Half-size 3G WWAN PCI Express MiniCard module with optional Wi-Fi
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OVERVIEW AND PURPOSE

This document describes the GTM66x/67x Module Development Kit hardware, software and installation instructions. This user guide is applicable for the following products:

<table>
<thead>
<tr>
<th>Commercial Name</th>
<th>Product Number</th>
<th>Wi-Fi</th>
<th>2G Bands</th>
<th>WCDMA Bands</th>
<th>EVDO Bands</th>
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<td>GTM661W</td>
<td>MO6612</td>
<td>No</td>
<td></td>
<td>800-850/900/1900/2100</td>
<td>No</td>
</tr>
<tr>
<td>GTM661E</td>
<td>MO6611</td>
<td>No</td>
<td></td>
<td>900/2100</td>
<td>No</td>
</tr>
<tr>
<td>GTM669W</td>
<td>MO6692</td>
<td>No</td>
<td>All models support 2G quad band: 850Mhz 900Mhz 1800Mhz 1900Mhz</td>
<td>800-850/900/1900/2100</td>
<td>800/1900</td>
</tr>
<tr>
<td>GTM669U</td>
<td>MO6693</td>
<td>No</td>
<td></td>
<td>800-850/1900</td>
<td>800/1900</td>
</tr>
<tr>
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<td>MO6712</td>
<td>✓</td>
<td>850Mhz 900Mhz 1800Mhz 1900Mhz</td>
<td>800-850/900/1900/2100</td>
<td>No</td>
</tr>
<tr>
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<td>MO6711</td>
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<td></td>
<td>900/2100</td>
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</tr>
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<td>800/1900</td>
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<td>MO6793</td>
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This GTM66x/67x WWAN modem is the perfect solution for embedding 2G, 3G, EVDO and Wi-Fi technology in compact devices such as netbooks, tablet PCs, Routes, security cameras, small consumer electronics devices or broadband M2M applications where a standard connector is still preferred.

The GTM66x/67x 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 GTM669/679 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.

The GTM67x also supports IEEE802.11b/g/n(draft) up to 150Mbps.

For evaluation purposes the GTM66x/67x modules are housed in a GIJS cradle, offering a convenient evaluation and development platform.
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 GTM66x/67x integration package.

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

- Module Development Kit.
- 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 half-size PCIe Minicard form factor and the possibility to have Wi-Fi on the same PCIe Minicard interface; this is the perfect module for integration in compact devices such as netbooks, tablet PCs, Routes, security cameras, small consumer electronics devices or broadband M2M applications. The GPS and voice capabilities give this module a unique position.

The Development Kit consists of 2 evaluation boards:
- The main evaluation board (Gijs cradle) mounted on a Padoek antenna board. This cradle provides a standard USB interface, Wi-Fi interface (using a HDMI interface form factor), a SIM card holder, an external power supply and the on board GTM66x/67x module.
- The secondary WiFi board (Gijs express cradle - for GTM671 only). With the main board it is possible to connect the GTM66x/67x module package (No Wi-Fi) to any standard USB host controller. The secondary Wi-Fi board is needed to connect the Wi-Fi interface (via a HDMI cable) to the PCIe bus. This board provides both HDMI and USB interfaces to connect the WWAN modem and the Wi-Fi through the same PCIe interface.

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  DEVKIT PACKAGE CONTENT

Your Module Development Kit comes with the following items:

- Evaluation board (GIJS cradle) containing the GTM66x/67x module
- Secondary Wi-Fi board (GIJS express cradle - only needed in case of GTM67x)
- Padoek R1 board (Antennas board)
- USB cable
- Power adaptor (5VDC / 2A @ 100-240V)
- HDMI cable (only for GTM67x development kit)

The module will have the latest firmware which was available during the assembly of this development kit. Drivers, the latest version of the firmware and the dashboard applet will be available via extranet:

https://extranet.option.com

Username: GTM6xx
Password: GTM6xx

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: Main evaluation board (GIJS cradle).
Points of interest (See Figure 2):
1) GTM66x/67x PCI Express Minicard Module.
2) PCI Express connector.
3) Main Wi-Fi antenna connector.
4) Auxiliary RF antenna connector/GPS antenna connector.
5) Auxiliary Wi-Fi antenna connector.
6) Main RF antenna connector.
7) SIM card holder.
8) Wi-Fi activity LED: This LED indicates WLAN activity.
9) Registration and USB activity LED: This LED indicates that the module has registered to the mobile network when it is continuously on. Also indicates USB communication activity when the LED is blinking.
10) Power LED: Indicates that GTM66x/67x is powered.
11) Wi-Fi interface: Wi-Fi interface on a HDMI form factor to connect to the secondary Wi-Fi board (See Figure 3).
12) Power plug.
13) Mini USB connector (male).
14) 2.5mm Audio jack and headset (for voice enabled modules).
15) Audio Reset button: Audio CODEC chip reset button.
16) Controlling Switch.*
17) UART: External debugging interface.*
18) Option internal connector.
19) Controlling Interface.*
20) Option internal connector.
Points of interest (See Figure 3):

1) HDMI connector for Wi-Fi interface on Main evaluation board (See Figure 2).
2) USB connector for GTM66x/67x modem connectivity.
3) PCI Express connector.
Points of interest (See Figure 4):

1) Main RF antenna.
2) Auxiliary RF antenna/GPS antenna.
3) Main Wi-Fi antenna.
4) Auxiliary Wi-Fi antenna.
5) Dedicated GPS antenna (No RF diversity).
6) LNA connector (Option internal).
7) Power connectors (Option internal).

* See detailed description.
4.2 Detailed description

4.2.1.1 Controlling Switch

**Switches:**

(1) Switch to change from PCM to UART
   Values: ON = PCM, OFF = UART
   Default value: ON.

(2) Selection of bit format.
   Values: ON = LINEAR, OFF = COMPANDING
   Default value: ON = LINEAR.

(3) Switch to mute the ear piece on the audio jack.
   Values: ON = EAR ON, OFF = EAR OFF
   Default value: ON.

(4) Switch to mute the microphone on the audio jack.
   Values: ON = MIC ON, OFF = MIC OFF
   Default value: ON.

* Be aware that the numbers mentioned on the switch are not the correct ones. The correct numbers are mentioned on the PCB, next to the switch.
4.2.1.2 UART

Figure 6: UART Specification

4.2.1.3 Controlling Interface

Figure 7: Controlling Interface 1 Specification.

* To be able to use these connectors it is needed to remove the stuffed PCM chip from the GIJS cradle. For more information contact your Option point of contact.
** For future implementation.
4.3 Installation

(1) Start by screwing the Main evaluation board (Figure 2) on the Padoek R1 board (Figure 4) as shown on Figure 8 (these two boards should already come screwed on the Module Development Kit). This is very important to maintain the ground connection between the two boards for the correct antenna performance.

Figure 8: Main evaluation board on Padoek R1 board
(2) Connect all antennas, RF and Wi-Fi (See NOTES 1 and 2), to the GTM66x/67x and to the correspondent antenna on the Padoek R1 board (the standard antenna connections should already come on the Module Development Kit).

NOTE 1: Wi-Fi antennas are only needed if using GTM67x. It is very important to plug the Wi-Fi antennas on both main (3) and auxiliary (5) antenna connectors on the module before starting to use the Wi-Fi functionality.

NOTE 2: The Dedicated GPS antenna (5) on the Padoek R1 board is only intended on applications that do not need Auxiliary RF antenna (2). To use it, simply change the antenna connector from the Auxiliary RF antenna (2) towards the Dedicated GPS antenna (5).
(3) Insert your SIM card in the SIM card holder (7). Do this by pushing the SIM card in the cardholder until it clicks into place.

![Figure 10: SIM card holder.](image)

(4) Connect the mini USB connector to the USB plug (13). If Wi-Fi and voice are necessary, insert your HDMI cable into the Wi-Fi interface (11) and your headset on the audio jack (14).

![Figure 11: HDMI, Power, USB and Headset connectors.](image)

NOTE: The Wi-Fi interface (11) is only intended to be used when GTM67x is housed on the GIJS cradle. If GTM66x is housed on the GIJS cradle, Wi-Fi is not available and therefore the Wi-Fi interface should remain disconnected.
(5) Confirm that the controlling switch is on the default position explained on section 4.2.1.1.

![Controlling switch on default position](image1)

**Figure 12: Controlling switch on default position.**

(6) If GTM66x is in use, the secondary board is not needed and the other end of the USB cable can be directly connected to the computer. If GTM67x is in use, follow steps (7) and (8) to connect your device on the computer.

(7) Connect the other end of the HDMI cable to the HDMI connector on the secondary Wi-Fi board (1). Connect the other end of the USB cable to the USB connector on the secondary Wi-Fi board (2).

![Connections on secondary Wi-Fi board](image2)

**Figure 13: Connections on secondary Wi-Fi board.**

(8) Connect the Secondary Wi-Fi board on the computer using an available PCI express connector.

(9) Finally connect the power adaptor to the power plug (12) as shown in Figure 11.

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

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 installation of the GTM67x differs in one section with the GTM66x, and other Option devices, due to the Wi-Fi interface. For this Wi-Fi interface an installation package is provided on extranet. The installation procedure for the Wi-Fi interface is explained on section 5.1.3.

For more information about the driver package structures, review the APPENDIX A: PACKAGES CONTENT.

5.1 Driver installation on Windows XP

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. The installation procedure for the modem driver is explained on section 5.1.2.

5.1.1 General info: Driver set

On successful installation of all drivers, including the Wi-Fi drivers for GTM67x, 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 and PCI devices. Be aware that the list of devices may differ depending on the module configuration.
Notice that the Wi-Fi interface on the GTM67x is installed in a PCI interface instead of a USB interface.
5.1.2 **Modem installation procedure**

Make sure you have a clean system before continuing with the installation procedure.

Check on extranet to acquire the latest driver version. This driver package can contain either an executable file (setup.exe) for automatic installation or just the driver files for manual installation.

https://extranet.option.com
Username: GTM6xx
Password: GTM6xx

At this point you should copy the driver package to a known location on your hard disk drive and, depending on the driver package content, proceed with the automatic or manual installation.

NOTE: At the time of this writing the latest driver version was version 5.2.1.0.

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” contained on the driver package downloaded from the extranet. 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 GTM66x/67x 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 14 on the USB interface.

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 15: Balloon message “Found New Hardware” for the Modem.
(2) In the first dialog ("Can Windows connect to Windows Update to search for software?"), select “No, not this time”.

![Figure 16: Welcome to the Found New Hardware Wizard](image)

(3) In the next dialog, select “Install from a list or specific location (Advanced)”. Select the option “Include this location in the search:” and enter the correct path to your drivers.
Figure 17: Install the software automatically (Recommended)

Figure 18: Install from a list or specific location (Advanced)
(4) Click “Finish” in the next screen “Completing the Found New Hardware Wizard”.

![Found New Hardware Wizard](image)

Figure 19: Completing the Found New Hardware Wizard

(5) Repeat steps 2 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 all typical installed devices. Please configure the device manager by selecting “View”, “Devices by connection” (See Figure 14).

NOTE: Be aware that the Wi-Fi interface for GTM67x will fail installing to install with this procedure due to a lack of Wi-Fi drivers on the standard option drivers 5.2.x.x. For Wi-Fi interface installation, please refer to section 5.1.3.
Figure 20: No drivers found for the Network controller.

Figure 21: Cannot install the hardware.
Figure 22: Problem occurred during Hardware installation.
5.1.3 Wi-Fi installation procedure (GTM67x)

Since the Wi-Fi interface is not yet installed on the computer, it will still be recognized as a New Network controller.

![Diagram of network controllers and hubs]

Figure 23: New Network Controller.
Check on extranet to acquire the latest Wi-Fi driver version. This Wi-Fi driver package will contain an executable file (setup.exe).

https://extranet.option.com
Username: GTM6xx
Password: GTM6xx

At this point you should copy the driver package to a known location on your hard disk drive and proceed with the installation.

1. Open the installation package for the Wi-Fi interface obtained from the extranet and execute the installer called “setup.exe”.

2. Choose a proper language for the installation and click “Next”. In this document, English has been used.

Figure 24: Language selection.
(3) Click “Next” on the Atheros Client Installation Program window.

Figure 25: Atheros Client Installation Program.

(4) Read and Accept the License agreement. Click “Next”.

Figure 26: License Agreement.
(5) Choose the first setup type called “Install Client Utilities and Driver” and click “Next”. Be sure that the device is already connected to the PC.

![Figure 27: Setup Type.](image)

(6) Choose the destination and click “Next”.

![Figure 28: Choose Destination Location.](image)
(7) Select a program folder and click “Next”.

Figure 29: Select Program Folder.

(8) Read the important note and click “Next”.

Figure 30: Important note.
(9) Select to use the Atheros Client Utility (ACU) to control this new Wi-Fi interface and click “Next”.

![Figure 31: Choosing ACU to control the new Wi-Fi interface.](image)

(10) A reboot will be needed when choosing the previous option. Click “Yes” when the following message appears.

![Figure 32: Reboot needed.](image)
(11) A final message will be shown before the installation starts. Click “OK” when the following message appears.

![Final installation message](image)

Figure 33: Final installation message.

(12) The installation will start installing the device drivers and the ACU. The installation can be cancelled at any time by clicking on the “Cancel” button.

![Installation in progress](image)

Figure 34: Installation in progress.
(13) When the installation is finish, reboot the computer by selecting the “Yes, I want to restart my computer now” option and clicking on the “Finish” button.

![Image of Atheros Client Installation Program]

Figure 35: Restart now.

(14) After the restart, the Device Manager will show a new Network device called “Option GTM67x PCIe WiFi Adapter” as shown in Figure 14.
5.2 **Driver installation on Windows Vista**

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. The installation procedure for the modem driver is explained on section 5.2.2. The installation procedure for the Wi-Fi interface is explained on section 5.2.3.

5.2.1 **General info: Driver set**

On successful installation of all drivers, including the Wi-Fi drivers for GTM67x, 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 and PCI devices. Be aware that the list of devices may differ depending on the module configuration.

![Figure 36: Ports occupied by the GTM66x/67x](image)

Notice that the Wi-Fi interface on the GTM67x is installed in a PCI interface instead of a USB interface.
5.2.2 Modem installation procedure

Make sure you have a clean system before continuing with the installation procedure.

Check on extranet to acquire the latest driver version. This driver package can contain either an executable file (setup.exe) for automatic installation or just the driver files for manual installation.

https://extranet.option.com
Username: GTM6xx
Password: GTM6xx

At this point you should copy the driver package to a known location on your hard disk drive and, depending on the driver package content, proceed with the automatic or manual installation.

NOTE: At the time of this writing the latest driver version was version 5.2.1.0.

5.2.2.1 Automatic installation

(1) Without the cradle being connected, run the driver installer “setup.exe” contained on the driver package downloaded from the extranet. 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 GTM66x/67x to the laptop as described in section 4. Windows Vista will recognize the device and start installing drivers. No user interaction is required.

Figure 37: 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 38: 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 36.

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 39: Windows needs to install driver software](image)

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

![Figure 40: More installation options.](image)
(4) Select “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.
(6) Windows will now start with the installation of driver software.

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

Figure 43: 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 36).

NOTE: Be aware that the Wi-Fi interface for GTM67x will fail installing to install with this procedure due to a lack of Wi-Fi drivers on the standard option drivers 5.2.x.x. For Wi-Fi interface installation, please refer to section 5.1.3.
Figure 44: Unable to install Network Controller.

Figure 45: problem occurred during Hardware installation.
5.2.3 Wi-Fi installation procedure (GTM67x)

Since the Wi-Fi interface is not yet installed on the computer, it will still be recognized as a New Network controller.

![Diagram of network controllers](image)

Figure 46: New Network Controller.
Check on extranet to acquire the latest Wi-Fi driver version. This Wi-Fi driver package will contain an executable file (setup.exe).

https://extranet.option.com

Username: GTM6xx
Password: GTM6xx

At this point you should copy the driver package to a known location on your hard disk drive and proceed with the installation.

(1) Since the installation on Windows Vista is the same as in Windows XP, follow the procedure explained on section 5.1.3, steps (1) to (13).

(2) After the restart, the Device Manager will show a new Network device called “Option GTM67x PCIe WiFi Adapter” as shown in Figure 36.
5.3 Driver installation on Windows 7

The driver set described in this section supports Windows 7 32/64 bit edition. The driver name should be 5.1.x.x. The installation procedure for the modem driver is explained on section 5.3.2. The installation procedure for the Wi-Fi interface is explained on section 5.3.3.

5.3.1 General info: Driver set

On successful installation of all drivers, including the Wi-Fi drivers for GTM67x, 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 and PCI devices. Be aware that the list of devices may differ depending on the module configuration.

Notice that the Wi-Fi interface on the GTM67x is installed in a PCI interface instead of a USB interface.
5.3.2  *Modem installation procedure*

Make sure you have a clean system before continuing with the installation procedure.

Check on extranet to acquire the latest driver version. This driver package can contain either an executable file (setup.exe) for automatic installation or just the driver files for manual installation.

At this point you should copy the driver package to a known location on your hard disk drive and, depending on the driver package content, proceed with the automatic or manual installation.

**NOTE:** At the time of this writing the latest driver version was version 5.1.38.0.

5.3.2.1  *Automatic installation*

(1) Without the cradle being connected, run the driver installer “setup.exe” contained on the driver package downloaded from the extranet. 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 GTM66x/67x 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.

![Installing device driver software](image)

Figure 48: Installing device driver software.

(2) Windows will fail to install the correct drivers

![Device driver software was not successfully installed](image)

Figure 49: Failing installing the correct drivers.
(3) Open the device manager by searching for it in the start menu search field and clicking on it.

![Device manager showing Globetrotter HSUPA Modem](image1)

Figure 50: Device drivers not installed

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

![Update Driver Software](image2)

Figure 51: Update Driver Software.
(5) Choose “Browse my computer for driver software”.

![Figure 52: Browse my computer for driver software.](image)

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

![Figure 53: Browse for driver software on your computer](image)
(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 54: Windows Security to install unsigned drivers.](image)

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

![Figure 55: The software for this device has been successfully installed.](image)
(9) Repeat the process starting from 4 to 8 for all other remaining unknown devices. Except for the Network Controller located on the PCI interface.

![Diagram of remaining unknown devices]

Figure 56: 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 47).


5.3.3 Wi-Fi installation procedure (GTM67x)

Since the Wi-Fi interface is not yet installed on the computer, it will still be recognized as a New Network controller.

Check on extranet to acquire the latest Wi-Fi driver version. This Wi-Fi driver package will contain an executable file (setup.exe).
At this point you should copy the driver package to a known location on your hard disk drive and proceed with the installation.

(1) Since the installation on Windows 7 is the same as in Windows XP, follow the procedure explained on section 5.1.3, steps (1) to (13).

(2) After the restart, the Device Manager will show a new Network device called “Option GTM67x PCIe WiFi Adapter” as shown in Figure 47.
6  FIRMWARE UPGRADE

This section describes the procedure to make a firmware upgrade on the GTM66x/67x (on windows). Be aware that firmware upgrade is not always mandatory and that should only be performed if there is a need to add firmware fixes or new features into the GTM60x. This section can be skipped if no new firmware is available or if the update is not needed for the user purposes.

NOTE: At the time of this writing the latest firmware version was version 1.7.4.0. Check on extranet to acquire the latest firmware version package (if any).

For more information about the firmware package structure, review the APPENDIX A: PACKAGES CONTENT.

(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 file “Blacktip_NYOS_fw_v[new_firmware_version].exe”. A window will open like in the screenshot below.
(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.
7 HOW TO SEND AT COMMANDS

This section briefly describes how to send AT commands using HyperTerminal to communicate with the GTM66x/67x.

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:

![Run device manager](image)

(2) Check the port used by the application interface. In this example, the application port is COM9. NOTE: In Windows 7 the application interface is called the Control Interface.
(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.
(4) Just click “OK” on the “Phone and Modem Options” screen.

Figure 63: Location information.
(5) Enter a name for your HyperTerminal connection and press OK.

Figure 64: Connection Description
(6) In the next window, change the “Connect using:” field to the application port you checked under (2). Click OK.
(7) Now the next window will appear. Modify the “Bits per second” field to 115200 and click OK.
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.

![Typical HyperTerminal session](image)

Figure 67: 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 GTM66x/67x CONFIGURATION

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

Configuring the GTM66x/67x 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 GTM66x/67x. Finally a connection to the internet is made.

8.1 Radio ON/OFF

The GTM66x/67x 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:

\[ \text{AT+CFUN?} \]

The expected return should be \(+\text{CFUN}=1\) (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:

\[ \text{AT+CFUN}=1 \]

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_OPSYS=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 GTM66x/67x 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 GTM66x/67x will not register until the correct PIN is entered.

8.6 Registration

SMS and data connections are only possible if the GTM66x/67x is registered on a network.
An AT command is use 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 (WCDMA)

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 is on (Figure 2). 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:
(2) Click “Next” and following figure will appear. Select “Connect to the Internet” and click “Next” again.
(3) Select “Set up the connection manually”, and click the “Next” button.

![Figure 70: Manual connection setup.](image)

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

![Figure 71: Connection with dial-up modem.](image)
(5) Select the correct RAS modem (Modem - GlobeTrotter MO66x/67x modem interface), and click the "Next" button.

Figure 72: 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 73: Connection Name.
(7) Type in *99# for the telephone number to dial and click the “Next” button.

Figure 74: Number to dial.

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

Figure 75: Connection Availability.
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.

![New Connection Wizard](image)

**Figure 76: Internet Account Information.**

**NOTE:** Some operators require having the username and password parameters filled even if they are not used for user authentication. On those networks, filling in a dummy username and password allows the modem to make a connection.
(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.

![New Connection Wizard](image)

**Figure 77: 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.
Click the dial button. After a while, a connection to the Internet is made.
(13) To disconnect, go to the appropriate network systray icon and select “Disconnect” from the context menu (via right mouse button).

![Disconnect](image)

Figure 81: 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.

![Network and Internet](image)

Figure 82: Connect to the Internet.
Figure 83: Select a Dial-up connection.

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

Figure 84: Select the GlobeTrotter® modem.
(3) Next, Windows needs your ISP information. Enter the telephone number *99# and click “Connect”.

![Figure 85: Settings for Dial-up connection.](image)

NOTE: Some operators require having the username and password parameters filled even if they are not used for user authentication. On those networks, filling in a dummy username and password allows the modem to make a connection.

(4) In the following screens, you can monitor the progress as Windows sets up the connection:
Figure 86: Connecting...

Figure 87: Testing... (This step can be skipped)
Figure 88: Connected.

Figure 89: Connected.
(5) To disconnect, go to the appropriate network systray icon and select “Disconnect” from the context menu (via right mouse button).

![Figure 90:Disconnecting.](image)

(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 91:Select your connection.](image)
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.

![Connected](image)

Figure 92: Connected.

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

![Connected on systray](image)

Figure 93: Connected on systray.
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.
(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 96: Reconnect using the Dial-up connection.
9.2 Using NDIS interface

9.2.1 On Windows XP/Vista (Applet)

(1) Locate the applet file: The dashboard applet “GtmNicAppXX.cpl” can be located on the “NDIS sample” folder inside the driver package downloaded from the extranet. 32 and 64 bit versions are available for the user.

(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.

![Dashboard Applet](image)

Figure 97: 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”.

![Diagram of Wireless WAN configuration window](image)

Figure 98: Connected.

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

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

![Subscription settings](image)

Figure 100: Subscription settings.

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

![Autoconnect settings](image)

Figure 101: Autoconnect settings.
(4) The Internet connection should be active now. The connection status should be connected.

![Image of network connection status](image)

Figure 102: 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 103: 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) Check that the Controlling Switch is configured with the default values explained on section 4.2.1.1.

NOTE: This configuration is applicable on GIJS cradle version 2.0. 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.

\[ \text{AT}_\text{ODO}=0 \]

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.

\[ \text{AT}_\text{OPCMENABLE}=1 \]

The response to this AT command should be: OK

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

\[ \text{AT}_\text{OPCMPROF}=<\text{value}> \]
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.

\[ \text{ATD<phone number>;} \]

**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 2.5mm 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.
Figure 104: Voice call example.
11 GPS FEATURES

11.1 General

The GTM66x/67x 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 105: GPS interfaces on GTM66x/67x](image)

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 GTM66x/67x.

**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.
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.
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 107: Realtime configuration on Google Earth.

Figure 108: 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.
APPENDIX A: PACKAGES CONTENT

This appendix is intended to give a brief overview of the Modem driver, Wi-Fi driver and firmware package content.

Modem Driver Package content

The modem driver package available on the extranet is presented as a ZIP file named:

“PhaseY.Y.YWinDriver-5.X.X.X.zip”

In which Y.Y.Y is the phase number and 5.X.X.X is the version number depending on the host operating system. This ZIP file contains a folder called “PhaseY.Y.Y(WinDriver-5.X.X.X)” which needs to be extracted from the zip file.

This new folder will contain two other folders inside: “ReleaseNotes” and “SoftwarePackage” (See Figure 109).

Figure 109: Main Driver Package structure.
On the “ReleaseNotes” folder, the user will find a PDF file containing the release notes for the specific driver version (See Figure 110).

![Figure 110: “ReleaseNotes” folder content.](image1)

On the “SoftwarePackage” folder, the user will find a new ZIP file called “Driver-5_X_X_X-Signed.zip” or “Driver-5_X_X_X-Unsigned.zip” depending if the package has been signed or not to work on windows. These ZIP files will contain a folder called “Driver-5_X_X_X-Signed” or “Driver-5_X_X_X-Unsigned” respectively.

Depending on the driver version (5.2.X.X or 5.1.X.X), the folder content will differ (See Figure 111 and Figure 112).

![Figure 111: Driver 5.2.X.X “SoftwarePackage” folder content.](image2)
In both cases, the folders 32 and 64 will contain the drivers (SYS, CAT, DLL and INF files) for windows 32 and 64 bit operating systems. In some cases a “setup.exe” file can be found on those folders, allowing the user to follow the automatic installation procedure instead of the manual installation procedure.

In case of 5.2.X.X drivers (Figure 111) an extra folder called “NDIS sample” is provided. This folder contains information for the setup of a NDIS call on windows XP/Vista. It also contains two applets (CPL files) for NDIS testing purposes. The applet utilization is explained on section 9.2.1.

In case of 5.1.X.X driver (Figure 112) two extra folder called “MB-ProvisionedContexts” and “MB-VendorSpecificCommands” are provided. These folders contain important information for the Mobile Broadband implementation of our drivers.
Wi-Fi Driver Package content

The Wi-Fi driver package available on the extranet is presented as a ZIP file named:

“PhaseY.Y.Y(WiFiPackage_vX.X.X).zip”

In which Y.Y.Y is the phase number and X.X.X is the Wi-Fi package version number. This ZIP file contains a folder called “PhaseY.Y.Y(WiFiPackage_vX.X.X)” which needs to be extracted from the zip file.

This new folder will contain two files inside: “Release_Note.txt” and “WiFiPackage_vX.X.X.zip” (See Figure 113).

![Figure 113: Main Wi-Fi Driver Package structure.](image)

The “Release_Note.txt” file contains a brief description of the content of the WiFiPackage_vX.X.X.zip. This file shows the relation between the Option Wi-Fi driver package and the Atheros drivers included in the package.

The “WiFiPackage_vX.X.X.zip” contains a folder called “WiFiPackage_vX.X.X” which needs to be extracted from the zip file. In this folder (See Figure 114), the user will find the “setup.exe” installer needed for the Wi-Fi driver installation explained on sections 5.1.3, 5.2.3 and 5.3.3.
Figure 114: WiFiPackage_v.X.X.X package content.
Firmware Package content

The firmware package available on the extranet is presented as a ZIP file named:

“PhaseY.Y.Y(FWX.X.X.X).zip”

In which Y.Y.Y.Y is the phase number and X.X.X.X is the firmware version number. This ZIP file contains a folder with the same name that needs to be extracted from the zip file.

This new folder will contain three other folders inside: “AdditionalInfo”, “ReleaseNotes” and “SoftwarePackages” (See Figure 115).

![Figure 115: Main Firmware Package structure.](image)

On the “AdditionalInfo” folder, the user will find multiple documents containing relevant information related to the release. Most of these documents are references of the release note (See Figure 116).

![Figure 116: “AdditionalInfo” folder content.](image)
On the “ReleaseNotes” folder, the user will find a PDF file containing the release notes for the specific firmware version (See Figure 117).

![Figure 117: “ReleaseNotes” folder content.](image)

On the “SoftwarePackages” folder, the user will find, depending on the firmware version, two new folders containing UMTS and CDMA firmware as shown in Figure 118. Be aware that this structure may differ from firmware version to firmware version since some of them will only contain UMTS or CDMA builds.

![Figure 118: "SoftwarePackages" folder content.](image)

Any of these folders will contain three new ZIP files called “NYOS_X.X.X.X_SYSTEM_build_DATE_blacktip_upgrader.zip” (for Windows operating systems), “NYOS_X.X.X.X_SYSTEM_build_DATE_toast.tar.gz” (for Linux operating systems) and “NYOS_X.X.X.X_SYSTEM_build_DATE_android_toast.tar.gz” (for android systems). These ZIP files will contain the necessary files to perform a firmware upgrade on the each operating system (See Figure 119 and Figure 120).
As only Windows operating systems are in the scope of this document, the “NYOS_X.X.X.X_SYSTEM_build_DATE_blacktip_upgrader.zip” is the file that the user will need to perform the firmware upgrade. The content of that ZIP file is as shown in Figure 121 and Figure 122.
This executable file will allow the user to perform a firmware upgrade on their devices. The actual firmware is the PCK file contained on the same folder.

Figure 122: CDMA Firmware X.X.X.X Windows package content.
APPENDIX B: 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.

SOFTWARE: Option® warrants that the software programs licensed from it will perform in substantial conformance to the program specifications therefore for a period of ninety (90) days from the date of purchase from Option® or its Authorized Reseller. Option® warrants the magnetic media containing software against failure during the warranty period. No updates are provided. Option®’s sole responsibility hereunder shall be (at Option®’s discretion) to replace any defective media with software, which substantially conforms to Option®’s applicable published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. Option® makes 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®’s 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®.

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