

SIEMENS



Getting Started with HC25

Siemens Cellular Engine

Version: 03
DocId: HC25_startup_v03
Products: HC25

User's Guide

User's Guide:	Getting Started with HC25
Version:	03
Date:	2007-11-27
DocId:	HC25_startup_v03
Status	Confidential / Preliminary
Supported Products:	HC25

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1 Introduction

HC25 is the first Siemens wireless module to offer Tri-band UMTS, Quad-Band GSM capability and a GPS receiver on the same device. HC25 enables 3.6 Mbit/s HSDPA downlink speed in a UMTS network and also provides all common mobile connectivity features like voice, short messages, GPRS and EGPRS.

The HC25 module needs to connect to an adequate host device, such as the DSB75 Support Board. Designed to help application manufacturers and system integrators to test and develop their HC25 host application, the DSB75 provides all interfaces and peripherals needed to run the HC25. The connection can be made using the module's USB interface or the asynchronous serial interface ASC0. USB and ASC0 operation are mutually exclusive.

The purpose of this document¹ is to guide you through the process of connecting the hardware, installing the software on a Microsoft® Windows XP™ or Microsoft® Windows Vista™ system, and, last but not least, making the first data transmission via UMTS and HSDPA.

1.1 Related Documents

Documents supplied with HC25

- [1] HC25 Hardware Interface Description
- [2] HC25 AT Command Set
- [3] HC25 Release Notes
- [4] Application Note 02: Audio Interface Design for HC25
- [5] Application Note 16: Updating HC25 Firmware
- [6] Application Note 22: Using TTY / CTM Equipment with HC25
- [7] Application Note 26: Power Supply for Wireless Applications
- [8] Application Note 37: GPS Antenna Integration for HC25
- [9] Application Note 39: USB Interface Description
- [10] Application Note 40: Thermal Solutions for HC25 Applications
- [11] Application Note 43: Customizing HC25 Applications
- [12] Remote SAT User's Guide for HC25
- [13] Multiplexer User's Guide
- [14] Multiplexer Driver Installation Guide
- [15] Multiplexer Driver Developer's Guide

Other related documents

- [16] DSB75 Development Support Board Hardware Description
Designed for a wide range of Siemens wireless modules this document is ready for download on the Siemens Website: <http://www.siemens.com/wm>
Specific information required for using the DSB75 Support Board with HC25 modules can be found in [Section 5.1](#).

1. The document is effective only if listed in the appropriate Release Notes as part of the technical documentation delivered with your Siemens wireless product.

1.2 Abbreviations

Abbreviation	Description
ASC0	Asynchronous Serial Controller. Abbreviation used for serial interface of HC25.
APN	Access Point Name
CHAP	Challenge Handshake Authentication Protocol
B2B	Board-to-board connector
DSB75	Short for DSB75 Development Support Board
GPRS	General Packet Radio Service
HSDPA	High-Speed Downlink Packet Access
IP	Internet Protocol
ME	Mobile Equipment
MO	Mobile Originated
MT	Mobile Terminated
PAP	Password Authentication Protocol
PDP context	Packet Data Protocol context
PPP	Point-to-Point Protocol
TA	Terminal Adapter
TE	Terminal Equipment
UDI	Unrestricted Digital Information
UICC	Universal Integrated Circuit Card
UMTS	Universal Mobile Telecommunication System
URC	Unsolicited Result Code

2 Installation and Configuration

2.1 Technical Requirements for Running HC25 on DSB75

- Windows XP or Windows Vista computer, minimum USB 1.1 connector
- HC25 module
- HC25 driver package either contained in
 - the HC25 mass storage = delivery default for HC25 modules shipped from factory;
 - or in an extra ZIP file = driver update packages delivered separately. File name: "HC25_<release>_conman_install.zip" .Please refer to [Section 2.3](#) to decide which installation method to choose.
- If drivers from earlier HC25 releases are still installed be sure to uninstall them first. See [Section 2.9](#) for drivers of HC25 Release 01.xxx and [Section 2.9.4](#) for drivers of earlier test samples.
- Local Administrator Privileges on the particular Windows computer are required to install, and uninstall the drivers and the Siemens HC25 Connection Manager.
- Appropriate hardware platform, for example the reference evaluation kit delivered by Siemens for testing and developing HC25 applications:
 - DSB75 Support Board providing the application interface between the HC25 USB port and a computer's USB port as well as between the HC25 ASC0 interface and an appropriate serial COM port on the computer.
 - Adapter board for mounting the HC25 module onto the DSB75, throughout this manual generally referred to as HCxx-DSB75 Adapter
 - 9 to 15 Volts power supply applied at the DSB75 for powering up the DSB75 and the connected HC25 module
 - 1 mini antenna cable (50 Ohms) from the RF antenna connector (Hirose U.FL) on the HC25 module to the Hirose U.FL connector on the DSB75; 1 external RF antenna connecting to the SMA connector of the DSB75 (product name: SMARTEQ MiniMag), both delivered with DSB75
 - A metal plate for grounding the external RF antenna
 - An active or passive GPS antenna and a special GPS adapter cable with Hirose connector and female SMA connector to be connected to the module and to the active or passive GPS antenna.
 - Optional: Handset, for example Handset for Siemens products from Votronic delivered with DSB75See [Section 5.1](#) for information on the DSB75.
- USB cable
- RS-232 cable for asynchronous serial interface ASC0 (if used)
- Appropriate host application to control the USB ports under Windows, for example Hyperterminal integrated in Windows XP.
- UICC card
- Service Provider settings for data services, such as (E)GPRS, HSDPA and, if required, also for UDI. For details see [Section 3.10](#).
- Make sure to operate the HC25 always with the UICC card inserted in the card reader and a valid SIM PIN entered. This is because most AT commands require SIM PIN authentication.

2.2 Customizing HC25 Applications

If you wish to customize the product and manufacturer names displayed to your end users during the installation process, by the Windows Device Manager and on the Connection Manager user interface you can modify the required files and strings and develop a customized installation utility based on InstallShield 2008. For more information please refer to [11].

2.3 Choosing the Best Installation Strategy

The sequence of the installation steps depends on where the supplied driver package is located:

1. HC25 modules shipped from factory have the driver package located on the mass storage. Thus, the standard installation procedure is designed to be launched directly from the mass storage.
Overview of installation steps: First connect the HC25 module to the DSB75 and start the computer (see [Section 2.4](#)). Then install the Siemens HC25 Connection Manager to prepare the driver installation (see [Section 2.5.1](#) for Windows XP or [Section 2.6.1](#) for Windows Vista). Finally install the composite device drivers (see [Section 2.5.2](#) for Windows XP or [Section 2.6.2](#) for Windows Vista).
2. Latest driver updates are contained in the "HC25_<release>_conman_install.zip" file, usually ready for download from <http://www.siemens.com/wm>. If you wish to update to the latest driver versions, you have the following options:
 - Installing the drivers from the mass storage
Overview of installation steps: First uninstall the existing drivers from the Windows computer. Switch off or unplug the module. Switch on or replug the module. Delete all old files located in the mass storage and replace them with the new files, using exactly the same directory tree. Switch off or unplug the module. Switch on or replug the module. Install the Siemens HC25 Connection Manager and the composite device drivers from the mass storage.
If the HC25 module is intended to be inserted into more than one device take care that the mass storage always contains the latest drivers.
See [Section 2.10.3](#) for details.
 - Installing the drivers from any folder inside the Windows system
Overview of installation steps: First uninstall the existing drivers from the Windows computer. Switch off or unplug the module. Install the Siemens HC25 Connection Manager. Switch on or replug the module. Install the composite device drivers.
See [Section 2.10.2](#) for details.

2.4 Installing the Hardware

To properly connect the HC25 module and all accessories to the DSB75 Support Board follow the steps listed below.

Note: The names of connectors, interfaces and switches given in brackets are the same as used in [16] and below in [Section 5.1](#).

- Check that all switches of the HCxx-DSB75 Adapter and the DSB75 Support Board are set as described in [Section 5.1](#). See also [Figure 10](#) which shows an exploded view of all parts.
- Connect the one end of the mini antenna cable to the RF antenna connector (Hirose U.FL) located on the module's top side (the middle antenna connector). Also, connect the GPS antenna adapter cable to the GPS antenna connector (Hirose U.FL) located on the module's top side at the right corner.
- Mount the HC25 module upside down onto the 50-pin board-to-board connector (X104) of the adapter board. Use the supplied M2 screws and nuts to screw the module to the adapter.
- Attach the HCxx-DSB75 Adapter to the 2x40-pin header (X101/X102) located on the DSB75. Take gentle care that all pins are aligned correctly, then press down evenly on the adapter board until it is firmly seated. Use the supplied M3 screw and bolt to secure the adapter board to the DSB75 Support Board.
- Connect the other end of the mini antenna cable to the Hirose U.FL connector (X505) of the DSB75.
- Screw the external antenna (MiniMag) into the SMA connector (X506) on the DSB75. To improve the antenna performance use a metal plate for grounding. The external antenna should be positioned in the center of a metal plate.
- Connect the GPS antenna adapter cable to the external of passive GPS antenna.
- Connect the Western plug (X502) of the handset to the Western jack on the DSB75.
- Connect the power cables to the red (X400 = BATT+) and black (X401 = Ground) connectors of the DSB75.
- Plug the USB cable to the computer's USB port and to the USB port (X110) of the DSB75. Press the IGT key (S421) of the DSB75 to switch on the HC25 module. Start your Windows computer.
- If the HC25 USB drivers are not yet installed on the computer you will be prompted to do so. To continue see [Section 2.5](#) for Windows XP or [Section 2.6](#) for Windows Vista.

Note: The RS-232 cable can be connected any time to the module's asynchronous serial ASC0 interface and to the COM1 port of the DSB75 (the middle connector X201). Yet, keep in mind that, by factory default, the HC25 module is prepared for use as composite USB device on a Windows XP or Windows Vista system. Therefore, please refer to [Section 2.11](#) for details of how to configure HC25 either for ASC0 or USB usage.

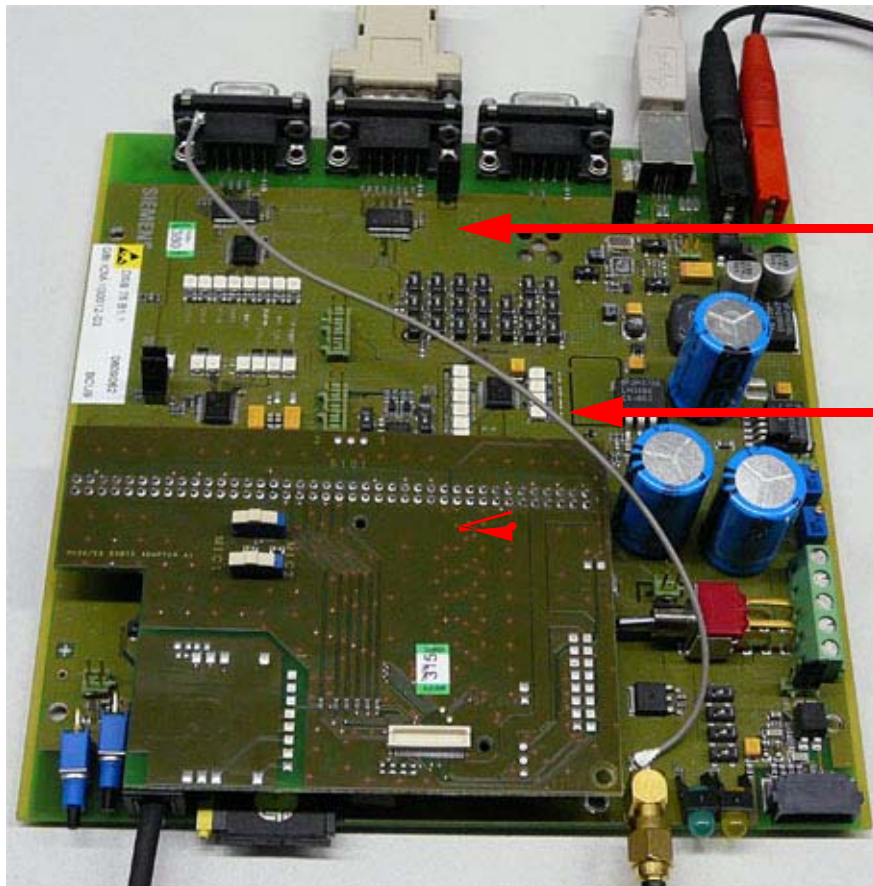


Figure 1: DSB75 Support Board with mounted adapter board and mini antenna cable



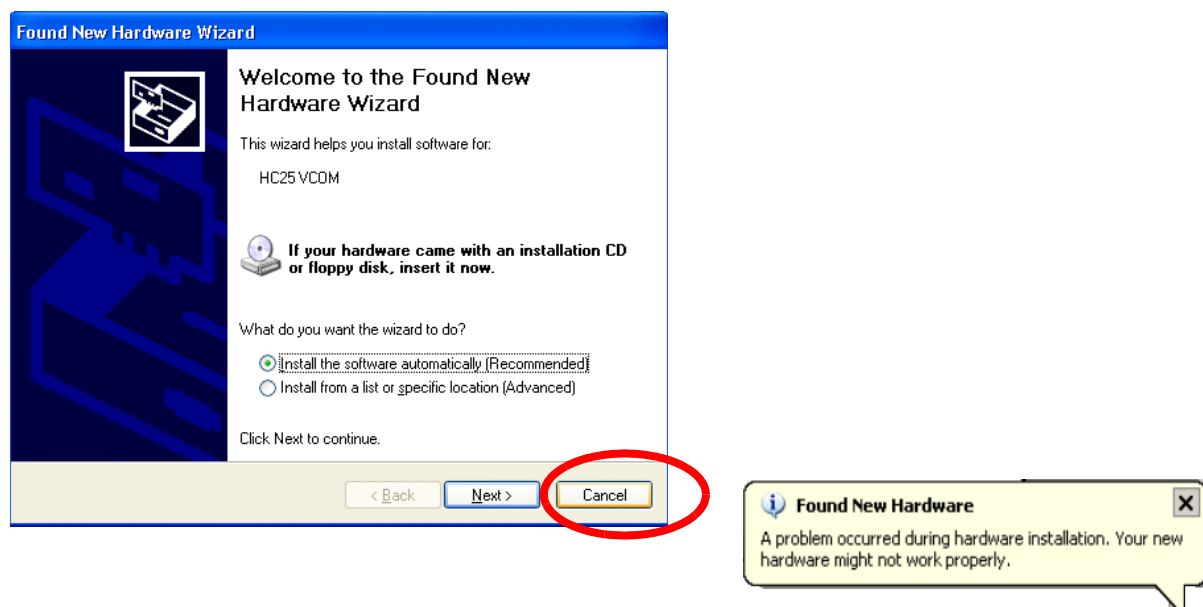
Figure 2: DSB75 Support Board with HC25 module and accessories connected

2.5 Installation on Windows XP

2.5.1 Installing Siemens HC25 Connection Manager and Preparing Driver Installation on Windows XP

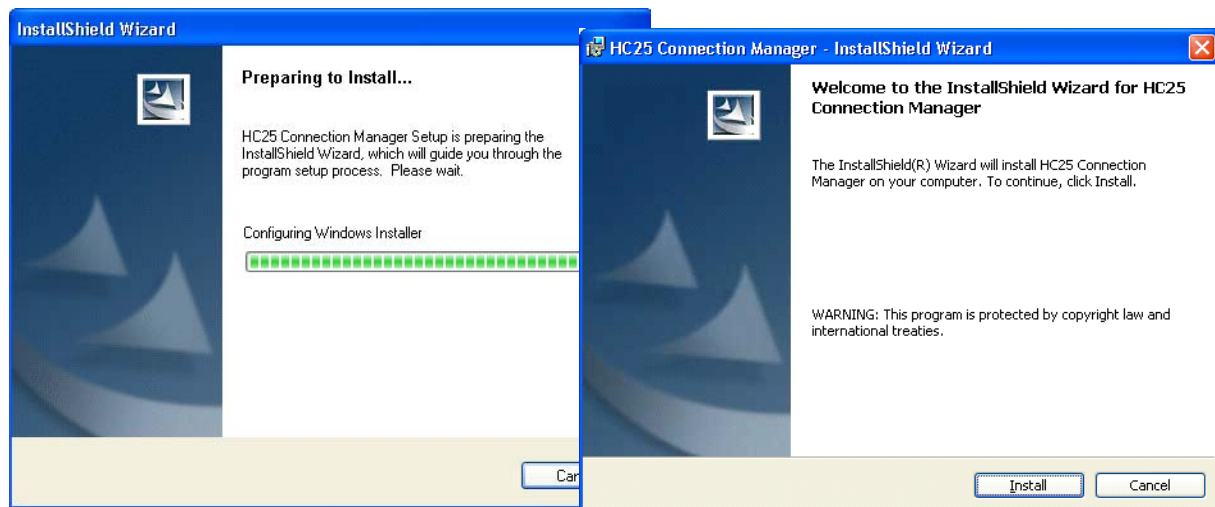
After switching on or plugging the module, you will see the *New Hardware Found Wizard* coming up three times, requesting you to install the software for HC25 VCOM, HC25 NET and HC25 Modem. Click *Cancel* in each dialog.

At the same time the module enumerates as mass storage device in your Windows XP system, showing up as a *Removable Disk* assigned to the next free drive in the Windows Explorer. An additional Windows taskbar icon also indicates the mass storage device.



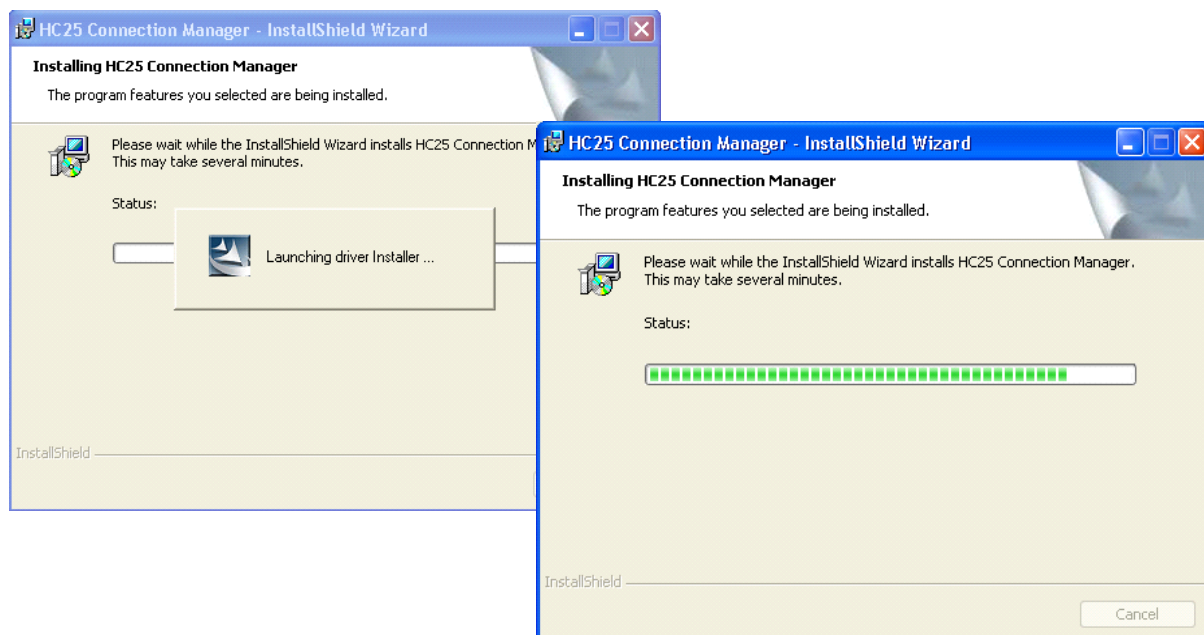
The wizard's error message that pops up in the Windows taskbar shall be ignored. The installation will proceed automatically.

Note: If the installation fails to start automatically after you have canceled the three *New Hardware Found Wizards* simply navigate to the mass storage drive (= Removable Disk in the Windows Explorer) and double-click the provided "autorun.exe" file.



Please wait a brief moment, then press *Install* to start the installation of the Siemens HC25 Connection Manager.

The progress of the installation will be indicated as illustrated below. In addition, it is possible that there are up to 3 warning messages saying that the software has not passed Windows Logo testing. Please ignore the messages and press *Continue* anyway.



Now the installation of the Siemens HC25 Connection Manager, and the driver software for the composite device is preinstalled. The last installation dialog closes automatically.

See [Section 2.5.2](#) to continue.

2.5.2 Installing USB and Ethernet Drivers on Windows XP

HC25 will be installed as a composite device that comprises three virtual devices, one by one added to your Windows XP system:

- Siemens HC25 USB Com Port driver
- Siemens HC25 Wireless Ethernet Adapter driver
- Siemens HC25 HSDPA USB Modem driver

During the installation, the HC25 USB interface will be assigned two virtual COM ports, one for the virtual modem port and one for the virtual application port. Windows will automatically allocate the next available COM port to each virtual interface.

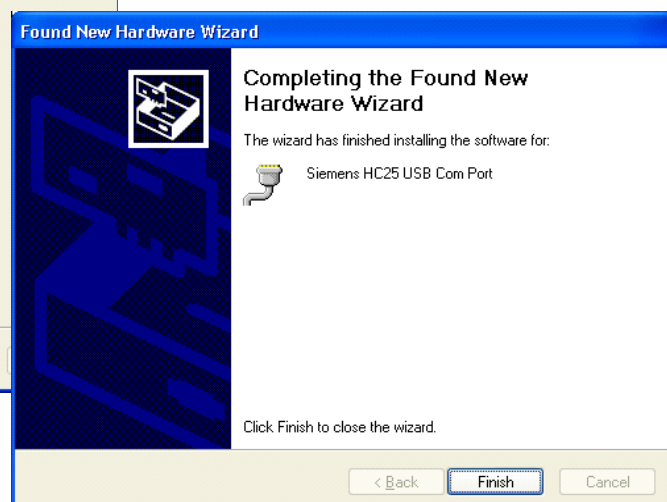
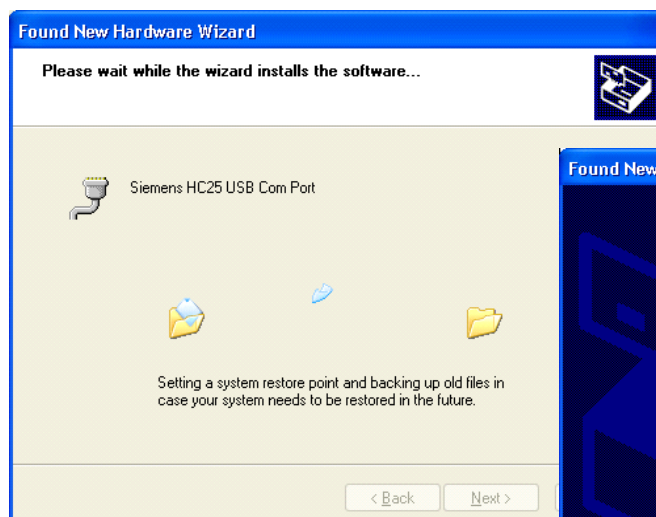
Once the Siemens HC25 Connection Manager installation has completed Windows detects the HC25 as a new USB composite device.



The *Found New Hardware Wizard* will start. Click *Next* to proceed with the installation of the "Siemens HC25 USB Com Port".

The progress of the driver installation is indicated.

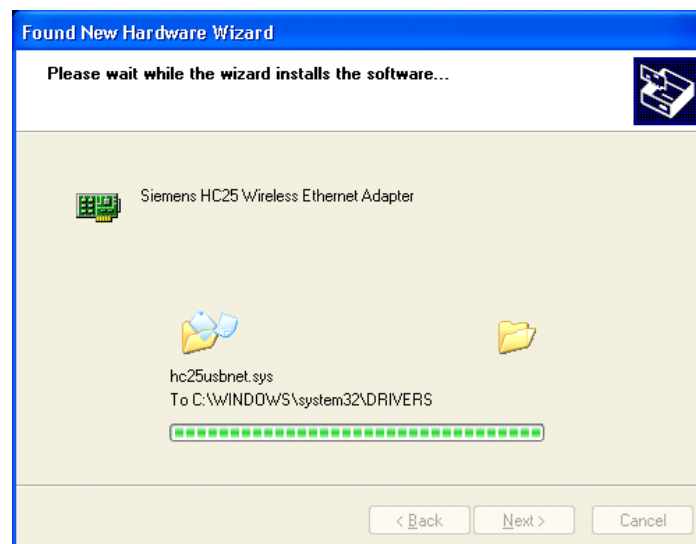
In addition, there might be a warning message saying that the software has not passed Windows Logo testing. Please ignore the message and press *Continue anyway*.



Click *Finish* to complete the installation of the "Siemens HC25 USB Com Port".

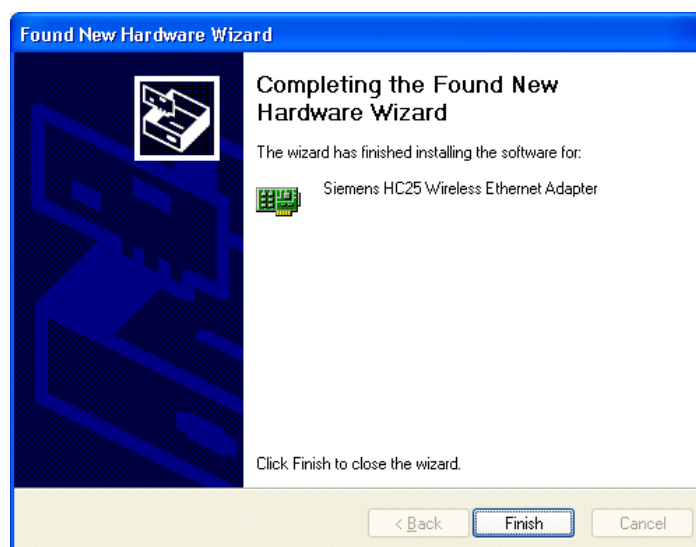


Now the installation of the "Siemens HC25 Wireless Ethernet Adapter" will start. Click *Next*.

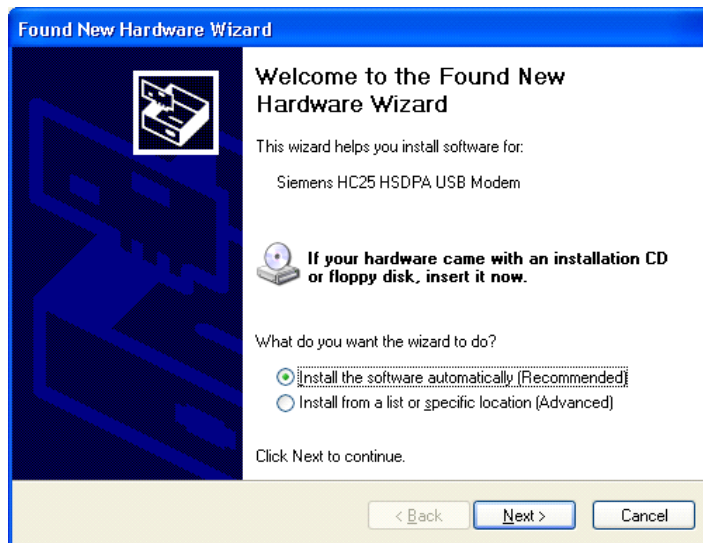


The progress of the driver installation is indicated.

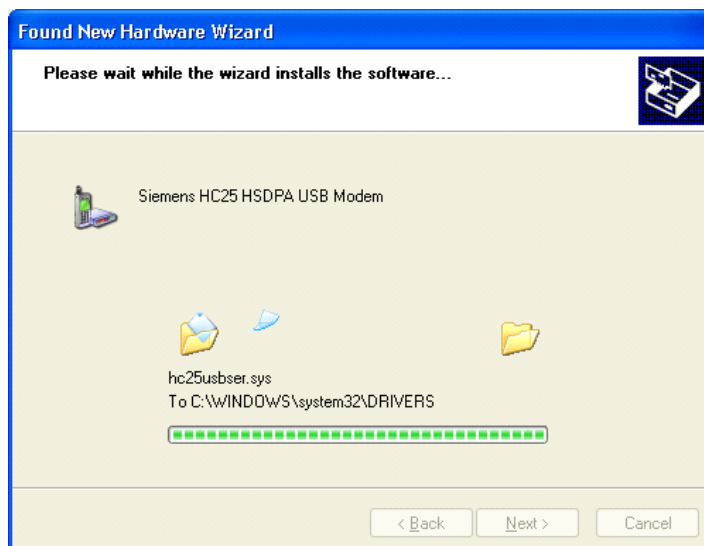
In addition, there might be a warning message saying that the software has not passed Windows Logo testing. Please ignore the message and press *Continue anyway*.



Press *Finish* to complete the "Siemens HC25 Wireless Ethernet Adapter" installation.

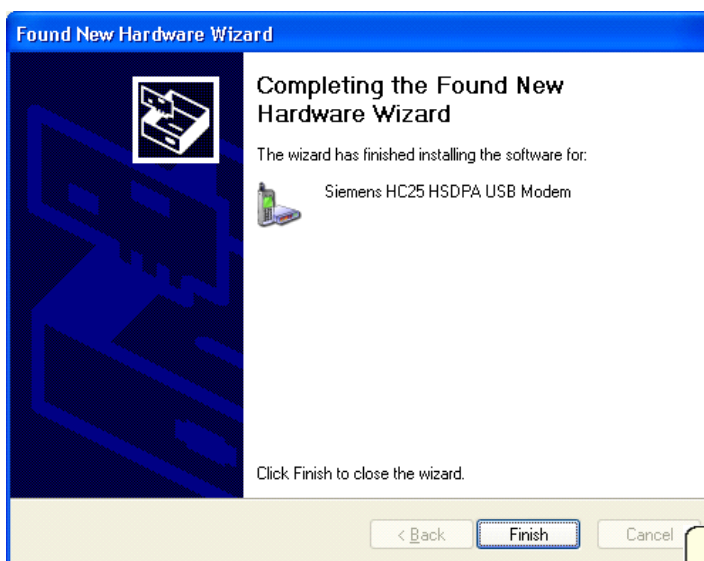


Now the installation of the "Siemens HC25 HSDPA USB Modem" will start. Click *Next*.



The progress of the driver installation is indicated.

In addition, there might be a warning message saying that the software has not passed Windows Logo testing. Please ignore the message and press *Continue anyway*.



Press *Finish* to complete the "Siemens HC25 HSDPA USB Modem" installation.

At this point the installation of all three virtual devices is completed. Windows XP notifies you that the hardware is ready to use.

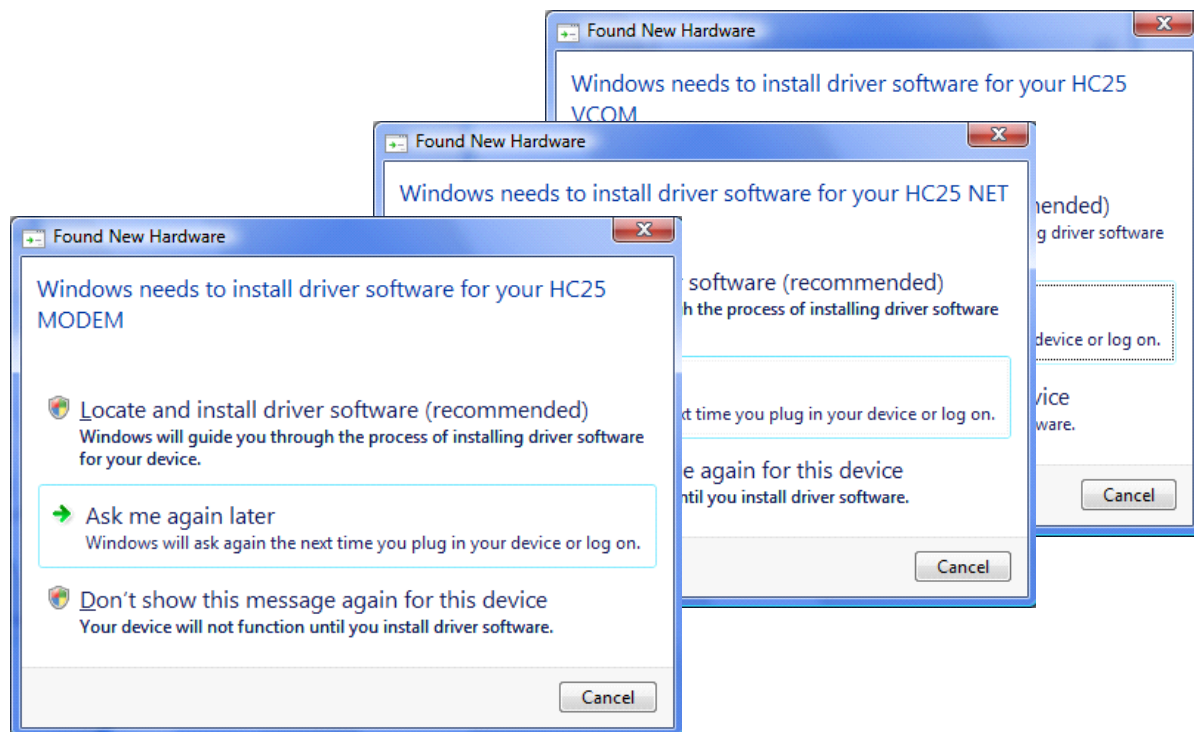


2.6 Installation on Windows Vista

2.6.1 Installing Siemens HC25 Connection Manager and Preparing Driver Installation on Windows Vista

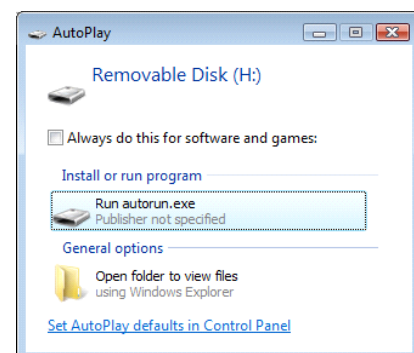
If you plug the HC25 module and install the HC25 drivers the first time, the *New Hardware Found* wizard will pop up three times requesting you to install the software for the virtual devices HC25 VCOM, HC25 NET and HC25 MODEM. Click *Cancel* in each dialog. If you reinstall the drivers these dialogs will usually not appear.

At the same time the module enumerates as a mass storage device in your Windows Vista system, showing up as a *Removable Disk* assigned to the next free drive in the Windows Explorer. An additional Windows system tray icon also indicates the mass storage device.



If *Autoplay* is enabled on the computer you will be prompted to select "Run autorun.exe".

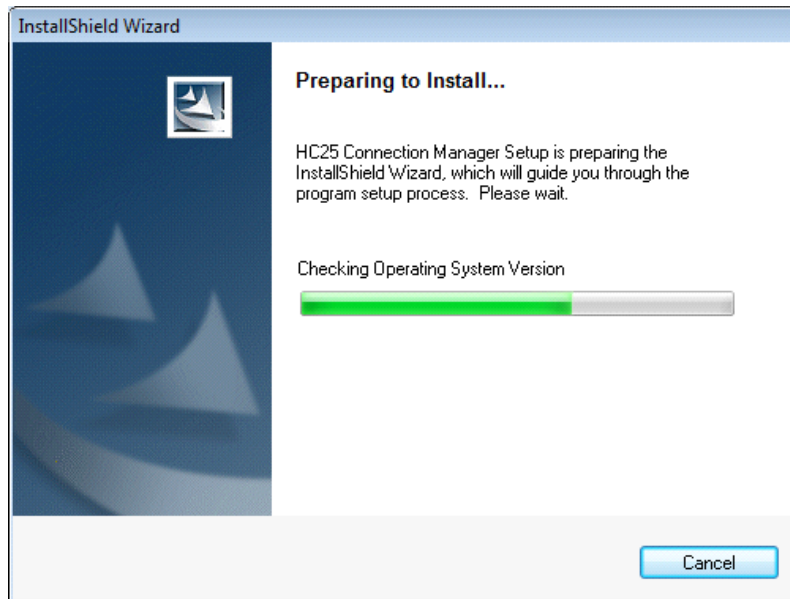
If the installation does not start automatically, due to the specific computer configuration, navigate to the mass storage drive and double-click the provided "autorun.exe" file.



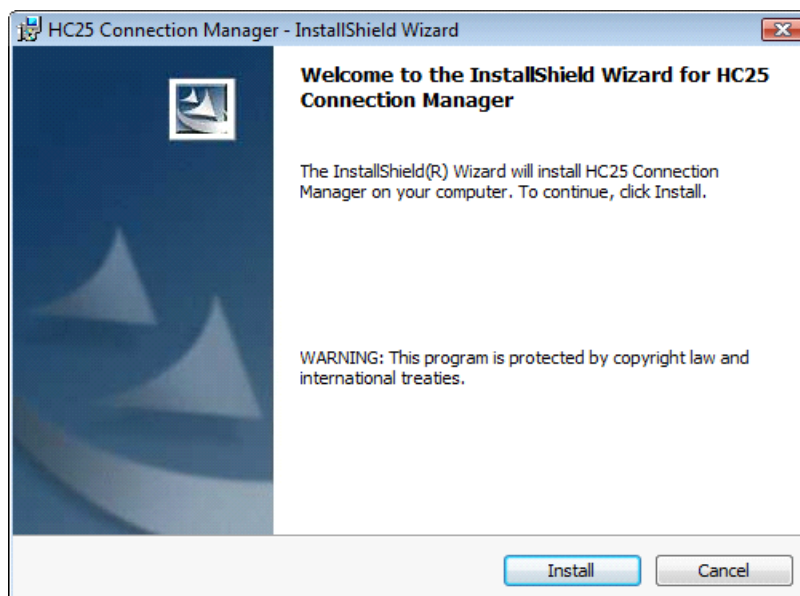
The autorun.exe icon starts to blink in the task bar of Windows Vista while showing this message:

"autorun.exe is requesting your permission"

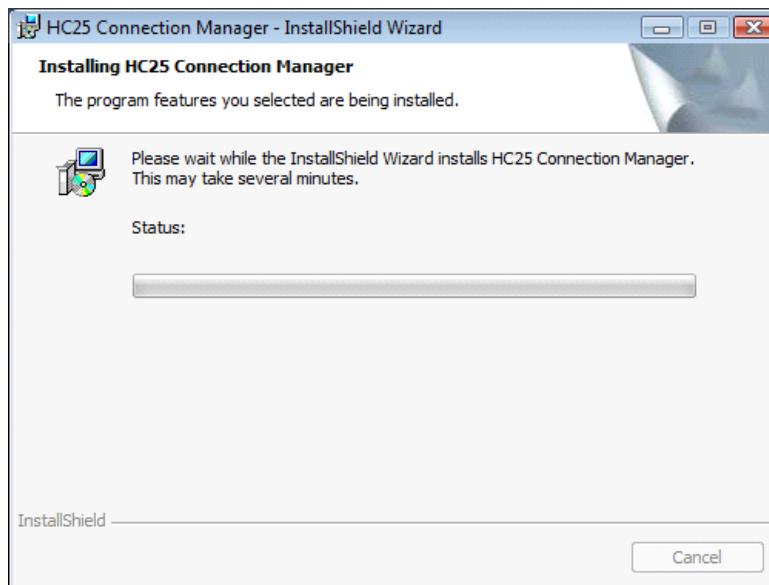
Please click on the icon. A popup window "User Account Control" will show: "An unidentified program wants access to your computer". Please press "Allow" to start the HC25 installer on Windows Vista.



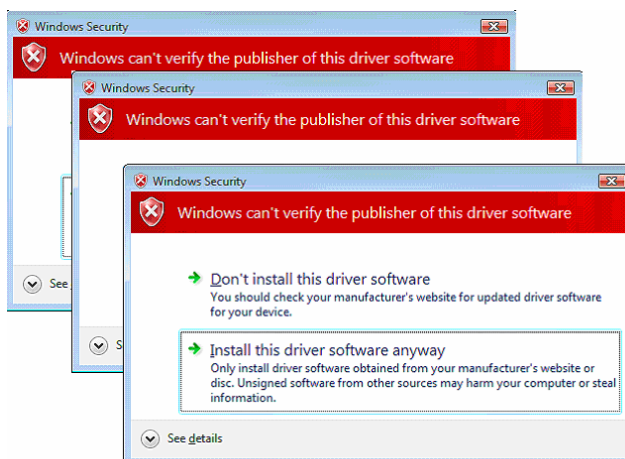
The installer will start to prepare the installation.



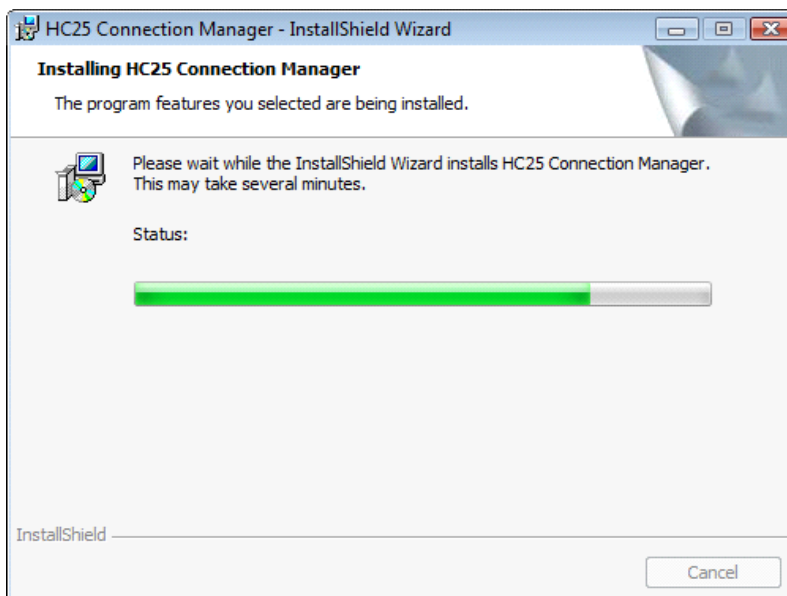
Now the Siemens HC25 Connection Manager can be set up. Press *Install*.



The progress of the installation is indicated.



It is possible that there are up to 3 warning messages saying that the software has not passed Windows Logo testing. Please ignore the messages and select the option *Install this driver software anyway*.



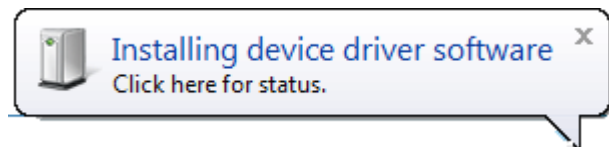
The Siemens HC25 Connection Manager setup is completed. The last installation dialog box closes automatically. See [Section 2.6.2](#) to continue.

2.6.2 Installing USB and Ethernet Drivers on Windows Vista

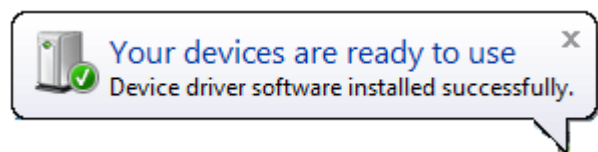
Once the Siemens HC25 Connection Manager installation has completed the HC25 will be set up as a composite device comprising three virtual devices:

- Siemens HC25 USB Com Port driver
- Siemens HC25 Wireless Ethernet Adapter driver
- Siemens HC25 HSDPA USB Modem driver

An icon will show up in the Windows Vista task bar to indicate the progress of the driver installation.



Finally, the icon indicates that all devices are ready to use.

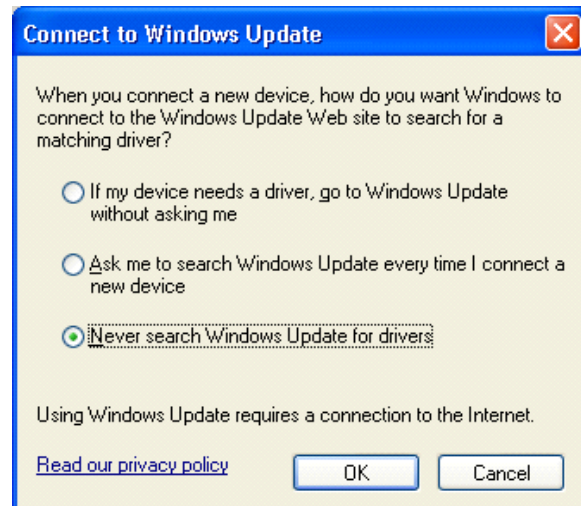


2.7 Special Installation Notes

If the installation does not work as expected, additional steps may be required, usually depending on the configuration of the Windows XP or Windows Vista computer.

HC25 does not show up as removable disk

- If the HC25 is not visible as removable disk (mass storage device) when connected and switched on the first time, it is possible that the computer is configured to search the Internet for Windows updates. As a result, Windows is waiting for additional user action.
- To avoid this scenario, it is recommended to switch off this option before trying to install the HC25.



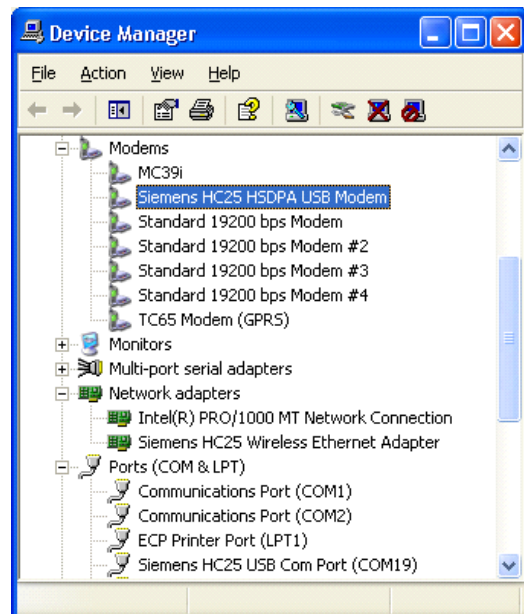
Siemens HC25 Connection Manager installed, but driver installation does not start

- If the Siemens HC25 Connection Manager installation completes successfully as explained in [Section 2.5.1](#) (Windows XP) or [Section 2.6.1](#) (Windows Vista), but the driver installation does not start as shown in [Section 2.5.2](#) (Windows XP) or [Section 2.6.2](#) (Windows Vista), it is possible that the HC25 has failed to change from mass storage device to composite device functionality.
- In this case, please stop the mass storage function manually. To do so, right-click the "Removable Disk" drive and select *Eject*. The installation should proceed according to [Section 2.5.2](#) or [Section 2.6.2](#).

If the HC25 still shows up as removable device, point to the associated Windows system tray icon, and select *Stop* from the resulting *Safely Remove Hardware* box. Then unplug and replug the USB cable.

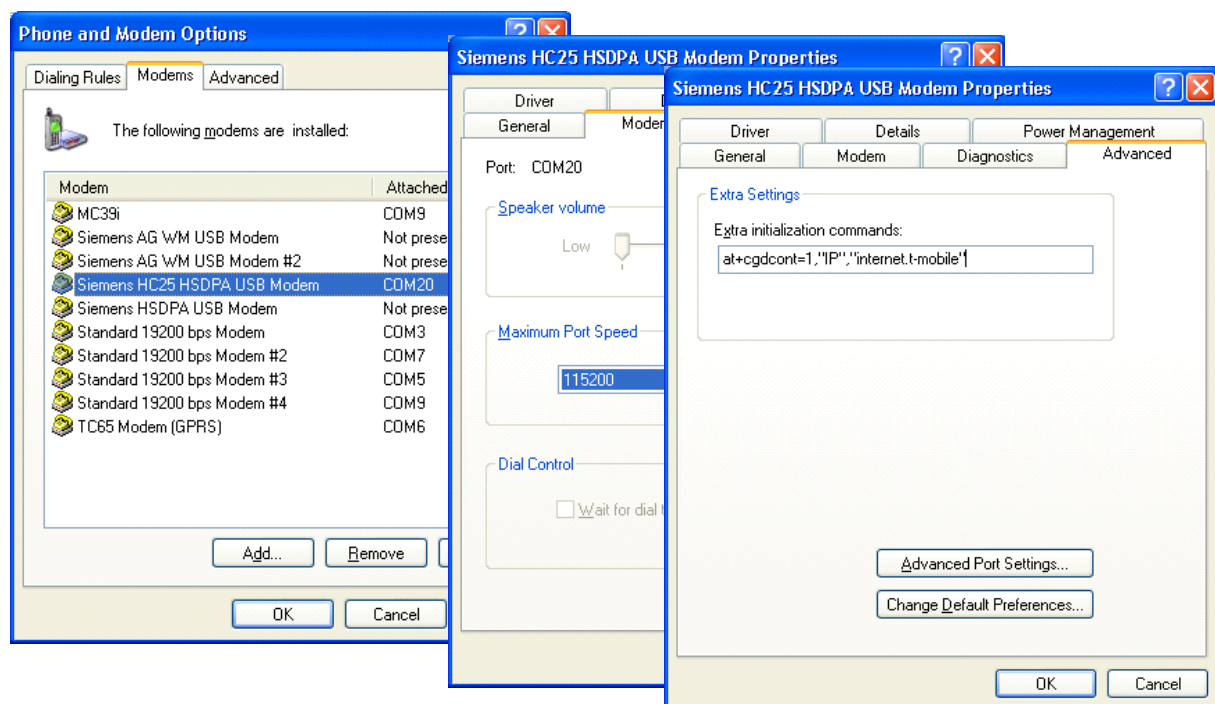
2.8 Installed Devices and Tools on Windows XP, Windows Vista

After successful installation, the HC25 module is set up as composite device comprising the virtual devices listed below. On Windows XP and Windows Vista, you can use the *Device Manager* to check that all components are properly installed and configured.



Siemens HC25 HSDPA USB Modem

- AT command and data interface, also referred to as "Modem" interface if queried using the AT^SQPORT command.
- Intended particularly for HSDPA and GPRS data connections.
- The virtual COM port Windows has assigned to this interface is listed in the Windows *Device Manager* under *Modems* and under *Control Panel | Phone and Modem Options*.
- The port number can be gathered from the property pages. This COM port can be used to set up dial-up network connections. The bit rate set by default on the modem property page is not relevant for USB and can be left unchanged. On the *Advanced tab* you can put the command string used to define the PDP context for your GPRS / HSDPA provider. See also [Section 3.7](#).



Siemens HC25 USB Com Port

- AT command interface, also referred to as "Application" interface if queried using the AT^SQPORT command.
- Mainly intended for controlling the HC25 module, for receiving URCs, also for sending, receiving, writing and reading short messages. Not intended as data interface for HSDPA and GPRS.
- The virtual COM port Windows has assigned to this port is listed in the *Device Manager* under *Ports (COM&LPT)*.

Siemens HC25 Wireless Ethernet Adapter

- Wireless network adapter intended for packet switched transmission, such as HSDPA and (E)GPRS data connections.
- Listed in the Windows *Device Manager* under *Network adapters*.
- Software controlled by the Siemens HC25 Connection Manager. To open the Siemens HC25 Connection Manager in Windows XP or Windows Vista, click *Start*, point to *Programs*, select *Siemens*, select *HC25 HSDPA USB Modem* and click *HC25 Connection Manager*. See [Section 3.10.1](#) for details on how to set up a connection.

2.9 Uninstalling Drivers and Siemens HC25 Connection Manager

The steps required to remove the installed HC25 components vary depending on whether the module switched on or off.

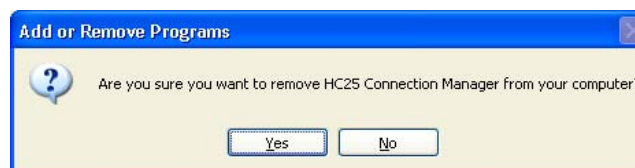
The procedures are almost the same for Windows XP and Windows Vista except for the minor differences described below.

2.9.1 Uninstalling Components if HC25 Connects to Windows XP

1. Ensure that the module is connected to the computer's USB port and switched on.
2. Close all HC25 applications, for example the Siemens HC25 Connection Manager or terminal program(s) connected to the virtual USB port(s).
3. Open the *Control Panel*. Click *Add or Remove Programs* and select HC25 Connection Manager. Press *Remove* to select the uninstaller of the HC25 Connection Manager and the HC25 drivers.



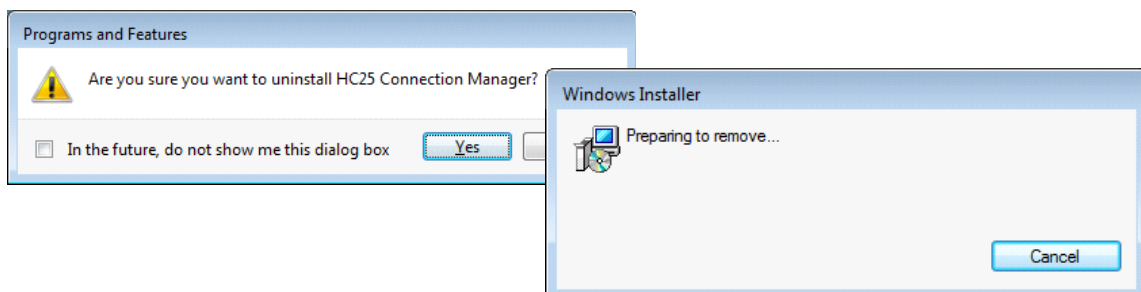
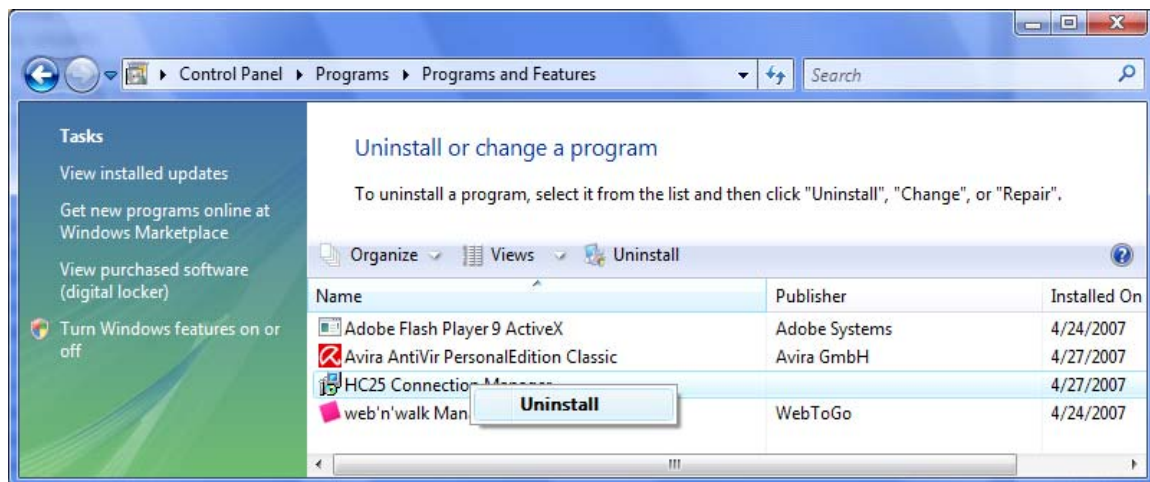
4. Press *Yes* to start the uninstaller.



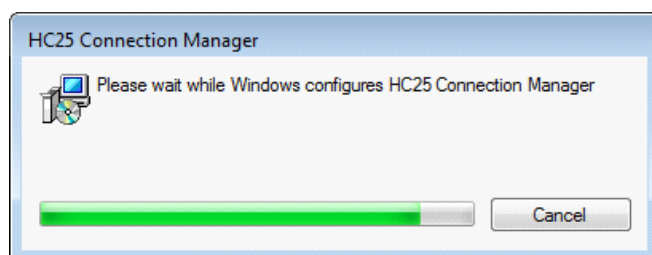
5. The Siemens HC25 Connection Manager and all HC25 drivers will be removed.

2.9.2 Uninstalling Components if HC25 Connects to Windows Vista

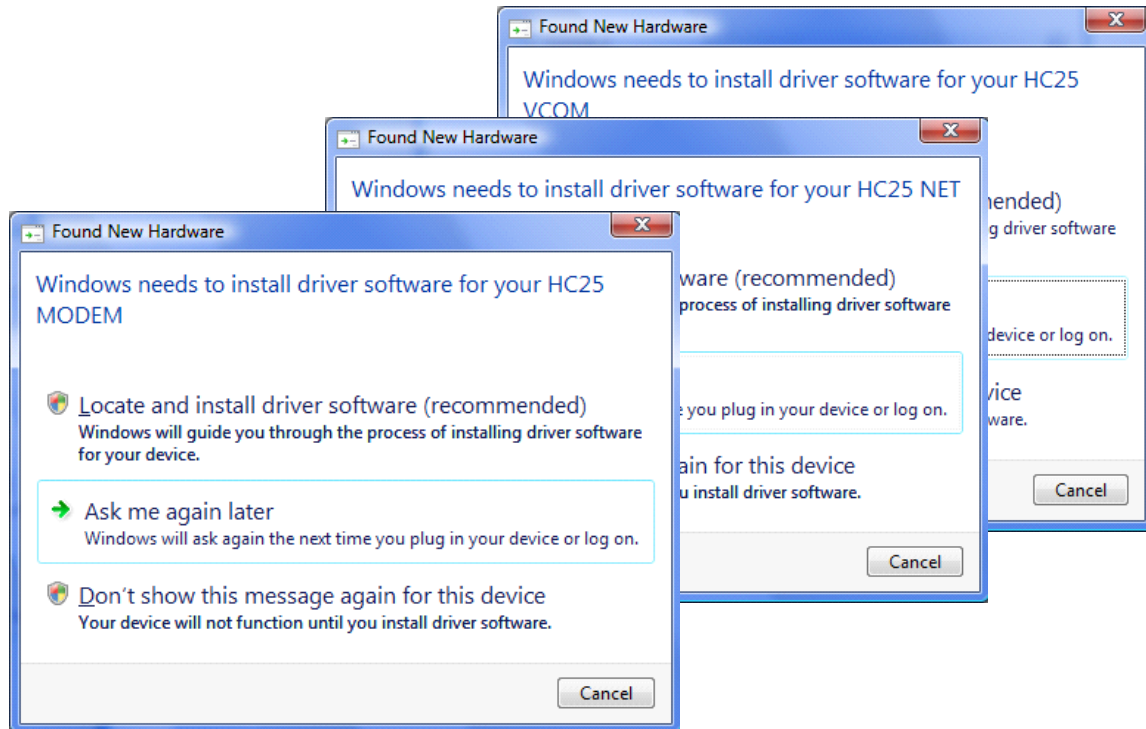
1. Ensure that the module is connected to the computer's USB port and switched on.
2. Close all HC25 applications, for example the Siemens HC25 Connection Manager or the host application(s) connected to the virtual USB port(s).
3. Open the *Control Panel*. Click *Programs and Features* and point to the HC25 Connection Manager. Double-click or right-click HC25 Connection Manager to start the uninstaller, then click *Yes* to confirm the resulting uninstall message.



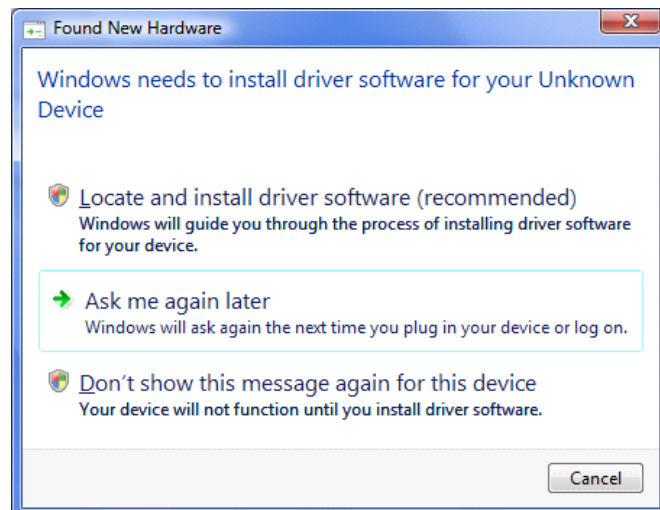
4. A popup window named *User Account Control* will display the message "An unidentified program wants access to your computer". Press the *Allow* button to launch the uninstaller on Windows Vista.
5. Wait a brief moment until the HC25 Connection Manager closes and all drivers are removed.



6. The *Found New Hardware* wizard will pop up three times because, after driver clean-up, Windows Vista starts searching for new drivers. Press *Cancel* to abort the search.



In some cases, the *Found New Hardware* wizards may indicate "Unknown Device" instead of HC25 VCOM, HC25 NET and HC25 MODEM. The procedure is the same - simply press *Cancel* three times.

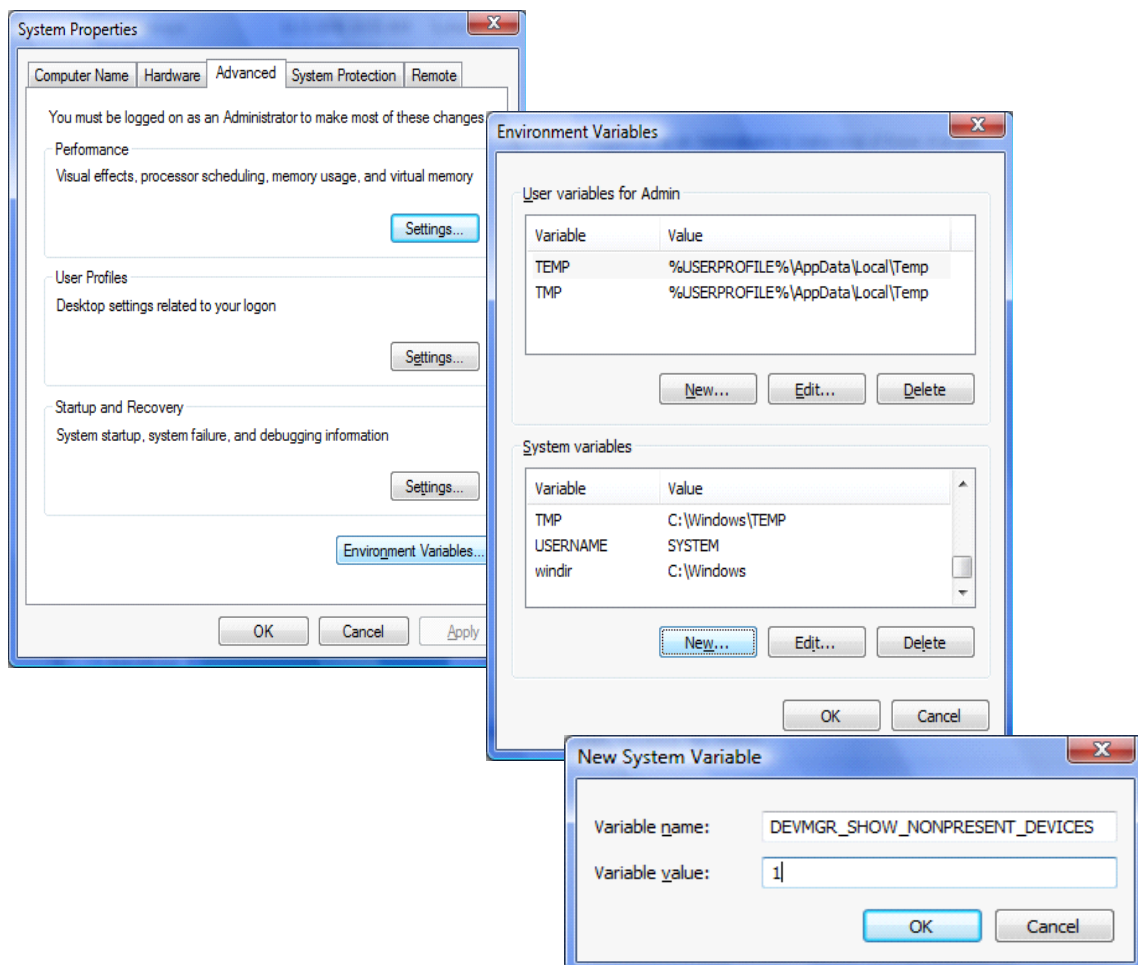


7. The Siemens HC25 Connection Manager and the HC25 drivers are removed now. Only the two files `hc25usbser.sys` and `hc25usbnet.sys` are left unchanged in the `..\\WINDOWS\\system32\\drivers` folder. Yet, this is no problem, as they will be overwritten next time you re-install the drivers.

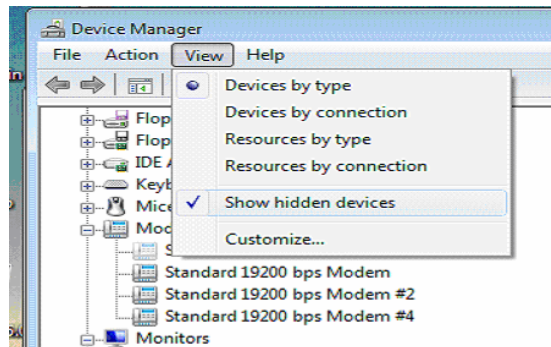
2.9.3 Uninstalling Components if HC25 is Disconnected

If disconnected or switched off, the HC25 module is not visible on the Windows XP or Windows Vista computer unless you enable the operating system to show hidden devices. The purpose of this section is to describe how to uninstall HC25 components in such case. The dialog boxes show Windows Vista, but Windows XP is quite similar.

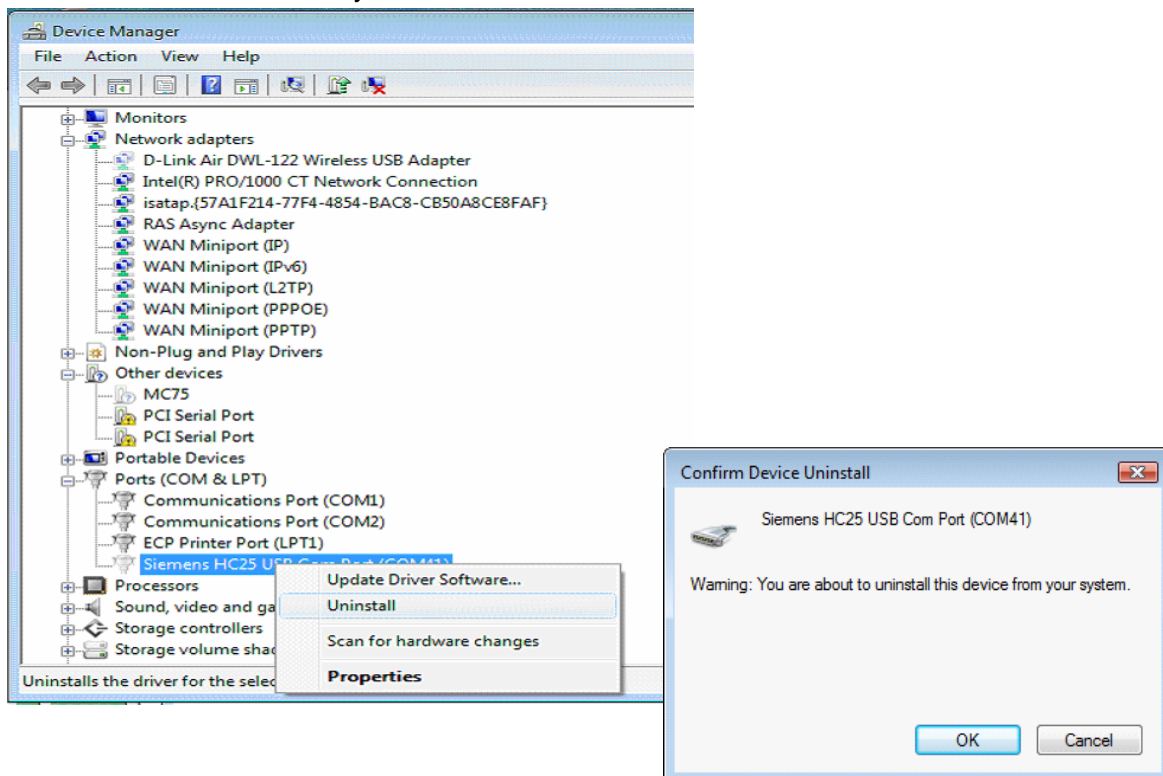
1. Remove the Siemens HC25 Connection Manager as described in [Section 2.9.1](#).
As a result, the Siemens HC25 Connection Manager software will be uninstalled, but the HC25 drivers are not.
2. Although not visible, the HC25 drivers are still blocking two virtual COM ports. To free the ports hidden devices must be shown as follows:
On Windows XP, open the *Control Panel*, click *System* and select the *Advanced* tab.
On Windows Vista, open the *Control Panel*, select *System and Maintenance*, click *System* and select *Advanced system settings* on the left panel of the dialog box.
Then press the *Environment Variables* button. In the resulting dialog box point to the *System variables* section and press the *New* button.
Enter the new system variable "DEVMGR_SHOW_NONPRESENT_DEVICES" and set value "1".



- Open the *Device Manager* (from *Control Panel*). Note that if the *Device Manager* is already open you need to close and re-open it to update the status of the devices. From the *View* menu select *Show hidden devices*.



- All hidden virtual HC25 devices are listed now. Right-click each device, one by one, select *Uninstall* and confirm the resulting uninstall messages. The example shows how to uninstall the Siemens HC25 USB Com Port. The Siemens HC25 Wireless Ethernet Adapter and the Siemens HC25 HSDPA USB Modem must be uninstalled in the same way.



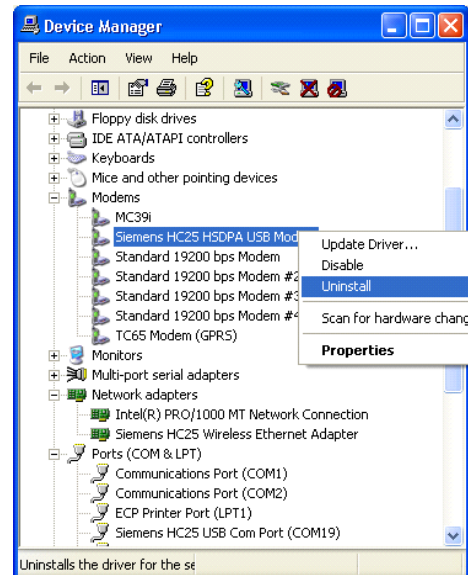
2.9.4 Uninstalling Components of HC25 Preview Releases

The following procedures apply only to drivers of earlier HC25 releases supplied as preview samples for testing only. These drivers were available only for Windows XP.

2.9.4.1 Uninstalling Earlier Drivers

1. Under Windows XP, open the *Device Manager* and select the drivers as described in [Section 2.8](#). Keep in mind that the drivers are listed in the *Device Manager* only when the module is switched on. Right-click the driver and, from the resulting menu, select *Uninstall*.

If the module is disconnected first follow the steps provided in [Section 2.9.3](#) and enable the *Device Manager* to show hidden devices.



2. Under `..\WINDOWS\system32\drivers` remove the two files "hcusbser.sys" and "hcusbnet.sys". (Please note that the newly installed HC25 drivers will now be set up as "hc25usbser.sys" and "hc25usbnet.sys").
3. Under `..\WINDOWS\INF` check for old "oem*.inf" and "oem*.pnf" files and remove all files related to earlier customer samples.

To do so, open the currently installed "oem*.inf" file(s) and compare the content with the "hcser.inf", "hcnet.inf" and "hcmdm.inf" supplied with the latest release. All "oem*.inf" and associated "oem*.pnf" files based on information from old "hcser.inf", "hcnet.inf" and "hcmdm.inf" files must be removed.

An easy way to compare the content of these files is checking the information given in the [Siemens] section, such as the two examples shown below:

Examples:

```
[SIEMENS]
%hcwwan.DeviceDesc_hc1% = hcwwan.ndi, USB\VID_0681&PID_&MI_01
```

```
[SIEMENS]
%hcwwan.DeviceDesc_hc1% = hcwwan.ndi, USB\VID_05C6&PID_7001&MI_01
```

2.9.4.2 Uninstalling Earlier Connection Manager

Old versions of the Siemens Connection Manager were installed in Windows XP under *Program Files | Siemens | ConnectionManager*. To uninstall the program simply remove the "con-man.exe" file.

Any shortcuts and icons must be deleted manually.

2.10 Updating HC25 Drivers

Driver updates are contained in a ZIP file named "HC25_<release>_conman_install.zip". The ZIP file is either delivered separately or ready for download from <http://www.siemens.com/wm>.

The following sections describe how to install the new drivers either from any location on a Windows XP computer (see [Section 2.10.1](#)) or a Windows Vista computer (see [Section 2.10.2](#)) or from the HC25 mass storage (see [Section 2.10.3](#)).

Before installing new drivers be sure to uninstall existing drivers as described in [Section 2.9](#).

2.10.1 Installing Driver Update from Any Folder on Windows XP

1. Switch off the HC25 module or unplug the USB cable.
2. Copy or unpack the new driver package to any folder on your Windows XP computer. The folder tree must be the same as shown in [Section 2.10.3, Figure 4](#). Therefore, do not copy or unpack the files into one folder only.
Recommendation: When you extract the supplied "HC25_<release>_conman_install.zip" take care to retain the folders and subfolders stored in the ZIP archive.
3. Double-click the "autorun.exe" file from the unzipped driver package.
4. The installation of the Siemens HC25 Connection Manager will start and, at the same time, the composite device driver software will be preinstalled. Simply follow the screens described in [Section 2.5.1](#). The last installation dialog closes automatically.
5. Now, switch on the HC25 module or replug the USB cable.
6. Windows will detect the HC25 module as a new device. The *New Hardware Found* wizard pops up three times, prompting you to install the following devices:
 - Siemens HC25 USB Com Port driver
 - Siemens HC25 Wireless Ethernet Adapter driver
 - Siemens HC25 HSDPA USB Modem driverTo do so, follow the screens described in [Section 2.5.2](#), i.e. simply press *Next* in each dialog, using the option *Install the software automatically (Recommended)*.

Keep in mind that, before the composite device drivers are installed, the HC25 enumerates as mass storage if the factory default settings of the AT^SUSB command are left unchanged (parameter <start> equals "MdmNet" and timeout <mnto> equals 10 seconds). The mass storage is not needed, but you may be required to take the following precautions:

- If the installation of all three drivers completes before the <mnto> timeout expires the mass storage will be deactivated automatically. But as 10 seconds are typically not enough for all three drivers it is very likely that the HC25 enumerates as mass storage during the installation. As a result, the driver installation (step 6 above) may be halted, for example after the first (or already the second) driver was set up. Yet, this is nothing to worry about - all you need to do is manually ejecting the mass storage. So, right-click the *Removable Disk* drive inside the Windows Explorer and select *Eject*. This will deactivate the mass storage functionality, and at the same time, cause the *New Hardware Found* wizards for the next one or two drivers to pop up.
- If you prefer to install driver updates always from a location other than the HC25 mass storage, you can disable the <mnto> timeout of the AT^SUSB command (set 0 seconds). The setting is non-volatile. For details on AT^SUSB please refer to [\[2\]](#).

IMPORTANT: To avoid mixing up the driver packages located in the mass storage and in any other folder be sure to run the "autorun.exe" only from the new unzipped driver package.

2.10.2 Installing Driver Update from Any Folder on Windows Vista

1. Switch off the HC25 module or unplug the USB cable.
2. Copy or unpack the new driver package to any folder on your Windows XP computer.
The folder tree must be the same as shown in [Section 2.10.3](#), [Figure 4](#). Therefore, do not copy or unpack the files into one folder only.
Recommendation: When you extract the supplied "HC25_<release>_conman_install.zip" take care to retain the folders and subfolders stored in the ZIP archive.
3. Double-click the "autorun.exe" file from the unzipped driver package.
4. The installation of the Siemens HC25 Connection Manager will start and, at the same time, the composite device driver software will be preinstalled. Simply follow the screens described in [Section 2.6.1](#). The last installation dialog closes automatically.
5. Now, switch on the HC25 module or replug the USB cable.
6. The installation of the composite device drivers continues automatically as described in [Section 2.5.2](#).

On Windows Vista, the 10s timeout <mnto> of the AT^SUSB command will often be sufficient for the composite device driver installation, eliminating the need for HC25 to temporarily enumerate as mass storage. However, if 10 seconds are not enough, the HC25 enumerates as mass storage, and the driver installation (step 6 above) may be halted as explained in [Section 2.10.1](#) for Windows XP. In this case, manually eject the mass storage. To do so, right-click the *Removable Disk* drive inside the Windows Explorer and select *Eject*. This will deactivate the mass storage functionality, and the installation will proceed.

If you prefer to install driver updates always from a location other than the HC25 mass storage, you can disable the <mnto> timeout of the AT^SUSB command (set 0 seconds). The setting is non-volatile. For details on AT^SUSB please refer to [\[2\]](#).

IMPORTANT: To avoid mixing up the driver packages located in the mass storage and in any other folder be sure to run the "autorun.exe" only from the new unzipped driver package.

2.10.3 Installing Driver Update from HC25 Mass Storage

To ensure that the driver update installation can be started from the mass storage of the HC25 we recommend to follow the steps listed below. By this approach, the factory settings of the AT^SUSB command can be left unchanged: parameter <start> equals "MdmNet" and timeout <mnto> equals 10s.

1. Uninstall the drivers and the Siemens HC25 Connection Manager as described in [Section 2.9](#).
2. Switch off or unplug the module, then switch on or replug the module.
3. Abort the installer if started automatically (press *Cancel* in all three *New Hardware Found* wizards).
4. Because no installed drivers are found (within the above AT^SUSB timeout <mnto>), the HC25 module enumerates as mass storage, usually showing up as *Removable Disk* assigned to the next free drive of the Windows Explorer. Navigate to this drive and delete all existing files, folders and subfolders containing the old driver package (see [Figure 3](#)).

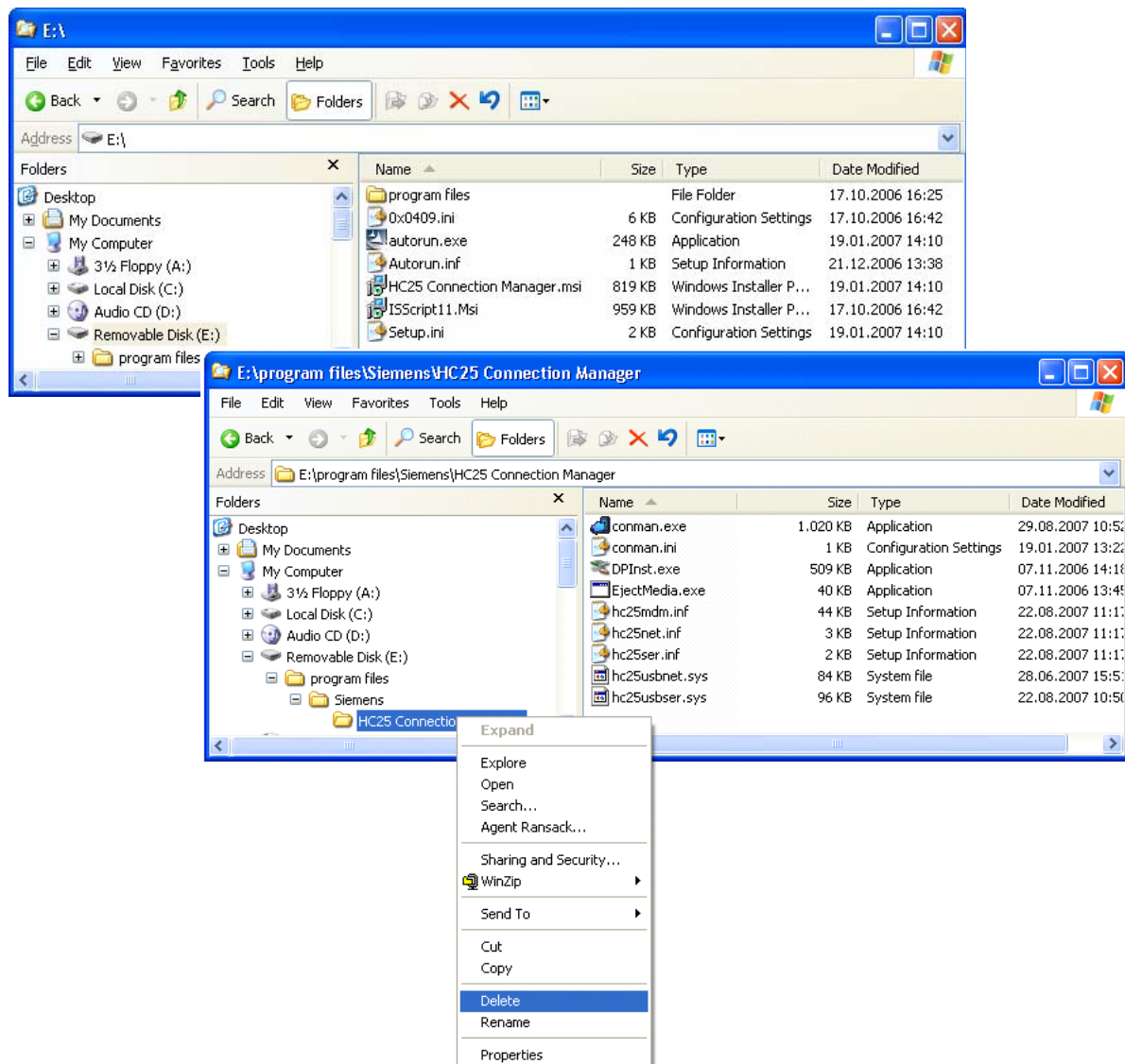


Figure 3: Deleting obsolete HC25 driver files, folders and subfolders

5. Copy or unpack the new driver package to the mass storage drive. The folder tree must be the same as shown below. Therefore, do not copy or unpack the files into one folder only. Recommendation: When you extract the supplied "HC25_<release>_conman_install.zip" take care to retain the folders and subfolders stored in the ZIP archive.

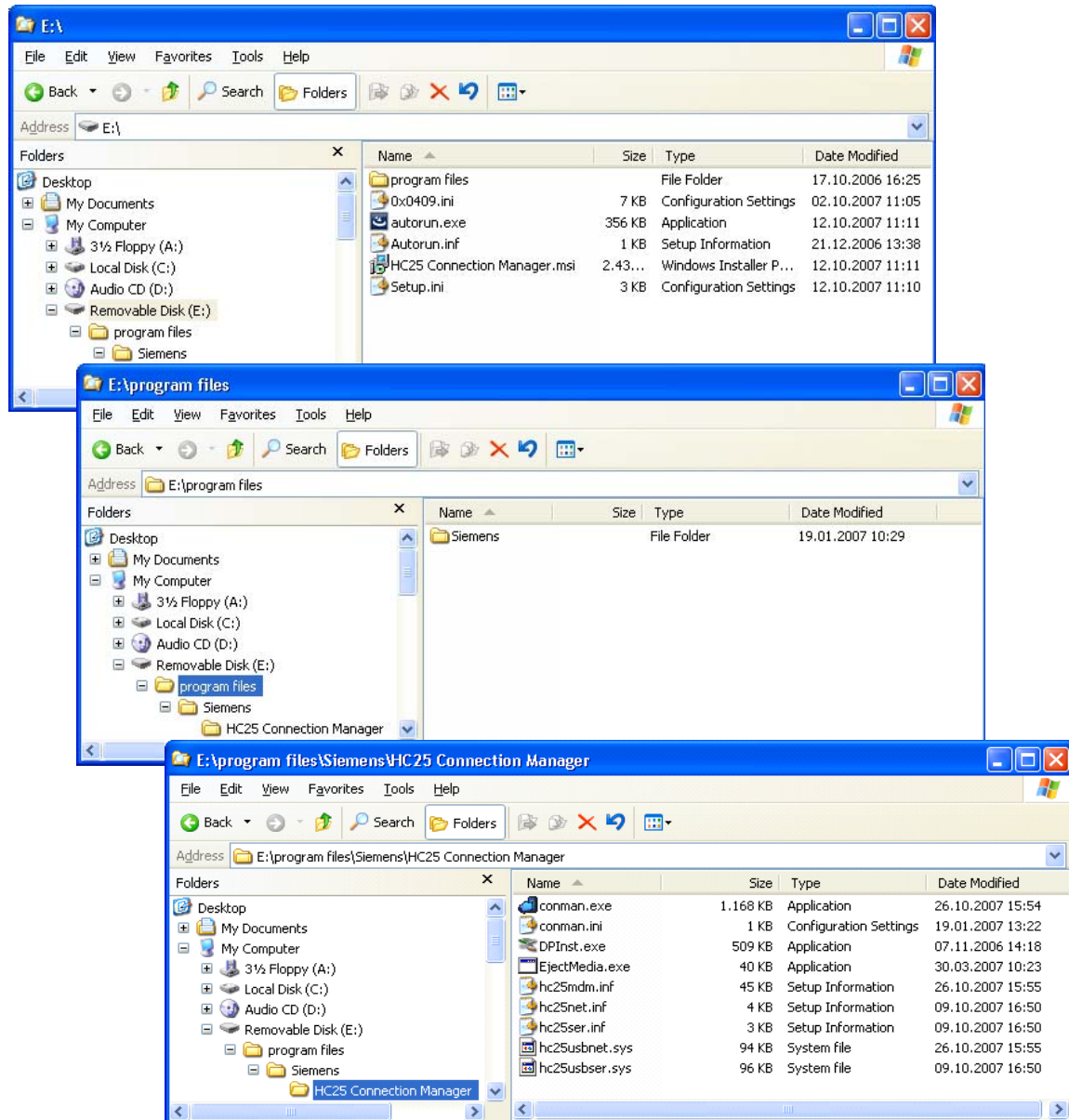


Figure 4: Folder tree of HC25 driver package

6. Close the Windows Explorer and switch off or unplug the HC25 module.

Now the module is prepared for easy installation from the mass storage. You can switch on or replug the HC25 module any time and proceed as described in [Section 2.5](#) for Windows XP or [Section 2.6](#) for Windows Vista.

2.11 Configuring the HC25 for Operation via ASC0 or USB

ASC0 and USB operation are mutually exclusive: ASC0 usage disables access to the virtual USB devices and, vice versa, USB usage disables access to the ASC0 interface. The command `AT^SUSB="Startup",<start>` determines which mode to use.

By factory default, the HC25 is prepared for use as a composite USB device connected to a Windows XP or Windows Vista system. This requires the supplied HC25 USB composite device driver package to be installed as described in this manual.

Therefore, if your host application is designed to communicate with HC25 through the ASC0 interface you will initially need a Windows XP or Windows Vista environment with the HC25 USB composite device driver package installed. This system may be used to change the "Startup" settings of `AT^SUSB` and reconfigure the HC25 modules for use on ASC0.

<code>AT^SUSB="Startup"</code> <code>^SUSB: "Startup","MdmNet"</code> OK	Read the current configuration. Response: On power-up HC25 enumerates as USB composite device (delivery default).
<code>AT^SUSB="Startup","None"</code> <code>^SUSB: "Startup","None"</code> OK <code>AT^SMSO</code> OK	Configure HC25 for ASC0 operation: The setting "None" means that on power-up only the ASC0 interface will be accessible. Switch off HC25 to make the changes take effect.

Of course, if configured for ASC0, HC25 modules can be connected to systems that have no HC25 USB drivers installed.

In a Windows XP or Windows Vista environment with installed HC25 USB drivers and plugged USB cable the HC25 will enumerate as USB composite device even though configured for ASC0. Despite that the virtual USB devices cannot be used.

Updating the HC25 firmware via the ASC0 interface requires that the USB cable is disconnected. For details see [\[5\]](#).

For ASC0 operation the host application or Terminal program must have RTS/CTS flow control enabled. The module is permanently configured for `AT\Q3`.

ASC0 is permanently configured for 115200 bps bit rate. Other values selectable with `AT+IPR` exist only for compatibility reasons, but do not take effect if set.

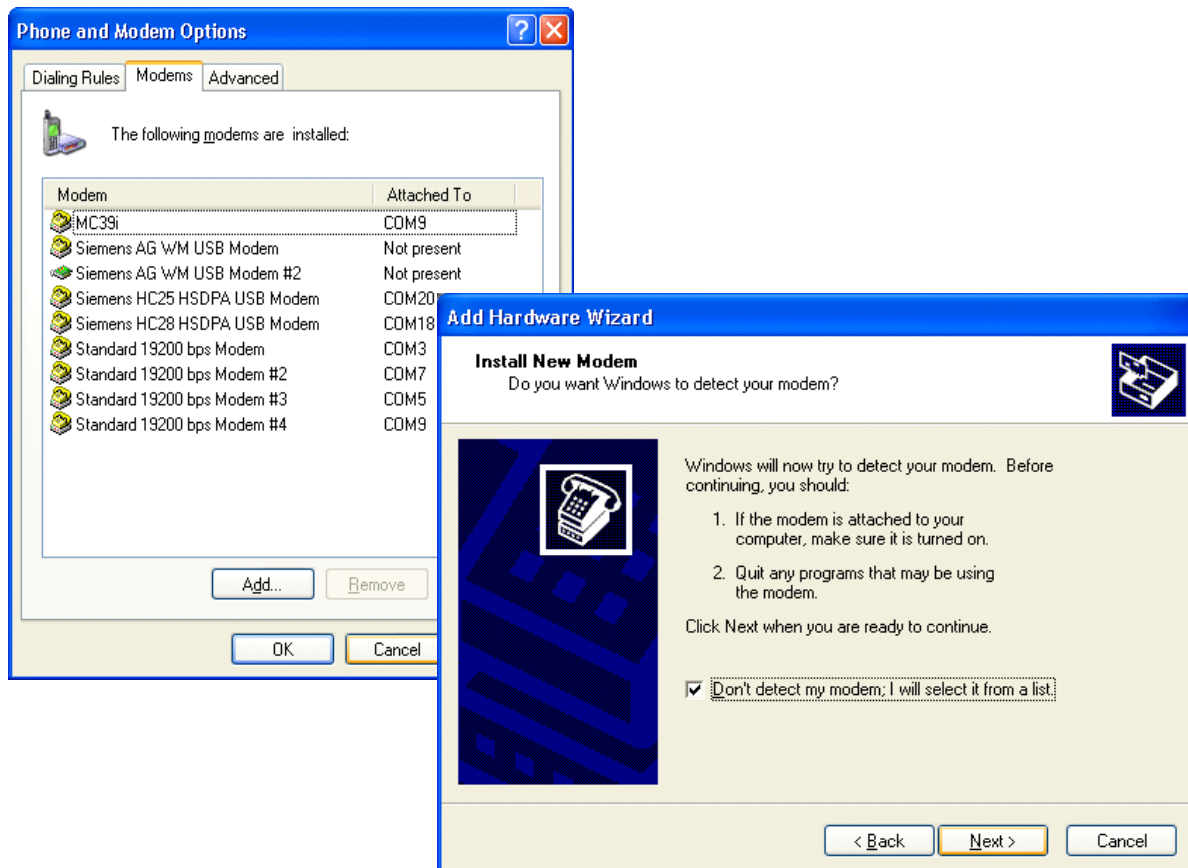
2.11.1 Installing a Modem on the ASC0 Interface

If you wish to install a modem on the ASC0 interface you may either use the "Standard 19200 bps Modem" integrated in Windows, or the HC25 specific serial modem delivered together with HC25. The delivery only includes an INF file named "HC25genmdm.inf".

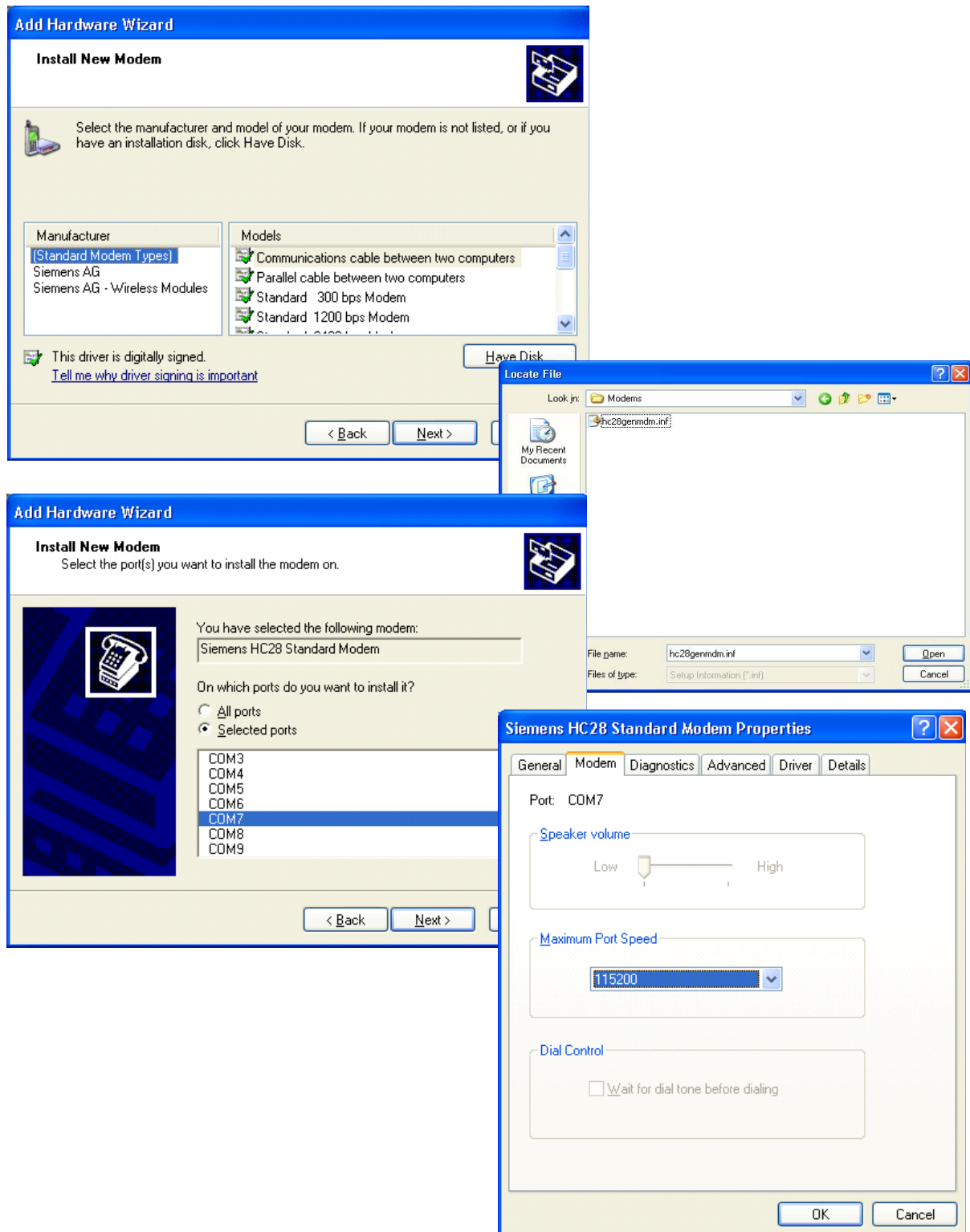
This section summarizes the basic steps for installing the HC25 modem on a Windows XP computer. Those for Windows Vista are similar.

Click on *Start*, select *Settings | Control Panel | Phone and Modem Options | Modems* and press the *Add* button. Select the COM port the module's ASC0 interface is connected to on your Windows computer. Keep in mind that the terminal program or host application connected to this COM port must be disconnected during the installation, otherwise it will not be visible in the list of selectable COM ports.

The *Add Hardware Wizard* opens. Check the option *Don't detect my modem; I will select it from a list* and click *Next*.



The resulting list of manufacturers and models can be ignored, simply press the *Have Disk* button and navigate to the source drive where the "HC25genmdm.inf" file is located.



After the installation has completed make sure that the port speed on the *Modem* property page is set to 115200 bps. In the Windows *Device Manager* the modem will be listed as "Siemens HC25 Standard Modem".

The steps required to configure the modem for dial-up connections are the same as for all other modems and can be found in [Section 4.1](#).

3 Using the HC25 Module

This chapter first provides an overview of all available HC25 interfaces. The second part shows the basic steps required to register to the network, to select UMTS mode or GSM mode and to attach to HSDPA or GPRS.

The examples are based on a UICC card provisioned by the German network operator T-Mobile. The used UICC card is capable of UMTS and GSM and enables the subscriber to switch back and forth between both networks.

3.1 AT Command Interfaces

HC25 features two interfaces for processing AT commands:

- Modem interface and
- Application interface.

Both AT command interfaces can be assigned to the various physical and virtual interfaces of HC25. Basically, their allocation is dependent on whether the HC25 is configured for operation through its asynchronous serial interface ASC0, or as USB composite device comprising two virtual COM ports and a virtual wireless Ethernet adapter. ASC0 and USB operation are mutually exclusive: ASC0 usage disables access to the virtual USB devices and, vice versa, USB usage disables access to the ASC0 interface. The command `AT^SUSB="Startup",<start>` determines which mode to use. Please refer to [Section 2.11](#) (this manual) and to [\[2\]](#) for details on `AT^SUSB`.

The following sections summarize the functions of the Modem interface and the Application interface as well as their allocation to the module's physical and virtual interfaces. For greater detail refer to [\[2\]](#), especially the sections "AT Command Interpreter" and "Unsolicited Result Code Presentation", the configuration command `AT^SCFG` with the feature "URC/DstIfc", `<udi>` and the `AT+CMUX` command.

To easily identify both interfaces you can use the `AT^SQPORT` command.

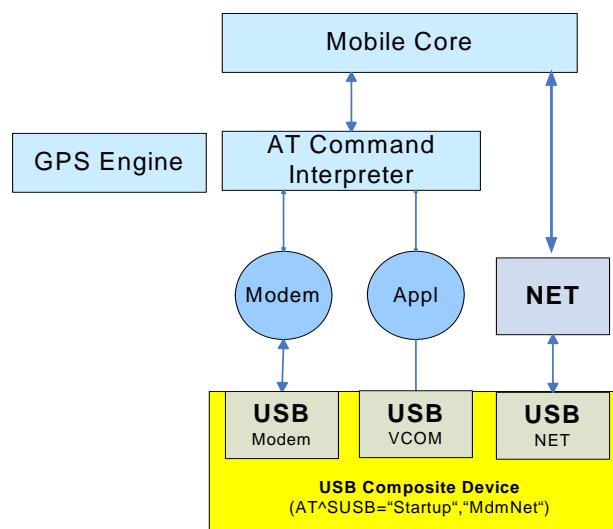


Figure 5: Interfaces available with factory default settings

3.1.1 Modem Interface

This interface is referred to as "Modem" if queried with the AT^SQPORT command. In the quick reference tables of [2] it is named "MDM".

```
AT^SQPORT
Modem
OK
```

The Modem interface is intended particularly for circuit and packet switched transmission (HSDPA, (E)GPRS, CSD, Fax, Voice). URCs relevant for data calls (RING, NO CARRIER) are issued on the Modem interface, all other URCs normally only on the Application interface.

The Modem interface can be assigned to one of these HC25 interfaces:

- Asynchronous serial interface ASC0
- A logical channel of the USB composite device. For example, by factory default, in Windows XP or Windows Vista the virtual modem port (MODEM) listed as "Siemens HC25 HSDPA USB Modem" in the Windows *Device Manager* under *Modems*.
- First Multiplex channel if Multiplex mode is activated.

3.1.2 Application Interface

This interface is referred to as "Application" if queried with the AT^SQPORT command. In the quick reference tables of [2] it is named "APP".

```
AT^SQPORT
Application
OK
```

The Application interface is designed especially for controlling the HC25, i.e. for entering AT commands, receiving URCs, and also for sending and receiving short messages. It cannot be used as data interface for HSDPA, (E)GPRS, CSD and Fax.

The Application interface can be assigned to one of these HC25 interfaces:

- A logical channel of the USB composite device. For example, by factory default in Windows XP or Windows Vista the virtual COM port (VCOM) listed as "Siemens HC25 HSDPA USB Com Port" in the Windows *Device Manager*, under *Ports (COM&LPT)*.
- Second Multiplex channel if Multiplex mode is activated.
If HC25 is configured for ASC0 usage, the Application interface is available only if Multiplex mode is activated.

3.1.3 AT Command Interpreter

Both the Modem interface and the Application interface are handled by the same AT command interpreter. As a result, AT commands entered on both interfaces are not executed in parallel but sequentially, one after the other. So, an AT command issued on one interface will be buffered on this interface to be executed after the other interface has completed processing earlier AT command(s).

When a dial-up connection is established over the Modem interface, the Application interface can be used simultaneously for any control functions. This eliminates the need for the user to enter AT commands, such as +++ and ATO, to switch back and forth between command and online mode when working on one interface only. Yet, it should be noted that the dial-up connection disables the echo on both interfaces, due to the initialization strings typically set by modems. The echo can be re-activated by executing ATE1.

If ASC0 operation is enabled all communication between HC25 and the host application takes place only on the Modem interface. Therefore, Multiplex mode is recommended to have the Application interface available for control functions.

3.1.4 Multiplex Mode

Multiplex mode according to GSM 07.10 and 3G TS 27.010 enables a serial interface to be partitioned into virtual channels. It can be used either on the USB interface or on the asynchronous serial interface ASC0 of the HC25 module.

Multiplex mode can be started only on the Modem interface. This may be either the ASC0 interface or the virtual modem port of the USB composite device.

In either case, the Modem interface will be mapped to the first Multiplex channel, and the Application interface will be mapped to the second multiplex channel. As a result, the functions of the first and second multiplex channel are the same as described in sections 3.1.1 through 3.1.3 for the Modem interface and the Application interface.

The third multiplex channel is reserved for GPS and will be used to output NMEA data if the GPS receiver is switched on and NMEA output is enabled with AT^SGPSS.

If you are using the demo driver WinMux supplied with HC25 for Windows XP and Windows Vista note that each multiplex channel will be assigned a virtual COM port of its own.

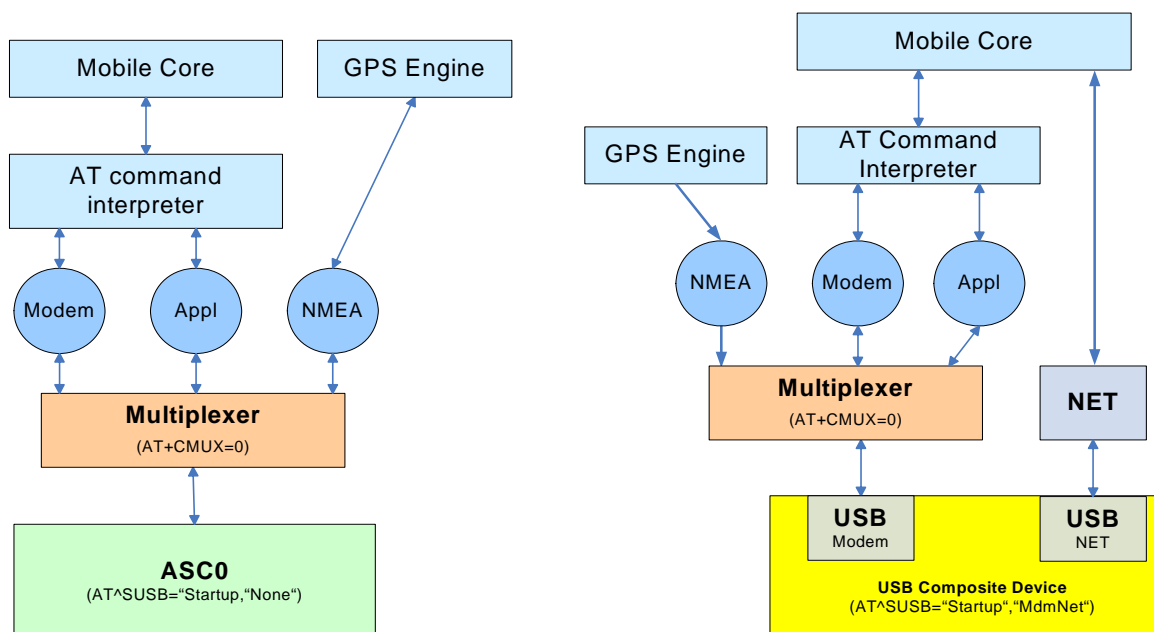


Figure 6: Interfaces available in Multiplex mode either on ASC0 or USB

3.1.5 Handling of Unsolicited Result Codes

URCs are normally indicated only on the Application interface, no matter whether the Modem interface or the Application interface was used to send the AT commands for activating their presentation. This URC management scheme is the default configuration recommended for a typical HC25 application. If you wish to change the default configuration please carefully read the section "Unsolicited Result Code Presentation" in [2] and the description of the AT^SCFG feature "URC/Dstlfc", <udi>. The examples below reflect the default settings.

Default for URC routing on USB composite device:

AT^SUSB="Startup"	Check startup mode of HC25.
^SUSB: "Startup","MdmNet"	Response: HC25 is used as USB composite device.
OK	
AT^SCFG="URC/Dstlfc"	Check which interface is used to output URCs.
^SCFG: "URC/Dstlfc","app"	Response: URCs will be output on the Application interface.
OK	

If the Modem interface is assigned to ASC0 and Multiplex mode is not enabled, HC25 automatically changes the "URC/Dstlfc" configuration such that all URCs will be routed to the Modem interface.

Default for URC routing on ASC0:

AT^SCFG="Startup"	Check startup mode of HC25.
^SUSB: "Startup","None"	Response: ASC0 usage enabled, USB usage disabled.
OK	
AT^SCFG="URC/Dstlfc"	Check which interface is used to output URCs.
^SCFG: "URC/Dstlfc","mdm"	Response: URCs will be output on Modem interface.
OK	

With Multiplex mode activated on the ASC0 interface, the default destination interface for URCs will automatically be set to "app", i.e. the Application interface (the second Multiplex channel in this case) will be used for URC presentation.

3.2 Switching on the HC25

The HC25 can be started by activating the IGT line. If the HC25 connects to the DSB75 press the IGT key (S421) or plug in the USB cable. Please wait approximately 2 seconds before using the module, for example before entering AT commands.

For further information please refer to [Section 5.1.7](#).

3.3 Switching off the HC25

To shut down the HC25 module, enter the AT^SMSO command. This enables the ME to save all data and perform an orderly shutdown.

```
AT^SMSO
OK
```

The ME switches off.

The HC25 module can also be switched off by using the IGT line as described in [\[2\]](#), Section AT^SCFG and in [\[1\]](#), Section "Configuring the IGT Line for Use as ON/OFF Switch").

For further information please refer to [Section 5.1.7](#).

3.4 Registering to the Network

Make sure to operate the HC25 always with the UICC card inserted in the card reader and a valid SIM PIN entered. This is because most AT commands require SIM PIN authentication.

Write command: AT+CPIN=<pin>[, <new pin>]

```
AT+CPIN?
+CPIN: SIM PIN
OK
AT+CPIN="1234"
OK
AT+CPIN?
+CPIN: READY
OK
```

Entering the SIM PIN.

3.5 Selecting UMTS or GSM

The GSM 07.07 operator selection command AT+COPS has been enhanced to enable the subscriber to select whether to use UMTS or GSM. You can quickly switch back and forth between both network types while the ME remains registered.

Write command: AT+COPS=<mode>[, <format>[, <oper>[, <act>]]]

The parameter <act> (access technology) can take the values listed below. The parameter is stored non-volatile.

- 0 GSM network
- 2 UMTS network

Note: By factory default, an automatic network selection mode is set which enables the ME to select either UMTS or GSM, depending on the network coverage. This automatic mode remains enabled until you explicitly set either UMTS or GSM using the <act> parameter of AT+COPS. Setting the <act> parameter forces the ME to select either UMTS only or accordingly, GSM only. If the specified network is not available, the network registration will be disabled. Setting <mode> to 0 without choosing a specific <act> enables the automatic selection mode once again.

AT+COPS? +COPS: 0,0,"T-Mobile D",2 OK	Querying the current network mode. The ME is registered to the German operator T-Mobile and uses UMTS.
AT+COPS=0,,0 #(or AT+COPS=,,0) OK	Selecting the GSM network.
AT+COPS? +COPS: 0,0,"T-Mobile D",0 OK	Query the current network type. The response confirms that the ME has changed to the GSM network.
AT+COPS=0,,2 #(or AT+COPS=,,2) OK	Selecting the UMTS network.
AT+COPS? +COPS: 0,0,"T-Mobile D",2 OK	
AT+CPIN? +CPIN: READY OK	There is no need to enter the SIM PIN again.
AT+COPS=0 OK	Setting automatic network selection mode.

Furthermore, the command AT+COPS serves to query or specify several modes of selecting the GSM network operator. These functions are not discussed in this document.

3.6 Attaching to the HSDPA or (E)GPRS Network

The HC25 can be configured whether to try automatically to attach to the HSDPA or (E)GPRS network immediately after registering to the UMTS or GSM network. To set your preferences use the "GPRS/AutoAttach" parameter of the AT+SCFG command.

AT+SCFG="GPRS/AutoAttach",enabled ^SCFG: "GPRS/AutoAttach", "enabled" OK	Configuring HC25 to try automatically to attach to the HSDPA or (E)GPRS network.
AT+CPIN=1234 OK	Entering the PIN.
+CREG: 1	HC25 is properly registered to the network.
AT+CGATT? +CGATT: 1 OK	Querying the current service state. The ME is attached. Depending on the selected network type (see AT+COPS), it is either attached to the HSDPA or GPRS service.

3.7 Defining the PDP Context for HSDPA or (E)GPRS Network

Use the AT+CGDCONT command to configure the correct provider settings. The PDP context is stored non-volatile.

Write command:

AT+CGDCONT=<cid>[, <PDP_type>[, <APN>[, <PDP_addr>]]]

AT+CGDCONT=1,"IP","internet.t-mobile" OK	Specifying the PDP context (example shows the APN of the German network provider T-Mobile).
AT+CGDCONT? +CGDCONT: 1,"IP","internet.t-mobile","",0,0 OK	Checking the current PDP context definition.

The focus of this document is only on the parameters <cid>, <PDP_type> and <APN>. The string parameters must be enclosed in quotation marks.

Under Windows XP and Windows Vista, the PDP context can, optionally, be entered on the *Modem* property page as described in [Section 2.8](#).

3.8 Making a Voice Call (MO)

The commonly used GSM 07.07 dialing command ATD is fully applicable both in the UMTS and the GSM network.

To make a mobile originated voice call enter ATD, type the destination number and add a semi-colon. The result code OK will be returned immediately after dialing, prior to call setup.

To end the call, use the AT+CHUP command (ATH is for data calls only).

ATD030111111111;	The HC25 subscriber makes a voice call.
OK	
at+clcc	Checking the call status (MO call is active).
+CLCC:	
1,0,0,0,0,"030111111111",129,"Tom"	
	The HC25 subscriber terminates the call.
AT+CHUP	
OK	
at+clcc	Checking the call status (no call).
OK	

3.9 Answering a Voice Call (MT)

A mobile terminated voice call is indicated by the RING URC. To answer the call, enter ATA.

To terminate the call use AT+CHUP.

3.10 HSDPA or GPRS Data Transfer

HC25 offers two ways to access the GPRS or HSDPA networks:

- the Siemens HC25 Connection Manager provided for the Siemens HC25 Wireless Ethernet Adapter. The program is part of the HC25 driver package. See [Section 3.10.1](#).
- a dial-up network connection via the installed Siemens HSDPA USB Modem as described in [Section 3.10.2](#).

Contact your service provider to obtain the appropriate settings for access to the (E)GPRS and HSDPA services, as a rule the following:

- APN (network operator specific Name of Access Point that connects the GSM network to the Internet)
- Primary and secondary DNS
- Static IP address or DHCP
- QoS settings
- User name and password

Before trying to connect to the data services make sure that the module is registered to the network. To take advantage of HSDPA the <act> parameter of AT+COPS shall equal "2". For (E)GPRS the parameter shall be "0".

The SIM PIN can be entered from the host application using the AT+CPIN command. As an alternative to this, the SIM property page of the Siemens HC25 Connection Manager can be used for entering the PIN unless already done from the host application.

3.10.1 Data Transfer via Siemens HC25 Connection Manager

3.10.1.1 Opening and Closing Siemens HC25 Connection Manager

To open the Siemens HC25 Connection Manager in Windows XP or Windows Vista, click *Start*, point to *Programs*, select *Siemens*, select *HC25 HSDPA USB Modem* and click *HC25 Connection Manager*.

The Siemens HC25 Connection Manager can be opened only when the HC25 module is switched on. This implies to close the Siemens HC25 Connection Manager before switching off or restarting the HC25 module. Otherwise, the following warning message will appear, for example, when you restart the HC25 module although the Siemens HC25 Connection Manager is still open.



3.10.1.2 Revision History of Siemens HC25 Connection Manager

The SIM property page described in [Section 3.10.1.3](#) is available as of Version 1.4.00 of the Siemens HC25 Connection Manager.

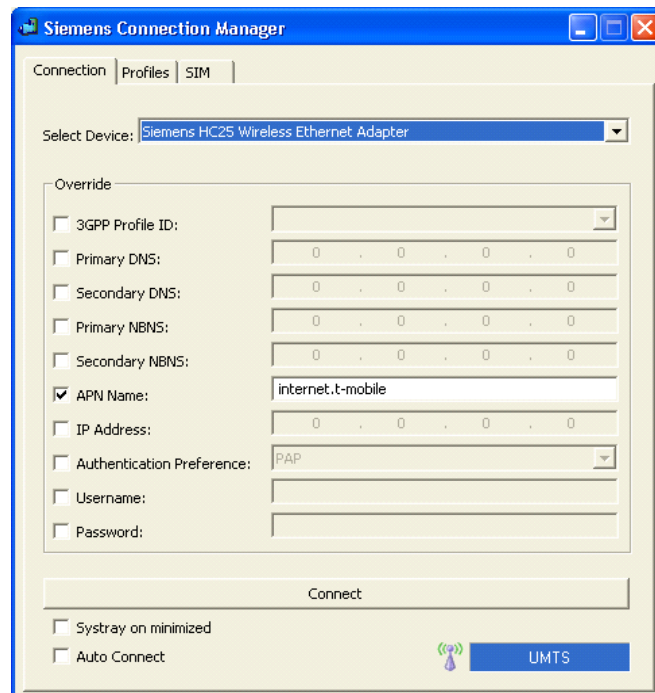
For earlier versions of the Siemens HC25 Connection Manager up to version 1.3.01 Windows Vista users were required to log on as administrator. As of Version 1.4.00 this is no longer necessary.

3.10.1.3 Using the Siemens HC25 Connection Manager

This section describes how to use the Siemens HC25 Connection Manager on Windows XP or Windows Vista.

Connection property page

- Use the *Select Device* listbox to choose the Siemens HC25 Wireless Ethernet Adapter. When opened the first time or after disabling the adapter, the listbox may be empty.
- Check the *APN Name* box and enter the APN (Access Point Name) of your service provider.
- If necessary, check the *Authentication Preference* box and select the type of authentication protocol. Otherwise, PAP and CHAP apply by default. Username and password are also provider dependent.
- Press the *Connect* button to set up a connection. Then simply open your Internet browser. The box on the rightmost bottom represents the signal strength.
- To close the connection press the *Disconnect* button (available when connected).



The *Auto Connect* check box on the leftmost bottom can be activated if you want the Siemens HC25 Wireless Ethernet Adapter to automatically connect to the network each time you restart the HC25. This option can be used particularly with a flat rate subscription. In this case, take care that the SIM PIN authentication is also done automatically.

SIM property page

The *SIM* property page can be used to enter the SIM PIN, unless already done from the host application.

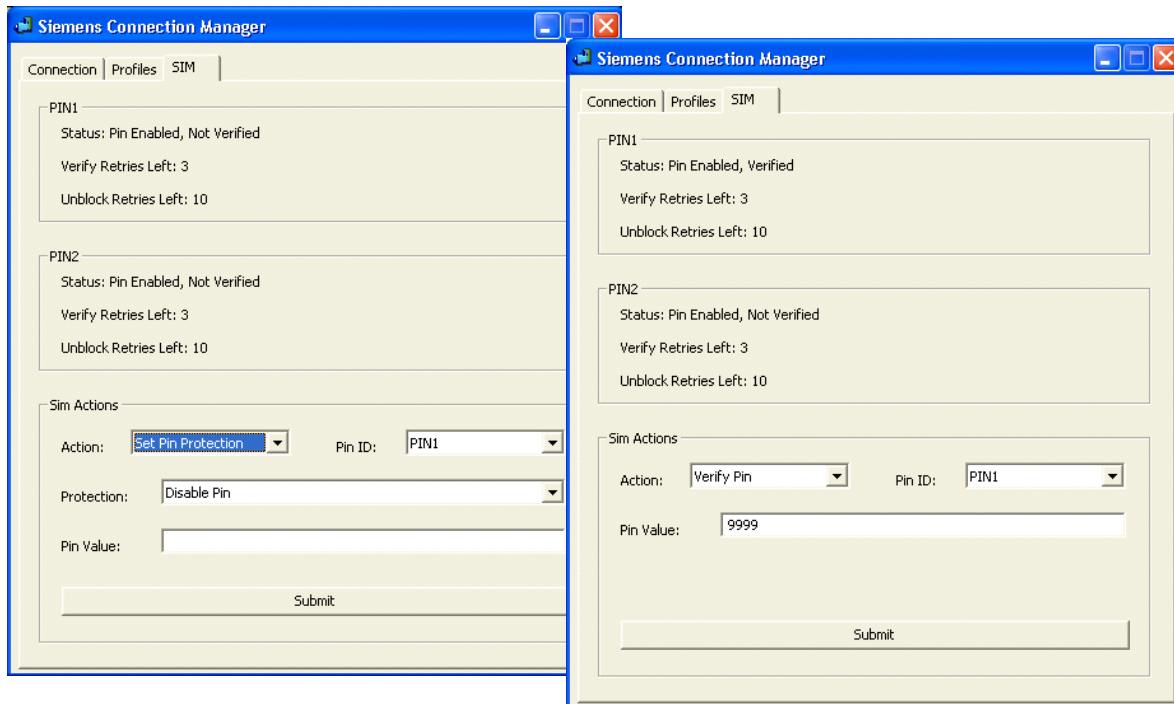
The PIN needs to be given only once, either in the host application with AT+CPIN or on the SIM property page of the Siemens HC25 Connection Manager. Please note that entering the PIN from the host application will not update the values shown on the SIM property page, although PIN authentication is applicable to the Siemens HC25 Connection Manager as well. The other way round, after entering the PIN from the Siemens HC25 Connection Manager the PIN status of the AT+CPIN command will change to "+CPIN: READY".

Use the *Sim Actions* group box to select a function and to enter the PIN. Press the *Submit* button to make the action take effect. The PIN1 and PIN2 group boxes show the result of the last action.

You can choose to enable or disable the PIN protection. When doing so, keep in mind that the selected PIN protection mode is valid for the entire HC25 module. Therefore, any change implies a change to the "SC" lock settings made with AT+CLCK.

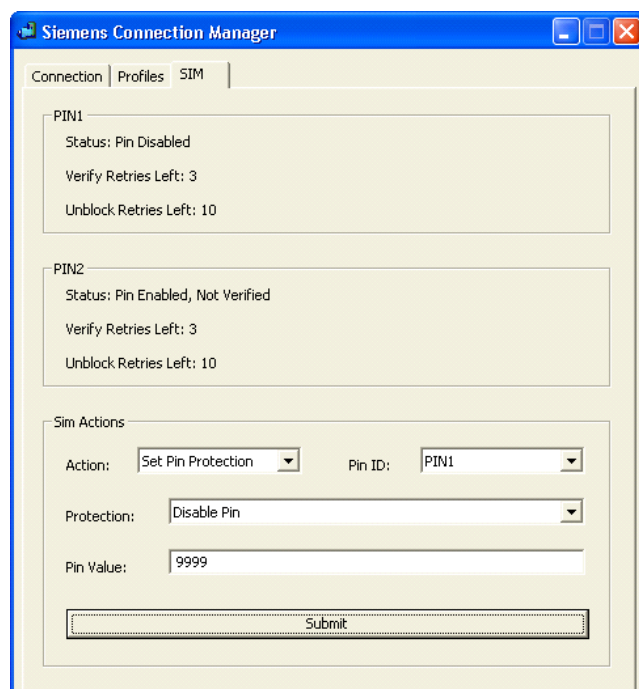
Enable PIN protection (factory default):

- Select *Enable PIN protection* from the *Action* drop-down field, type the PIN into the *Pin Value* field, select *Verify Pin* and press the *Submit* button. The result is shown in the *PIN1* group box: *Status: Pin Enabled, Not Verified*. Corresponding AT+CLCK configuration: AT+CLCK="SC",1.
- From now on, you will need to enter the PIN either from the host application with AT+CPIN or on the SIM property page of the Siemens HC25 Connection Manager. In the latter case, type the PIN into the *Pin Value* field, select *Verify* from the *Action* drop-down field and press the *Submit* button. The result is shown in the *PIN1* group box: *Status: Pin Enabled, Verified*.



Disable PIN protection:

- Select *Disable PIN protection* from the *Action* drop-down field, enter the PIN into the *Pin Value* field and press the *Submit* button. The result is shown in the *PIN1* group box: *Status: Pin Disabled*. Corresponding AT+CLCK configuration: AT+CLCK="SC",0.
- From now on, PIN authentication will be done automatically each time you restart the module.



3.10.2 Data Transfer via Dial-Up Network

The focus of this section is on Windows XP. Instructions on how to create a new dial-up network connection on Windows XP can be found in [Chapter 4](#). Windows Vista is not shown in detail.

Before dialing, make sure that the virtual USB Modem port is not used by any application (eg. by a terminal program or by the host application).

Also, ensure that you have the PDP context for your service provider defined by using the AT+CGDCONT command. The command string can be entered either on the *Modem* property page on the Windows *Control Panel* or in the host application (see [Section 2.8](#) and [Section 3.7](#)).

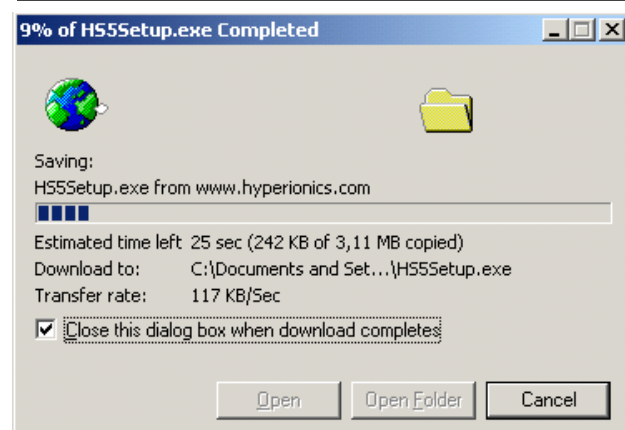
From the *Control Panel* of Windows XP, choose *Network Connections* and select the dial-up network connection created for HC25 (on Windows Vista go to *Network* and select *Network and Sharing Center*). The correct dial string *99***1# should already be given, if entered in the Phone number box when the dial-up network connection was added. Otherwise, you can type the number here before dialing. User name and password may or may not be required, depending on the network operator.



The connection is properly established when the following messages are reported:



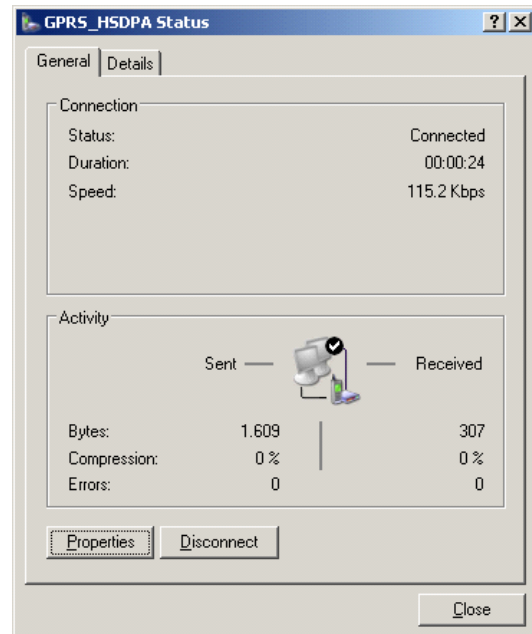
To verify the data rates for up- and/or down-link, you can use, for example, the file download status dialog of your Internet browser.



Terminating the dial-up network connection

To stop a HSDPA or GPRS data connection disconnect the dial-up network connection. This can be done in two ways:

1. Double-click the dial-up network connection icon in the system tray. In the resulting connection status dialog press the *Disconnect* button.
2. The other way is available on the Network Connections page of the Control Panel: Right-click the active connection to open a context menu where to choose *Disconnect*.



3.10.2.1 Local Echo Settings

Due to the initialization strings typically set by modems, a dial-up network connection may automatically change the local echo settings: Opening a dial-up network connection deactivates (ATE0) and activates (ATE1) the local echo. Releasing the dial-up network connection deactivates the echo once again (ATE0). As Modem and Application interface are controlled from the same AT command interpreter the change takes effect on both interfaces.

Therefore, after closing a dial-up network connection you are advised to wait a few seconds before entering an AT command on the Application interface. Otherwise, it is possible that the echo deactivation command ATE0 is still being executed on the Modem interface while another AT command is already entered on the Application interface. As a result, the AT command response expected on the Application interface may appear incomplete.

Likewise, if you enter an AT command on the Application interface in parallel to a dial-up network connection running on the Modem interface at the time when the echo is deactivated take into account that the expected response may be indicated either partially or not at all.

Each time after closing a dial-up network connection you are advised to send the ATE1 command to enable the local echo again.

4 Appendix I

4.1 Adding and Configuring a New Dial-Up Network Connection

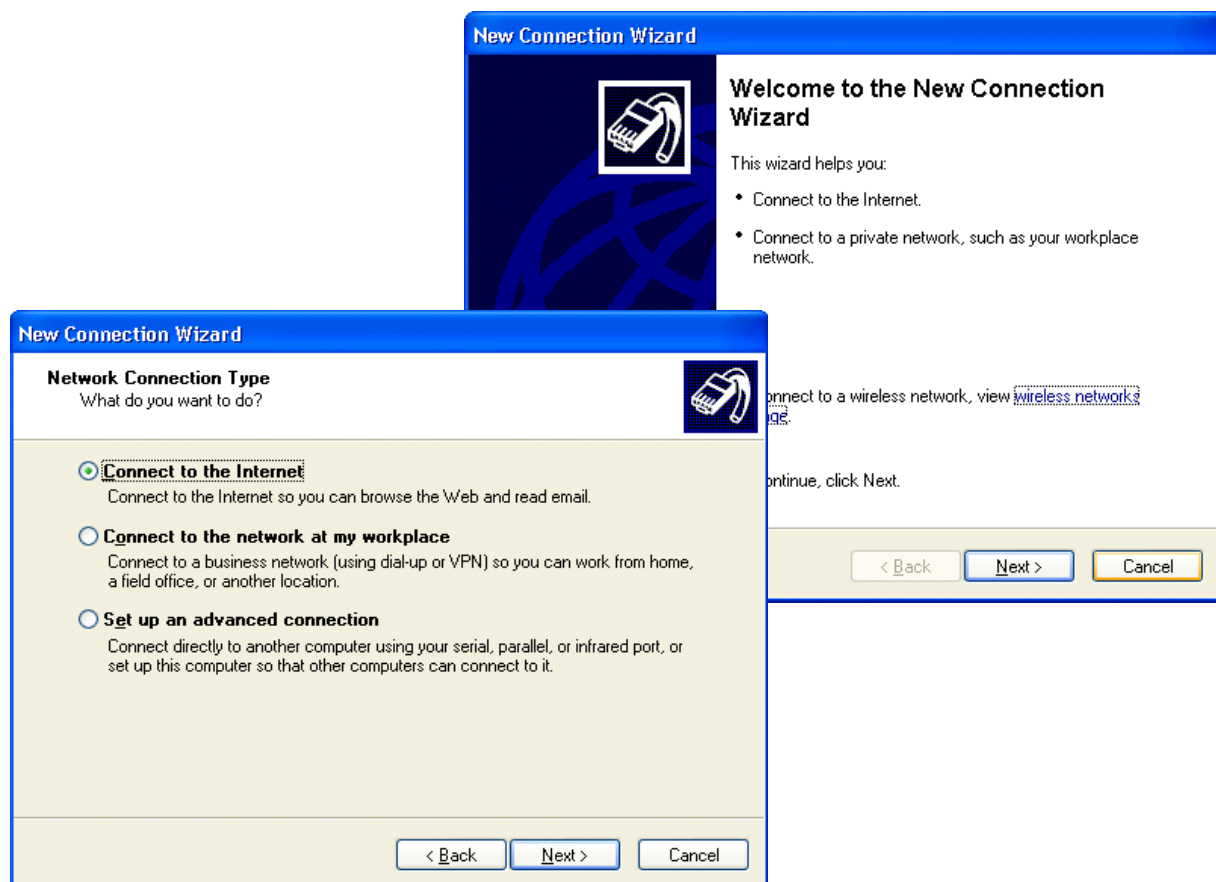
This section will help you create and configure a new dial-up network connection when using the installed Siemens HSDPA USB Modem to access the GPRS or HSDPA network.

All step-by-step instructions and figures provided below refer to Windows XP. On Windows Vista, use the *Network and Sharing Center* to configure a dial-up network connection.

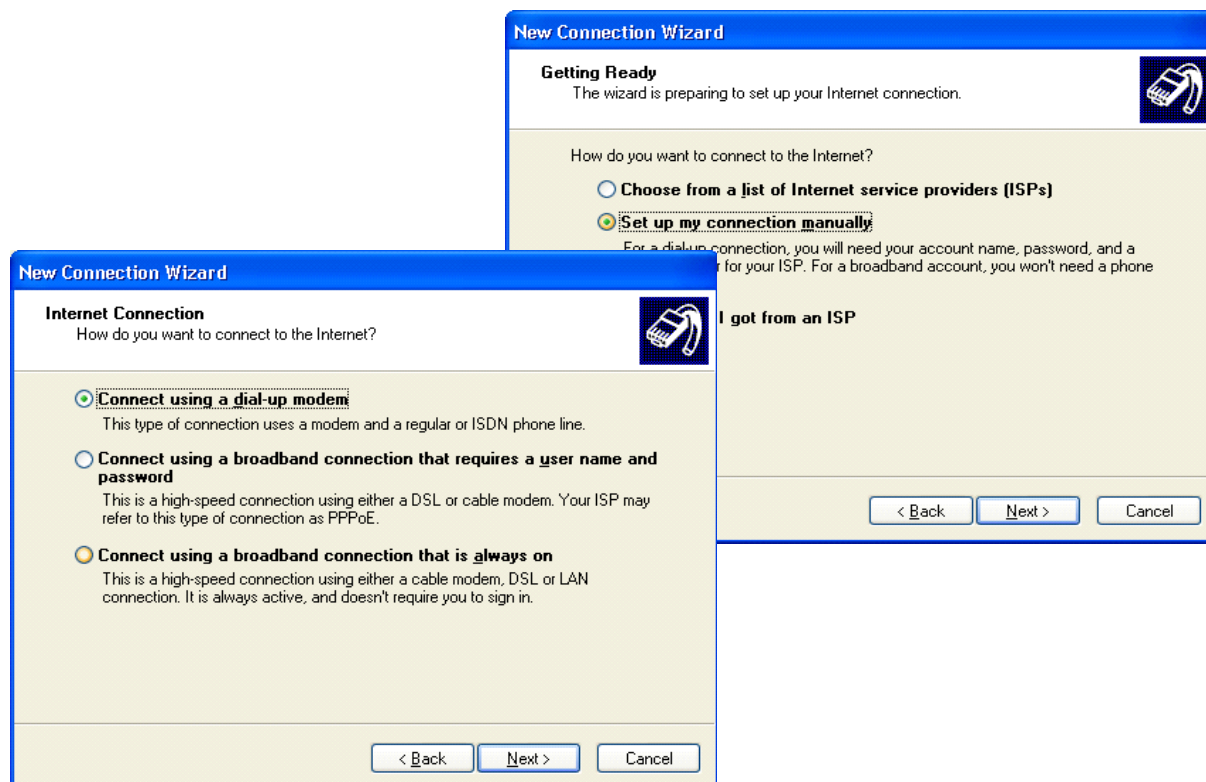
4.1.1 Creating a New Dial-up Network Connection

There are several ways to start creating a new dial-up network connection. For example, open the *Control Panel*, double-click *Network Connections*, select *New connection*. Another way is to select *Settings* from the *Start* menu, click *Network Connections*, then *New Connection Wizard*.

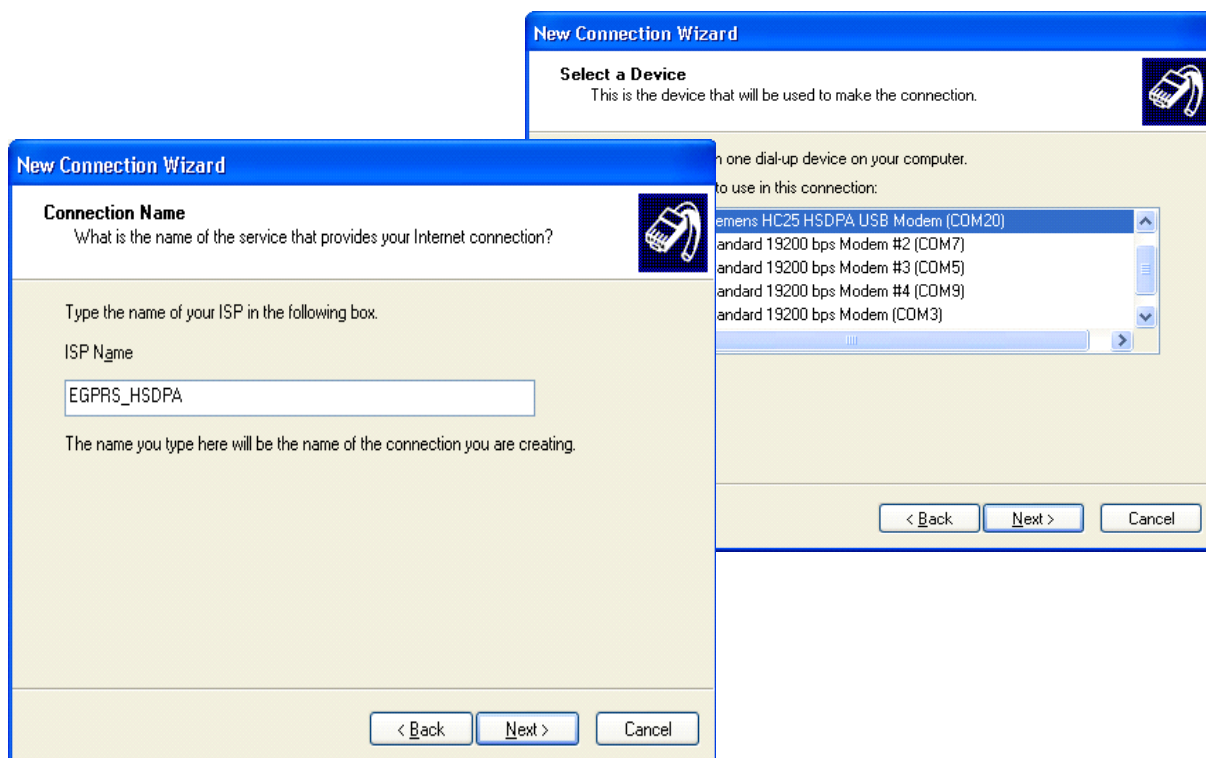
In any case, the *Network Connection Wizard* opens. Click *Next* to continue. Put a check mark on *Connect to the Internet* and click *Next*.



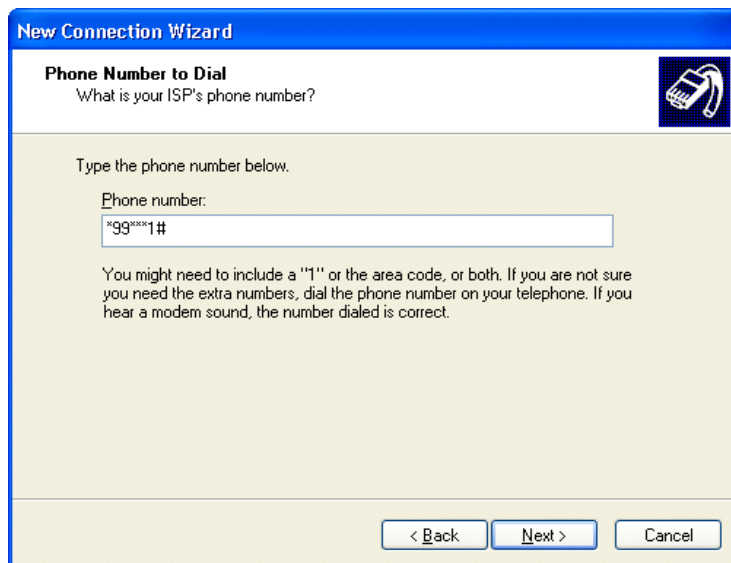
Select the option *Set up my connection manually* and click *Next*. Select *Connect using a dial-up modem* and click *Next*.



Select the modem that you want to use for the dial-up network connection. Click *Next* to continue. Type an appropriate *Connection name* and click *Next*.

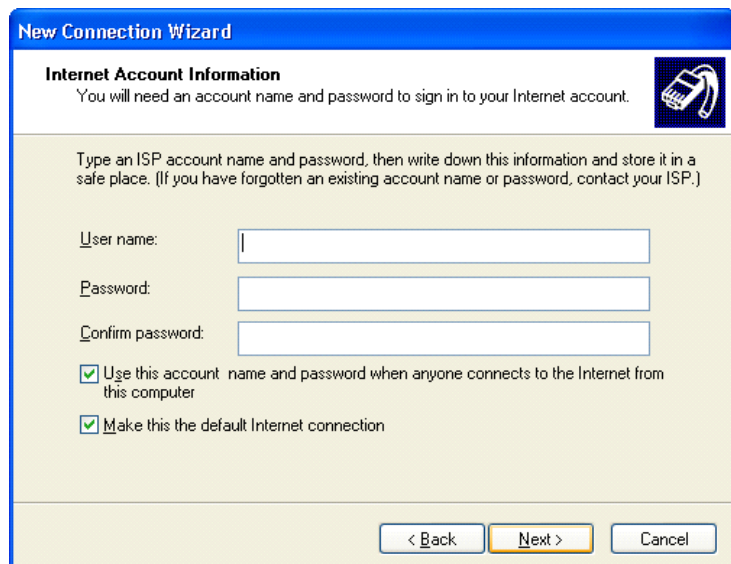


In the *Phone number* box, put the dial string `*99***1#` commonly used to access the GPRS network. Note: The number "1" added before the hash determines that the first PDP context shall be used. The number must be identical to the <cid> value set with AT+CGD-CONT (see [Section 3.7](#)).



The screenshot shows the 'New Connection Wizard' window with the 'Phone Number to Dial' tab selected. The title bar reads 'New Connection Wizard'. The main heading is 'Phone Number to Dial' with a subtext 'What is your ISP's phone number?'. There is a telephone icon in the top right. The instruction says 'Type the phone number below.' followed by a text box containing '*99***1#'. Below the text box, a note states: 'You might need to include a "1" or the area code, or both. If you are not sure you need the extra numbers, dial the phone number on your telephone. If you hear a modem sound, the number dialed is correct.' At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

Depending on the network, you may be required to put a User name and a *Password* for the dial-up network connection. If not required, you may leave all boxes empty. Click *Next*.



The screenshot shows the 'New Connection Wizard' window with the 'Internet Account Information' tab selected. The title bar reads 'New Connection Wizard'. The main heading is 'Internet Account Information' with a subtext 'You will need an account name and password to sign in to your Internet account.' and a telephone icon in the top right. The instruction says '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 boxes for 'User name:', 'Password:', and 'Confirm password:'. Below these are two checked checkboxes: 'Use this account name and password when anyone connects to the Internet from this computer' and 'Make this the default Internet connection'. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

In the resulting dialog, click *Finish*. This will cause the *Connect...* dialog to appear (screen is shown in [Section 4.1.2](#)). Yet, at this moment, it is recommended that you press *Cancel* in order to check, and if necessary, to configure the dial-up network connection as described in [Section 4.1.2](#).



The screenshot shows the 'New Connection Wizard' window with the 'Completing the New Connection Wizard' tab selected. The title bar reads 'New Connection Wizard'. The main heading is 'Completing the New Connection Wizard' with a telephone icon in the top left. The text says 'You have successfully completed the steps needed to create the following connection:'. Below this is a list for 'EGPRS_HSDPA':

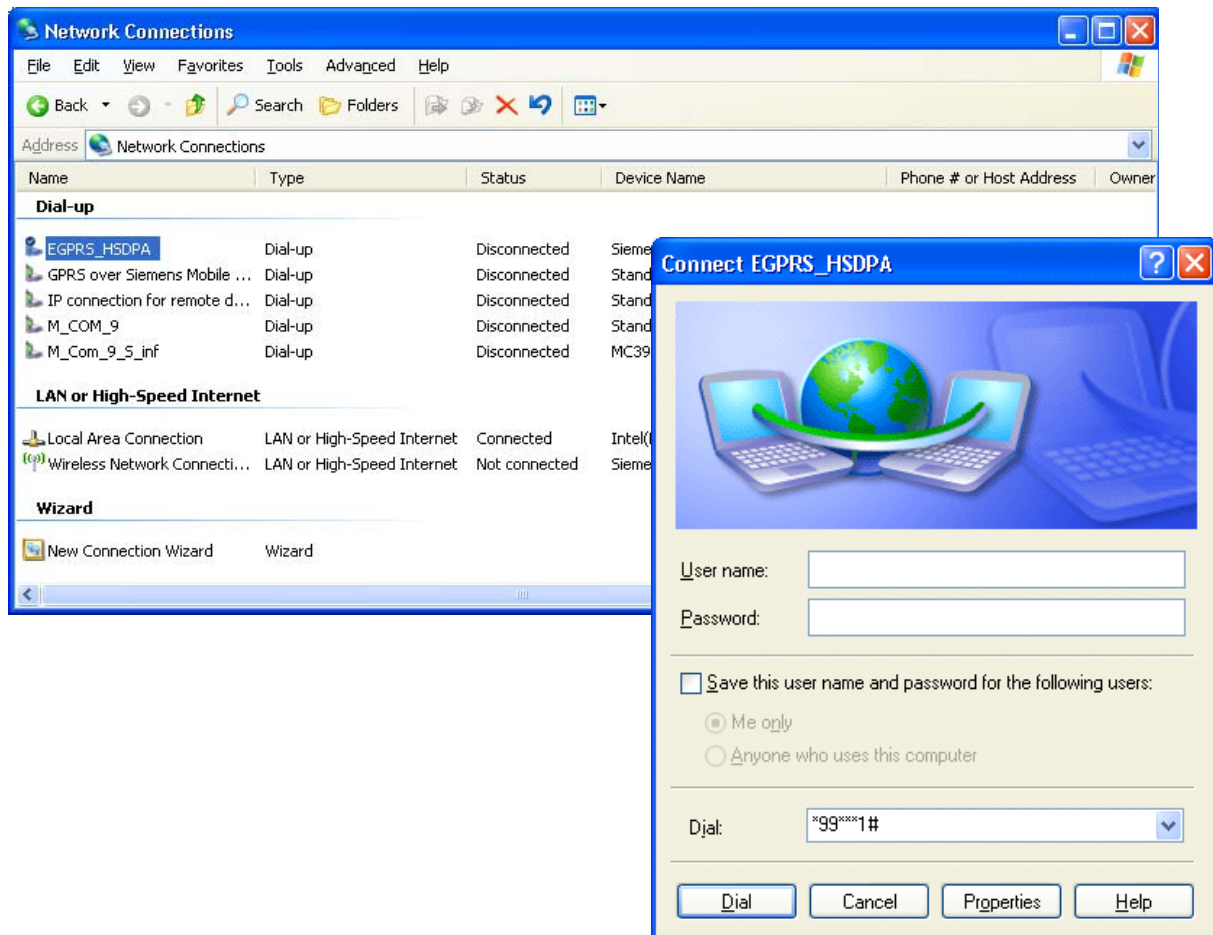
- Make this the default connection
- Share with all users of this computer
- Use the same user name & password for everyone

The text continues: 'The connection will be saved in the Network Connections folder.' There is an unchecked checkbox 'Add a shortcut to this connection to my desktop'. At the bottom, it says 'To create the connection and close this wizard, click Finish.' and there are three buttons: '< Back', 'Finish', and 'Cancel'.

4.1.2 Configuring a Dial-up Network Connection

Every newly created dial-up network connection should be configured before using it to establish a PPP connection.

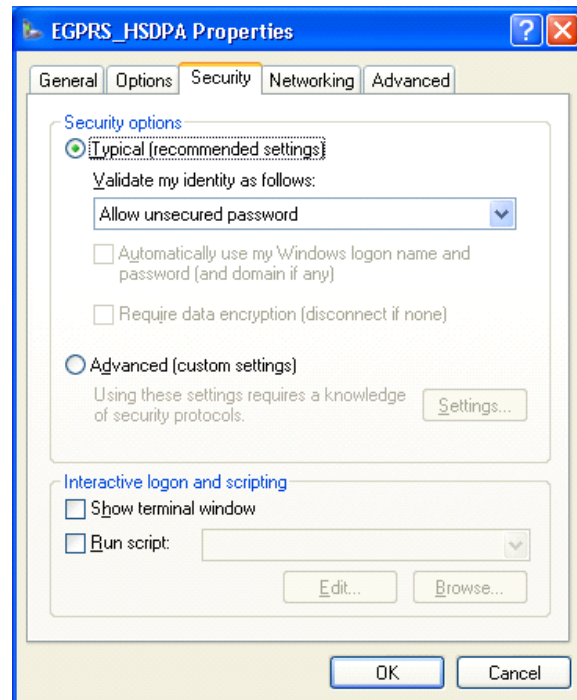
Open the *Control Panel*, double-click *Network Connections*, select the dial-up network connection you want to configure. In the resulting *Connect...* dialog, press the *Properties* button.



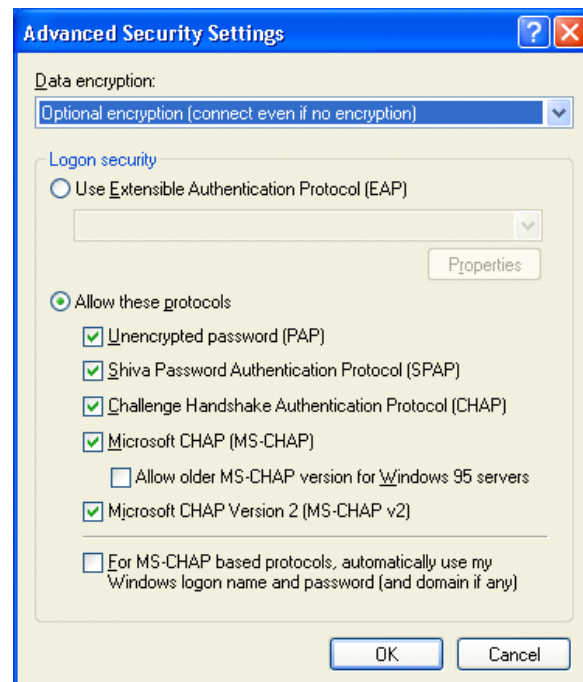
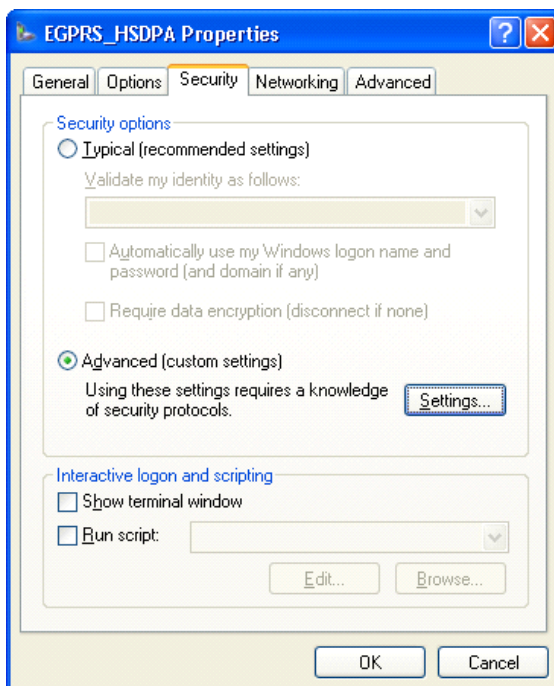
On the *General* tab, select the modem you want to configure. The correct dial string *99***1# should already be given, if entered before in the *Phone number* box when the dial-up network connection was created (see [Section 4.1.1](#)).

Select the *Security* tab to verify or edit authentication options for PPP connections.

By default, Windows XP enables the option *Typical* with unsecured passwords for the commonly used but unsafe PAP authentication method. As this is the minimum level of security supported in all networks the setting usually enables the subscriber to make a connection, though at the expense of security.

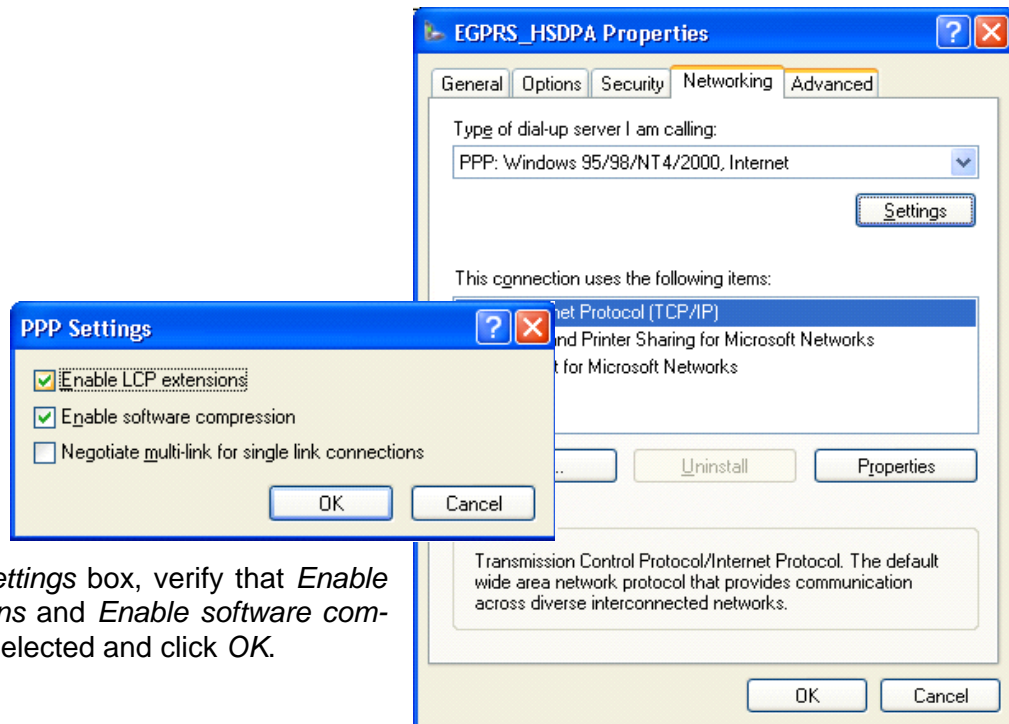


Many network operators apply more secure authentication methods for PPP connections, such as CHAP. For access to these networks, activate the *Advanced (custom setting)* option and press the *Settings* button. On the resulting *Advanced Security Settings* property page, enable or disable the authentication protocols according to the information provisioned by your service provider.



Note: If an attempt to connect to a HSDPA or GPRS network fails, check that the authentication protocols are properly set.

On the *Networking* tab, the default settings are acceptable in most cases: The drop-down menu shows *PPP: Windows 95/98/NT/2000, Internet* for the type of dialup server as default.

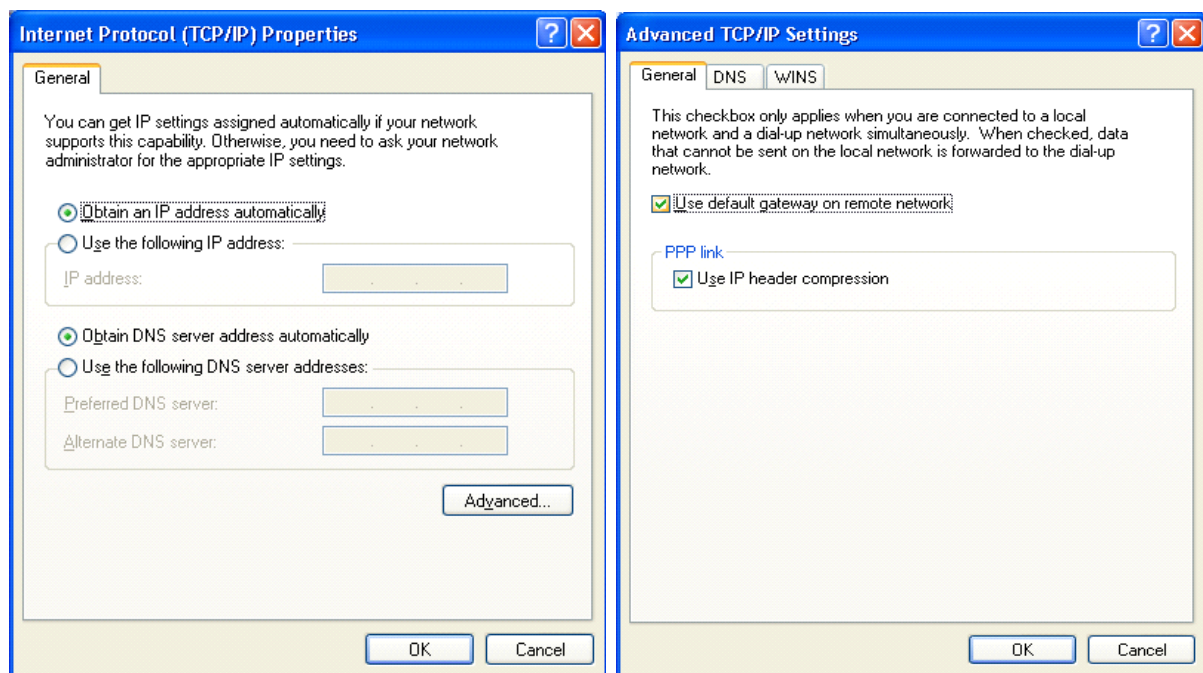


In the *PPP settings* box, verify that *Enable LCP extensions* and *Enable software compression* are selected and click *OK*.

Select the *Internet Protocol (TCP/IP)* on the *Networking* tab and press the *Properties* button to go to the *General* page. In most cases, it is sufficient to accept the default settings: *Obtain an IP address automatically* and *Obtain DNS server address automatically*.

Otherwise, you have to select the options *Use the following IP address / Use the following DNS addresses* and specify the IP addresses provisioned by your network operator.

The *Advanced* button opens a further property page where you can set your preferences when working in a local network and a dial-up network at the same time.



5 Appendix II

5.1 Interface Description of DSB75 Support Board and HCxx-DSB75 Adapter

This section refers to the DSB75 Support Board and the adapter board needed to mount a HC25 module onto the DSB75 Support Board. An overview of how to install the module and connect all accessories is provided in [Section 2.4](#).

Please note that the DSB75 Support Board is designed for a wide range of Siemens wireless modules. A detailed interface description can be found in [\[16\]](#). The focus of this section is only on the adapter board and HCxx specific information for the DSB75 Support Board.

The names of all connectors, interfaces, switches and LEDs used in [\[16\]](#) are also used throughout this manual, however some DSB75 pins may have different names or are not relevant for HC25.

5.1.1 Configuring the HCxx-DSB75 Adapter

Before you start installing all components check that the slide switches on your adapter board are set as shown in [Figure 7](#). See also [Section 5.1.12](#) for details on MIC1 and MIC2.

Please note that there are several generations of the adapter board on the market. All information provided in this manual refers to the two adapter board types "HC25/HC28-DSB75 Adapter" and "HC15/HC25-DSB75 Adapter prepared for HC28". The major difference over earlier revisions is that both types support the asynchronous serial interface ASC0. Furthermore, the slide switches S100 and S101 are no longer mounted on the "HC25/HC28-DSB75 Adapter". Throughout this manual the adapter board is named HCxx-DSB75 Adapter.

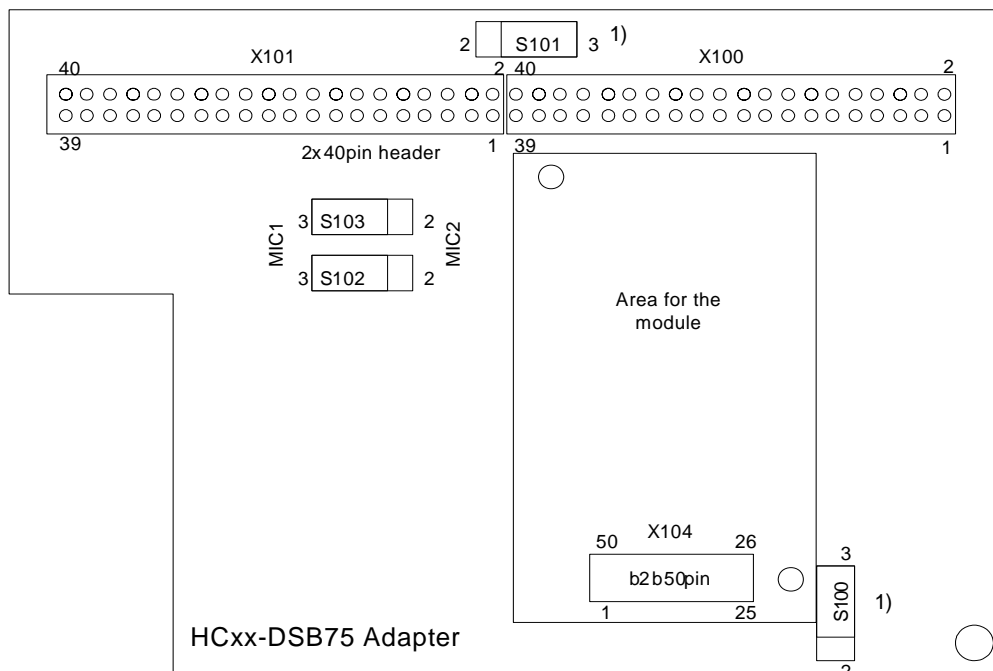


Figure 7: HCxx-DSB75 Adapter - connector pinning and slide switch settings

¹⁾ S100 and S101 not mounted on adapter named HC25/HC28-DSB75 Adapter

5.1.2 Configuring the DSB75 Support Board

Check that all slide switches and jumpers on the DSB75 Support Board are set as shown in [Figure 8](#).

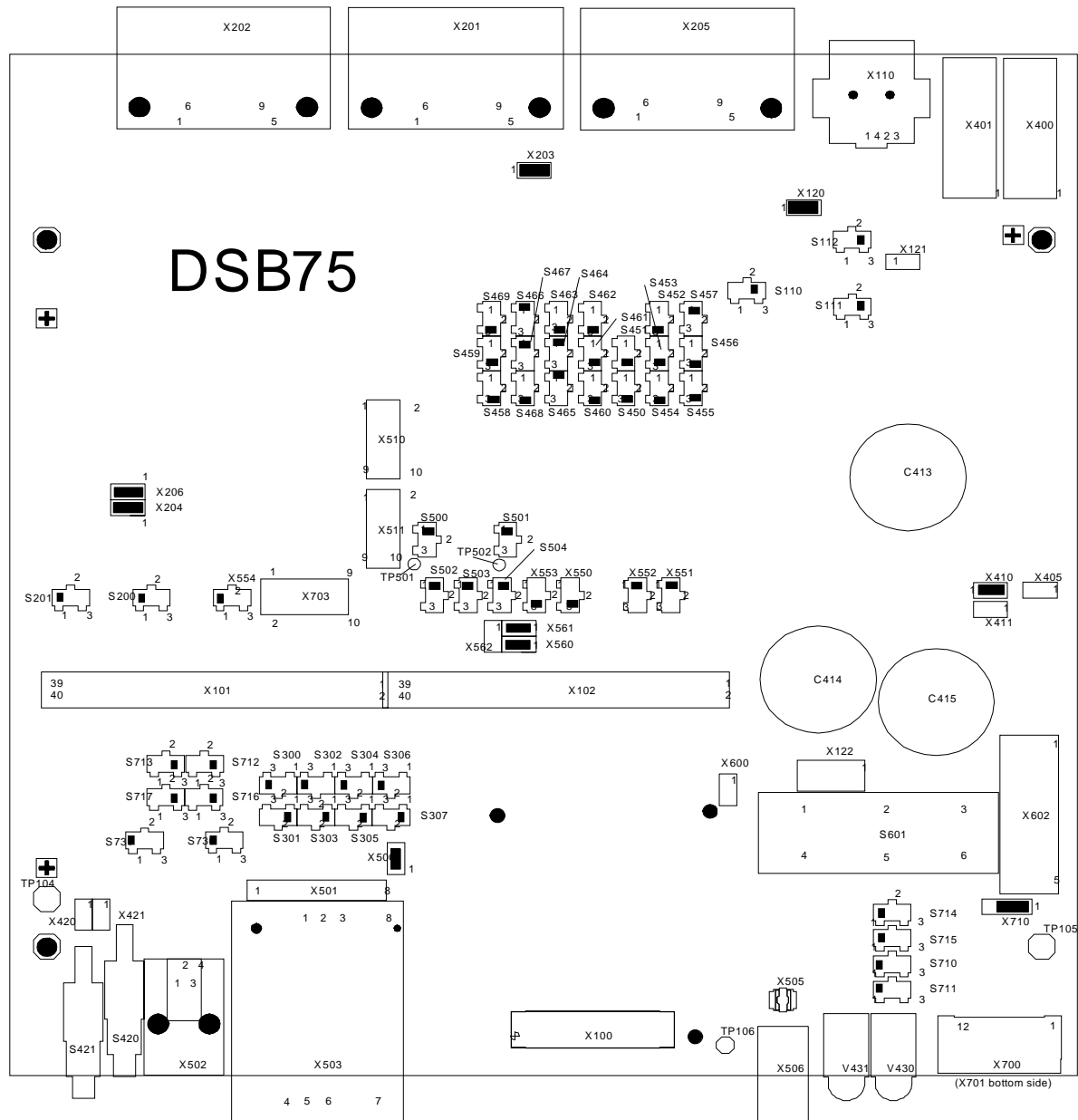


Figure 8: DSB75 - connectors, switches, slide switch settings

X505 = RF cable connector Hirose U.FL	X400 = Power supply connector (red) for 9V - 15V
X506 = SMA antenna connector	X401 = GND (black)
X100 = Do not use	X700, X701 = Audio interface 2
X503 = SIM card holder	X110 = USB connector
X502 = Audio interface 1 (western jack)	X201 = COM1 for asynchronous serial interface ASC0
X420, S420 = EMERG_OFF	X202, X205 = Do not use
X421, S421 = IGT	X101, X102 = 2x40-pin header for adapter board

5.1.3 Connection Diagram for HC25 Evaluation Kit

Figure 9 illustrates the setup of an evaluation kit for HCxx modules. The test equipment has to be connected as shown in the figure.

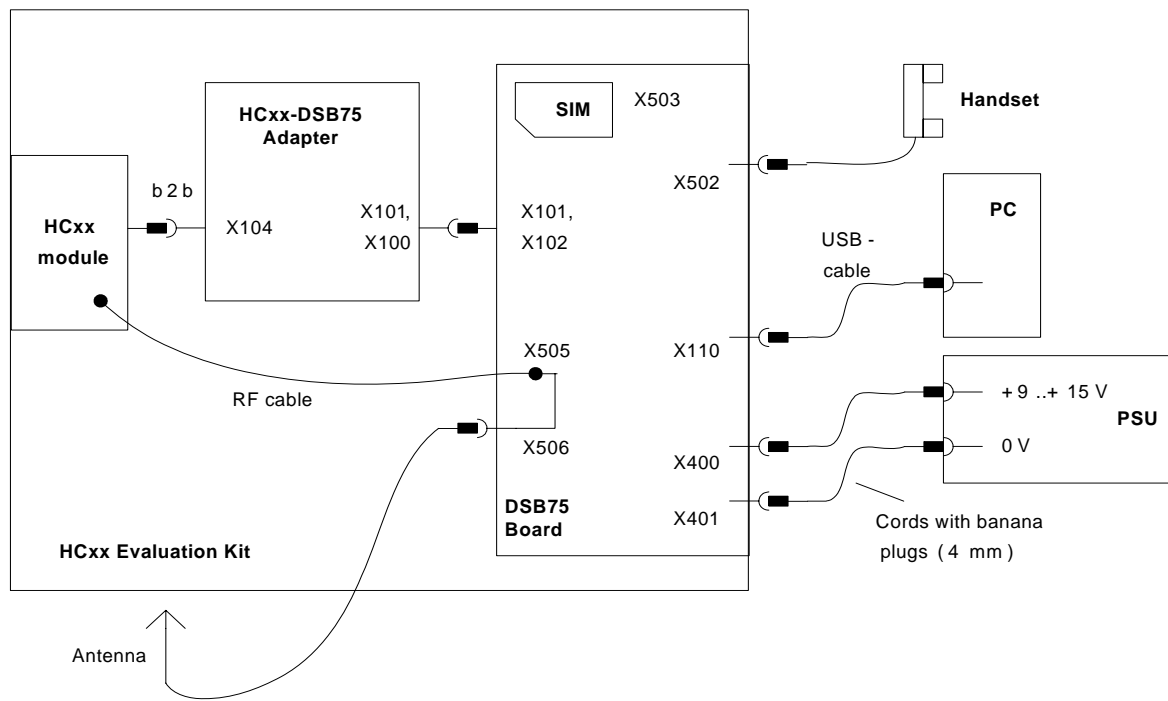


Figure 9: Connection diagram for HC25 evaluation kit

5.1.4 Mounting HC25 onto DSB75

Figure 10 shows an exploded view of the DSB75 Support Board, the HCxx-DSB75 Adapter and the connected HC25 module.

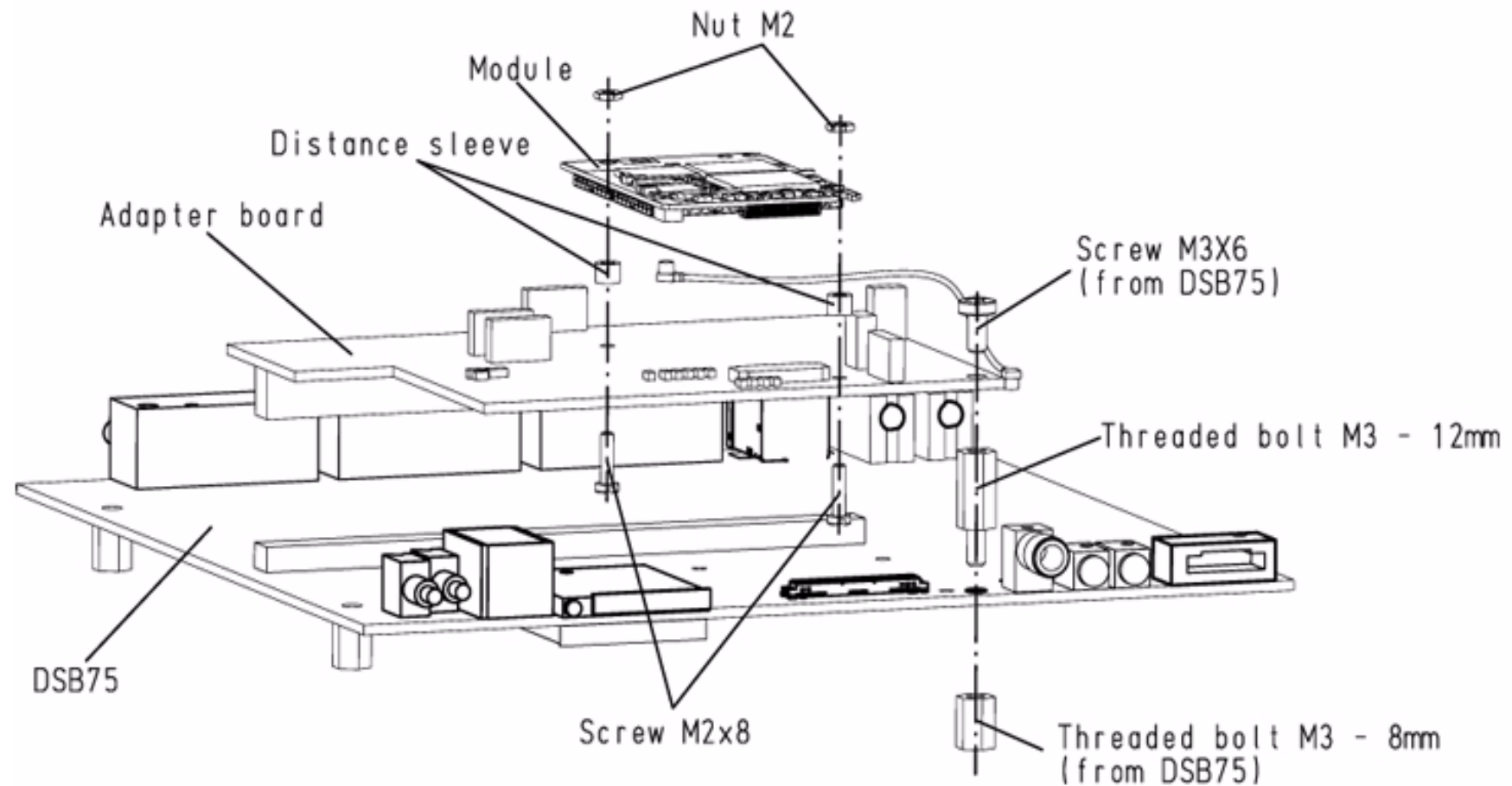


Figure 10: Mounting HC25 to DSB75 (exploded view)

5.1.5 Board-to-Board Connector

This section shows the pin assignment of the 50-pin board-to-board connector (B2B) on the HC25 module and the mating 50-pin connector X104 on the HCxx-DSB75 Adapter. The board-to-board connector on the DSB75 Support Board is not applicable.

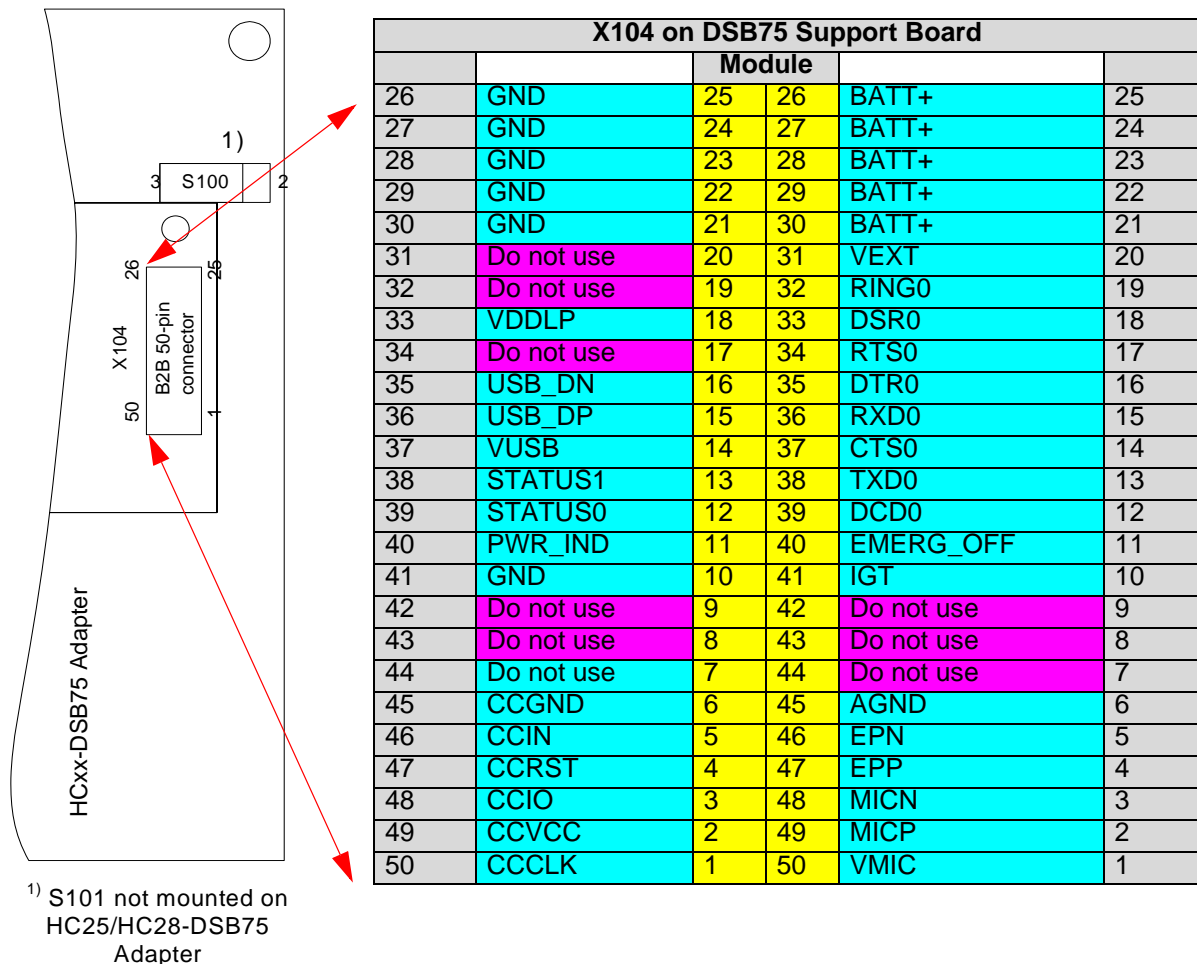


Figure 11: B2B connector on HCxx-DSB75 Adapter (X104) and HC25 module

5.1.6 2x40 Pin Header on DSB75 Support Board and HCxx-DSB75 Adapter

Figure 12 shows the pin assignment of the 2x40 pin header on the DSB75 Support Board and the mating connector on the HCxx-DSB75 Adapter.

Each 2x40 pin header consists of two sections, referred to as X100/X101 on the HCxx-DSB75 Adapter, and X101/X102 on the DSB75 Support Board.

All used HC25 pins at the 50-pin board-to-board connector X104 are connected to the pin header sections X100 and X101 on the HCxx-DSB75 Adapter. Some signal lines are connected to slide switches or OR jumpers or capacitors. As the DSB75 applies also to other Siemens wireless products the pin names are not always the same on both sides.

Test points on the HCxx-DSB75 Adapter are available only at soldering pads of the 2x40 pin header. See also Section "Test Points" in [16].

Getting Started with HC25

5.1 Interface Description of DSB75 Support Board and HCxx-DSB75 Adapter

SIEMENS

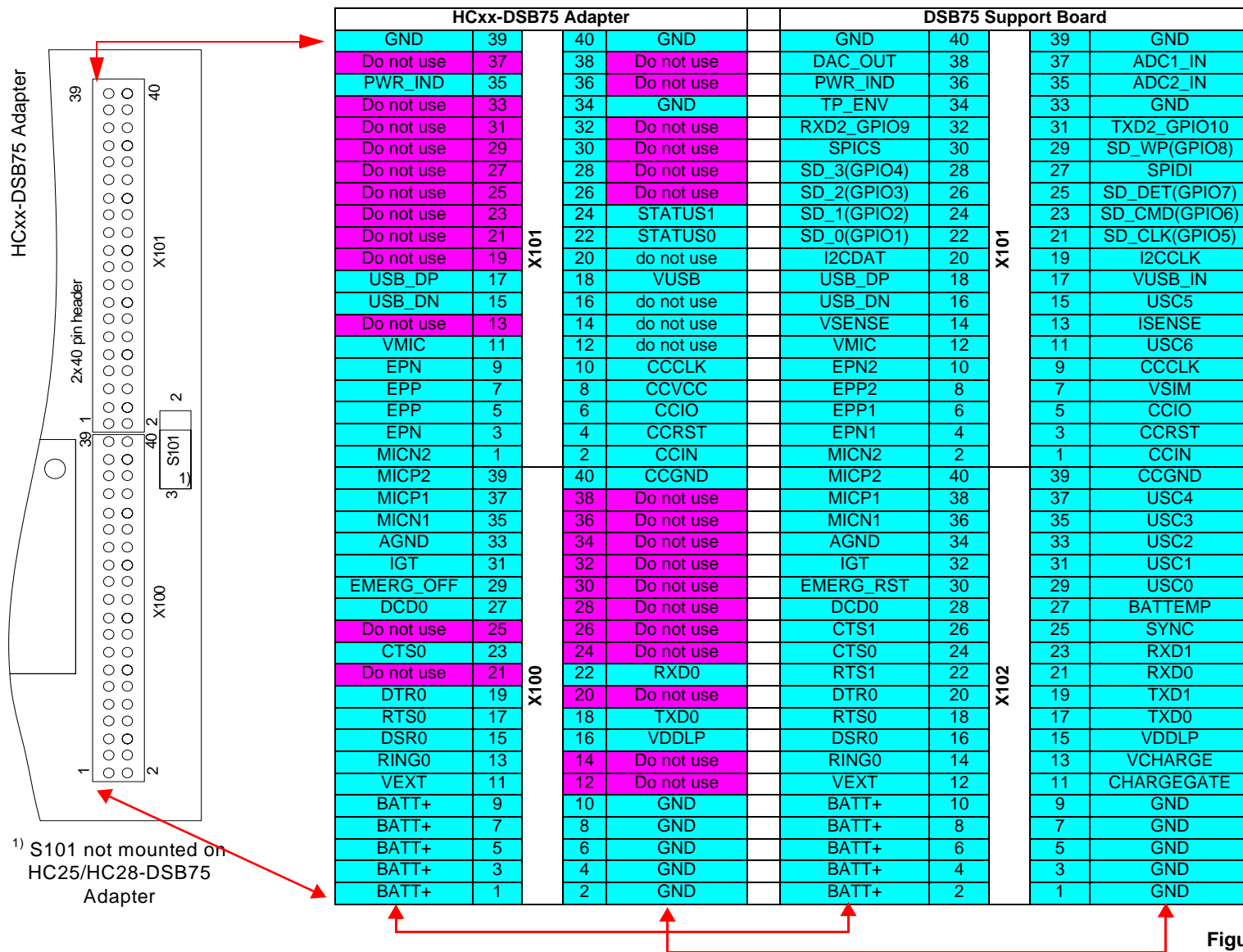


Figure 12: 2x40 pin headers on HCxx-DSB75 Adapter and DSB75

5.1.7 Turn on/off a HC25 Module Connected to the DSB75

Turn on/off procedures for HC25 are described in [1]. When turning on/off the module make sure to meet the timing requirements specified in [1].

There are several ways to switch on the module:

- Pressing the non-locking ignition key S421 (IGT) of the DSB75
- Plugging in the USB cable to the X110 connector
- Toggling the high-low state of the DTR line at the COM1 interface X201

Please note that the S420 switch is intended for emergency shutdown, not for emergency reset as described in [16] for other Siemens wireless modules.

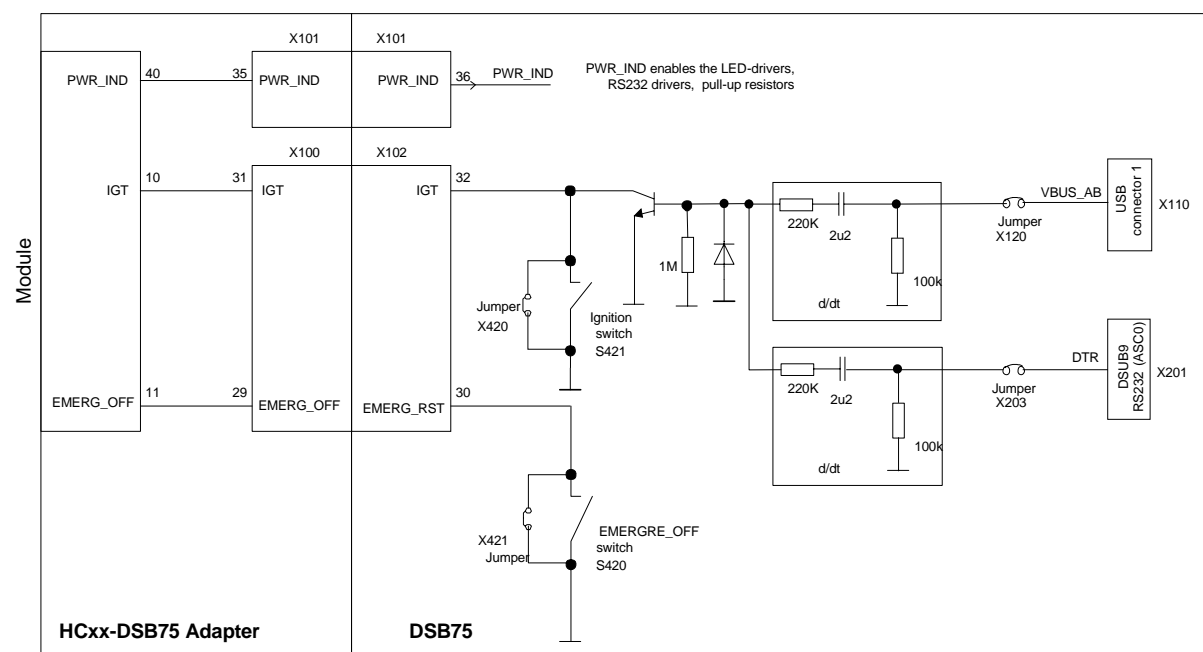


Figure 13: On/off circuit on HCxx-DSB75 Adapter and DSB75

5.1.8 SIM Interface

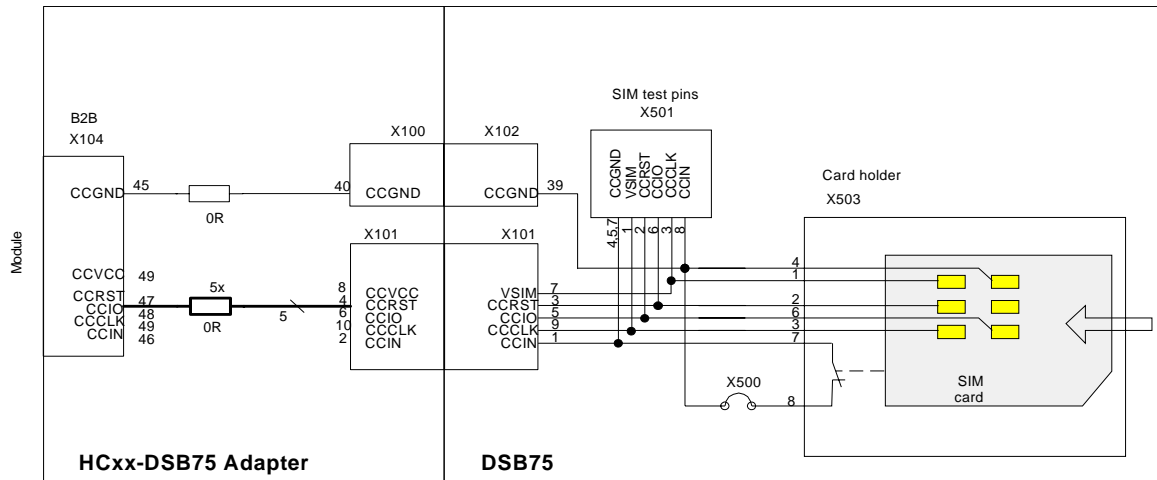


Figure 14: SIM interface on HCxx-DSB75 Adapter and DSB75

5.1.9 USB Device Interface

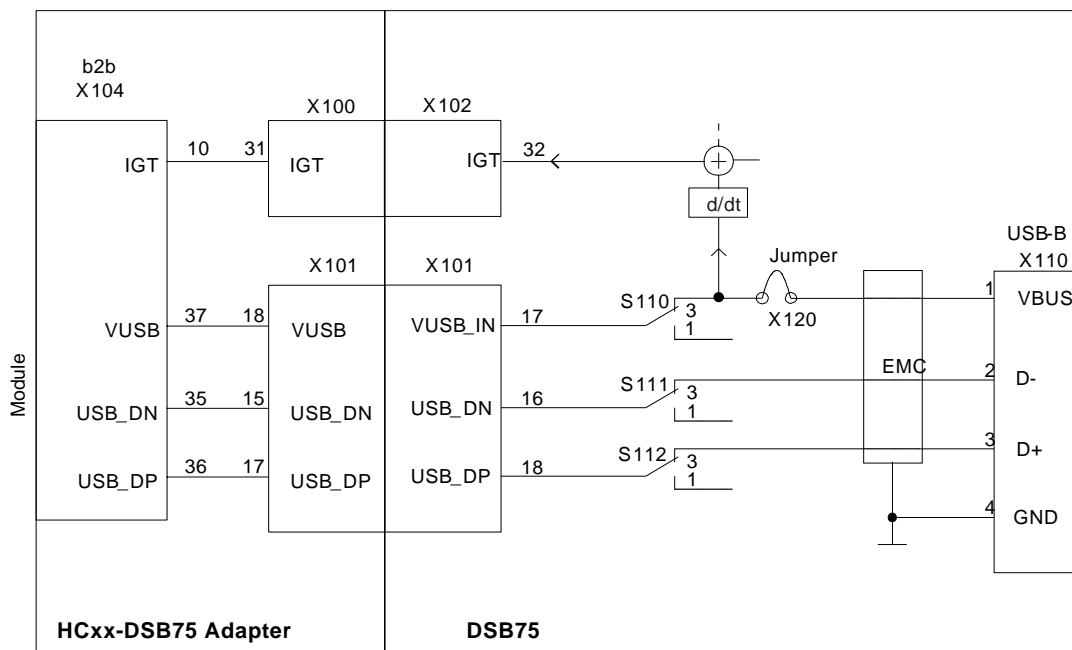
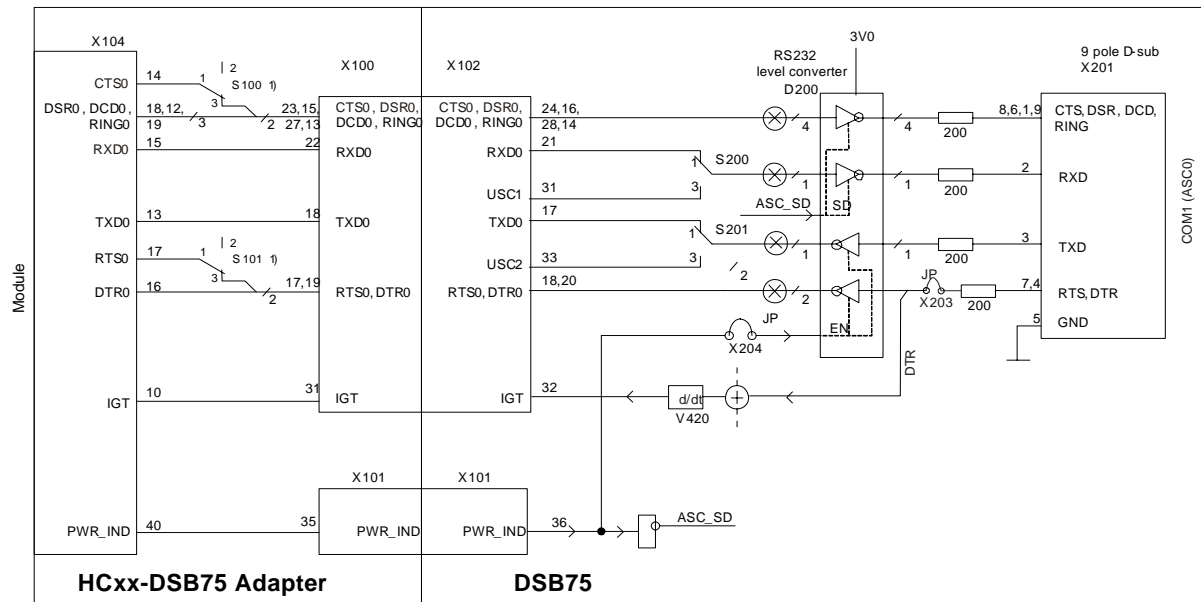


Figure 15: USB interface on HCxx-DSB75 Adapter and DSB75

5.1.10 Asynchronous Serial Interface ASC0

See [Section 2.11](#) for details on how to configure the HC25 module for ASC0 or USB usage.



¹⁾ S100, S101 not mounted at HC25/HC28-DSB75 Adapter
(fixed wired 1 to 3 instead)

Figure 16: Asynchronous serial interface ASC0 on HCxx-DSB75 Adapter and DSB75

5.1.11 Status LEDs

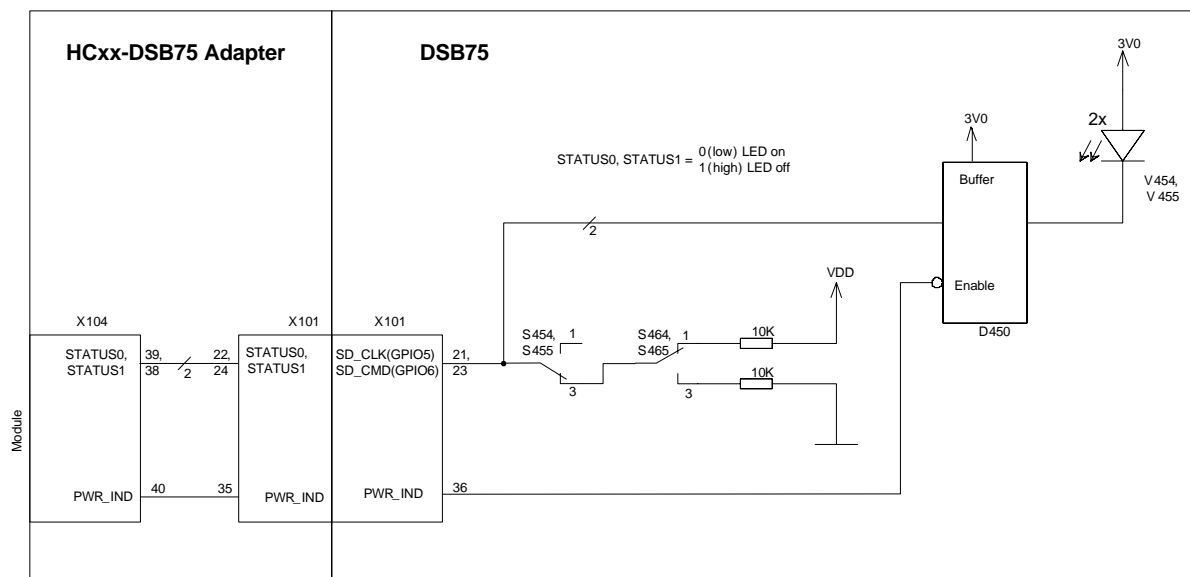


Figure 17: Status LEDs on HCxx-DSB75 Adapter and DSB75

5.1.12 Analog Audio Interface

The DSB75 Support Board and the HCxx-DSB75 Adapter have two analog audio interfaces, but the HC25 module has only one. Nevertheless you can connect audio devices to both audio interfaces on the DSB75. To switch back and forth between both interfaces set the slide switches S102 and S103 on the HCxx-DSB75 Adapter and select an appropriate audio mode using the AT^SNFS command.

Audio interface 1

- Unbalanced audio interface optimized for the reference handset as part of the Siemens reference HC25 reference setup. Use the western jack X502 and set both slide switches S102 and S103 to position 3 (marked MIC1 on the HCxx-DSB75 Adapter).
- Compatible audio equipment delivered with the DSB75 Support Board: "Votronic Handset HH-SI-30"

Audio interface 2

- Balanced audio interface designed for use with headsets or speakerphones. For this interface the DSB75 Support Board provides the two 12-pin connectors named X700 or X701, each for a different connector size. For audio interface 2, set both slide switches S102 and S103 to position 2 (marked MIC2 on the HCxx-DSB75 Adapter).
- Compatible audio equipment that can be purchased for use with audio interface 2:
 - "Headset PTT HHS-510"
 - "Siemens Car Kit Portable HKP-500" compatible with Lumberg connector X701
 - "Siemens Car Kit Portable" compatible with Lumberg connector X700

Further details and a specification of both audio interfaces located on the DSB75 can be found in [\[16\]](#).

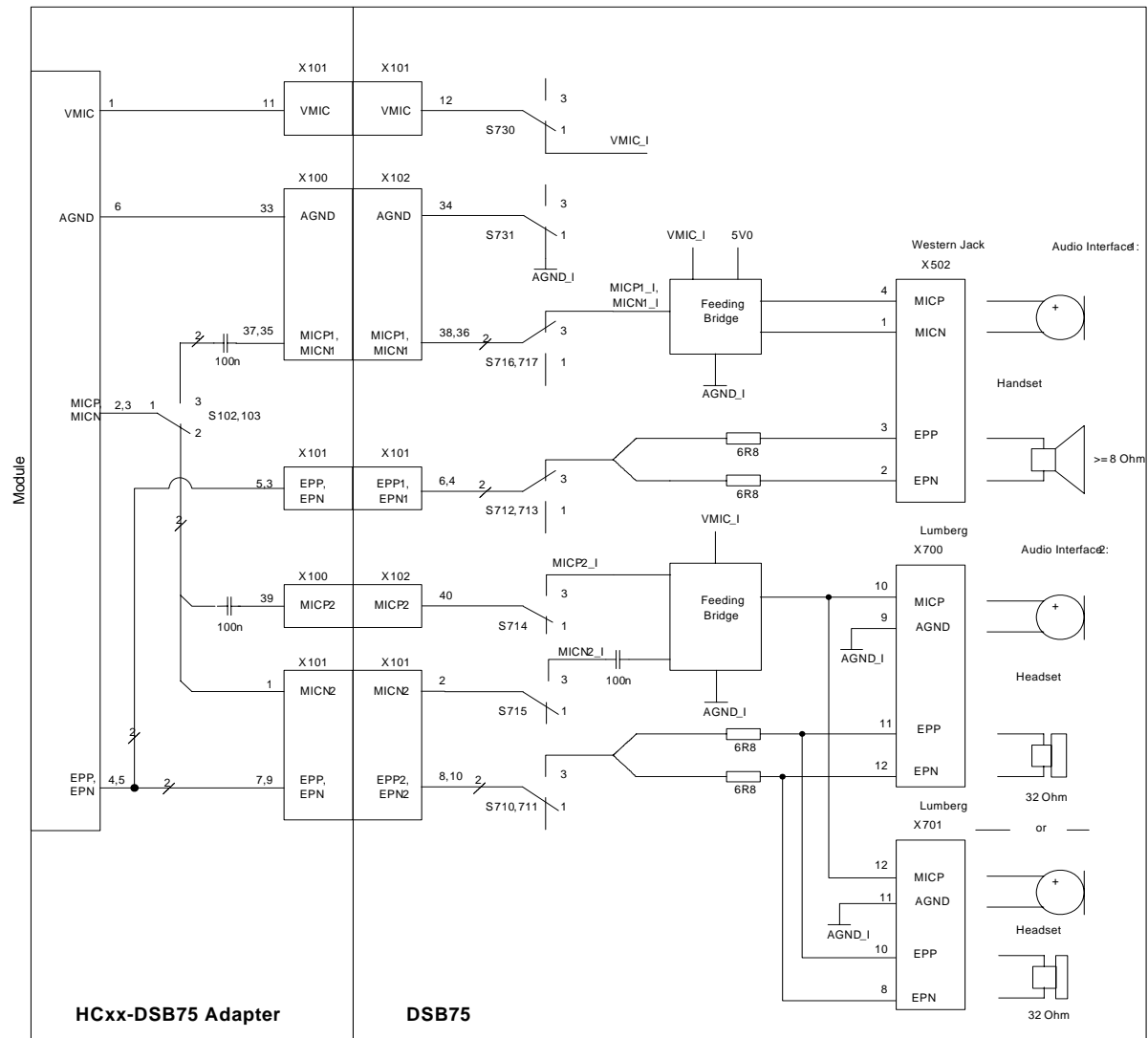


Figure 18: Audio interfaces on HCxx-DSB75 Adapter and DSB75

5.1.13 Power Supply Interface

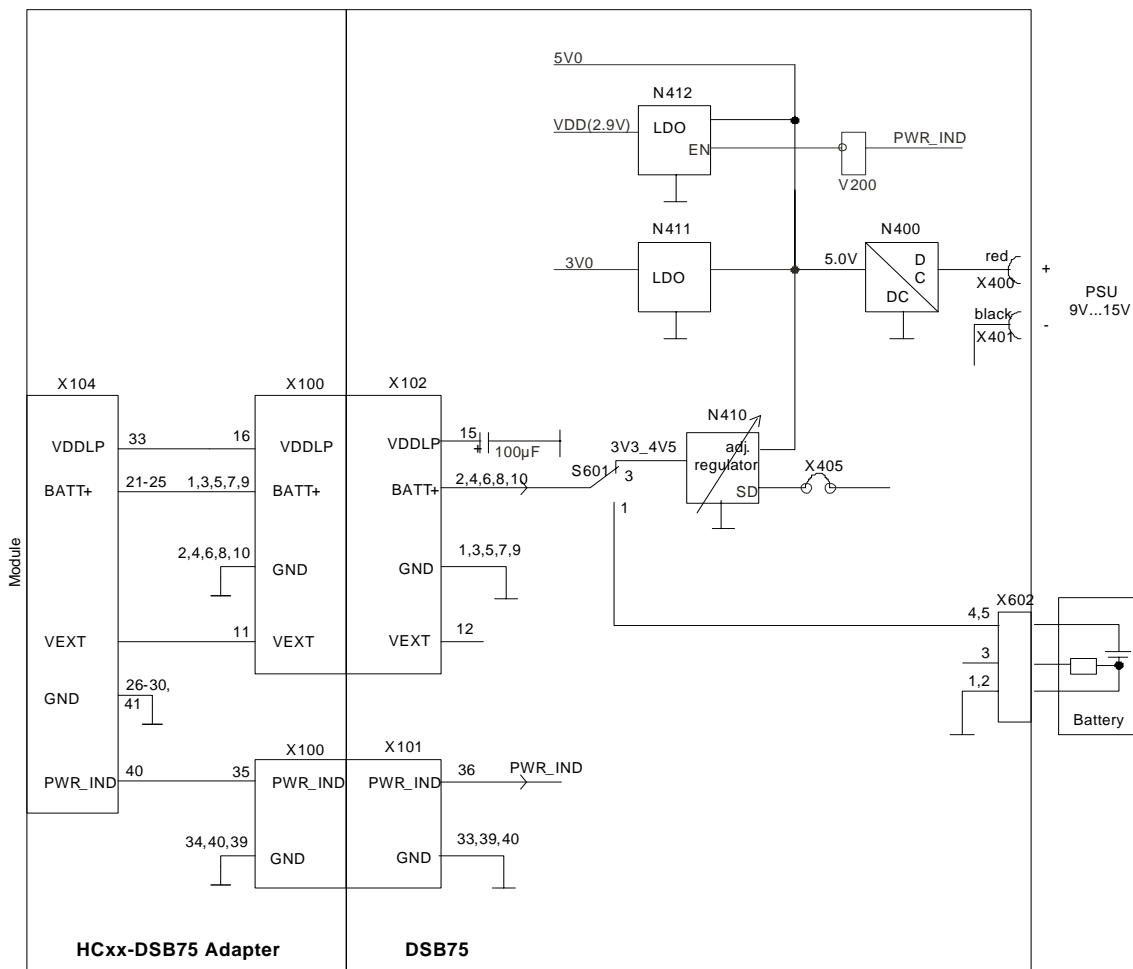


Figure 19: Power supply interface on HCxx-DSB75 Adapter and DSB75

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