028,,07,,,*47
$GPGSV,4,2,16,13,,,16,65,288,,18,20,132,,19,,,*7F
$GPGSV,4,3,16,21,69,109,,22,03,158,,26,,,29,29,080,*4E
$GPGSV,4,4,16,30,,,31,13,201,,25,,,01,,,*48
$GPGGA,134111.0,,,0,,,,,*7F
$PQXFI,134111.0,,,,*63
$GPVTG,T,,M,N,K,N*2C
$GPRMC,V,,,,,N*53
$GPGSA,A,1,,,,,*1E
-
```

Figure 85: HyperTerminal connected to GPS data interface

11.2.2 Using the GPS in Google Earth

You can test the GPS by displaying your current position in Google Earth. To use the GPS in Google Earth the following steps can be used.

(1) Open Google Earth.

(2) Click the “Tools” dropdown in the menu bar and choose “GPS” . Click on the “Realtime” tab and choose “NMEA” as protocol.

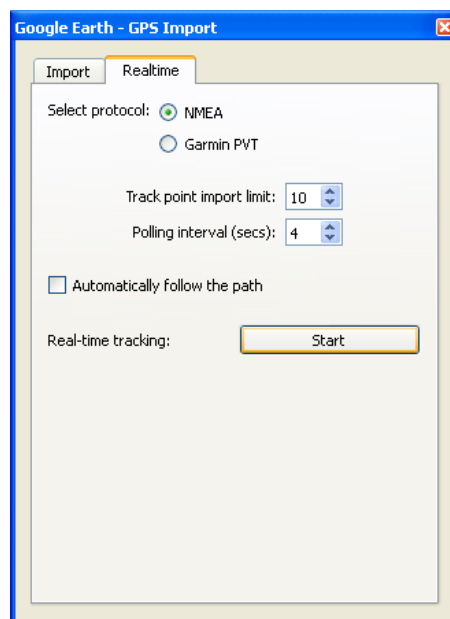


Figure 86: Realtime configuration on Google Earth.

(3) Click *“Start”* . Google Earth will now be able to find your location via GPS. If you want to stop using the GPS, you can click *“Stop”* on the Realtime tab.

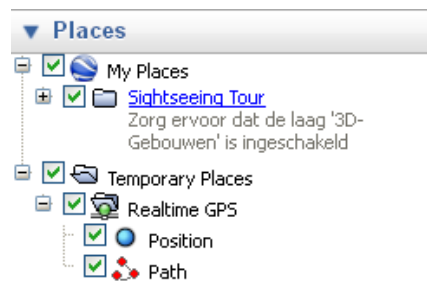


Figure 87: Realtime GPS location found

NOTES: Google Earth will need an active internet connection to find the maps. Google Earth also needs a low COM port number to work.

REFERENCES

Ref	Document
	GTM60x Integration Package

APPENDIX A: LIMITED WARRANTY

HARDWARE: Option® warrants its products to be free from defects in workmanship and materials, under normal use and service, for one year. If a product does not operate as warranted during the applicable warranty period, Option® shall, at its option and expense, repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item. All products replaced will become property of Option®. Replacement products may be new or reconditioned. Option® shall not be responsible for any software, firmware, information or memory data of Customer contained in, stored on, or integrated with any products returned to Option® pursuant to any warranty.

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no warranty that its products will work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or error-free, or that all defects in the products will be corrected. For any third-party products listed in the Option® software product documentation or specifications as being compatible, Option® will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by a “bug” or defect in the third party’s product.

STANDARD WARRANTY SERVICE: Standard warranty service for hardware products may be obtained by delivering the defective product, accompanied by a copy of the dated proof of purchase, to Option®’s Corporate Service Centre or to an Authorized Option® Reseller during the applicable warranty period. Standard warranty service for software products may be obtained by calling Option®’s Corporate Service Centre or an Authorized Reseller, within the warranty period. Products returned to Option®’ Corporate Service Centre must be pre-authorized by Option® with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepared, insured, and packaged appropriately for safe shipment. The repaired or replaced item will be shipped to Customer, at his own expense, not later than thirty (30) days after receipt by Option®.

WARRANTIES EXCLUSIVE: If an Option® product does not operate as warranted above, customer's sole remedy shall be repair or replacement, at Option®'s option. The foregoing warranties and remedies are exclusive and are in lieu of all other warranties, express or implied, either in fact or by operation of law, statutory or otherwise, including warranties of merchantability and fitness for a particular purpose, Option® neither assumes nor authorizes any person to assume for it any other liability in connection with the sale, installation, maintenance or use of its products. Option® shall not be liable under this warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by Customer's or any third person's misuse, neglect, improper installation or testing, unauthorized attempts to repair, or any other cause beyond the range of intended use, or by accident, fire or other hazard.

LIMITATION OF LIABILITY: In no event, whether based in contract or tort (including negligence) shall Option® be liable for incidental, consequential, indirect, special or punitive damages of any kind, or for loss of revenue, loss of business, or other financial loss arising out of or in connection with the sale, installation, maintenance, use, performance, failure, or interruption of its products, even if Option® or its Authorized Reseller has been advised of the possibility of such damages.

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GTM609W

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FCC-ID: NCMOMO6092

IC: 2734A-MO6092

Certification Leaflet

AGENCY REQUIREMENTS

Licensed by QUALCOMM Incorporated under one or more of the following United States Patents and/or their counterparts in other nations: 4,901,307; 5,490,165; 5,056,109; 5,504,773; 5,101,501; 5,506,865; 5,109,390; 5,511,073; 5,228,054; 5,535,239; 5,267,261; 5,544,196; 5,267,262; 5,568,483; 5,337,338; 5,600,754; 5,414,796; 5,657,420; 5,416,797; 5,659,569; 5,710,784; 5,778,338

Federal communications commission notice

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:

- > 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 or television technician for help.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Option could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

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

Avis de conformité aux normes d'Industrie Canada.

Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003 et RSS-210.

Son fonctionnement est soumis aux deux conditions suivantes:

- (1) cet appareil ne doit pas causer d'interférence et*
- (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.*

Exposure Information to Radio Frequency Energy

Users concerned with the risk of Radio Frequency exposure may wish to limit the duration of their calls and to position the antenna as far away from the body as is practical.

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par l'appareil de sans fil Dell est inférieure à la limite d'exposition aux fréquences radio d'Industry Canada (IC). Utilisez l'appareil de sans fil Dell de façon à minimiser les contacts humains lors du fonctionnement normal.

Ce périphérique a été évalué et démontré conforme aux limites SAR (Specific Absorption Rate – Taux d'absorption spécifique) d'IC lorsqu'il est installé dans des produits hôtes particuliers qui fonctionnent dans des conditions d'exposition à des appareils portables (les antennes se situent à moins de 20 centimètres du corps d'une personne).

Ce périphérique est homologué pour l'utilisation au Canada. Pour consulter l'entrée correspondant à l'appareil dans la liste d'équipement radio.

Modular approval

The module can be integrated into fixed or mobile categorized end-products, so that 20 cm separation distance to end-user can be assured. You can integrate the module in a portable device, in this case a permissive change application would be required.

Approbation par module

Le module peut être incorporé à un produit final classé comme fixe ou mobile, mais d'une manière à garantir que l'utilisateur final soit à une distance de 20 cm. Vous pouvez incorporer le module à un appareil portable, et dans ce cas, une demande de changement autorisée serait requise.

Device marking

The integrated device must carry the CE mark and Notified body number of the Notified Body used in the Annex IV conformity assessment of the module on the manufacturing label as described in the R&TTE directive 1999/5/EC Annex VII. This Notified Body approval only applies to the module and not the final integrated product. The final integrated product should undergo its own conformity process to the R&TTE directive and should meet all applicable CE marking directives in order to place the CE mark on the final integrated product.

The end device must also be appropriately marked with the FCC identification, "Contains FCC ID:NCMOMO6092", as described in FCC Part 2.925 and 2.926.

Industry Canada requires the host device to be marked with "Contains transmitter module IC: 2734A-MO6092" conform to section 3.2.1 from the RSS-GEN guidelines.

Marquage du dispositif

Le dispositif incorporé doit porter la marque CE et le numéro de l'organisme notifié utilisé dans l'Annexe IV de l'évaluation de la conformité du module, sur l'étiquette de fabrication, tel que décrit dans l'Annexe VII portant sur les équipements radio et équipements terminaux de télécommunication (« R&TTE »). Cette approbation de l'organisme notifié ne s'applique qu'au module et non au produit final après intégration. Le produit final après intégration devrait être lui-même l'objet d'un processus d'évaluation de la conformité à la directive sur les équipements radio et équipements terminaux de télécommunication et devrait suivre toutes les directives applicables relatives au marquage CE pour placer la marque CE sur le produit final après intégration.

Le dispositif fini doit aussi être marqué, de la manière appropriée, avec l'identification du FCC,

"Contains FCC ID: NCMOMO6092", tel que décrit dans « FCC Part 2.925 » et 2.926. Industrie Canada exige que le dispositif hôte soit marqué sous la forme « Contains transmitter module IC: 2734A-MO6092 » conformément à la section 3.2.1 des directives CNR-Gen.

Manufacturer's Disclaimer Statement

The information in this document is subject to change without notice and does not represent a commitment on the part of the vendor. No warranty or representation, either expressed or implied, is made with respect to the quality, accuracy, or fitness for any particular purpose of this document. The manufacturer reserves the right to make changes to the content of this document and/or the products associated with it at any time without obligation to notify any person or organization of such changes. In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use this product or documentation, even if advised of the possibility of such damages.

For questions regarding your product or declaration, contact:

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SYSTEM REQUIREMENTS

> Must be supplied by a SELV (Safety Extra Low Voltage) circuit with limited power.

European Union declaration of conformity

This product bears the CE marking and complies with the R&TTE Directive (1999/5/EC), EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms:

- Radio Frequency spectrum efficiency:
 - > EN 301 511, v9.0.2
 - > EN 301 908-1, v4.2.1
 - > EN 301 908-2, v4.2.1

- Electromagnetic Compatibility
 - > EN 301 489-1, v1.8.1: 2008
 - > EN 301 489-3, v1.4.1: 2002
 - > EN 301 489-7, v1.3.1: 2005
 - > EN 301 489-24, v1.5.1: 2010
 - > EN 300 440-2, v1.4.1: 2010

- Safety and Health
 - > EN 60950-1: 2006 +A11: 2009

This product may be used in the following countries:

- > All EU Memberstates
- > Iceland
- > Switzerland
- > Norway
- > United States of America

For questions regarding your product or FCC declaration, contact:

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To identify this product we refer to the Part, Series, or Model number found on the product.