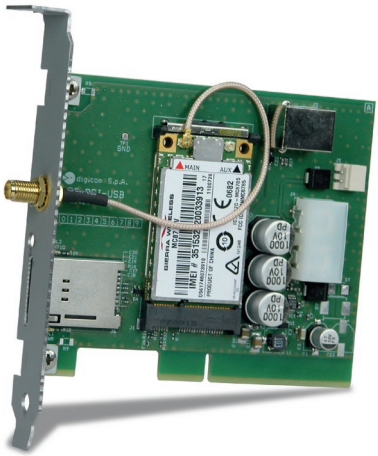
digicom

3G Modem USB Internal
HSDPA & HSUPA

- **HSDPA/HSUPA** internal modem
- **USB 2.0** interface
- **Industrial applications, automation**
- **External antenna** on SMA connector
- **PCI** slot for mechanical mounting



3G Modem USB Internal

User's Guide
rev. 1.0 12/2009

3G Internal

INDEX

PREFACE II
DECLARATION CE OF CONFORMITY II
ASSISTANCE AND CONTACTS II
SAFETY WARNINGS III

1. INTRODUCTION 1.1
1.1. TECHNICAL FEATURES 1.1
1.2. HARDWARE DESCRIPTION 1.2
1.2.1. POWER SUPPLY CONNECTORS 1.2
1.3. LED DESCRIPTION 1.3
1.4. PACKAGE CONTENT 1.3

2. INSTALLATION 2.1
2.1. HARDWARE INSTALLATION 2.1
2.2. DRIVER INSTALLATION 2.1
2.2.1. WINDOWS 2.1
2.2.2. LINUX 2.4

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PREFACE

In order to guarantee your safety and a correct functioning, be sure to follow these safety warnings. The whole set (with cables included) must be installed in a place lacking of or distant from:

- Dust, humidity, high temperatures and direct exposure to sunlight.
- Heat irradiating objects, which may damage your device or cause any other problem.
- Objects producing a high electromagnetic field (Hi-Fi speakers, etc.).
- Corrosive liquids or chemical substances.

ENVIRONMENTAL CONDITIONS
Environment temperature: from 0 °C to +55 °C Relative humidity: from 20 to 80 % n.c.
CLEANING INFORMATION
Use a soft dry cloth and avoid any solvents or abrasive materials.
SHOCKS OR VIBRATIONS
Caution against shocks or vibrations.

DECLARATION CE OF CONFORMITY

We, Digicom S.p.A., with registered office at Cardano al Campo (VA - Italy) - Via Volta 39, declare under our sole responsibility, that the products named **3G Modem USB Internal**, to which this declaration refers to, satisfy the essential requirements of following Directive:

- 1999/5/CE 9th March 1999, R&TTE (concerning radio equipment and telecommunication terminal equipment and the acknowledgment of their conformity) Law Decree 9th May 2001, n.269, (G.U. n. 156 of 7-7-2001).
  As indicated in conformity with the requirements of following Reference Standards or of other regulations documents:
  - EN 301 489-1
  - EN 301 489-7
  - EN 55022
  - EN 55024
  - EN 301 511
  - EN 60950-1

ASSISTANCE AND CONTACTS

Most of questions can be answered by looking up in the Support > F.A.Q. section of our website at www.digicom.it.
If you can't find the answer you're looking for, please contact our Technical Support at **support@digicom.it**

SAFETY WARNINGS

Read these instructions and norms carefully before powering the device. Violation of such norms may be illegal and cause hazard situations. For any of the described situations please refer to the specific instructions and norms.
The device is a low power radio transmitter and receiver. When it is ON, it sends and receives radio frequency (RF) signals.
The device produces magnetic fields. Do not place it next to magnetic supports such as floppy disks, tapes, etc.
Operating your device close to other electrical and electronic equipment - such as a television, phone, radio or a personal computer - may cause interferences.

INTERFERENCES

The device, like all other wireless devices, is subject to interferences that may reduce its performances.

ROAD SAFETY

Do not use your device while driving. In case of use on cars, you must check that the electronic equipment is shielded against RF signals. Do not place the device in the air bag deployment area.

AIRCRAFT SAFETY

Switch off your device when on board aircrafts by disconnecting the power supply and deactivating the internal backup battery. Using GSM devices on aircrafts is illegal.

HOSPITAL SAFETY

Do not use the device near health equipment, especially pacemakers and hearing aids, in order to avoid potential interferences. Take care when utilizing the device inside hospitals and medical centres, which make use of equipment that could be sensitive to external RF signals. Switch it off when use is expressly forbidden.

EXPLOSIVE MATERIALS

Do not use the device in refuelling points, near fuel or chemicals. Do not use the device where blasting is in progress. Observe restrictions and follow any specific regulation or instruction.

INSTRUCTIONS FOR USE

Do not use the device in direct contact with the human body and do not touch the antenna if not strictly necessary.
Use approved accessories only. Consult documentation regarding any possible device connected to the device. Do not connect incompatible products.

INFORMATION FOR USERS

According to the 2002/95/CE, 2002/96/CE and 2003/108/CE Directives, relative to reduction in the use of hazardous substances in electrical and electronic apparatus, as well as to disposal of waste materials.

The symbol of a crossed box applied on the apparatus or on its package indicates that at the end of its useful life the product must be collected separately from other waste materials.

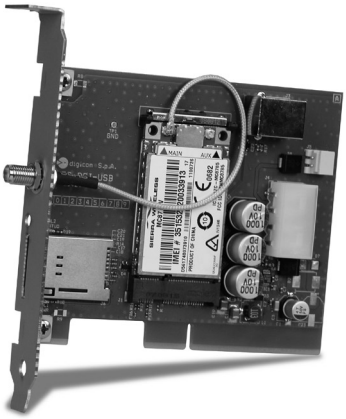
The user must therefore take the apparatus which has reached the end of its useful life to appropriate separate collection centres for electronic and electro-technical waste materials, or deliver it back to the reseller when purchasing new apparatus of an equivalent type, giving one piece in for one piece out.

Suitable separate waste collection for then sending the cast-off apparatus for recycling, treatment and environmentally friendly disposal, contributes towards preventing any possible negative effects on the environment and on health and encourages recycling of the materials the apparatus is made up of.

Unauthorised disposal of the product by the user will lead to payment of the administrative sanctions in force in the country where it is put on the market.

1. INTRODUCTION

Thank you for purchasing a Digicom product!



3G internal modem with USB interface suitable for all the industrial and remote control applications.
It's an **HSDPA/UMTS/EDGE/GPRS** USB modem to be always connected without any further subscription: telephone line, adsl line, etc.

The **HSDPA/HSUPA high speed technology** up to **7.2 Mbps in download** and **2Mbps in upload** gives you an Internet access at the same speed of an ADSL cable connection with the advantage of a wireless connection.

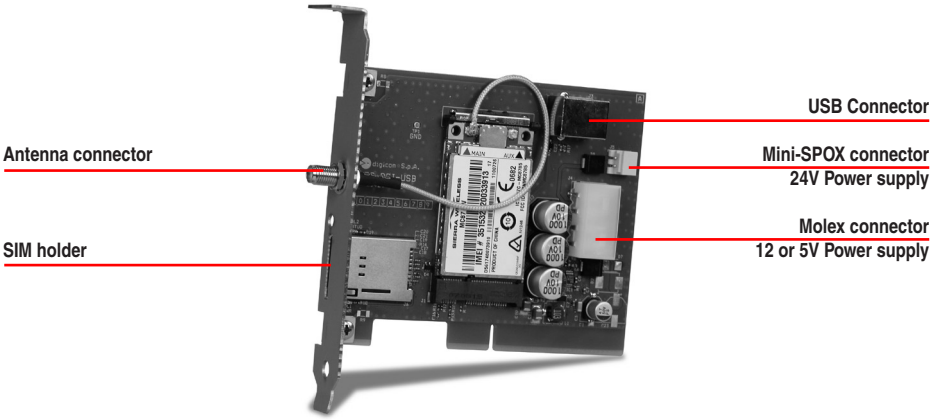
The interfacing of 3G Modem is performed through the internal USB interface of the PC Card. The 2.0 USB port is used for the data connection only and it isn't used for the card power supply. This feature allows to overcome the limit of 500 mA max supplied by the USB port with better performances on field.

3G Modem USB Internal offers a wide range of power supply: +5, +12 o +24V.
3G Modem USB Internal has an **external antenna** with 3 meters cable that can be positioned to have a better sigal. It is possible to remove the supplied antenna to substitute it with a higher gain one.

1.1. TECHNICAL FEATURES

- 2100MHz UMTS band
- 2100/1900/850MHz UMTS band(optional)
- EDGE/GPRS/GSM band: 850/900/1800/1900MHz
- HSDPA (High Speed Downlink Packet Access) up to 7.2 Mbps
- UMTS (Universal Mobile Telecommunications Systems) up to 384 Kbit/s
- EDGE (Enhanced Data Rates for GSM Evolution) up to 248 Kbit/s
- GPRS (General Packet Radio Service) up to 85 Kbit/s
- Omnidirectional external Antenna with 3 meters cable
- SMA antenna connector for the the connection of high gain antennas where needed
- Send/receive SMS
- USB 2.0 interface
- Type B USB connector
- 2,54mm USB connector (optional)
- Plug in (3V) SIM card holder from front panel
- Led indicators: Power and Status
- +12V Power supply: on 4 pins Molex connector
- +5V Power supply (optional): on 4 pins Molex connector
- +24V Power supply: on special mini spox connector
- AT command support
- Driver for Windows 7, Vista, XP, 2000
- Linux supported
- Temperature range: from 0°C to +55°C
- R&TTE Approval
- CE Mark

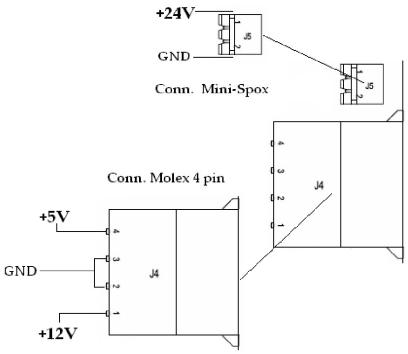
1.2. HARDWARE DESCRIPTION



1.2.1. Power supply connectors

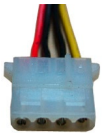
3G Modem USB Internal can be powered at 5 VDC, 12 VDC through the 4 PIN Molex connector or at 24V through the Mini-Spox connector.

- **5/12V model**
  Standard 3G Modem USB Internal power is 12V (Molex 4PIN). An hardware modification is necessary for the 5V operation (please contact Digicom S.p.A.).



PC connectors for power supply are usually cabled as follows:

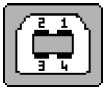
+12 VDC Yellow
Ground Black
Ground Black
+5 VDC Red



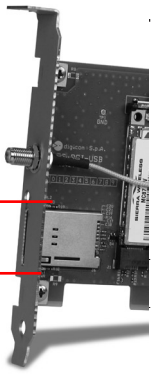
USB connector

Here below the cabling of the used USB connector.
3G Modem USB Internal can mount also USB connectors step 2.54mm.

1 VCC	+5VDC
2 D-	Data -
3 D+	Data +
4 GND	Ground



1.3. LED DESCRIPTION



2 leds are present on 3G Modem USB Internal card:

LED	COLOR	STATUS	DESCRIPTION
Status	**Red**	Fixed ON	Device ready
		Slow flashing	PIN request or SIM not present
		Fast flashing	Data traffic
PWR	**Green**	ON	Device powered on
		OFF	Device powered off

1.4. PACKAGE CONTENT

- 3G Modem USB Internal
- Antenna
- Quick Guide

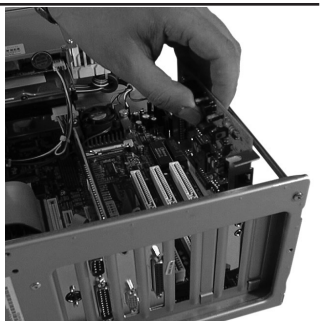
2. INSTALLATION

The installation procedure divides into:
- **Hardware installation**
- **Driver installation**

NOTE: Windows requires the driver installation as first step, unlike Linux that wants the hardware installation before.

2.1. HARDWARE INSTALLATION

The installation on a PCI card is used as example.



Go on with the following procedure with PC off.
- Remove the product from its package and verify it is ok.
- Before operating on your PC, **disconnect the power plug**.
- **Remove the PC cover** to access the internal slots.
- Find out a **free PCI slot**.
  This slot is used for mechanical fixing only.
- **Insert 3G Modem USB Internal** and fix the card using the screw of the slot.
- **Connect** 3G Modem USB Internal to a USB port of your PCI card.
- **Insert the SIM**, we suggest to disable the PIN.

Attention: it is not possible to insert the SIM when the card is powered.

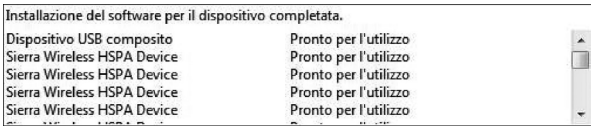
- **Connect the power** to 3G Modem USB Internal.
- **Close** the PC cover.

2.2. DRIVER INSTALLATION

2.2.1. Windows

- In the folder (\driver\windows) you find "**3G_Watcher_Generic_Build1665.msi**" file. When executed this file will automatically install the driver and the Watcher utility to establish and manage the data connection.
- If your application requires the drivers only, go on with the manual installation as follows:
- Execute the "**DriverInstaller**" utility (\driver\windows\DriverInstaller), the driver installation will start.

- Once the procedure is over you can go on with the hardware installation.
- At **restart the operating system** will detect a **new hardware** and the installation will be automatically performed.



- **Now 3G Modem USB Internal is ready for use.**

Connection mode

In order to perform an Internet connection, create a new Remote Access connection selecting the new "**Sierra Wireless HSPA Modem**", or use the Watcher utility.

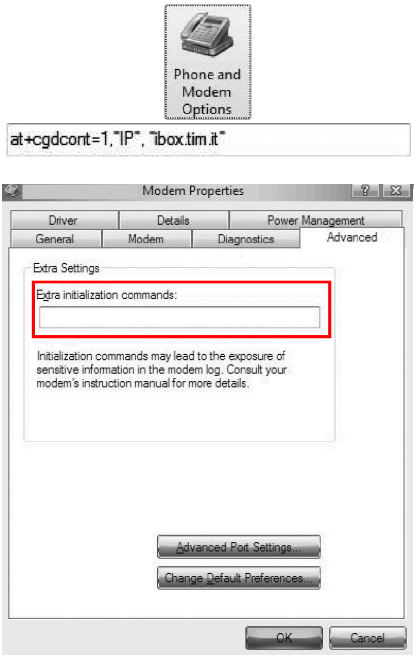
Watcher Utility

After the installation is completed, you can manually execute the **"Watcher" utility** present in the "**3G_USB_Modem_Internal**" folder.
The utility is simple and intuitive. It allows you to create a profile for your operator and to establish a connection without modifying the modem driver.

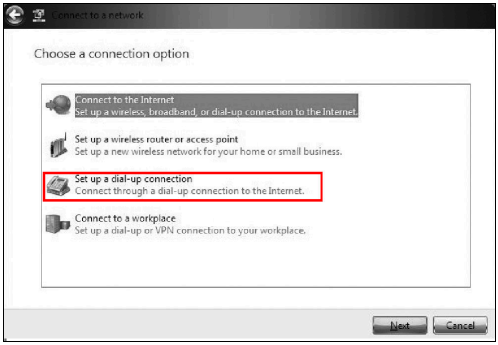
Remote access connection

- Before creating the remote access connection, it is necessary to insert ad additional string in the "**Sierra Wireless HSPA Modem**" driver to specify the APN used by your operator.

  Example: TIM's APN is "ibox.tim.it" The command will be: **at+cgdcont=1,"IP", "ibox.tim.it"**



- In the remote access connection the telephone number to be dialed will be: ***99***1#**.



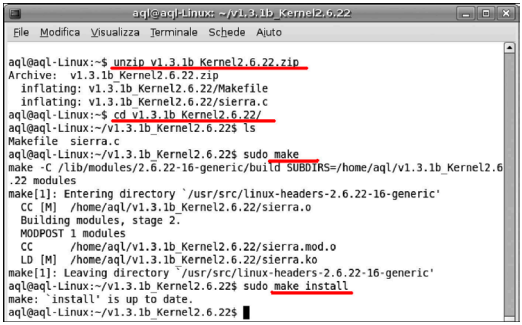
2.2.2. Linux

Perform the hardware installation first and then the driver installation (\driver\linux).

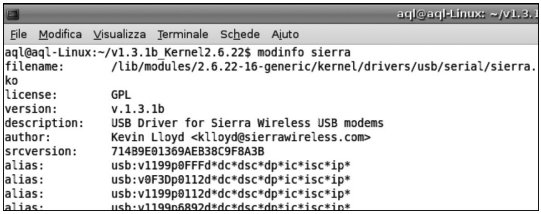
- Refer to the Kernel folder installed on your computer (command: uname -r) and digit the following commands:
  - **unzip v.x.y.z_Kernel2.x.y.zip** (i.e. v1.3.1b_Kernel2.6.22.zip)
  - **cd v.x.y.z_Kernel2.x.y** (i.e. v1.3.1b_Kernel2.6.22)

- Enter the directory containing "Makefile" and "sierra.c".
  Compile and install the driver with the following commands:
  - **make**
  - **make install**

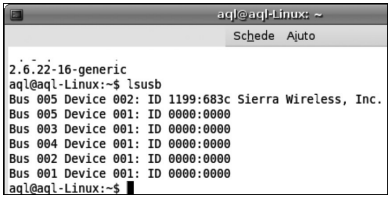
Note: You must be administrator or Super User (# su) to execute these commands.



- With "**modinfo sierra**" command you can verify the installed driver version.

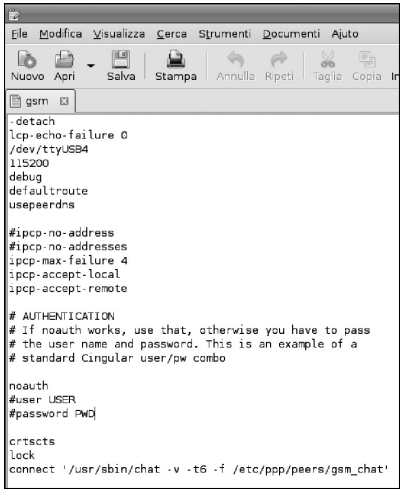


- With "**lsusb**" command you can verify if 3G Modem USB Internal has been recognized by Linux.

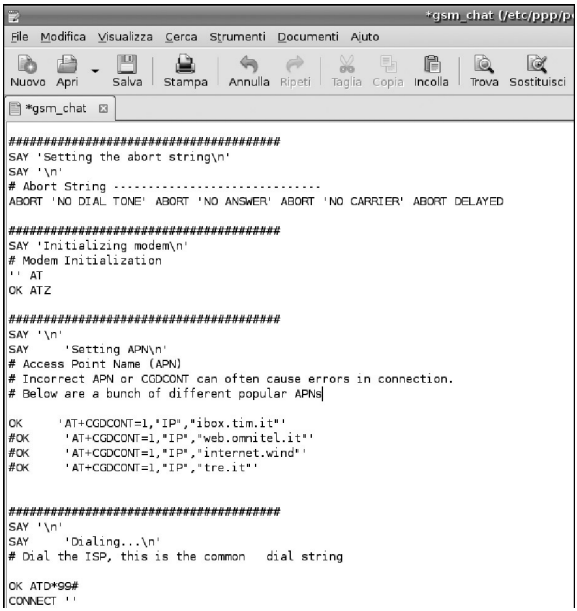


Connection mode

- In the "**3GUSB_Linux_131b**" folder you find the "**ppp.zip**" file containing the script for the PPPD connection.
- Unzip the file and modify the two scripts "gsm" and "gsm_chat" (present in the /ppp/peers folder) with the parameters of your operator necessary for the connection.
- In the "**gsm**" file check that the port for the connection is **/dev/ttyUSB4**. If "user" and "password" are requested, insert them removing the "#" comment to the two rows and add it to the "noauth" row.



- In the "**gsm_chat**" file insert the APN of the used operator. In the script you find the most common APN. If your SIM uses one of these APN, it is sufficient to remove the start row comment; eventually modify one.



- After modifying the two scripts it is necessary to copy the "/ppp" folder in "/etc" :
  - **cp -r ./ppp /etc**
  - **cd /etc/ppp**
  - **chmod a+x ip-up.local ip-down.local**

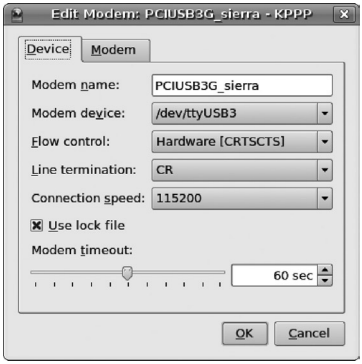
Note: You must be administrator or Super User (# su) to execute these commands.

The command to enable the call is: **pppd call gsm**

NOTE: with some versions of pppd a few problems may occur with DNS dynamic configuration. In order to solve it, copy "/etc/ppp/resolv.conf" in "/etc/resolv.conf".

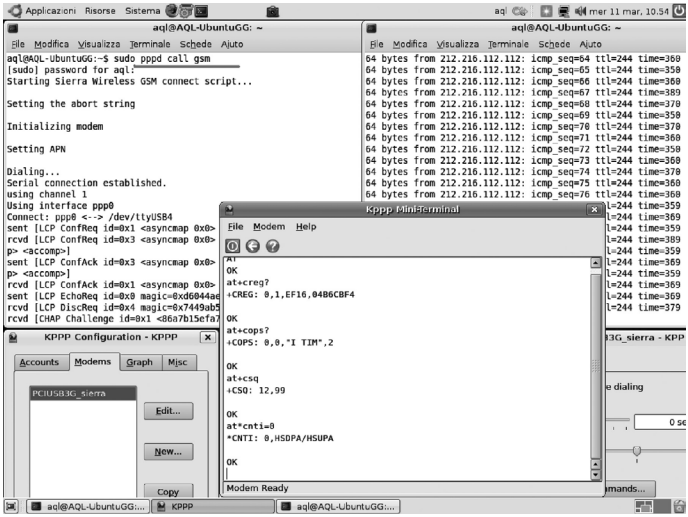
AT Commands

The port for AT commands is **/dev/ttyUSB3**.



With some commands it is possible to verify the status of registration to operator:

- "at+csq" gives information on the signal (good connection with values higher than 10)
- "at+creg?" to verify the used operator
- "at*cnti=0" to verify the type of technology used for connection (HSDPA, UMTS, GPRS…)



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