

GC89

Sony Ericsson GC89

User Guide



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Introduction

Congratulations and thank you for buying a Sony Ericsson GC89.

The GC89 is a combined wireless LAN (WLAN) adapter and quad band GSM product, that allows you to access wireless local area networks, share local printers and files with others in the network, access the internet and roam the office, wire free. The GC89 is designed for use in the home and at work; it is very simple to install and use; the software provided allows you to select the best data service available so that the GC89 is always available for data transfer.

The GC89 enables your laptop PC to:

- Connect to your corporate network
- Browse the Internet
- Send and receive e-mails
- Receive information services in real time
- Access files, databases and discussion groups
- Send and receive SMS text messages
- Edit SIM card entries

Note:

Before using your GC89 you MUST read *Guidelines for Safe and Efficient Use* on page 87.

The GC89 wireless LAN facility is based on the IEEE 802.11 standard. A LAN is composed of two or more computers connected to each other to share files or common equipment such as a printer or an internet connection. A wireless LAN provides the same functionality of a wired network without the need to install networking cables and other networking equipment. Not only is a wireless LAN easier to deploy, but it also allows for roaming. For example, when using the GC89 wireless LAN facility, it is possible to roam from one room in the house to another, or from a conference room to an office without being disconnected from the network.

The GC89s wireless LAN facilities can be used wherever there are connection “hotspots”. Wireless LAN hotspots are becoming increasingly common in both public places, such as hotels and airports (allowing Internet connection), and within offices (providing connections to corporate networks).

The GC89s GSM, GPRS and EDGE facilities provide almost worldwide portable modem access to the Internet or to corporate networks.

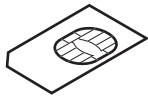
Hardware Overview

The GC89 is a standard 32-bit Cardbus PC card with a 15mm extension which contains the GSM and WLAN antennas.

The amount of power drawn from the laptop battery is dependant upon a number of factors including status, frequency band, distance to the base station and number of timeslots used. See *Technical Specifications* on page 90 for a general guide to power consumption.

Before using the GC89, you must install the software and drivers on your computer, see *GC89 Hardware Set Up* on page 11.

SIM Card



When you subscribe to a mobile network operator, you are issued with a SIM card (Subscriber Identity Module card). The SIM contains your personal subscriber data. You need to insert a SIM into your GC89 before it will work.

Software Overview

Wireless Manager

You can use the Wireless Manager to:

- Display GSM/GPRS/EDGE and wireless LAN status information
- Create or modify connection settings
- Connect to the Internet or a corporate network
- Manage GC89 settings
- Manage SIM card and PC phone books
- Send and receive SMS messages

Using the GC89 with your Applications

Data Programs

You can use the GC89 as a modem to provide Intranet/Internet connectivity for a wide range of applications.

Documentation

The GC89's documentation is designed to enhance your understanding of its capabilities. The following guides are provided:

- A printed Quick Start Guide aimed at getting you operational as quickly as possible.
- An online User's Guide (this document) containing a comprehensive description of the GC89 functionality. You can read the guide on the computer screen or print it onto either European A4 or American Letter sized paper.

The User's Guide is located on GC89 CD-ROM as Adobe Acrobat PDF files. The GC89 CD-ROM also contains Adobe Acrobat Reader[®] which you can install if necessary.

Illustrations

The illustrations in this manual were obtained using the GC89 on a Microsoft Windows[®] XP operating system. The dialogs that appear on your PC may differ depending on the version of Windows[®] in use.

Getting Started

Checklist

Make sure the following items are in the box when you unpack it:

- **Aluminium protective case for storing the GC89**
- **GC89**
- **Quick Start Guide**
- **CD-ROM**

The CD contains: drivers, software, documentation and a readme file.

System Requirements

This section lists the network subscriptions, hardware and software requirements for running the GC89.

Wireless LAN Connection

In order to use your GC89 as a wireless LAN adapter for a corporate network, you must have the appropriate access and log-on rights. Contact your corporate IT support function to arrange access and request the following information:

- Network names (SSID) of the specific wireless networks to connect to.
- WPA (Wi-Fi Protected Access) wireless network key information (may include network authentication type, encryption type, network key) for any WPA-enabled networks you want to connect to.
- WEP (Wired Equivalent Privacy) wireless network key information (network key) for any WEP-enabled networks you want to connect to.
- An IP address (if not using a DHCP server).
- Networks connected to an authentication server, if any.

Note:

If you require access to a network account, you will also require the accounts domain name, a user name and a password.

In order to use your GC89 as a wireless LAN adapter with a small office or home network, you must have the appropriate access and log-on rights. The Access Point that communicates with the GC89 has a predefined name (SSID) that your computer recognizes upon startup.

- If you are connecting to an existing WEP-enabled network, obtain the network key from the AP (access point) installer.
- If you are connecting to a WPA-enabled AP (access point), obtain the WPA (Wi-Fi Protected Access) wireless network key information (network authentication type, encryption type, network key) from the AP (access point) installer.
- If you are setting up a new wireless network and want to enable WEP security, use any string of characters for the network key.

Note:

Your network key is either 5 or 13 ASCII (text) characters, or 10 or 26 hexadecimal (0-9, A-F) characters.

Network and Subscription

The network subscription you use in conjunction with your GC89 depends on the functions and features your network operator can provide. Contact your network operator or service provider to make sure the options you require are available. Make sure that data options are included in your subscription, as these are usually optional services.

Note:

Mobile operators often provide a number of connectivity options via EDGE/GPRS such as WAP and Internet. Verify the service you require, such as Internet, email or corporate VPN (Virtual Private Network) service is available through your mobile operator and enabled on your subscription.

The functionality of the different subscriptions available from networks operators are discussed below:

Circuit Switched Data (CSD)

CSD is the original GSM network data transfer method, used in the past for WAP. Almost all GSM networks have this capability at 9.6 kbps. It is possible for the network to upgrade the speed to 14.4 kbps. The GC89 operates at this higher speed where available.

General Packet Radio Service (GPRS)

GPRS is a type of network connection which provides “always on” mobility. The connection set up is fast and, once connected, applications may send and receive data whenever required. In today’s GPRS networks, the GC89 receives data at speeds up to 53.6 kbps and transmits at speeds up to 26.8 kbps.

Enhanced Data Rates for Global Evolution (EDGE)

EDGE enhances GPRS by increasing data throughput by a factor of 3. GPRS networks enhanced with EDGE are often referred to as E-GPRS (Enhanced GPRS) networks. EDGE provides the “always on” capability of GPRS but at faster speeds. EDGE technology is transparent, simply make a GPRS connection as usual and benefit from the increase in speed where EDGE is available in a network. When EDGE is available you can expect increased speeds of up to 200 kbps, dependent on network coverage.

Short Message Service (SMS)

The PC can send and receive SMS text messages using the SMS Messages screen in the Wireless Manager, see *Wireless Manager SMS Messages Screen* on page 70, for more details.

Hardware

You will need:

- **A PC that has the minimum specification recommended by Microsoft to run the version of Windows® installed on it.**
- **A 32-bit Cardbus PC Card slot.**
- **A Sony Ericsson GC89.**
- **A SIM card.**

Software

You will need:

- **Windows® 98SE, Me, 2000 (SP4) or XP.**
- **Sony Ericsson Wireless Manager CD-ROM.**

Note:

The Wireless Manager can be downloaded from the Sony Ericsson website, details are given below.

Services Available Over the Internet

The Sony Ericsson website contains support to facilitate easy communications and rapid information retrieval, wherever you are. It gives you access to on-line customer services, on-line user manuals, software downloads, and useful information. The address is:

<http://www.SonyEricsson.com>

General information on wireless LAN can be obtained from:

<http://www.wlana.org>

Installation

The Wireless Manager CD-ROM contains the software required to operate your GC89.

You will also need to make sure that the GSM services you require are included on your SIM card subscription. For an explanation of the services that are available see *Network and Subscription* on page 9. Contact the organization that supplied you with your SIM card and request that the specific services (EDGE, GPRS, CSD or SMS) you require are added to your subscription. If you are intending to use WLAN, you will need to have access rights to corporate networks and hotspots you intend to use.

Note:

If you are installing onto a Windows 98SE operating system, make sure you have your Windows® installation CD-ROM as it may be required.

The CD-ROM contains the following software:

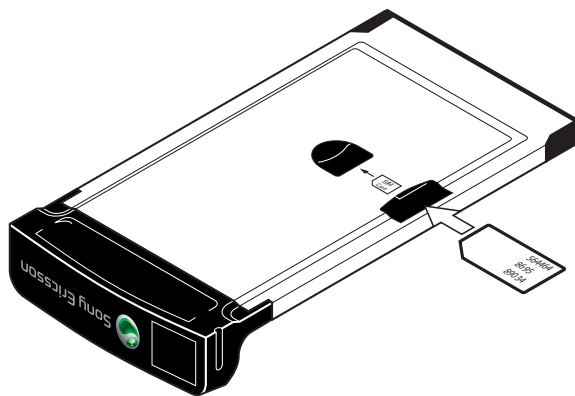
- Wireless Manager
- User Documentation
- On-line Help
- ReadMe text file containing the latest information about the GC89.

GC89 Hardware Set Up

1. Remove your GC89 card from its protective cover.
2. Insert your SIM card into the slot on the back of GC89, with the gold contacts facing downwards.

Note:

The cut corner of the SIM card must be placed into the PC card as demonstrated below. The gold contacts should face downwards.



To use the PCMCIA slot for another device, remove the GC89 card as instructed in *Safe Removal of the GC89* on page 57, then insert the other device.

When the GC89 is not in use it is recommended that you store it in the protective carrier box provided.

Important!

Do not insert the card into the laptop until you have installed the software from the CD-ROM. Simply cancel the **New Hardware** wizard if the card is accidentally inserted prior to software installation.

Installing the Software

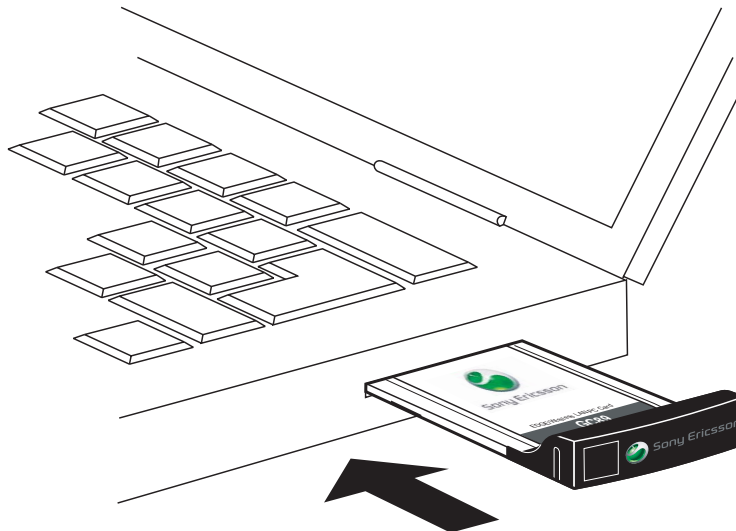
1. Insert the GC89 CD-ROM in your CD drive.

After a few seconds a Sony Ericsson splash screen is displayed.

Note:

If the CD-ROM does not autorun, select **Start** → **Run** and type **D:\Setup.exe** into the Run dialog. (Where *D* is your CD drive.)

2. The Wireless Manager is installed in the same language as your Windows® installation, or English if your Windows® language is not available. See *Supported Languages* on page 96 for more details.
3. The InstallShield Wizard for Sony Ericsson Wireless Manager opens; follow the instructions on screen. Installation will appear to pause around 65% whilst drivers are installed; do not cancel. When installation is complete click **Finish**.
4. Insert the GC89. Make sure it is fully inserted.



5. After a few seconds, the New Hardware Wizard opens and installs the necessary drivers onto your PC from the GC89 CD. The wizard may require you to locate a specific driver file. If this happens, a dialog opens; click **Browse** and select one of the following:

Component	GC89 CD-ROM Location
EDGE/GPRS Drivers on a Windows 98SE or ME machine	D:\Driver\Driver9x
EDGE/GPRS Drivers on a Windows 2000/XP machine	D:\Driver\Driver2k
Wireless LAN Driver (semwl5.inf) on a Windows 2000/XP machine	D:\WLAN-2K
Wireless LAN Driver (semwl5a.inf) on a Windows 98SE/ME machine	D:\WLAN-9x

In the above table, D is referred to as your CD drive.

Note:

When installing on Windows 98SE, Windows® may prompt for the original Windows 98SE CD-ROM to be inserted. If the CD-ROM is not inserted when requested, Windows® will subsequently reboot with error messages relating to missing files. Therefore, it is strongly recommended that the Windows 98SE CD-ROM is available before installation starts.

6. Select the driver file requested by the Wizard and click **Open**. The Hardware Wizard finishes the installation.
7. Select **Programs** ➔ **Sony Ericsson** ➔ **Wireless Manager** to start using your GC89.

Note:



If you are prompted to reboot the laptop during software installation, you may find that the Wireless Manager attempts to start before all of the drivers are installed. The reason this occurs is the New Hardware Wizard is still busy installing the 3 device drivers. The Wireless Manager splash screen appears, followed by a warning dialog saying “You must have a Sony Ericsson GC89 EGPRS Modem installed to run this application. Please install a Sony Ericsson GC89 EGPRS Modem and try again”. If this occurs:

1. Click **Ok**.
2. Wait for the New Hardware Wizard to complete the driver installation.
3. Reboot the laptop.
4. Start the Wireless Manager using the icon on the desktop or via **Programs** ➔ **Sony Ericsson** ➔ **Wireless Manager**.

Create a EDGE/GPRS or CSD Connection

Predefined customised connection settings may have already been entered by your mobile operator or IT Manager. Check the connection drop-down menu for any existing entries, if they are available go to *Using your Connection* on page 16.

If no predefined customised connections exist, the Network Connection Wizard automatically starts when the Wireless Manager is opened for the first time.

1. Click  or select **View**  **Connection Wizard**. The Connection Wizard opens.
2. Select the radio button next to **Create a new connection**. Enter a name, for example 'My Connection'. Click **Next**.

Note:

Your connection name should not exceed 16 characters for it to be fully visible in Wireless Manager.

3. The **Type of Connection** screen opens. Select the type of connection you require:
 - For EDGE/GPRS see steps 4 to 8
 - For CSD see steps 9 to 12

GSM/GPRS Connection

4. Select **GSM/GPRS**. Select your Network Operator from the **Choose Network** drop down list. If your Network Operator is not listed, select **<Other>**. Click **Next**. See *Network and Subscription* on page 9 for more information on GPRS.
5. If the Access Point Name dialog opens, check the APN displayed (for some operators it is deliberately blank). If you selected **<Other>** enter the APN for your operator. Contact your Network Operator if necessary to find out the correct APN.
6. To modify the selected APN's settings, Click **Advanced...** See *Appendix A - Connection Parameters* on page 103, for descriptions of the updateable parameters in the Advanced dialog. The Secondary APN information is only used in special customised cases where the information will be filled in for you. Otherwise the tick-box must be left un-ticked and secondary APN name blank. Click **Apply** to save any changes before closing the dialog. Click **Next**.

Note:

Your connection will automatically switch to EDGE when the network is available, allowing your PC Card to work at faster speeds.

7. If the operator you have selected in step 4 does not require a User ID and Password leave this dialog blank if it is displayed. If you have to logon to your service provider, enter your **User ID** and **Password** into the specific fields. If you want to enter your User ID and Password every time you connect, de-select the **Save Password** box. Click **Next**.

Note:

Some versions of Windows® deliberately change the number of asterisks that represent a password and place asterisks in the password field when the password is blank in order to make the display secure.

8. Click **Finish** to create your connection or **Back** to review your settings.

CSD Connection

9. Select CSD. Select your service provider from the **Choose Network** drop down list. If your service provider isn't listed select **<Other>** or **<North America>** depending on your location. Click **Next**.
10. If you selected a Network Operator from the **Choose Network** drop down list, the telephone number dialog should be automatically filled in. If you selected **<Other>** or **<North America>** from the **Choose Network** drop down list, enter the number you need to dial to connect to your Network Operator in the **Telephone Number** field, include your country and area code. Ensure **Use Area Code and Country Code** is de-selected.

Note:

Contact your Network Operator for a telephone number if necessary.



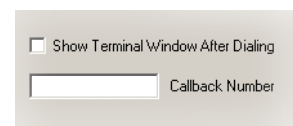
The screenshot shows a dialog box titled "Connection Wizard" with a close button in the top right corner. The main heading is "Telephone Number". Below the heading, there is instructional text: "Enter the telephone number to dial when making a connection. If appropriate, select the country code and enter the area code." There are three input fields: "Area Code:" (a small text box), "Telephone number:" (a larger text box), and "Country code:" (a dropdown menu). Below these fields is a checkbox labeled "Use area code and country code" which is currently unchecked. At the bottom right of the main area is an "Advanced..." button. At the very bottom of the dialog are four buttons: "< Back", "Next >", "Cancel", and "Help".

11. Click **Advanced...** You can specify your preferred CSD network connection speed from the drop down list and the method you want to use to connect to the network on the Speed tab of the Advanced dialog. Click **Next**.

Note:

If you are unsure which speed to choose from the Speed tab, start with Analogue 9600, and check to see if it works. Once your connection works on Analog, you can try the V110/V120 settings. V110/V120 connects faster than analog. When roaming you may need to repeat this procedure to adapt your settings to the capability of the network.

12. Select the **Options** tab in the **Advanced** dialog to specify a callback number, if required. Callback is a service that allows the call direction to be reversed. If you want to watch the progress of a callback in a terminal window click the **Show Terminal Window After Dialing** box.



The screenshot shows a section of a dialog box with a checkbox labeled "Show Terminal Window After Dialing" which is currently unchecked. Below the checkbox is a text input field labeled "Callback Number".

See *Appendix A - Connection Parameters* on page 103, for descriptions of the updateable parameters in the **Advanced** dialog. Click **Apply** to save any changes before closing the dialog.

13. If you need a **User ID** and **Password** to logon to your service provider enter them into the specific fields. If you do not need a username and password leave the fields blank. Click **Next**.

Note:

Some versions of Windows® deliberately change the number of asterisks that represent a password and place asterisks in the password field when the password is blank in order to make the display secure.

14. Click **Finish** to create your connection or **Back** to review your settings.

Modify a Connection

1. Select **Modify a Connection**. The **Select a Connection** drop down menu is activated. Click on the menu and select the connection you want to modify.
2. Click **Next**.
3. Change settings as required.

Delete a Connection

1. Select **Delete a Connection**. The **Select a Connection** drop down menu is activated. Click on the menu and select the connection you want to delete.
2. Click **Next**. The Success dialog is displayed. Click **Finish** to close the **Connection Wizard**.

Using your Connection

To Connect

1. Open Wireless Manager.
2. If requested, enter your SIM Card PIN and click **OK**. The Status screen is displayed.
3. Select the connection you require from the drop down list and click **Connect**. If requested, enter your User ID and Password.

To disconnect an active connection

1. Click **Disconnect** on the Status screen.

The Wireless Manager ends the connection.

Alternatively:

Right click on the **Wireless Manager** icon in the system tray and select **Disconnect**.

Note:

You can also use the Preferences dialog to set up an auto connection when the Wireless Manager is opened. See *Wireless Manager GSM/GPRS/EDGE Preferences* on page 58 for more details.

Browse the Internet via a GSM/GPRS/EDGE Connection

You can connect to the Internet using a CSD or GPRS/EDGE connection:

1. Open your preferred connection from the Status screen. See *Using your Connection* on page 16 for details on opening a connection.
2. Start your Internet browser. You are online and can browse the Internet.

Send and Receive emails

You will need an email program installed on your PC in order to send and receive emails. You can send and receive emails using a CSD or GPRS/EDGE connection:

1. Open your preferred connection from the Status screen. See *Connection* on page 52 for details on opening a connection.
2. Start your email program. You are online and can send and receive emails.

Create a Wireless LAN Connection

The method used to create a Wireless LAN Connection depends on the Windows Operating System you have installed on your PC. Go to the section that covers your Operating System:

- *Making a Basic Network Connection Windows 2000/XP* on page 18
- *Making a Basic Network Connection in Windows Millennium* on page 28
- *Making a Basic Network Connection in Windows 98SE* on page 33

Making a Basic Network Connection Windows 2000/XP

To configure a wireless network in Windows 2000/XP, use one of the following methods:

- The native Windows 2000/XP support (Windows[®] Zero Configuration Service)
- The Sony Ericsson Wireless Utility, see *Configuring your Windows 2000/XP Network Using the Sony Ericsson Wireless Utility* on page 23 for more details.

Configuring Your Network Using Windows[®] Zero Configuration Service

In countries other than the United States and Japan you must set the Location property to the country in which you are using your Sony Ericsson 802.11 Wireless LAN Adapter. This ensures compliance with local regulatory restrictions on transmit power and optimizes network performance.

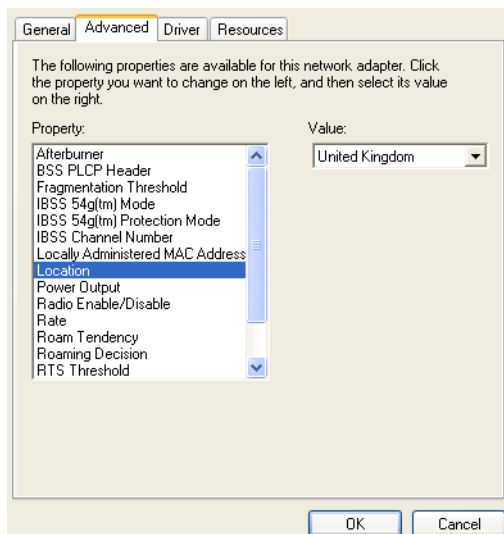
Configuring Your Location

1. Click **Start** ➔ **Control Panel**.
2. If you are not in Classic View, click **Switch to Classic View** in the upper left corner of **Control Panel**.
3. Double-click **Network Connections**.
4. Right-click **Wireless Network Connection** ➔ **Properties**.
5. On the General tab of **Wireless Network Connection Properties** dialog box, click **Configure**.
6. Click the **Advanced** tab on **Sony Ericsson 802.11 Wireless LAN Adapter Properties** dialog box.
7. In the Property list, click **Location**, and then click the name of your location in the **Value** list.

Note:

If your location is not listed, click **Default**.

8. Click **OK**.



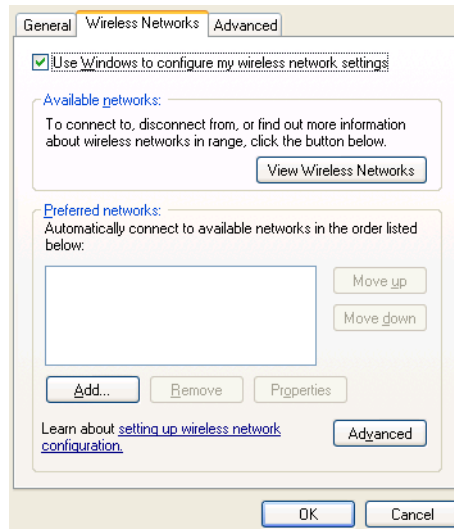
Configuring Your Network

Before you attempt to connect to your network, verify that your access point is connected correctly and working. Consult your access point documentation to configure your access point. After you have configured your access point, follow the steps described below to configure your wireless network.

To manually configure your network connection

1. Click **Start** ➔ **Control Panel**.
2. If you are not in Classic View, click **Switch to Classic View** in the upper left corner of Control Panel.
3. Double-click **Network Connections**.
4. Right-click **Wireless Network Connection** ➔ **Properties**.
5. In Wireless Network Connection Properties, click the **Wireless Networks** tab.
6. Verify that the **Use Windows to configure my wireless network settings** check box is selected. If it is not, select the check box.

7. Click **Add**.

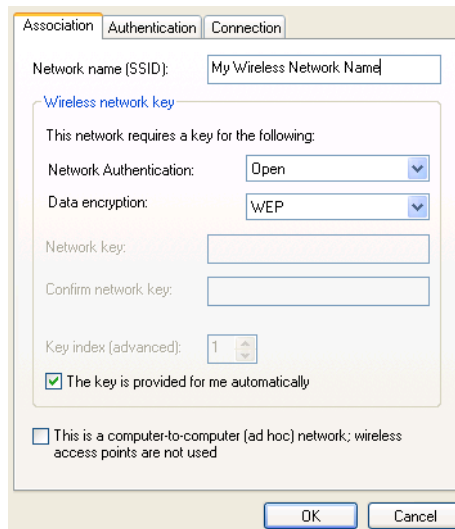


8. On the Association tab, type the name of your network in the **Network name (SSID) box**.

Note:


To automatically connect to your network when it is in range, select the **Connect when this network is in range** check box on the **Connection** tab.

9. Click **OK**.



Your network name is displayed on the Wireless Networks tab under Preferred networks.

To connect to or disconnect from wireless networks in range

1. Right-click  in the taskbar at the lower right corner of your screen, and then click **View Available Wireless Networks**.
2. To connect to one of the listed networks, select the network and click **Connect**; if you are already connected to one of the listed networks and you want to disconnect, select the network and click **Disconnect**.

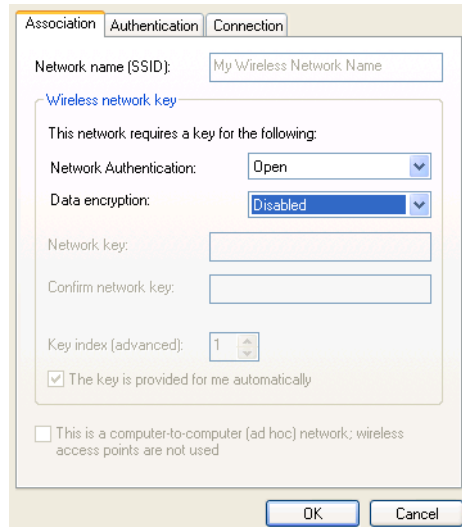
Network security settings must now be configured. The two most basic options are *no security* and *WEP*. Either of these two options is usually appropriate for home users. The no security option

provides no network security, allowing anyone to access your wireless network. The WEP option provides a basic level of security to your wireless network.

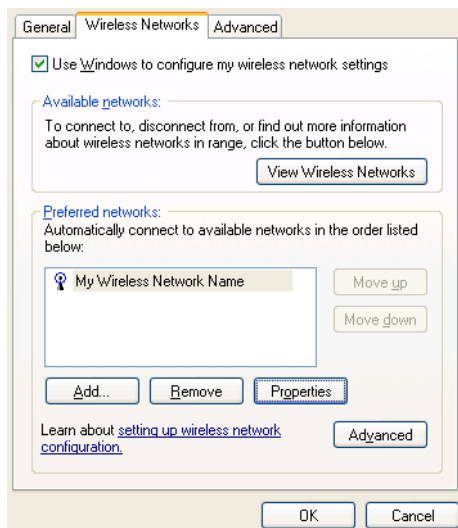
Additional advanced security settings are also available, which are typically used in corporate environments or for advanced users who require higher levels of security. You must ensure that the security settings chosen for the wireless connection exactly match those on the access point.

Setting Your Wireless Network Connection To Have No Security

1. Under **Preferred networks**, click the name of your wireless network.
2. Click **Properties**.
3. Click **Open** from the **Network Authentication list**.
4. Click **Disabled** in the **Data encryption list**.



5. Click **OK**.



6. Click **OK**.

The configuration of your wireless network connection is now complete. For information about the status of your connection, see *Viewing the Status of Your Wireless Connection* on page 39.

Setting Your Wireless Network Connection With WEP Security

1. Under *Preferred networks*, click the name of your wireless network.
2. Click **Properties**.
3. Select **Open** from the *Network Authentication* drop down list.
4. **The key is provided for me automatically** check box should be cleared.
5. Type the WEP network key in the **Network key** field. Your network key must exactly match the network key of the access point. Your network key is either 5 or 13 ASCII (text) characters, or 10 or 26 hexadecimal (0-9, A-F) characters.
6. Type the key again in the **Confirm network key** field.

Association Authentication Connection

Network name (SSID): My Wireless Network Name

Wireless network key

This network requires a key for the following:

Network Authentication: Open

Data encryption: WEP

Network key:

Confirm network key:

Key index (advanced): 1

The key is provided for me automatically

This is a computer-to-computer (ad hoc) network; wireless access points are not used

OK Cancel

7. Click the **Authentication** tab and clear the **Enable IEEE 802.1X authentication for this network** check box.

Association Authentication Connection

Select this option to provide authenticated network access for wireless Ethernet networks.

Enable IEEE 802.1x authentication for this network

EAP type: Smart Card or other Certificate

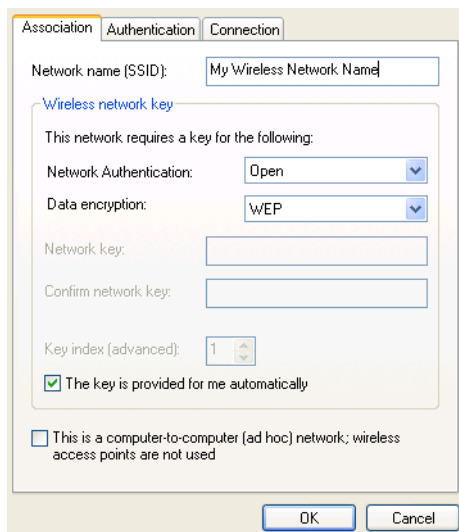
Properties

Authenticate as computer when computer information is available

Authenticate as guest when user or computer information is unavailable

OK Cancel

8. Click **OK**.



9. Click **OK**.

The configuration of your wireless network connection is now complete.

Configuring your Windows 2000/XP Network Using the Sony Ericsson Wireless Utility

This section is relevant to users on Windows XP, with Windows Zero Configuration enabled, and to users on Windows 2000.

In countries other than the United States and Japan you must set the Location property to the country in which you are using your Sony Ericsson 802.11 Wireless LAN Adapter. This ensures compliance with local regulatory restrictions on transmit power and optimizes network performance.

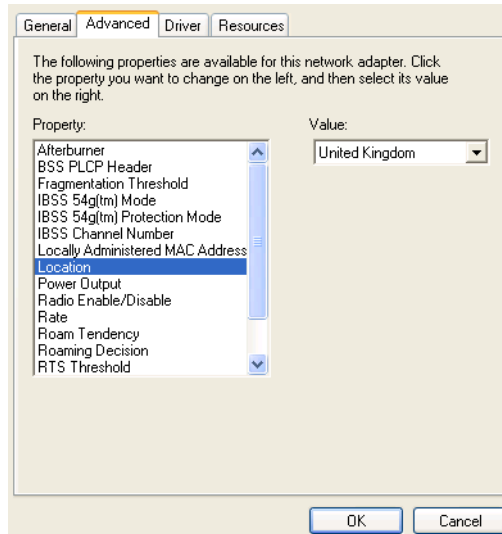
Configuring Your Location

1. Click **Start** ➔ **Settings** ➔ **Network and Dial-up Connections** ➔ **Local Area Connection**.
2. Click **Properties**.
3. On the **General** tab of **Local Area Connection Properties**, click **Configure**.
4. Click the **Advanced** tab on **Sony Ericsson 802.11 Wireless LAN Adapter Properties**.
5. In the **Property** list, click **Location**, and then click the name of your location in the **Value** list.

Note:


If your location is not listed, click **Default**.

6. Click **OK**.



Configuring Your Network

Before you attempt to connect to your network, verify that your access point is connected correctly and is working. Consult your access point documentation to configure your access point. After you have configured your access point, follow the steps described below to configure your wireless network.

1. Click **Start** ➔ **Settings** ➔ **Control Panel** ➔ **Sony Ericsson Wireless Utility** .
2. Click the **Wireless Networks** tab in Sony Ericsson Wireless Utility. Windows 2000 users can skip to step 4.

Note:

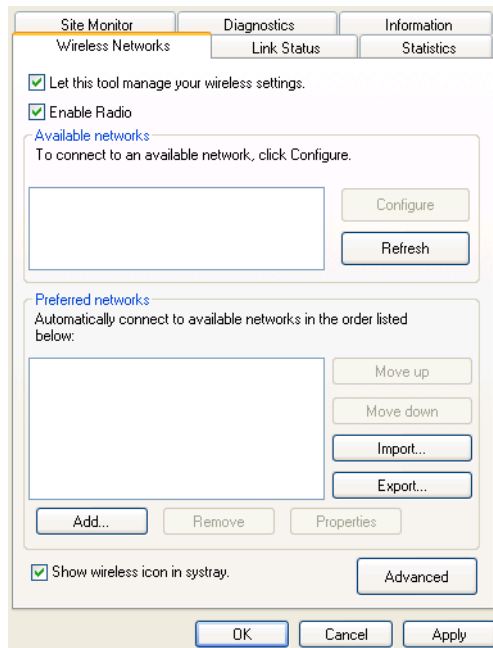
The names of wireless networks that are visible to your computer are shown under Available networks. The name of your network is usually shown here.

3. Verify that the **Let this tool manage your wireless settings** check box is selected. If it is not, select it, and then click **Apply**.

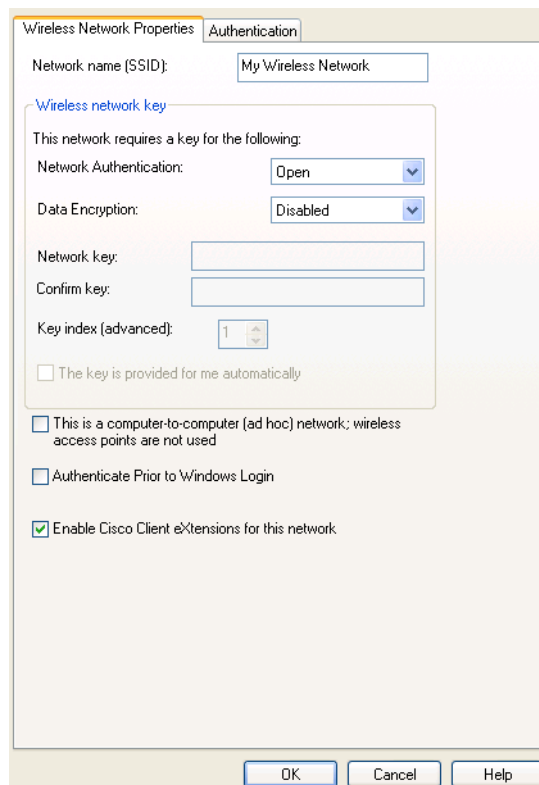
Note:

If this checkbox is unavailable, you cannot use the Sony Ericsson Wireless Utility to manage your wireless settings. For this checkbox to be available, you must log on to your system as Administrator. If you are unable to log on as Administrator, contact your network administrator for assistance. Your network administrator can either grant Administrator rights or arrange to have your computer automatically import the appropriate preferred networks. Alternatively, if you are using Windows XP you can use Windows® Zero Configuration Service to manage your wireless settings.

4. If you see the name of your network under **Available networks**, click the network name, and then click **Configure**. If you do not see your network listed, click **Add**.



5. In **Wireless Network Properties**, if the name of your network does not already appear in the **Network name (SSID)** box, type the name of your network in the **Network name (SSID)** box.
6. Click **OK**.



Note:

Authenticate Prior to Windows[®] Login is used to guarantee a network connection (including association, authentication, and DHCP). To enable this feature, click the Authenticate Prior to Windows[®] Login check box. To disable this feature, clear the check box.

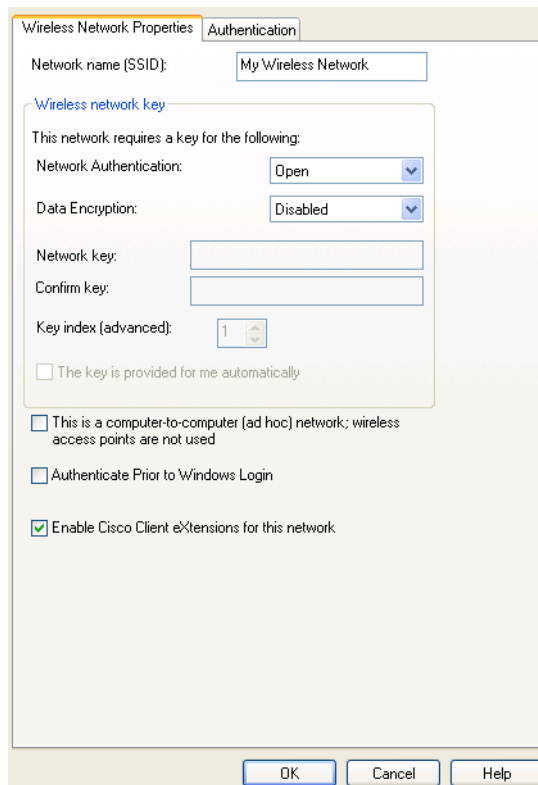
Your network name is displayed on the **Wireless Networks** tab under **Preferred** networks.

Network security settings must now be configured. The two most basic options are no security and WEP. Either of these two options is usually appropriate for home users. The no security option provides no network security, allowing anyone to access your wireless network. The WEP option provides a basic level of security to your wireless network.

Additional advanced security settings are also available, which are typically used in corporate environments or for advanced users who require higher levels of security. You must ensure that the security settings chosen for the wireless connection exactly match those on the access point.

Setting Your Wireless Network Connection To Have No Security

1. Under **Preferred networks**, click the name of your wireless network.
2. Click **Properties**.
3. Click **Open** from the **Network Authentication** list.
4. Click **Disabled** in the **Data encryption** list.



5. Click **OK**.

6. Click **OK**.

The configuration of your wireless network connection is now complete.

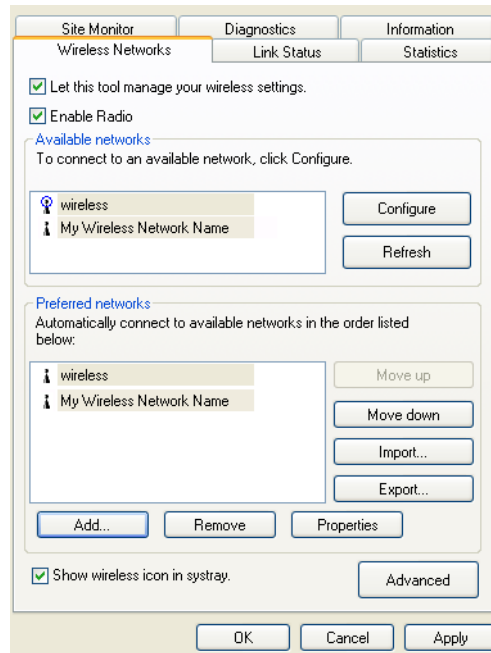
Setting Your Wireless Network Connection With WEP Security

1. Under **Preferred networks**, click the name of your wireless network.

2. Click **Properties**.
3. Click **Open** from the **Network Authentication** list.
4. Click **WEP** in the **Data encryption** list.
5. Type the WEP network key in the Network key box. Your network key must exactly match the network key of the access point. Your network key is either 5 or 13 ASCII (text) characters, or 10 or 26 hexadecimal (0-9, A-F) characters.
6. Type this key again in the **Confirm key** box.

The screenshot shows the 'Wireless Network Properties' dialog box with the 'Authentication' tab selected. The 'Network name (SSID)' is 'My Wireless Network'. The 'Wireless network key' section is highlighted, showing 'Network Authentication' set to 'Open' and 'Data Encryption' set to 'WEP'. The 'Network key' and 'Confirm key' fields are both filled with asterisks. The 'Key index (advanced)' is set to '1'. There are three checkboxes at the bottom: 'The key is provided for me automatically' (unchecked), 'This is a computer-to-computer (ad hoc) network; wireless access points are not used' (unchecked), 'Authenticate Prior to Windows Login' (unchecked), and 'Enable Cisco Client extensions for this network' (checked). The 'OK', 'Cancel', and 'Help' buttons are at the bottom right.

7. Click **OK**.



8. Click **OK**.

The configuration of your wireless network connection is now complete. For information about the status of your connection, see *Viewing the Status of Your Wireless Connection* on page 39.

Making a Basic Network Connection in Windows Millennium

These instructions are based on the assumption that your Sony Ericsson 802.11 Wireless LAN Adapter is factory installed and that your software has been installed. If you received your wireless network card as part of your computer, both of these procedures have been done for you. If you did not receive your wireless network card as part of a computer, consult the Quick Start Guide that came with your wireless network card for instructions on installing the hardware and software.

Windows Millennium users must use the Sony Ericsson Wireless Utility to configure wireless network connections, as described in this section.

In countries other than the United States and Japan you must set the Location property to the country in which you are using your Sony Ericsson 802.11 Wireless LAN Adapter. This ensures compliance with local regulatory restrictions on transmit power and optimizes network performance.

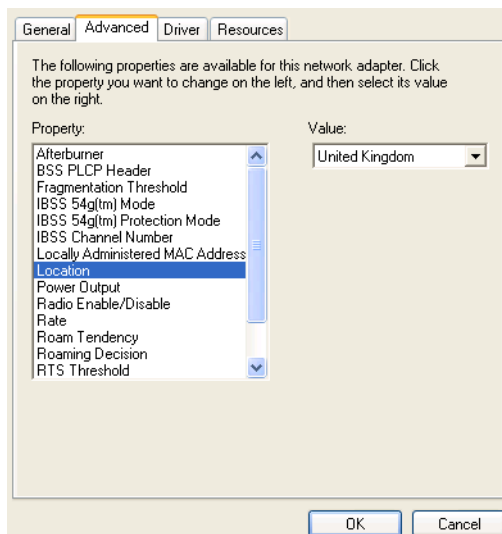
Configuring Your Location

1. Click **Start** ➔ **Settings** ➔ **Network and Dial-up Connections** ➔ **Local Area Connection**.
2. Click **Properties**.
3. On the **General** tab of **Local Area Connection Properties**, click **Configure**.
4. Click the **Advanced** tab on **Sony Ericsson 802.11 Wireless LAN Adapter Properties**.
5. In the **Property** list, click **Location**, and then click the name of your location in the **Value** list.

Note:

If your location is not listed, click **Default**.

6. Click **OK**.



Configuring Your Network

Before you attempt to connect to your network, verify that your access point is connected correctly and is working. Consult your access point documentation to configure your access point. After you have configured your access point, follow the steps described below to configure your wireless network.

1. Click **Start** ➔ **Settings** ➔ **Control Panel** ➔ **Sony Ericsson Wireless Utility** .
2. Click the **Wireless Networks** tab in Sony Ericsson Wireless Utility.

Note:

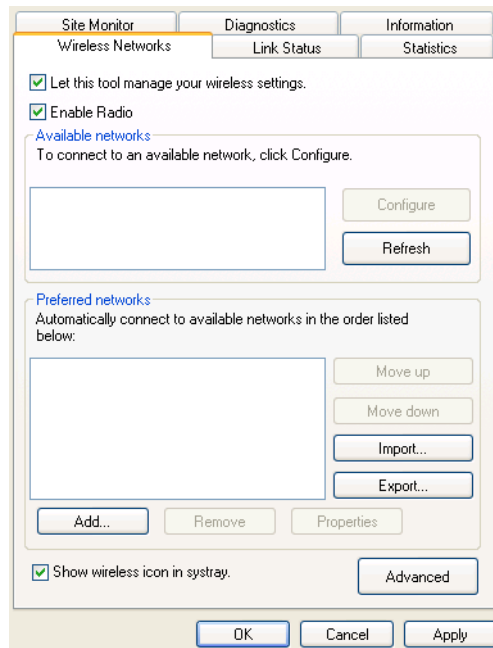
The names of wireless networks that are visible to your computer are shown under Available networks. The name of your network is usually shown here.

3. Verify that the **Let this tool manage your wireless settings** check box is selected. If it is not, select it, and click **Apply**.

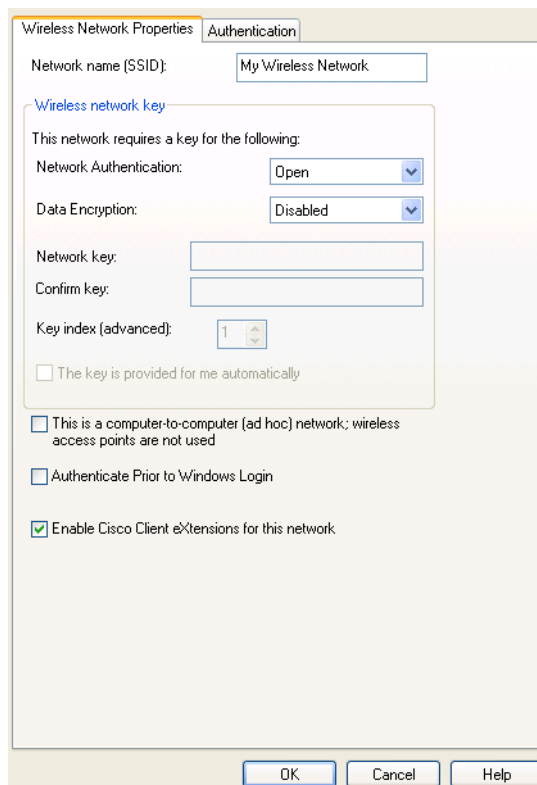
Note:

If this checkbox is unavailable, you cannot use the Sony Ericsson Wireless Utility to manage your wireless settings. For this checkbox to be available, you must log on to your system as Administrator. If you are unable to log on as Administrator, contact your network administrator for assistance. Your network administrator can either grant Administrator rights or arrange to have your computer automatically import the appropriate preferred networks. Alternatively, if you are using Windows XP you can use Windows® Zero Configuration Service to manage your wireless settings.

4. If you see the name of your network under **Available networks**, click the network name, and then click **Configure**. If you do not see your network listed, click **Add**.



5. In Wireless Network Properties, if the name of your network does not already appear in the **Network name (SSID)** box, type the name of your network in the **Network name (SSID)** box.
6. Click **OK**.



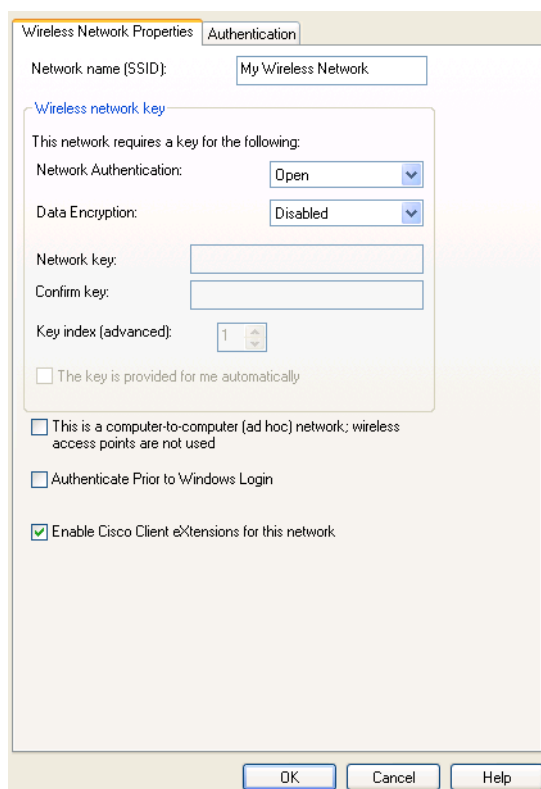
Your network name is displayed on the **Wireless Networks** tab under **Preferred networks**.

Network security settings must now be configured. The two most basic options are no security and WEP. Either of these two options is usually appropriate for home users. The no security option provides no network security, allowing anyone to access your wireless network. The WEP option provides a basic level of security to your wireless network.

Additional advanced security settings are also available, which are typically used in corporate environments or for advanced users who require higher levels of security. You must ensure that the security settings chosen for the wireless connection exactly match those on the access point.

Setting Your Wireless Network Connection To Have No Security

1. Under Preferred networks, click the name of your wireless network.
2. Click **Properties**.
3. Click **Open** from the **Network Authentication** list.
4. Click **Disabled** in the **Data encryption** list.



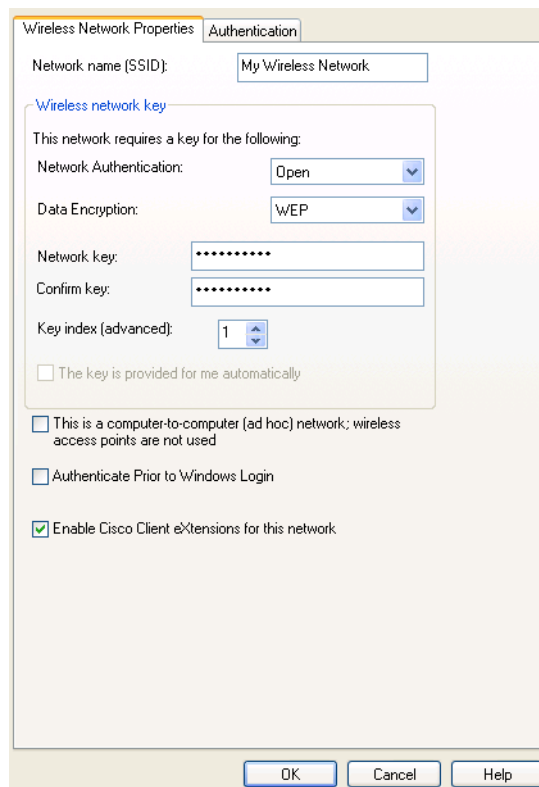
5. Click **OK**.
6. Click **OK**.

The configuration of your wireless network connection is now complete.

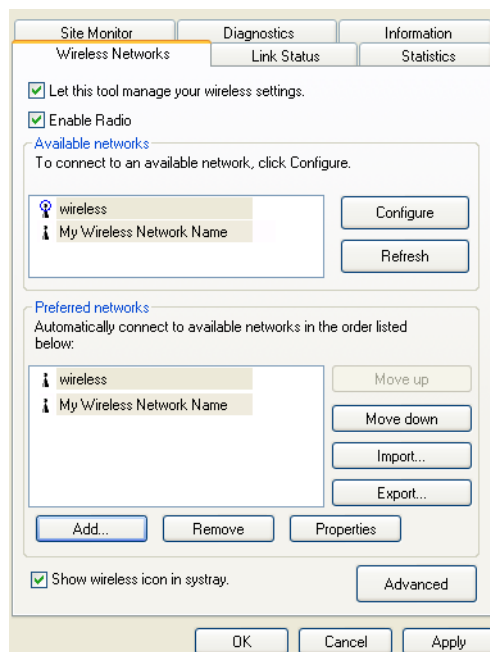
Setting Your Wireless Network Connection With WEP Security

1. Under **Preferred networks**, click the name of your wireless network.
2. Click **Properties**.
3. Click **Open** from the Network Authentication list.
4. Click **WEP** in the Data encryption list.

5. Type the WEP network key in the Network key box. Your network key must exactly match the network key of the access point. Your network key is either 5 or 13 ASCII (text) characters, or 10 or 26 hexadecimal (0-9, A-F) characters.
6. Type this key again in the **Confirm key** box.



7. Click **OK**.



8. Click **OK**.
9. The configuration of your wireless network connection is now complete.

Making a Basic Network Connection in Windows 98SE

These instructions are based on the assumption that your Sony Ericsson 802.11 Wireless LAN Adapter is factory installed and that your software has been installed. If you received your wireless network card as part of your computer, both of these procedures have been done for you. If you did not receive your wireless network card as part of a computer, consult the Quick Start Guide that came with your wireless network card for instructions on installing the hardware and software.

Windows 98SE users must use the Sony Ericsson Wireless Utility to configure wireless network connections, as described in this section (for additional information on the Sony Ericsson Wireless Utility, see *Using the Sony Ericsson Wireless Utility* on page 38).

In countries other than the United States and Japan you must set the Location property to the country in which you are using your Sony Ericsson 802.11 Wireless LAN Adapter. This ensures compliance with local regulatory restrictions on transmit power and optimizes network performance.

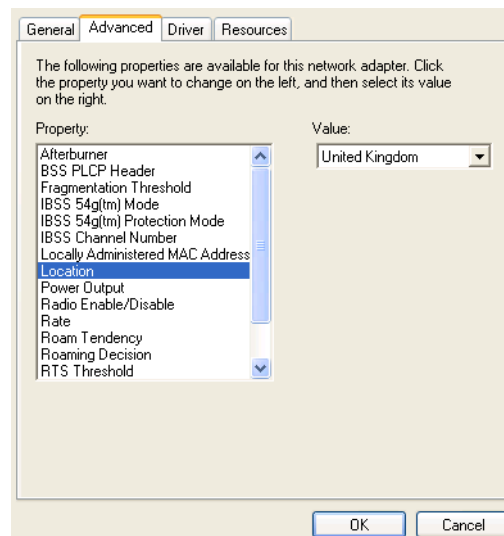
Configuring Your Location

1. Click **Start** ➔ **Settings** ➔ **Network and Dial-up Connections** ➔ **Local Area Connection**.
2. Click **Properties**.
3. On the **General** tab, click **Configure**.
4. Click the **Advanced** tab on **Sony Ericsson 802.11 Wireless LAN Adapter Properties**.
5. In the **Property** list, click **Location**, and then click the name of your location in the **Value** list.

Note:

If your location is not listed, click **Default**.

6. Click **OK**.



Configuring Your Network

Before you attempt to connect to your network, verify that your access point is connected correctly and is working. Consult your access point documentation to configure your access point. After you have configured your access point, follow the steps described below to configure your wireless network.

1. Click **Start** ➔ **Settings** ➔ **Control Panel** ➔ **Sony Ericsson Wireless Utility** .
2. Click the **Wireless Networks** tab in Sony Ericsson Wireless Utility.

Note:

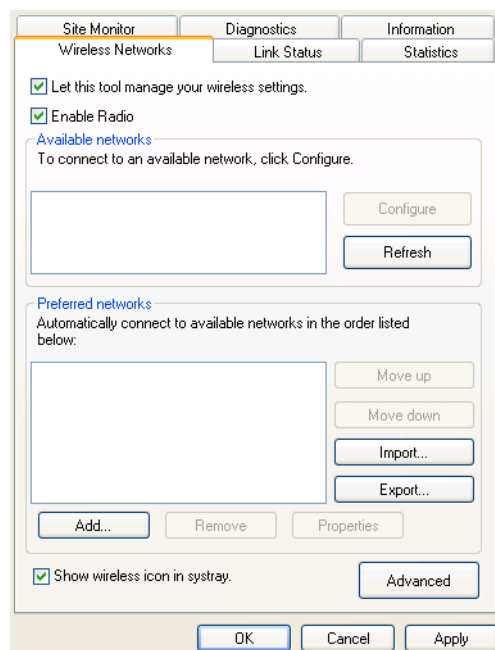
The names of wireless networks that are visible to your computer are shown under Available networks. The name of your network is usually shown here.

3. Verify that the **Let this tool manage your wireless settings** check box is selected. If it is not, select it, and then click **Apply**.

Note:

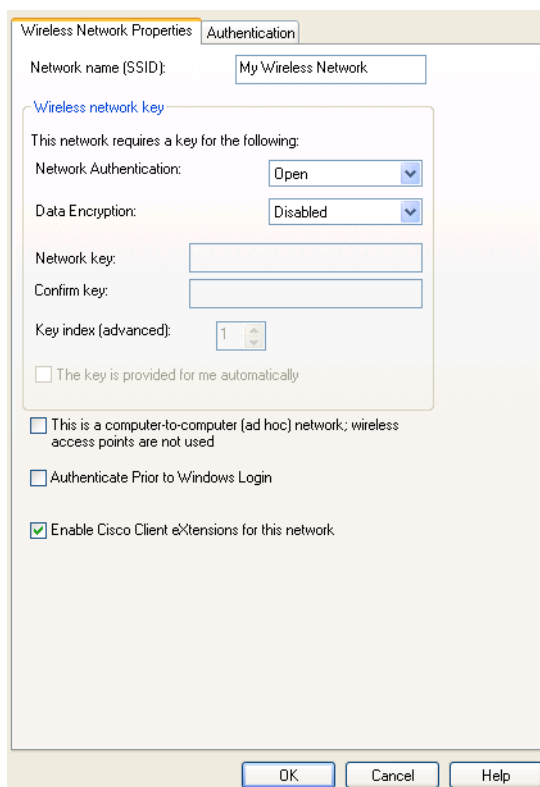
If this checkbox is unavailable, you cannot use the Sony Ericsson Wireless Utility to manage your wireless settings. For this checkbox to be available, you must log on to your system as Administrator. If you are unable to log on as Administrator, contact your network administrator for assistance. Your network administrator can either grant Administrator rights or arrange to have your computer automatically import the appropriate preferred networks. Alternatively, if you are using Windows XP you can use Windows[®] Zero Configuration Service to manage your wireless settings.

4. If you see the name of your network under **Available networks**, click the network name, and then click **Configure**. If you do not see your network listed, click **Add**.



5. In Wireless Network Properties, if the name of your network does not already appear in the **Network name (SSID)** box, type the name of your network in the **Network name (SSID)** box.

6. Click **OK**.



Your network name is displayed on the **Wireless Networks** tab under **Preferred networks**.

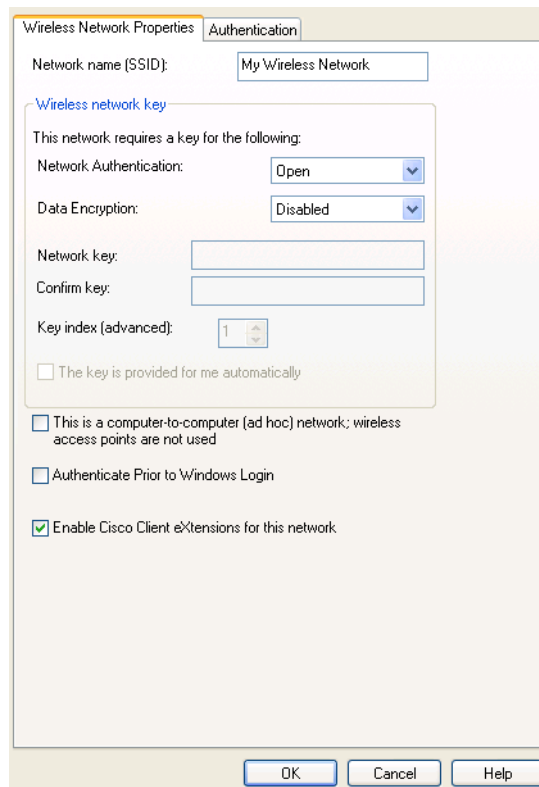
Network security settings must now be configured. The two most basic options are no security and WEP. Either of these two options is usually appropriate for home users. The no security option provides no network security, allowing anyone to access your wireless network. The WEP option provides a basic level of security to your wireless network.

Additional advanced security settings are also available, which are typically used in corporate environments or for advanced users who require higher levels of security. You must ensure that the security settings chosen for the wireless connection exactly match those on the access point.

Setting Your Wireless Network Connection To Have No Security

1. Under **Preferred networks**, click the name of your wireless network.
2. Click **Properties**.
3. Click **Open** from the **Network Authentication** list.

4. Click **Disabled** in the Data encryption list.



5. Click **OK**.
6. Click **OK**.

The configuration of your wireless network connection is now complete.

Setting Your Wireless Network Connection With WEP Security

1. Under **Preferred networks**, click the name of your wireless network.
2. Click **Properties**.
3. Click **Open** from the **Network Authentication** list.
4. Click **WEP** in the **Data encryption** list.
5. Type the WEP network key in the Network key box. Your network key must exactly match the network key of the access point. Your network key is either 5 or 13 ASCII (text) characters, or 10 or 26 hexadecimal (0-9, A-F) characters.

6. Type this key again in the **Confirm key** box.

Wireless Network Properties Authentication

Network name (SSID): My Wireless Network

Wireless network key

This network requires a key for the following:

Network Authentication: Open

Data Encryption: WEP

Network key:

Confirm key:

Key index (advanced): 1

The key is provided for me automatically

This is a computer-to-computer (ad hoc) network; wireless access points are not used

Authenticate Prior to Windows Login

Enable Cisco Client extensions for this network

OK Cancel Help

7. Click **OK**.

Site Monitor Diagnostics Information

Wireless Networks Link Status Statistics

Let this tool manage your wireless settings.

Enable Radio

Available networks

To connect to an available network, click Configure.

wireless Configure

My Wireless Network Name Refresh

Preferred networks

Automatically connect to available networks in the order listed below:

wireless Move up

My Wireless Network Name Move down

Import...

Export...

Add... Remove Properties

Show wireless icon in systray. Advanced

OK Cancel Apply

8. Click **OK**.



The configuration of your wireless network connection is now complete.

Using the Sony Ericsson Wireless Utility

The user interface you see when you start the Sony Ericsson Wireless Utility may look slightly different than the illustrations shown in this user guide, depending on the operating system you are using.

In addition to providing a means for viewing the link status of a connection, monitoring the available networks that within range, running diagnostic tests, viewing statistics about network activity, and viewing important information about your Sony Ericsson 802.11 Wireless LAN Adapter, the Sony Ericsson Wireless Utility can also be used to configure your wireless network connection.

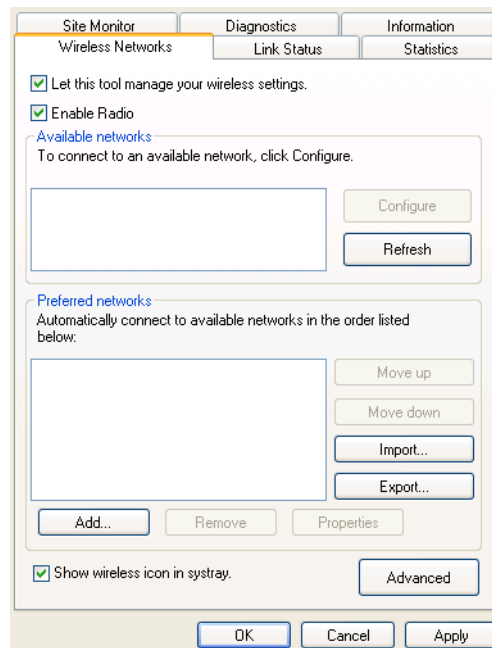
Opening the Sony Ericsson Wireless Utility

The Sony Ericsson 802.11 Wireless LAN Adapter Utility starts automatically every time you start your computer. When the system startup process is complete,  is displayed in the taskbar at the lower right corner of your screen. The utility begins scanning across the wireless frequencies for wireless APs and other wireless clients. The appearance of the utility icon varies, depending on the strength of the signal being received from the wireless AP or wireless client (if any) with which your computer has associated. If your computer has not yet established a wireless network connection, all of the bars in the icon are uncolored .

If the utility icon is not in the system tray, select the **Show wireless icon in systray** check box on the **Wireless Networks** tab.

Opening the Utility in Windows 2000/ME and 98SE

9. Click **Start** ➔ **Settings** ➔ **Control Panel** ➔ **Sony Ericsson Wireless Utility** .



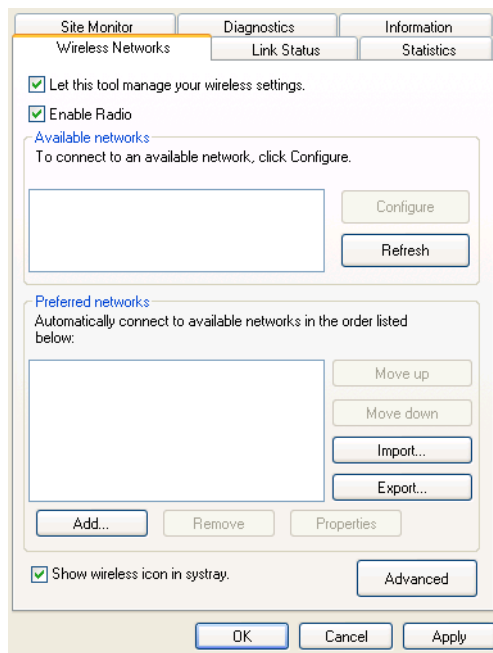
10. Click the **Wireless Networks** tab.

11. Enable the radio by selecting the **Enable Radio** check box (if it is not already selected).

Opening the Utility in Windows XP



1. Click **Start** ➔ **Control Panel (Classic View)**.

2. Double-click **Sony Ericsson Wireless Utility** .



3. Click the **Wireless Networks** tab.
4. Enable the radio by selecting the **Enable Radio** check box (if it is not already selected).


Enabling and Disabling the Radio


To disable the radio, right-click  in the taskbar and select **Disable Radio**. To enable the radio, right-click  and select **Enable Radio**.

Viewing the Status of Your Wireless Connection


The quality of your wireless network connection is affected by two things:

- The strength of your wireless networking signal.
- The level of noise created by other wireless signals in your home or office.

The signal strength is graphically indicated by  in the taskbar (located at the lower right corner of your screen). The appearance of the icon indicates the strength or weakness of the signal.

To view the client IP address, and the name, speed, signal strength, and status of your wireless network connection, move your mouse pointer over .

Note:

On Windows XP you can also view the connection status and signal strength by moving your mouse pointer over the Windows® Wireless Network Connection icon  in the taskbar.



A fully green icon indicates that the signal strength is very good or excellent.



A partially green icon indicates that the signal is good or low.

Suggested action: Move closer to the access point.



A grey icon indicates that there is no signal being received.

Probable causes:

The computer is trying to establish an initial connection but has not yet succeeded.

You may have moved out of range of the access point.

Suggested action:

Wait.

Move closer to the access point.

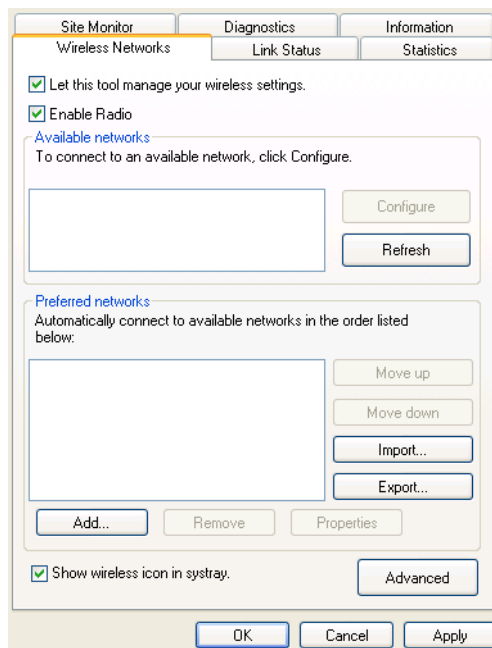


An icon with a red bar indicates that there is no radio connection.

Suggested action: Enable the WLAN radio by right-clicking the icon and then selecting **Enable Radio**.

Wireless Networks

The **Wireless Networks** tab allows you to configure your wireless network connection. Before you begin, ensure that the **Enable Radio** and **Let this tool manage your wireless settings** check boxes are both selected.



For instructions on how to configure your wireless network connection using the Sony Ericsson Wireless Utility, see:

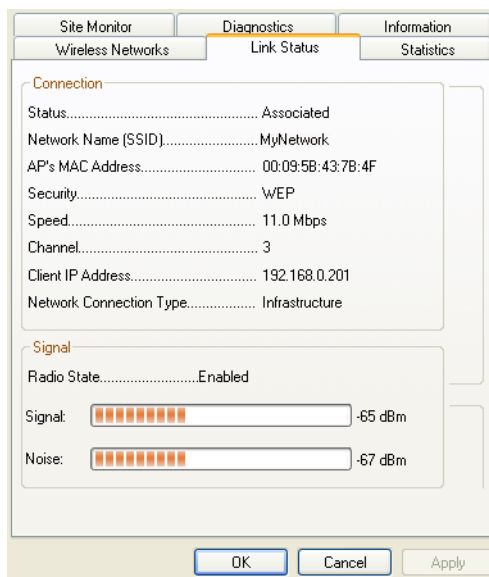
- *Making a Basic Network Connection Windows 2000/XP* on page 18
- *Making a Basic Network Connection in Windows Millennium* on page 28
- *Making a Basic Network Connection in Windows 98SE* on page 33

Link Status

The Link Status tab provides information on the status of your wireless network connection. The signal panel on this tab provides advanced information (signal strength and noise level) about the access point signal detected by your Sony Ericsson 802.11 Wireless LAN Adapter.

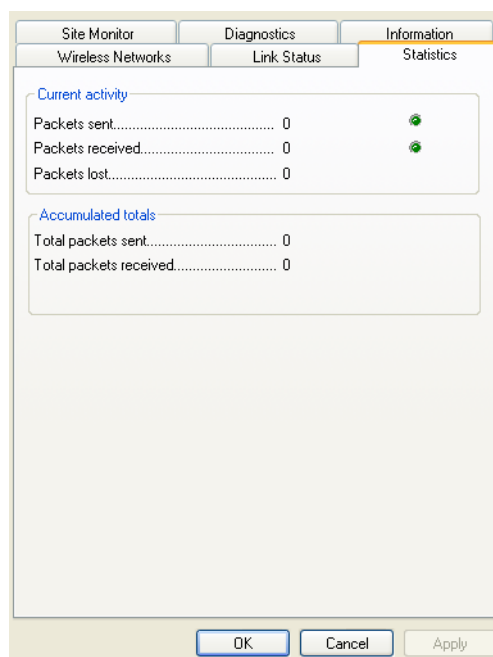
The two-character country code that represents the country for which the operating characteristics of your Sony Ericsson 802.11 Wireless LAN Adapter have been set is shown opposite Location. If you are not in the United States or Japan and plan to use your computer in a different country, you may need to change the **Location** property.

To identify the country represented by the two-character country code refer to the Country Decoding Table.



Statistics

Transmission activity information is shown on the Statistics tab.



Site Monitor

The broadcasting wireless networks that are within range of your Sony Ericsson 802.11 Wireless LAN Adapter are listed on the Site Monitor tab. Network properties such as the channel on which the network is operating, the strength of the received signal, and the type of security are shown for each network. By clicking the name of a listed network, you can see under **Selected Network** the operating mode for that network, the data rates that are supported, and an indication of the signal strength. To see advanced site monitoring details and to start a log file, double-click the network name.

Note:

Use of Site Monitor may degrade performance of the IEEE 802.11 network while Site Monitor is in use.


Diagnostics

You can run a number of diagnostic tests on your Sony Ericsson 802.11 Wireless LAN Adapter to verify its operational and functional status.

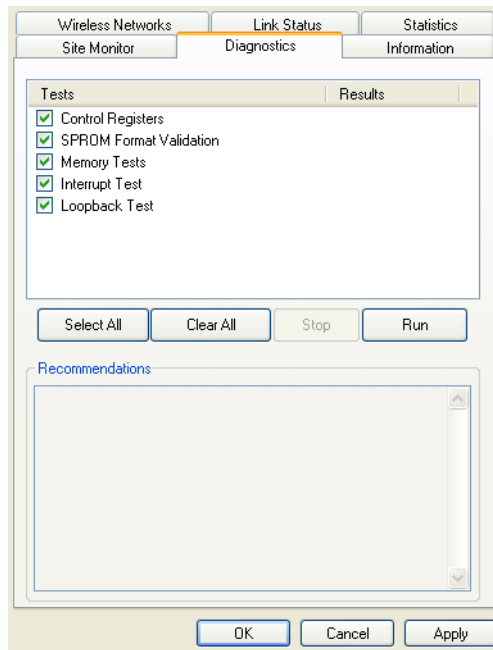
Note:

The network connection is lost when you run the diagnostics. When the test run is over, however, your network connection is automatically reestablished.

To run a diagnostic test

1. Open the **Sony Ericsson Wireless Utility** .
2. Click the **Diagnostics** tab.
3. To see a description of the test, click each test and look in the **Recommendations** area.
4. To run an individual test, or some but not all of the tests, clear the check box (by clicking it) for those tests that you do not want to run. All tests are selected by default.

5. Click **Run**.



- If the Sony Ericsson 802.11 Wireless LAN Adapter fails any of the diagnostics tests, see *Troubleshooting* on page 79.

Information

Important information about your Sony Ericsson Wireless Utility and your Sony Ericsson 802.11 Wireless LAN Adapter are shown on the Information tab.

Advanced Wireless LAN Features

Setting up an Ad Hoc Group Network

In ad-hoc mode, a peer-to-peer network is created. An example might be networking laptops in a meeting room in order to share information. The network is set up at the start of the meeting and disappears when the last laptop is shut down. The following instructions explain how to set up an ad hoc network using two PCs, however you can network any number of PCs together, just make sure they have a unique IP number.

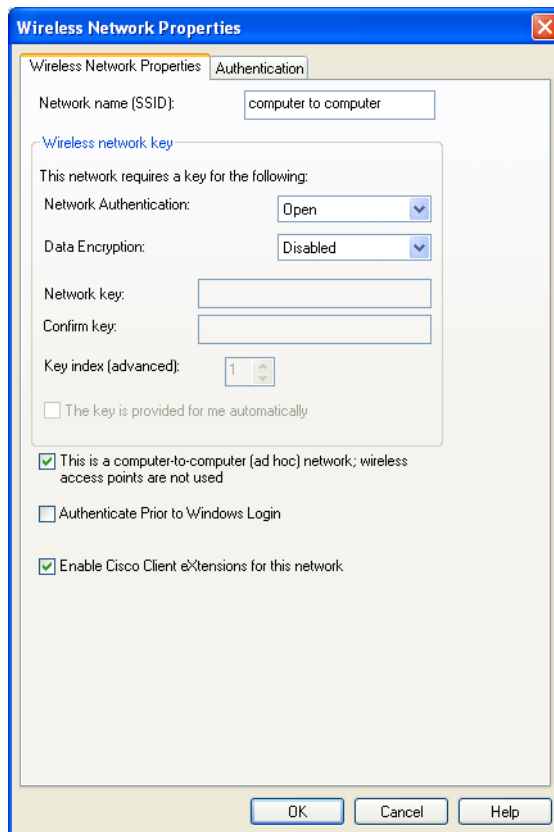
1. Click **Start**, point to **Settings**, point to **Control Panel**, and then click **Sony Ericsson Wireless Utility**.
2. Click the **Wireless Networks** tab.
3. Verify that the **Let this tool manage your wireless settings** check box is selected. If it is not, select it, and then click **Apply**.

Note:

If this checkbox is unavailable, you cannot use the Sony Ericsson Wireless Utility to manage your wireless settings. For this checkbox to be available, you must log on to your system as Administrator. If you are unable to log on as Administrator, contact your network administrator for assistance. Your network administrator can either grant Administrator rights or arrange to have your computer automatically import the appropriate preferred networks. Alternatively, if you are using Windows XP you can use Windows[®] Zero Configuration Service.

4. Under **Preferred networks**, click **Add**.
5. Type the name of your ad hoc network in the **Network name (SSID)** box.

6. Select the **This is a computer-to-computer (ad hoc) network; wireless access points are not used** check box.



7. Click **OK**.

Your network name is displayed on the **Wireless Networks** tab under **Preferred networks**.

For information about the status of your connection, see *Viewing the Status of Your Wireless Connection* on page 39.

Network security settings must now be made. The two security options for ad hoc networks are *no security* and WEP. Additional security options are available only on *infrastructure* networks. The *no security* option provides no network security, allowing anyone to access your wireless network. The WEP option provides some level of security to your wireless network.

Configuring Your Ad Hoc Network with No Security

1. Under **Preferred networks**, click the name of your wireless ad hoc network.
2. Click **Properties**.
3. Click **Open** in the **Network Authentication** list.
4. Click **Disabled** in the **Data encryption** list.
5. Click **OK**.
6. Click **OK**.

Your ad hoc network configuration is now complete. For information about the status of your connection, see *Viewing the Status of Your Wireless Connection* on page 39.

Configuring Your Ad Hoc Network with WEP Security

1. Under **Preferred networks**, click the name of your wireless ad hoc network.
2. Click **Properties**.
3. Click **Open** in the **Network Authentication** list.
4. Click **WEP** in the **Data encryption** list.
5. Type the WEP network key in the **Network key** box. Your network key must exactly match the network key of the other computers in your ad hoc network. Your network key is either 5 or 13 ASCII (text) characters, or 10 or 26 hexadecimal (0-9, A-F) characters.
6. Type this key again in the **Confirm key** box.
7. Click **OK**.
8. Click **OK**.

Your ad hoc network configuration is now complete. For information about the status of your connection, see *Viewing the Status of Your Wireless Connection* on page 39.

Connecting the PCs

1. Select one of the laptops, right click **My Computer** and select **Map Network Drive**. In the dropdown list, select a free harddrive name that is not occupied by any other name.
2. Type **\\laptop name or IP address\C\$** into the Folder field. For example, enter **\\192.168.0.1\C\$** to connect to the 1st laptop we set up. C\$ is specifying the drive on the laptop that you want to connect to.

Note:

To find a computers name, open a Command Prompt on the PC you want to find the name of. Type hostname and press return. The computer name is returned.

Note:

You can also use a Command Prompt to make sure you can see the other PC. Type **ping <IP address>** and press return (The IP address belongs to the PC you are trying to contact). In the example, we would enter ping 192.168.0.1. PC 1 sends a small amount of data to PC 2, and if connection is established between the PCs, replies for each packet of data sent are returned to PC 1.

3. If you are required to log on to the PC before access is granted, select **Connect using a different user name**. Make sure you have an alias and password set-up on the PC you are connecting to.
4. Enter your **User name** and **Password** into the Connect As... dialog.
5. Click **OK** and **Finish**.

After a while, a new window should popup in PC2 showing the hardrive of PC1. It is also listed with your Network Drives.


Tip:

See your Windows[®] documentation for further details on setting up a network of Windows[®] PCs.

Caution!

Unwanted users may try to connect to your ad hoc network. Use of security features such as WEP is recommended.

Disable the WLAN

1. Right click  and select **Disable radio**.

Sharing an Internet Connection

To connect a group of computers using a shared Internet connection, select one of the desktop computers to serve as the *host* computer (all other computers are called *clients*).

The host computer is the only computer that connects directly to the Internet. It is recommended that the desktop computer having the fastest microprocessor and the most memory is used as the host computer.

The host computer must be running either the Windows 2000 or Windows XP operating system.

Connection sharing requires that the host computer has either a modem or another network adapter in addition to the GC89. The modem or the additional network adapter is used to access the internet. The GC89 is used to share the connections with other clients.

Setting up Internet Connection Sharing (ICS) on the Host Computer

1. Connect the host computer to the internet.
2. Click the **Start** button.
3. Select **Settings** → **Control Panel**.
4. Double-click **Network and Dial-up Connections**.
5. If the host computer is connected to the internet using a dial-up connection, double-click **Dial-up Connection** → **Properties** → **Sharing**, and then ensure that both **Enable Internet Connection Sharing for this connection** and **Enabled on-demand dialing** are selected.

If the host computer is connected to the internet using a cable or DSL modem, double-click **Local Area Connection** → **Properties** → **Sharing**, and then ensure that the **Enable Internet Connection Sharing for this connection** option is selected.

Note:

For Windows 2000, you must enable local network sharing and select the Local Area Connection relating to the Sony Ericsson 802.11g adaptor. You can check this by looking at the Device Name in the Network and Dial-Up Connections list. If your Sony Ericsson 802.11g adaptor is listed as Local Area Connection 3, then select Local Area Connection 3 in the 'For local Network' drop-down box.

For Windows XP, follow the Bridging instructions below.

Bridge connections on Windows XP

The network bridge allows you to connect network segments by selecting the appropriate network connection and bridging them together. The network bridge manages your network segments, and creates a single IP subnet for the entire network. There is no configuration required, and you do not need to purchase additional hardware such as routers or bridges. IP addressing, address allocation, and name resolution is highly simplified in a single subnet IP network.

Only one bridge may exist on a Windows XP computer, but it can be used to bridge as many different network connections as the computer can physically accommodate.

Before you begin make sure you are logged on to the computer as an administrator.

1. Select **Start** ➔ **Control Panel**, and then double-click **Network Connections**.
2. Under LAN or High-Speed Internet select each of the private network connections that you want to be part of the bridge.
You must select at least two eligible network connections in order for Bridge Connections to create a bridge.
3. Right click one of the highlighted private network connections, and select **Bridge Connections**.
You can create only one network bridge on a computer, but the bridge can accommodate any number of network connections.

Caution!

Do not use this method to share a corporate network connection without first agreeing upon security procedures with the network administrator.

Note:

- Adapters that have Internet Connection Sharing (ICS) or Internet Connection Firewall (ICF) enabled cannot be part of the network bridge and will not appear on the Network Bridge checklist. Similarly, the Add to Bridge menu command is available only for adapters that you can add as connections to Network Bridge.
 - Only Ethernet, IEEE-1394 adapters, or Ethernet compatible adapters such as wireless and home phoneline adapters (HPNA), can be part of the network bridge.
 - Do not create a bridge between the public Internet connection and the private network connection, or add the public Internet connection to an existing network bridge, if you do not have ICF or Internet Connection Sharing (ICS) enabled. To do so will create an unprotected link between your network and the Internet, and your network will be vulnerable to intrusions.
 - If you remove adapters from the network bridge, and less than two adapters remain, Network Bridge will not perform its intended function, but it will continue to use system resources.
 - Network adapters that previously appeared under LAN or High-Speed Internet, appear under Network Bridge when they are added as connections. Network adapters that provide Internet connectivity, such as DSL and cable modems, cannot be bridged and will always appear under LAN or High-Speed Internet.
 - Network bridges with wireless or IEEE-1394 connections support traffic using Internet Protocol version 4 (IPv4) only.
4. Internet Connection Sharing, Internet Connection Firewall, Discovery and Control, and Network Bridge are not available on Windows XP 64-Bit Edition.

Caution!

When sharing an internet connection, unwanted users within the reach of the wireless LAN may be able to use it too. The use of security features such as WEP and WPA network keys are recommended.

Creating profiles for ICS Client machines

Set up an ad hoc network on your host machine and each client. Follow the *Create a Wireless LAN Connection* on page 18.

Static IP Number Management

Some users may require a static IP number for the WLAN connection in the office and a dynamic IP number outside the office.

If you are using Windows 98SE/Me/2000, it is necessary to manually change the TCP/IP properties of the Sony Ericsson 802.11g Wireless LAN adaptor:

1. Select **Control Panel** ➔ **Network and Dial-up Connections**.
2. Right click the WLAN connection and select **Properties** ➔ **General** ➔ **Internet Protocol (TCP/IP)** ➔ **Properties**.
3. Enter the static IP address for use in the office or select **Obtain IP address automatically** for use outside.

Under Windows XP, this situation can be automated:

1. Go to **Control Panel** ➔ **Network Connections** ➔ **Wireless Network Connection** ➔ **General** ➔ **Internet Protocol (TCP/IP)** ➔ **Properties**.
2. In the **General** tab select **Obtain an IP address automatically**.
3. In the **Alternate Configuration** tab select **User configured** and enter static IP address and any other network parameters that are required.

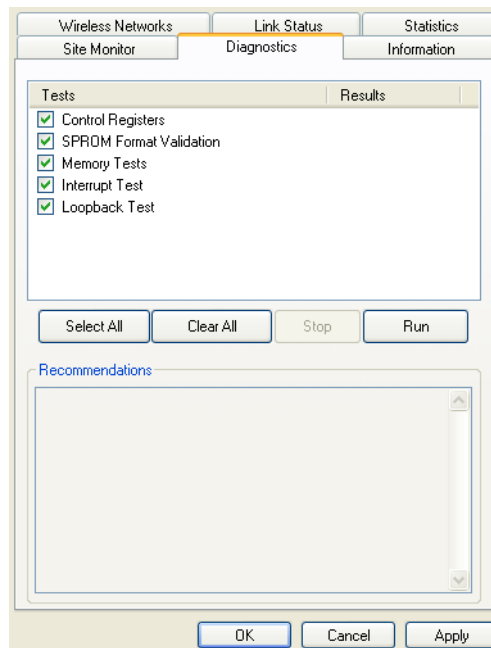
Wireless LAN Adapter Diagnostics

You can run a number of diagnostics on your GC89 wireless LAN adapter to verify its operational and functional status.

Note:

Your network connection is lost when you run the diagnostics. When the test run is over, your network connection is automatically re-established.

1. Open the Wireless Configuration Utility, as described in *Create a Wireless LAN Connection* on page 18, and click on the **Diagnostics** tab.



2. Select the tests you want to run. All tests are selected by default. To run an individual test or some but not all of the tests, clear the check box for those tests that you do not want to run.
3. Click **Run**.

GC89 WLAN Information


You can view detailed technical information about your GC89 WLAN connection by selecting the Information tab in the Sony Ericsson Wireless Configuration Utility. Your MAC number is listed on this screen.

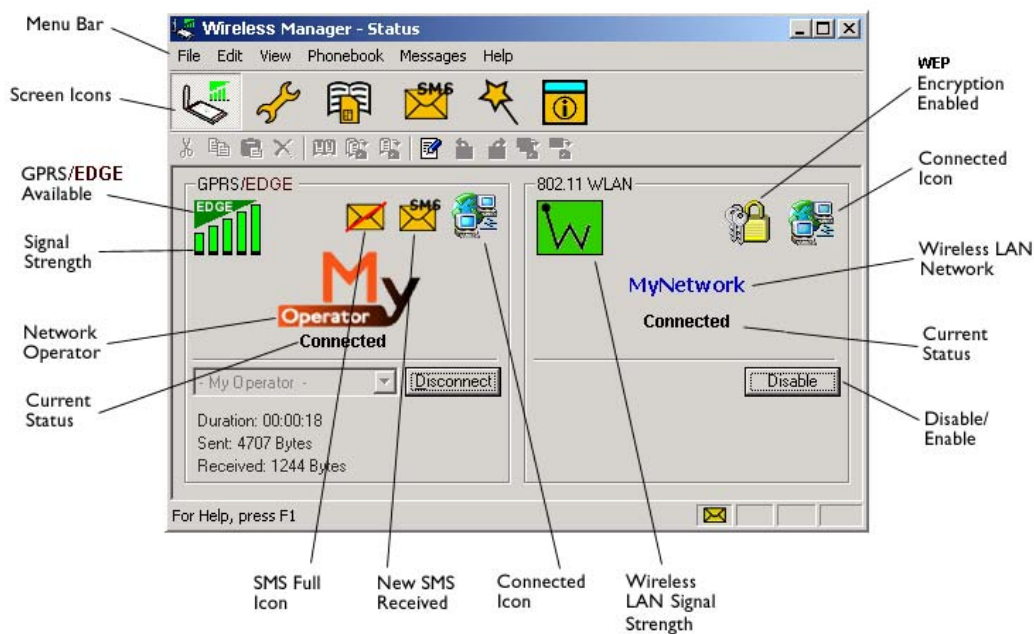
Concurrent WLAN and GPRS

The GC89 supports concurrent connections to GPRS and WLAN, however this ability may have been disabled for security reasons.

Switching between GPRS and WLAN connection is not automatic, even if both are available or the WLAN connection is established automatically as you enter the hotspot. This is because the connections will have different IP numbers. You are advised to check your connections as you enter and leave hotspots. You may need to re-request a transaction (for example refresh a web page) or restart an application.

Wireless Manager Status Screen



To view the Status screen either start Wireless Manager select **Start** → **Programs** → **Sony Ericsson** → **Wireless Manager** or select your desktop shortcut  or select **View** → **Status**.



The Status screen shows information about your GSM and wireless LAN network connections. The body of the screen is divided into two.

GSM Connection Status

The left side of the screen shows information about your GSM connection, including icons representing:

- Receive signal strength.
- GPRS/EDGE service status. See *GSM/GPRS Icons* on page 54 for more information.
- Unread SMS Text Message  status (or SIM Full indication ). See *Wireless Manager SMS Messages Screen* on page 70 for more details.
- Connection status

The left side of the screen also displays:

- The current Network Status, e.g. searching, radio off.
- The connection progress messages.

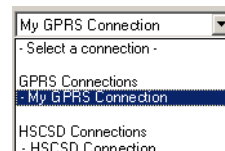
When a connection is established, the connection statistics (duration, bytes transmitted, bytes received) are displayed and updated at regular intervals.

Note:

Statistics display is not supported on Window 98(SE) or Me platforms. To view statistic data when using these operating systems, hover your mouse cursor over the standard Windows® Dial-up Networking icon.

Connection

To connect, cancel or disconnect a GPRS/EDGE or CSD data session use the Connect/Disconnect drop down menu. The menu displays all the connections you have defined, so you can quickly select the required connection.



The **Control** button, located underneath the drop down menu, changes its appearance depending on the state of the GC89 connection. The button allows you to:

- Initiate a connection (**Connect**)
- Cancel connection attempt (**Cancel**)
- **Disconnect** (Hang-up) an existing session

To create a connection see *Create a EDGE/GPRS or CSD Connection* on page 14.

Note:

You can also launch or terminate a CSD dialup networking session directly from the Windows® Network Connections icon.

Wireless LAN Connection Status

The right side of the **Status** screen shows information about your wireless LAN connection, including:

- Wireless LAN connection status
- Connection speed
- Signal strength
- Network name (SSID)

The **Disable/Enable** button allows you to switch the wireless LAN radio on and off.

Usage Statistics

Select **View** → **Usage**. A dialog displays the total connection time, data received and data sent for GPRS/EDGE, CSD and WLAN.

Click the **Reset** button to clear the counters. You may wish to clear the counters to correspond with your billing intervals.

Note:

Information in this dialog is indicative and may not correspond to the accurate billing information maintained by your network operator.

Start Using Wireless Manager

1. To start Wireless Manager select **Start** → **Programs** → **Sony Ericsson** → **Wireless Manager** or select your desktop shortcut .


2. If requested, enter your SIM Card PIN and/or Phone Lock code, click **OK**. It is only necessary to enter the PIN and/or code once during a PC session.

You are allowed three attempts to enter the correct PIN and/or code. If you fail to enter the SIM PIN correctly, it is blocked and if you fail to enter the Phone Lock code correctly, your GC89 is locked. Contact your network operator for your personal unblocking code (PUK). Enter the unblock code into the Card Blocked dialog and enter a new PIN code and confirm it.

To set the SIM Card PIN and Phone Lock code, see *Locks* on page 64.

3. The Wireless Manager opens, displaying the **Status** screen. Connectivity details are displayed on this screen. The current signal strength and EDGE/GPRS availability are shown. See *Wireless Manager Status Screen* on page 25, for more details.
4. The **Wireless Manager Icon** is displayed in the system tray of your PC.

Note:





There must be a SIM card in the GC89 for the Wireless Manager application to operate. However, the Wireless LAN functions may be used without a SIM card. Click  in the status tray, to access the WLAN functions.

Wireless Manager Icon




The Wireless Manager icons, displayed in your desktop system tray, allow you to view the current status of the GC89. Simply place your mouse cursor over an icon to display text.

Some of these icons have menus associated with them. See *Icon Menus* on page 55 for details.

GSM/GPRS Icons

-  GSM/GPRS/EDGE radio is disabled.
.....
- The GSM/GPRS/EDGE radio transmitter is enabled, but there is no GSM or GPRS/EDGE service available.
- X Wireless Manager is waiting for the GC89 card to be inserted.
-  The GC89 has GSM service and indicates a signal strength of 3 out of 5 bars. CSD, SMS and fax may be used, provided these are supported by the subscription. If you have selected a GPRS connection and the **Connect** button is grey, GPRS/EDGE is not available. If the **Connect** button is available, your mobile operator has configured the Wireless Manager to search for GPRS/EDGE when you connect. If the connection is successful, GPRS/EDGE is available and GPRS/EDGE availability is indicated as below when connected. When you disconnect, the signal meter returns to this state.
-  The GC89 has GSM and GPRS service. GPRS, CSD, SMS and fax may be used, provided these are supported by the subscription.
-  The GC89 has GSM and EDGE service. EDGE, CSD, SMS and fax may be used, provided these are supported by the subscription.

Wireless LAN Icons

-  Wireless LAN radio is disabled.
-  The wireless LAN radio transmitter is enabled, but there is no network available.
-  The GC89 has made a wireless LAN network connection. The degree to which this icon is green indicates the signal strength.



Windows® Icons

In addition, the following standard Windows® operating system icons also appear in the system tray

when the GC89 is inserted in your PC and in use.



Active Windows[®] dial-up or wireless connection. Hover your mouse over the icon or double click it to display information about the network connection (e.g. number of bytes sent/received). Up to two of these icons may be displayed, representing either Dial-up or GSM/GPRS/EDGE, and wireless LAN connections.



Disconnected Windows[®] Local Area Connection. Up to two of these icons may be displayed, representing GSM/GPRS/EDGE and wireless LAN connections.

These icons allow you to edit your Windows[®] Network dial-up connections. See *Making Windows[®] Network Connections Visible* on page 57 for details.

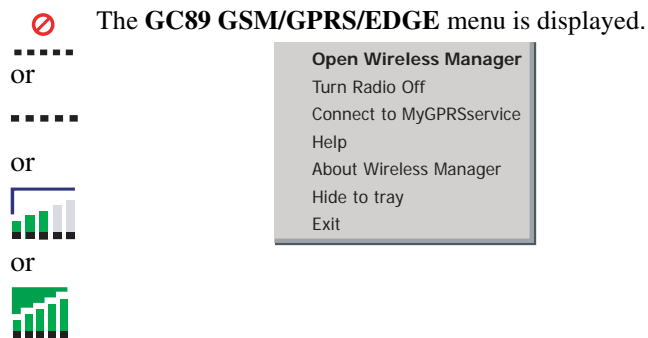


PC Card icon. This indicates that a PC card is present. It allows you to see certain properties and also to stop / remove the card. See *Windows[®] Log on Using GSM/GPRS Dial-up Connection* on page 62 for details.

Icon Menus

GC89 GSM/GPRS/EDGE menu

Right click one of the following icons to see the **GC89 GSM/GPRS/EDGE** menu options.



Note:

Some of these menu options are disabled, depending on the current state of the GC89.

The **GC89 GSM/GPRS/EDGE** menu options are described below.

Open Wireless Manager

Select **Open Wireless Manager** or double click on the Wireless Manager icon to open the **Wireless Manager**.

Radio Status (Turn GSM/GRPS Radio On/Off)

This menu option is dynamic. It monitors the current state of the GC89 GSM/GPRS radio transmitter and gives you the option to switch to the opposite state. (For example, if your GC89 GSM/GPRS radio transmitter is on the menu option reads **Turn GSM/GPRS Radio Off**.)

You can also set the status of the GSM/GPRS radio transmitter by selecting **Turn GSM/GPRS Radio On/Off** in the Wireless Manager **File** menu.

Connect/Disconnect

If you are currently disconnected, the menu gives you the option to connect to the most recently used GC89 GSM/GPRS connection. If you are connected the menu gives you the option to disconnect.

Help

Opens the Wireless Manager Online Help. You can also launch the Online Help from the **Wireless Manager** Help Menu. Pressing **F1** in any of the **Wireless Manager** dialogs opens the relevant help screen.

About

Displays a dialog that contains Wireless Manager software information.

Hide to Tray

Select the **Hide to Tray** option to visually close Wireless Manager leaving only the icons visible in the system tray. Use the **Open Wireless Manager** option to view the software again.

Exit

Exits the **Wireless Manager** application completely. Use the stop/remove commands if you wish it to remain in the background. See *Safe Removal of the GC89* on page 57 for more details.

GC89 Wireless Control menu

Right click on one of the following icons to see the GC89 Wireless Control menu options.



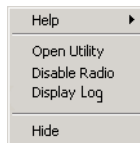
or



or



The **GC89 Wireless Control** menu is displayed.



The GC89 Wireless Control menu options are described below.

Help

This menu option provides information about the GC89 Wireless Control Utility.

Country (Where provided)

This menu option allows you to select the operating characteristics that comply with the regulations that apply in a particular country. Before connecting to a wireless network, you should verify that the Country value is correct. If you travel to different countries, you must remember to change the Country as appropriate.

If the destination country is not listed, set the value to Worldwide.

Open Wireless Utility

Opens the Wireless Configuration Utility.

See *Create a Wireless LAN Connection* on page 18 for details.

Note:

Use this option to access the WLAN functions if there is no SIM in the GC89.

Radio Status (Enable / Disable Radio)

This menu option is dynamic. It monitors the current state of the GC89 wireless LAN radio transmitter and gives you the option to switch to the opposite state (for example, if your GC89 Radio transmitter is on, the menu option reads **Disable Radio**).

You can also set the status of the wireless LAN radio transmitter by selecting Turn **Radio On/Off** in the Wireless Manager **File** menu.

Hide

This menu option allows you to hide the  icon from view on the system tray.

Making Windows® Network Connections Visible

The Windows® connection icons, displayed in the system tray, normally disappear once a connection is made. This means that you may not necessarily see an icon corresponding to each of the icons for your GSM/GPRS and CSD.

To make the icon visible, follow the steps described below.

- Right click the appropriate icon and select **Open Network Connections**. Alternatively select **Start** ➔ **Settings** ➔ **Network Connections**.
- A dialog opens displaying all the network and dial-up connections available on your PC. Right click the one you want to edit.
- Click the **Show icon in taskbar when connected** box. Click **OK** to close the dialog. When you have an active connection, use your mouse to hover over the icon to view connectivity details.
- **PC Card icon**
Indicates that a PC card is present and allows the user to see certain properties and to stop/remove the card.

Safe Removal of the GC89

You must stop the GC89 before attempting to remove it.

1. Close any active GC89 Networking Connections.
2. Exit Wireless Manager.
3. Click on the **PC Card** icon. All the currently connected devices are listed. Select **Stop Sony Ericsson GC89 EGPRS Modem**.
4. A dialog is displayed telling you it is safe to remove the card.
5. The GC89 can now be removed safely.

Important!

Incorrect removal of the GC89 can damage the card.

Wireless Manager GSM/GPRS/EDGE Preferences

You can change the general behavior of the Wireless Manager by selecting specific options in the **Preferences...** dialog.

1. From the **File** menu, select **Preferences**. The Preferences dialog opens, the **Radio Power** tab is displayed.

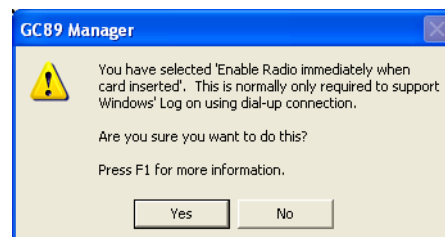


Radio Power Tab

You can use this tab to manage the state of the radio transmitter.

Enable Radio immediately when card inserted

You should normally leave this checkbox turned off. When enabled, the Windows[®] driver turns the radio transmitter on when the card is inserted and leaves it enabled even when the card is not in use. You should check this option if your Windows[®] logon requires you to log on using a dial-up connection; see *Windows[®] Log on Using GSM/GPRS Dial-up Connection* on page 62 for more details. When you click **OK** to activate this option the Wireless Manager displays the following dialog.



When this option is selected, the Wireless Manager radio power startup and shutdown choices are disabled.

The radio mode you specify at Wireless Manager start-up appears selected on the Radio tab.

On	<p>When the Wireless Manager is running in radio on mode it is registered to the network, connections can be made and SMS sent and received. The radio can be enabled in several ways;</p> <ul style="list-style-type: none">• Select Radio On when the Wireless Manager starts.• Specify the required radio state in Preferences ➔ Radio Power. <p>See <i>Wireless Manager GSM/GPRS/EDGE Preferences</i> on page 58 for more details.</p>
Off	<p>Radio Off indicates that the GC89 will not register to the mobile network. You may perform non-communication related activities such as phone book maintenance, but you must turn on the radio in order to make a connection or to send/receive SMS.</p>
Ask Me	<p>Triggers a dialog to be displayed every time the PC is turned on. The dialog asks you if the radio transmitter should be turned on or off during the active PC session. This is also called Aeroplane mode, because it prevents the radio transmitter from automatically turning on. This is a useful feature in areas where radio transmitters are not allowed; aircrafts, hospitals or blasting areas.</p>
Turn Radio Off	<p>At shutdown the radio is turned off.</p>
Reset card	<p>Turns the radio off and resets the card.</p>
Leave Radio As Is	<p>When the Wireless Manager closes the radio, it remains in its current state, i.e. if the radio is currently on it will remain on and you will still be able to use the Wireless LAN capabilities of the GC89.</p>

Text Messaging Tab

You can use this tab to enable reception of specific message classes from the SMS Cell Broadcast service and to set the SMS received audio alarm to on or off. Select the radio buttons to activate the options.

Example of SMS Cell Broadcast message types:

Code: Cell Broadcast Message

000	Index
010	News Flashes
020	Hospitals
030	Long-distance road reports
040	Weather

To enter multiple SMS Cell Broadcast message types separate each entry with a comma, for example: 000, 034, 076.

Note:

SMS Cell Broadcast message types are network operator specific. Contact your network operator for more details.

This screen also allows you to set a validity period for the SMS messages that you are sending. For example, if a message you send cannot be delivered because the recipient doesn't have their phone

on, the validity period sets a time limit on how long the service center should keep attempting delivery.

Notifications Tab

Click the **Notifications** tab. From here you can decide if you want to:

- display a splash screen every time Wireless Manager is opened.
- display a splash screen every time Wireless Manager is closed.
- display a program end confirmation box.

Select the check box to activate the options.

GPRS Connection Tab

Establish GPRS connection at startup

Select this option to automatically connect to your chosen network when Wireless Manager is started. Wireless Manager waits until GPRS is registered and then it establishes the specified GPRS connection.

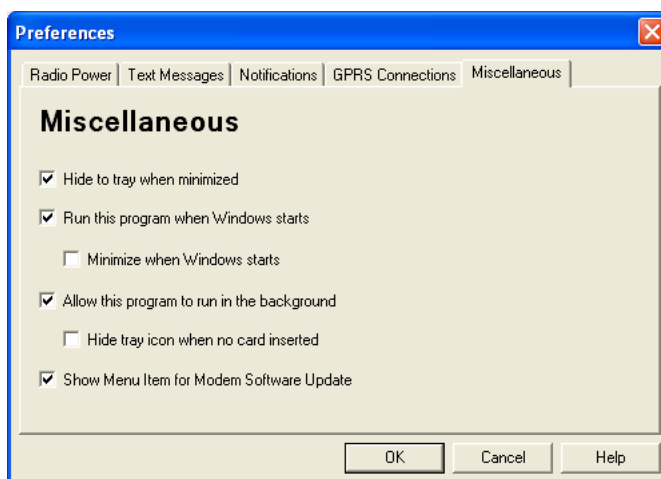
Simply select the name of the connection to be established from the drop down list.

To automatically connect when you start or restart your PC, see the example below. If you need to connect at Windows® log on see *Windows® Log on Using GSM/GPRS Dial-up Connection* on page 62.

- Example:
- If you want your GC89 to be available and a GPRS internet connection to be automatically established when you boot your laptop:
 - Set **Preferences** → **Miscellaneous** → **Run this program when Windows Starts**
 - Set **Preferences** → **GPRS Connection** → **Establish GPRS Connection At Startup** and select the GPRS connection required.

Miscellaneous Tab

Click the **Miscellaneous** tab.



- **Hide to tray when minimized**
If enabled, when the Wireless Manager is minimized, it removes any window from the taskbar and only shows the small icon in the system tray. To re-open the main window, double-click the tray icon or select **open** from the icon menu.
- **Run this program when Windows starts**
If enabled, the Wireless Manager starts when Windows® is started. If a GC89 is detected, the Wireless Manager runs. If not, the program closes (and runs in the background if permitted). When used with **Establish GPRS connection** at startup, this allows a GPRS session to be automatically connected when the user logs on, see *Windows® Log on Using GSM/GPRS Dial-up Connection* on page 62 for more details.
- **Minimize when Windows starts**
If enabled, the Wireless Manager starts when a user logs on to Windows® and it appears as an icon in the task bar only. If a GC89 is detected, the Wireless Manager runs and connects. If not, the program closes (and runs in the background if permitted).
- **Allow this program to run in the background**
If enabled, the Wireless Manager runs in the background, waiting for a GC89 to be inserted. When the card is detected, the Wireless Manager automatically opens and begins normal operations.
When the close box or **File** ➔ **Exit** is selected, the Wireless Manager closes but does not exit. It releases control of the card, so it may be stopped and removed, and runs in the background. You can start the program again from the **Start** menu, double-clicking the system tray icon, or by re-inserting the GC89.
You can stop Wireless Manager running in the background by right clicking on the PC screen and selecting **Exit**.
If you attempt to start Wireless Manager with no GC89 inserted, a warning dialog is displayed, informing you that the GC89 is not present, and Wireless Manager switches back to background mode.
- **Hide tray icon when no card inserted**
If this option is selected, Wireless Manager runs in background mode, the Wireless Manager icon is not displayed in the system tray. If the card is inserted, the icon reappears and the Wireless Manager is started.

Examples: If you want to activate your GC89 when the laptop is booted, so that it is ready to make a connection and send/receive SMS:

- Set **Preferences** ➔ **Miscellaneous** ➔ **Run this program when Windows Starts**.

If you want your GC89 to be available and a GPRS internet connection to be automatically established when you boot your laptop:

- Set **Preferences** ➔ **Miscellaneous** ➔ **Run this program when Windows Starts**.

- Set **Preferences** ➔ **GPRS Connections** ➔ **Establish GPRS Connection At Startup**.

- Select the GPRS connection required.

If you remove the GC89 during usage and want it to be automatically reactivated when you re-insert it:

- Set **Preferences** ➔ **Miscellaneous** ➔ **Allow this program to run in the background**.

Note: If you have **Establish GPRS connection at Startup** set, then the connection will also be automatically established when you insert the card.

If you want to start the laptop with the GC89 removed and have it automatically

activated when it is later inserted:

- Set **Preferences** ➔ **Miscellaneous** ➔ **Run this program when Windows Starts**.

- Set **Preferences** ➔ **Miscellaneous** ➔ **Allow this program to run in the background**.

Windows® Log on Using GSM/GPRS Dial-up Connection

The GC89 supports the Windows® **Log on using dial-up connection** feature.

To log on to Windows® using a dial-up connection, the GC89 must be inserted and the radio enabled before you log on. To enable the radio prior to logon, select **Enable radio immediately when card inserted** checkbox in the **Radio Power** preferences tab. See *Radio Power Tab* on page 58 for more details.

Important!

Never start your PC in this mode if you are in a location where mobile devices shouldn't be used (for example, on an aeroplane, in hospital or near a blast site).

Only check this option if you need to log on to a Windows® Domain via a wireless dial-up connection. This will permit the GC89 to register with the network and establish a connection when the Windows® logon screen is displayed.

Note:

It is not possible to display network status or signal strength during the Windows® logon procedure, so you should allow enough time for the GC89 to find and register with the wireless network prior to attempting to log on.

The dial-up connections available to the Windows® Logon must have been created by a user account with *Administrator* privilege and designated *For all users*. This must be done using the **Windows Network Connection Wizard**, because the **Wireless Manager** can only create connections for the current user ID.

Normally the **Windows Logon using dial-up connection** will be using a CSD session to a corporate network, so that the logon credentials can be validated by a Windows® Domain Server.

There may be special circumstances where a GPRS dial-up connection is required for logon. To create a GPRS dial-up connection, follow these steps:

1. Create the Windows® dial-up connection using the **Windows Network Connection Wizard**. For the telephone number, use *99***3#.
2. Set the GPRS context parameters in the GC89 using the following AT commands. Type the AT Commands into the Windows® Hyperterminal program.

```
AT+CGDCONT=3,"IP", "<AccessPointName>","",0,0
```

where <AccessPointName> is the name of the special GPRS access point for your corporate GPRS service.

Note:

In this example, we used GPRS Context 3. There are 10 possible contexts supported by the GC89 (1..10). Context ID 2 is reserved for use by connections created by the **Wireless Manager**. The context definition is stored in nonvolatile memory in the GC89 and only needs to be set up once. Cards could be set up, for example, by the IT Manager using a different laptop.

Refer to the AT Command Manual or contact your service provider for further assistance.

Wireless Manager Telephony Settings Screen

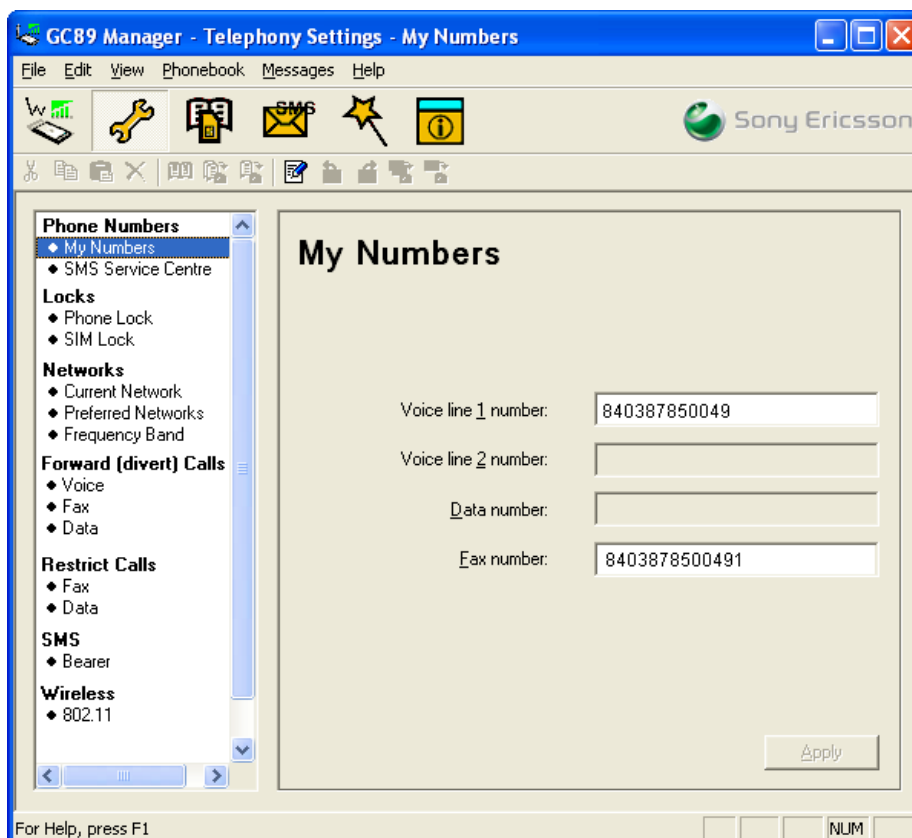
The Telephony Settings screen allows you to view and change the GSM settings of the GC89.

The functions of the Telephony Settings screen are very similar to the settings that you have access to via a mobile phone's display. A **Wireless 802.11** option provides access to the **Sony Ericsson Wireless Configuration Utility**.

Note:

Your GC89 has to be inserted into your computer to make changes to the settings.

1. Click  or select **View** → **Telephony Settings**.



The window is divided into two areas: the navigation area on the left and the information area on the right.

When you have selected a setting in the navigation area, Wireless Manager retrieves the current setting information from the GC89 and displays the information in the right area.

Phone Numbers

My numbers

You can list all your own numbers here. The numbers are for personal reference only and have no operational effect on the GC89.

Voice line 1 and 2:

The voice number or numbers issued with your SIM card that you use for normal voice calls. If you have line 2 (alternate line service) enter in the **Voice Line 2 number** field.

Data:

The number used to make a data call to the GC89 (Mobile Terminated).

Fax:

Fax is not supported by the GC89.

SMS Service Centre

When you send a text message it goes to your operator's service centre. They then forward it to the correct recipient. The SMS service centre is identified by a telephone number.

Note:

The SMS Service Centre number is normally read automatically from your SIM card.

To Set or change the service centre address:

1. Enter your operator's service centre phone number in the Number text box.
2. Click **Apply** to transfer the setting to your GC89.

Locks**Phone lock**

The phone lock protects the GC89 against unauthorized use if it is stolen and used with another SIM card. Phone Lock is not activated when you buy the GC89.

You can use this screen to change a default phone lock security code (0000) to any four to eight digit personalized code.

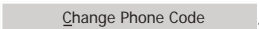
You can set the Phone Lock Status to one of the following states:

- **On** - A brief message *Phone lock* is displayed each time you turn on the computer. The **Enter phone lock code** dialog opens. Enter your code into the dialog and click **OK**.
- **Off** - The GC89 is not locked.
- **Automatic** - If the Automatic setting is selected, the message *Phone lock* only appears when a different SIM card is inserted into the GC89. After the security code has been entered correctly, the GC89 can be used with the new SIM card.

Note:

The Phone Lock code has four to eight digits and is shown as asterisks upon entry in the dialog.

To Change the Phone Lock code:

1. Click .
2. The **Change the Phone Lock Code** dialog opens. Make the required changes and click **OK**.
3. Click **Apply** when you have finished, to transfer the changes back to your GC89. This may take a few seconds.

SIM lock

Some SIM cards are protected with a PIN (Personal Identity Number) at the time of purchase. If the SIM card lock is activated, you have to enter the PIN every time you turn on your PC and open Wireless Manager. If you enter your PIN incorrectly three times in succession, the SIM card is blocked and you need a PUK code, from your network operator, to unblock the SIM card.

- To activate the SIM card lock, select the **On** radio button.

Caution!


Only activate the SIM card lock if you know the PIN code.

- To cancel the SIM card lock, select the **Off** radio button.

Note:

You have to use your PIN code to turn the SIM card lock off.

To Change the PIN Code:

1. Click .
2. Enter your old PIN code, followed by your new four to eight digit PIN code. Confirm the new code by entering it again.
3. Click **OK**.

Note:

The SIM card lock only protects your subscription and not your GC89 from unauthorized use. If you change your SIM card, the GC89 will still work with a new SIM card.

4. Click **Apply** when you have finished to transfer the changes to your GC89. This may take a few seconds.

Networks

Current Network

You can select which network you want to use by going to **Networks** and then choosing **Current Network**.

Searching for the available networks:

- Click **Retrieve**. The current network appears in the box with all the other currently available networks.

The available networks will fall into one of the following three categories:

- The home network.
- Available networks. These are networks that your home mobile operator has a roaming agreement with.
- Forbidden networks. These are networks that you can not use except for emergency calls. If your home network and a forbidden network come to an agreement that allows you to use the forbidden network, you can select this network even though it is forbidden.

Choosing another network:

1. Uncheck **Automatically choose a network for me**.
2. Select the network that you want to use.
3. Click **Apply** to transfer the setting to your GC89.

The message *Please wait* appears briefly on the screen. If you are not allowed to use the network that you have chosen, *Forbidden* is displayed.

Note:

GPRS is commonly available in GSM networks, but fewer roaming agreements are in place. You may therefore need to explicitly select one of the available networks in order to use GPRS when abroad. Check with your home operator to find out which networks are GPRS roaming partners in the country or region in which you want to roam.

Preferred Network

Note:

This option is only available if your operator provides it.

A list of preferred networks is stored on the SIM card. This is typically set up by your mobile operator as part of SIM manufacture. Preferred roaming partners are placed in the list so that you have the greatest range of available services when roaming. When the home network is not available, the GC89 will check the available networks against the preferred network list and select the one placed highest. Automatic network selection must be enabled.

If you want to add a new network:

1. Click **Add**. A new dialog with all the networks known to the GC89 appears on the screen.
2. Select the network that you want to add and click **OK**.
3. Click **Apply** to transfer the setting to your GC89 SIM card.

If you want to delete a network from the list:

1. Select the network that you want to delete.
2. Click **Remove**.
3. Click **Apply** to transfer the setting to your GC89's SIM card.

If you want to re-arrange the order of the networks listed:

1. Select the network that you want to move.
2. Click the **Move Up** or **Move Down** arrows to rearrange the order.
3. Click **Apply** to transfer the setting to your GC89's SIM card.

Note:

If the list of preferred networks is full, the **Add** button is disabled (grey).

Frequency Band

GSM operates in a number of different frequency bands. 900 and 1800MHz are used in Europe, Asia, Australia and Africa, while 850 and 1900MHz are used in North and South America.

By default your GC89 will operate in 'quad-band' mode and automatically find available networks in any of these frequency bands. It is not recommended to change this setting.

To change the frequency band setting:

1. Select the button to the left of the desired band.
2. Click **Apply** to transfer the setting to your GC89 PC Card.

Forward Calls (Divert)

Note:

The GC89 does not make or answer voice calls. The forward function enables you to send a voice call to an alternative number where it can be answered. For example, the mobile network voicemail service. However, you can make and answer data calls, provided you have appropriate software on your PC to handle them.

Voice

You can use the forwarding service to forward your voice calls to another phone number.

Note:

The Call forward service may not be available on all networks.

Selecting a call forward setting:

1. To obtain your current call forwarding settings from the network, click **Retrieve**.
2. Make your changes and select in which situation you want to forward your incoming calls. You can select from four different diversion options:
 - **Always:** this forwards all incoming calls to the phone number that you have entered in the text box
 - **When busy**
 - **No reply**
 - **Not reachable:** for example, when your phone is turned off
3. If you know which phone number to forward your calls to, type the number in the text box next to the forward option you have chosen.
Or
Click to choose a phone number from your phone book.
4. Click **Apply** to transfer them to your GC89. This may take a few seconds.

Your Line 1 forward setting has now been stored in the network.

Fax

The GC89 does not support fax, but you can forward incoming fax calls to another number.

Note:

The Call divert service may not be available on all networks. Also, if you are using the Call restricting function, this may influence Call divert.

Selecting a fax divert setting:

1. To obtain your current fax divert settings from the network, click **Retrieve**.
2. Select **Always** if you want to divert all the incoming calls to a specific phone number.
3. If you know which phone number to divert your calls to, type the number in the text box next to **Always**.

Or

Click to choose a phone number from your phone book.

4. Click **Apply** to transfer your settings to your GC89. This may take a few seconds.
Your fax divert setting has now been stored in the network.

Data

If you want to route your incoming data calls to another number, you can use the Call forward service.

Note:

The Call forward service may not be available on all networks. Also, if you are using the Call restricting function, this may influence Call forward.

Selecting a data forward setting:

1. To obtain your current data forwarding settings from the network, click **Retrieve**.
2. Select **Always** if you want to forward all the incoming calls to a specific phone number.
3. Select the **Always** check box and enter the destination number or click to choose a phone number from your phone book. Click **OK**.
4. Click **Apply** to transfer your settings to your GC89. This may take a few seconds.
Your data forward setting has now been stored in the network.

Restrict Calls

Restricting a certain type of call means that this type of call cannot be made to or from your GC89. You can restrict different types of outgoing and incoming calls.

The following restrictions can be set:

- all outgoing calls.
- all outgoing international calls.
- all outgoing international calls except to your own country.
- all incoming calls.
- all incoming calls when you are abroad (when roaming).

A password, issued with your subscription, is required to turn a call restrict on or off. Contact your network operator for further information.

Setting up Call restriction

To Change the call restrict status:

1. Click on the type of call you wish to restrict (e.g. Data).
2. To get your current call restrict settings from the network, click **Retrieve**.
3. Tick the boxes next to the call types that you want to restrict.
4. Only select one outgoing and one incoming option.
5. When you have finished, click **Apply**.
6. Type your restriction password into the dialog and click **OK**.

Note:

Data Call Restriction applies to CSD Data calls. There is no equivalent function to restrict GPRS/EDGE connections.

SMS

Bearer

Specify the connection method that is to be used for sending SMSs. You can specify a specific connection method or register a preference.

Wireless

802.11

To configure, monitor and control your GC89 wireless connections, click **Telephony Setting** ➔ **802.11** ➔ **Launch the Wireless Control Panel** button.

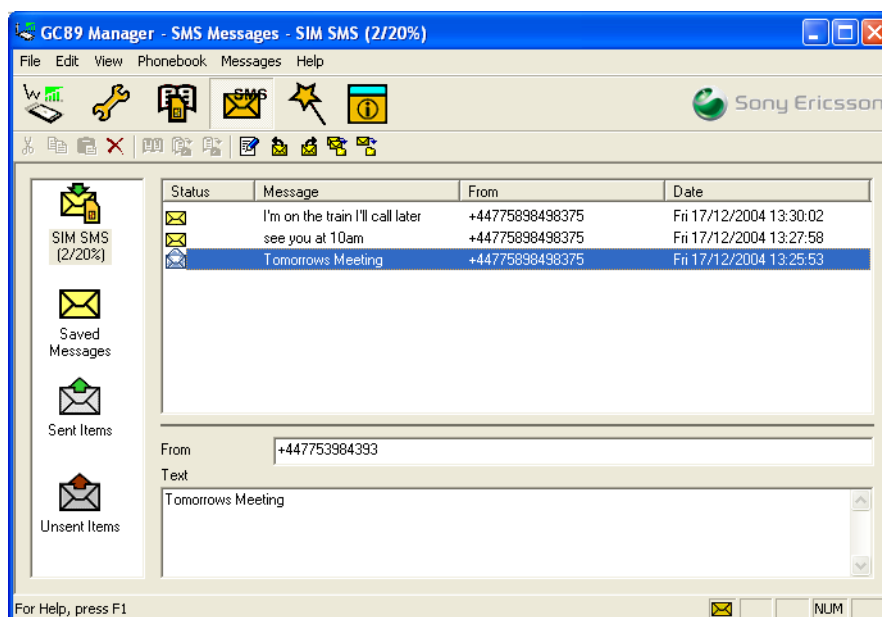
The Wireless Configuration Utility is displayed. See *Create a Wireless LAN Connection* on page 18 for details.

Wireless Manager SMS Messages Screen

The Wireless Manager's SMS Messages screen enables you to view, compose, edit, save, copy, delete, reply or forward SMS messages from your GC89 to other mobile devices.

Note:

To use Message functionality, SMS must be included in your subscription (contact your network operator for more details).



The SMS Messages screen is split into a left and right area.

The left area displays the folders: SIM SMS, Saved Messages, Sent Items and Unsent Items.

The right area displays the contents of the selected folder. The top half of the right pane displays a list of received messages (sorted by date), and the bottom half of the screen displays the content of a selected message. This is referred to as the **Information View**.

The folders and their names are static, therefore you cannot change them.



Click to display the contents of the SIM Inbox. When Wireless Manager is opened, any new SMS in the SIM Inbox are uploaded to the PC automatically. A status flag indicates whether a message is read or unread.



If a new SMS arrives when the Wireless Manager is open, is displayed on the Status screen and the SMS audio sound is played, if enabled in the **Preferences** dialog. See *Wireless Manager GSM/GPRS/EDGE Preferences* on page 58.



If you want to keep an SMS, use the copy or move menu options to place it in the Saved folder. Click on the folder icon to display the contents of the Saved folder.



A copy of each SMS that you have sent is stored in this folder. Click on the folder icon to display them.



Any composed messages that have not been sent are displayed when you click on this icon. SMS stored in this folder can be edited or sent when the GC89 is inserted. Any SMS messages that fail during transmission are also stored here; you can resend them at any time.

Each time the SMS Messages screen receives a new SMS message from the SIM, it checks the status of the SIM Inbox. If the SIM Inbox is full, a SIM Full icon is displayed in the left pane of the screen. See *SIM Inbox is Full*: on page 73.

Note:


For all the SMS Messages, screen menu options to operate the GC89 must be registered successfully on a network. You must have a GSM signal to **Send** SMS; the button is disabled (grey) if you don't have a signal.

Class 0 messages

If you receive a Class 0 message, it will appear in a pop-up dialog, which you can save or dismiss. If you choose to save the message it will be stored in you Saved Messages folder.

SMS Manager Functionality

To Send an SMS:

1. Select **Create New Message...** from the Messages menu or click .
2. The **New Message** dialog opens.
3. Enter the recipient's mobile phone number in the **To:** field or select a number from a phone book by clicking **Lookup...**
To send an SMS to multiple numbers, hold down **Ctrl** when selecting the numbers from the phone book.
4. Type your message into the **Message:** field.
5. If required, you can click the **Calculate SMS blocks** to see how many SMSs your message will be split into. You can check the **Request Status Report** to get confirmation when the SMS arrives at its destination (if this service is supported by your network).
6. Click **Send** to send the SMS or **Cancel** to close the dialog without sending the SMS.

To Edit a Message:

When you are working with a message, you can edit the text by cutting, copying and pasting.

Moving Text:

1. Select the text you want to move (the text can be in another PC application).
2. Select **Cut** from the Edit menu or **Ctrl** and **X** on the keyboard.
3. Place the cursor where you want to insert the text and select **Paste** from the Edit menu or **Ctrl** and **V** on the keyboard.

Note:

If you want to copy text, select **Copy (Ctrl and C)** from the Edit menu instead of **Cut (Ctrl and X)**.

Reply to an SMS:

1. Select the folder where the message is located.
2. From the list, select the message to which you wish to reply. The contents of the message are displayed in the information view.
3. Select **Reply** in the Messages menu. A dialogue appears. The **To:** field is automatically filled in and the original message is displayed in the **Message:** field.
4. If required you can click the **Calculate SMS blocks** to see how many SMSs your message will be split into. Also you can check the **Request Status Report** to get confirmation when the SMS arrives at its destination.
5. Type your reply and click **Send**.

To Forward an SMS:

1. Select the folder where the message is located.
2. From the list, select the message you want to forward. The contents of the message are displayed in the information view.
3. Select **Forward** in the Messages menu, a dialogue box opens.
4. Enter the phone number in the **To:** field or click **Lookup...** to select a number from a phone book.
To send an SMS to multiple numbers, hold down **Ctrl** when selecting the numbers from the phone book.
5. If required, you can click the **Calculate SMS blocks** to see how many SMSs your message will be split into. You can check the **Request Status Report** to get confirmation when the SMS arrives at its destination.
6. Click **Send**.

Delete an SMS:

1. Select the folder where the message is located.
2. From the list, select the message you want to delete. The contents of the message are displayed in the information view.
3. Select **Delete** from the Edit menu, or press the **Delete** button on your keyboard.
4. A confirmation message box opens, click **Yes** to delete the message.

Note:

To delete all messages, click **Select All** from the Edit menu before you select **Delete**.

Folder Management:

Sorting SMS:

1. Select the folder where the messages you want to sort are located.
2. Click the **Date** column heading to sort the SMS in ascending or descending date order.

Moving SMS:

1. Select the folder where the message you want to move is located.
2. From the list, select the message. The contents of the message are displayed in the information view.
3. Click **Move to** from the **Messages** menu. A progress dialog is displayed informing you that the SIM card is being updated.
4. The selected message is moved.

Note:

To move all messages, click **Select All** from the Edit menu before you select **Move to**.


Copy an SMS:

1. Select the folder where the message you want to copy is located.
2. From the list, select the message. The contents of the message are displayed in the information view.
3. Click **Copy to** from the **Messages** menu. A progress dialog is displayed informing you that the SIM card is being updated.
4. The selected message is copied.

Note:

To copy all messages, click **Select All** from the Edit menu before you select **Copy to**.

SIM Inbox is Full:

When the Wireless Manager detects that the SIM SMS storage is full, it displays  on the Status screen and in the SMS Messages screen. You must move or delete some SMS messages from the SIM Inbox to free storage space so that you can continue receiving new SMS messages from the network. To do this you can either:

- Move your SMS from SIM SMS to Saved Messages
- Right click on an SMS in SIM SMS and select delete.


Wireless Manager Phone Book Screen

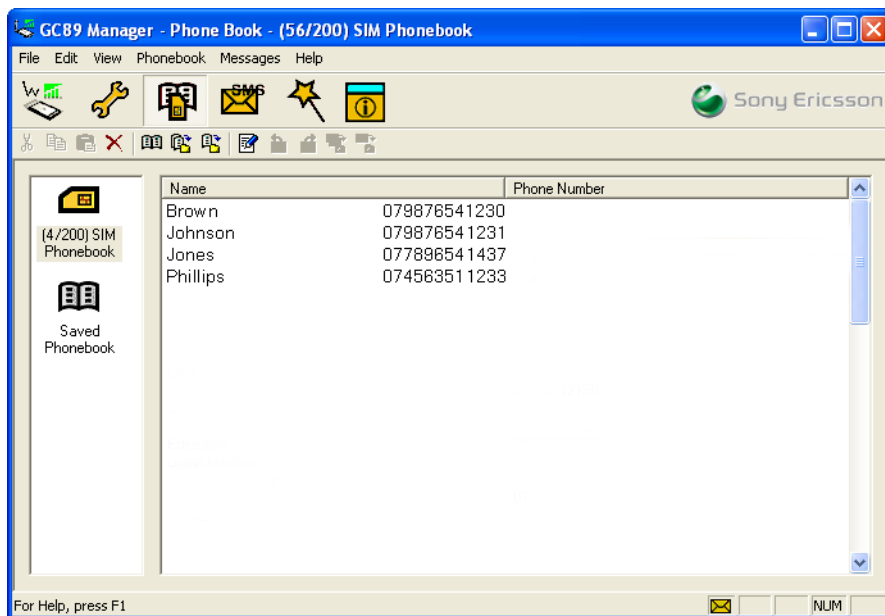
The Wireless Manager Phone Book screen helps you to organize your GC89's SIM Phone Book.



The Phone Book Screen

A SIM Phone Book can easily become disorganized; you can use the Phone Book screen to manage your SIM Phone Book entries.

You can add new numbers, edit existing numbers, export and import entries.

1. Click  to display the Phone Book screen.




2. Icons appear in the left pane representing the SIM Phone Book  and Saved Phone Book . You can manage your Phone Book entries by copying entries to the SIM Phone Book or the Saved Phone Book.
3. Click on the icon to display the Phone Book entries in the right pane.

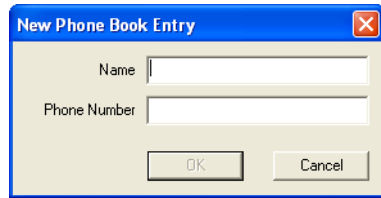
Note:

Your GC89 must be inserted to display this information.

Phone Book Functionality

To Add a Number:

1. Select **Add New** in the Phone Book menu or click  on the toolbar or key **Ctrl** and **N**.
2. The **New Phone Book Entry** dialog opens.



3. Enter the name and phone number.
4. Click **OK** to save the entry or **Cancel** to close the dialog.

Note:

Phone Book numbers are limited to 20 digits (including +) and names are limited to 18 alphanumeric characters.

New entries are added to the next available SIM index position.

To Modify a number:

1. Select the number you want to modify.
2. Select **Modify...** in the Phone Book menu.
3. The **Edit Phone Book Entry** dialog opens.
4. The fields in the dialog display the current entry's name and number.
5. Edit the information.
6. Click **OK** to save the entry or **Cancel** to close the dialog
If the modified entry is in the SIM Phone Book, the changes are automatically sent to the SIM.

To Find Entries:

1. Select **Find** in the Phone Book menu or key **Ctrl** and **F**.
2. The **Find** dialog opens. Enter the text or number you want to search for in the **Look for** field. The entry can be complete or incomplete.
3. Click **Find**. The Wireless Manager searches both Phone Books; when a match is found it is displayed in the right pane. Click **Find Next** to search again.
4. Click **Close** when you have finished searching.

To Copy an Entry:

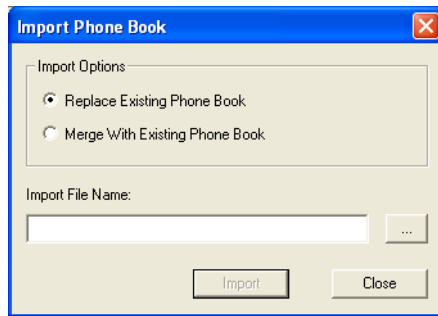
1. Select an entry from the SIM Phone Book or the Saved Phone Book.
2. Select **Copy To** in the Phone Book menu. The **Copy To** option is followed by the name of the Phone Book you have not selected the entry from.
3. A duplicate entry is made in the specified Phone Book. The new entry is assigned the next available position in the destination Phone Book.

To Move an Entry:

1. Select an entry.
2. Select **Move To** in the Phone Book menu. The **Move To** option is followed by the name of the Phone Book you have selected the entry from.
3. The entry is moved from its current Phone Book and placed in the selected one. The new entry is assigned the next available position in the destination Phone Book.

To Import an Entry or Phone Book:

1. Select **Import** from the Phone Book menu.



2. Select the **Replace Existing Phone Book** or **Merge with existing Phone Book** radio button.
3. Click **...** and browse to find the file you want to import.

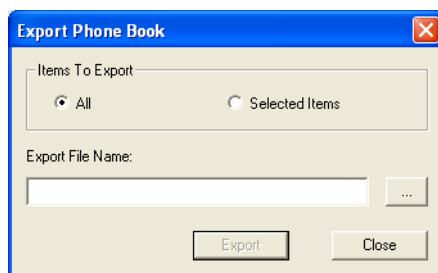
Note:

The file must be a text file in comma separated value (CSV) format. Any invalid lines or files will be ignored. Microsoft® Excel can be used to edit this file.

4. Click **OK** in the browse dialog. The path and file name are displayed in the **Import File Name** field.
5. Click **Import** to complete the import procedure.

To Export an Entry or Phone Book:

1. Highlight the entries or open the Phone Book you want to export.
2. Select **Export** from the Phone Book menu.



3. Select **All** to export the entire Phone Book, or **Selected Items** to export the highlighted entries.
4. Type a name for the file into the **Export File Name** field.
5. Click **...** and identify the save location.

Note:

The file will be saved as a text file in comma separated value (CSV) format. Microsoft® Excel can be used to edit this file.

6. Click **OK** in the browse dialog. The path and file name are displayed in the **Export File Name** field.
7. Click **Export** to complete the procedure.

Delete a number

1. Select the number that you want to delete.
2. Select **Delete**, from the Edit menu.
3. A confirmation dialog opens. Click **Yes** to delete the number.

Note:

If you want to delete all numbers, select **Select All** from the Edit menu before clicking **Delete**.


To Send a New SMS Message:


1. Select an entry from a Phone Book.
2. Select **Create New Message** from the Messages menu.
3. A new SMS Message dialog is opened and pre-addressed with the selected entries details.

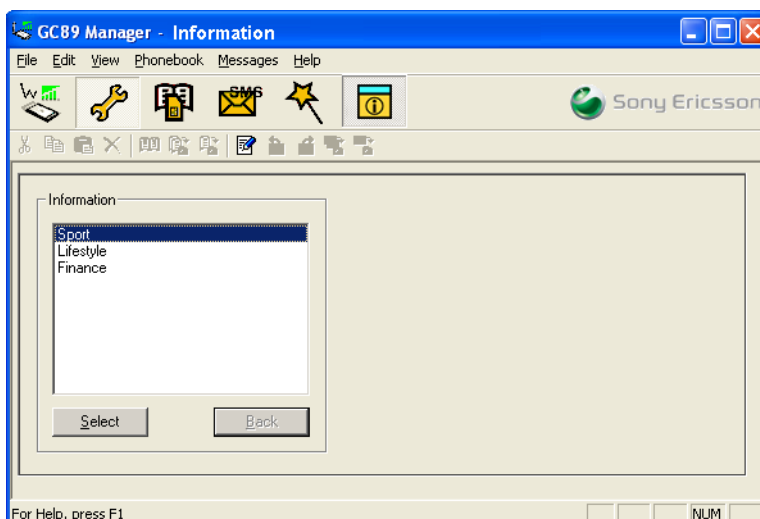
Wireless Manager Online Services Screen

Online Services is a customized service offered by network operators. This service is network or subscription dependant. The Online Services screen provides a mechanism that allows applications that exist on the SIM to interact and operate with the GC89. Typical services offered by network operators include:

- sports scores
- news
- financial data
- horoscopes
- interactive text game messages

Online Services are placed on your SIM card by your operator. Wireless Manager detects if these services are on the SIM card and displays the  if they are.

1. Click  to display the Online services screen. You can also display the Online Services screen from the View menu.



The screen displays a menu of the online services offered by your network operator.

Click on the category you require and click **Select**.

More detailed choices are sometimes displayed. If necessary select the required option and click **Select**.

The response may take various forms, depending on the network operator. For example, the news headlines might be sent as an SMS, which will be delivered to the SMS inbox.

Online Services menus are sometimes used to provide a list of voice-based services such as directory enquiries. If one of these is selected, you will not be connected because the GC89 does not support voice calls.

Note:

Contact your operator to find out which services are available for your account.

Troubleshooting

This chapter lists some problems that you might encounter while using your GC89. Some problems require you to contact your service provider, but most of the problems you can easily correct yourself.

Status Information

View ➔ **Wireless Manager Information** displays a dialog box containing useful information about connection status.

Status Log

The Wireless Manager creates a status log that can be used for customer support and field diagnostic assistance.

Each time the Wireless Manager runs, it creates a text file in the Windows[®] temp folder, called Wireless Manager_Log.txt. If the file is already present, it is overwritten.





An example of the contents of the log file is shown below:

```
03/05/01 14:17:56 - Signal Strength: 0
03/05/01 14:17:56 - Provider Name: MyOperator
03/05/01 14:17:57 - Radio State: 1
03/05/01 14:17:57 - GSM Registration: Searching
03/05/01 14:17:57 - GPRS Registration: Searching
03/05/01 14:17:57 - Network Operator:
03/05/01 14:18:06 - GSM Registration: Home Network
03/05/01 14:18:06 - GPRS Registration: Home Network
03/05/01 14:18:06 - Network Operator: MyOperator
03/05/01 14:18:21 - User: Connect: operatorinternet.apn
03/05/01 14:18:21 - Connection: Port successfully opened
03/05/01 14:18:21 - Signal Strength: 4
03/05/01 14:18:25 - Connection: Established: operatorinternet.apn
03/05/01 14:18:25 - Signal Strength: 4
03/05/01 14:18:32 - User: Disconnect
03/05/01 14:18:32 - Connection: Starting disconnect
03/05/01 14:18:34 - Connection: Disconnected
03/05/01 14:18:34 - Connection: Bytes Transmitted : 156
03/05/01 14:18:34 - Connection: Bytes Received : 468
03/05/01 14:18:34 - Signal Strength: 3
03/05/01 14:18:35 - User: Close Program
03/05/01 14:18:39 - User: Exit
```

Tip:

To easily locate the temp folder, enter %TEMP% in the **Start** ➔ **Run** dialog, or in the address bar of Windows[®] Explorer.

Wireless Manager Icon Errors

 appears in the task bar	Indicates that the Radio is turned off. Right click the Wireless Manager Icon, select Turn GSM/GPRS Radio On .
..... appears in the task bar	Indicates that the GC89 cannot find a network, there is no network within range or the received signal is too weak. You have to move to get a stronger signal.
 A signal is present but you can't connect to the GPRS/EDGE network	Indicates that a GSM network is present, but no GPRS/EDGE service is available. This can be caused by: no GPRS/EDGE service in the area, you are roaming on a network for which no GPRS/EDGE roaming agreement exists or there is a temporary fault on the network. Contact your network operator for more details.
---X appears in the task bar	GC89 isn't present, please insert.
 appears in the task bar	Indicates that the wireless LAN radio is turned off. Right-click the icon and select Enable Radio .
 appears in the task bar	Indicates that the GC89 cannot find a wireless network, there is no network within range or the received signal is too weak. You have to move to get a stronger signal.

Software Errors

Grey menu options in the software applications	Grey text indicates a function that is temporarily unavailable, for example, due to your subscription or due to a certain setting which has not been turned on.
---	---

GSM/EDGE/GPRS Error Messages


General

Modem not responding.... Error	Check the radio is turned on.
Dial-Up fails	Try to connect again.

SIM Card Errors

Wrong PIN/ Wrong PIN2	You have entered your PIN or PIN2 incorrectly. Enter the correct PIN or PIN2, and click OK . See <i>SIM lock</i> on page 65.
Codes do not match	When you want to change a security code (for example your PIN), you have to confirm the new code by entering it again. This error occurs when the two codes, that you have entered, do not match. See <i>Phone lock</i> on page 64.
PIN blocked/ PIN2 blocked	You have entered your PIN or PIN2 incorrectly three times in succession. To unblock, see <i>SIM lock</i> on page 65.
PUK blocked – contact operator	You have entered your personal unblocking key code (PUK) incorrectly 10 times in succession. Contact your network operator or service provider.

Wireless LAN Error Messages

Cable Disconnected	<p>A number of possible causes:</p> <ul style="list-style-type: none">• You have moved out of range of the wireless LAN signal. Move back closer to the hotspot.• The wireless LAN is switched off. Right-click the  icon and select Enable Radio.• The network transmission has been interrupted. Contact the Network Administrator.
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Wireless LAN Performance and Connectivity Problems

Data transfer is sometimes very slow

Microwave ovens and some cordless phones operate at the same radio frequency as the GC89 wireless LAN adapter. When the microwave oven or cordless phone is in use, it interferes with the wireless network.

Therefore, check for possible sources of interference in the path between the GC89 and the network access point (AP).

Data transfer is always very slow

Some homes and most offices are steel-framed structures. The steel in such buildings may interfere with your network's radio signals, thus causing a slowdown in the data transmission rate. Try moving your computers to different locations in the building to see if performance improves.

Computer is not communicating with the network


If your network has a wireless LAN access point, check all cables and make sure the power LED on the front of the AP is green. Verify that all of the wireless network properties settings are correct; see *Create a Wireless LAN Connection* on page 18.

Also, make sure that your computer is receiving a good signal from the access point; see *Viewing the Status of Your Wireless Connection* on page 39.


Network performance is really slow when the system is docked to a docking station that has an active Ethernet port

This condition occurs if you dock your system into a docking station that has an active Ethernet port while your GC89 is still active and connected to a wireless LAN access point. This is because Windows® must now handle two active network connections.

You must either disconnect the Ethernet cable from your docking station, or disable the wireless LAN radio on your GC89. If you disconnect the ethernet cable, you need to turn the proxy server off, go to **Tools** ➔ **Internet Options** ➔ **Connections tab** ➔ **LAN Settings** ➔ and uncheck the **Proxy Server** checkbox.

To disable the GC89 wireless LAN radio, right-click the  icon and then select **Disable Radio**.

Note:

The radio is not automatically enabled when your computer next starts. To enable the radio, right-click the  icon and then select **Enable Radio**.

Windows® Error Codes

Windows® 98 (SE)

Error 619: The port is disconnected during dial-up.	An ISDN mode (V110 or V120) has been selected when creating a connection, but is not supported by the network. Select Analogue mode when creating the connection in the Connection Wizard .
Error 629: The port was disconnected by the remote machine during dial-up.	Telephony settings are set to pulse dialing, change to tone dialing. Check the dialing settings for the current location (In Control Panel → Phone and Modem Option → Dialing Rules → Location → Edit) and change the Dial using setting to tone, or (if Pulse is a necessity), create a new location called EDGE Anywhere and set the dialing to Tone. EDGE anywhere location should then be used whenever you use the GC89.
Error 630: The port was disconnected due to hardware failure during dial-up.	A Dial-up networking connection is already connected. Close the connected dial-up and try again.
Error 645: Internal authentication error during dial-up.	Incorrect APN or CID selected for network. Modify your Dial-up Connection, see <i>Create a Connection</i> on page 21 for more details. Make sure that the APN file contains the name of the access point your network operator is using. The Dialup Wizard should do this automatically. If you are experiencing problems, contact your network operator.
Error 650: The Remote Access server is not responding during dial-up.	Incorrect User ID and/or password. Re-enter correctly.
Error 720: No PPP control protocols configured during dial-up.	The service is not supported by the SIM. This usually appears when you are trying to connect to GPRS Internet. Contact service provider to enable GPRS Internet access on SIM card.

Windows® 2000

Error 619: The port is disconnected during dial-up.	An ISDN mode (V110 or V120) has been selected when creating a connection, but is not supported by the network. Select Analogue mode when creating the connection in the Connection Wizard .
Error 691: Access denied, user name and password incorrect on the domain during dial-up.	The domain name entry is incorrect. Correct the domain name entry or delete if not required.
Error 718: The card was unable to dial during dial-up.	This error indicates a PPP conversation started, but it was terminated because the remote server did not respond within an appropriate time. This can be caused by poor line quality or a problem with the server (ISP). This error can occur when your modem has connected to the ISP and has sent a username and password, but there is no response from the server. Wait a few minutes and try again.

All Windows® Operating Systems

Error 734: The PPP link control protocol was terminated during dial-up.	The APN entry is incorrect, the signal is weak or the connection is lost whilst dialing. If you are experiencing problems contact your network operator and check the APN.
Error 678: Computer you are dialing is not responding during dial-up.	Either: Service is not supported by SIM (usually for CSD) or the computer is not answering. Check SIM settings with your service provider if necessary. Make sure that the server you are dialing is OK. If you are unsure which speed to choose from the Speed tab, start with Analogue 9600, and check to see if it works. Once your connection works on Analog, you can try the V110/V120 settings to see if faster speeds are available. V110/V120 also connects faster than analog. When roaming you may need to repeat this procedure to adapt your settings to the capability of the local network operator.
Connection Failed or Activation Failed. Please contact your Service Provider.	No specific reason for failure is available. Wait a few minutes and try again. If you continue to get this error check your connection settings or call your service provider for help.
Connection Failed. Invalid APN. Please check and enter the APN again.	The APN entry is incorrect, the signal is weak or the connection is lost whilst dialing. If you are experiencing problems contact your network operator and check the APN.

Connection Failed. Invalid User Name or Password. Please check and enter the User Name and/or Password in your connection profile.	Choose to modify your connection in the <i>Connection Wizard</i> . Go to the <i>User ID</i> screen and re-enter the User Name and Password given to you by your service provider. If you were not supplied with a User Name and Password leave the fields blank. Contact your service provider if you continue to have problems.
Connection Failed. Invalid Profile. Please check and re-enter your connection profile information, and try again. If the problem continues please contact your Service Provider.	Your service provider does not recognise you. Check the setting you have entered to create your connection. If you still get the error, contact your service provider and check whether you have GPRS Internet enabled on your subscription and the setting you should enter to create a connection.
Disconnected from Network.	You have been disconnected from the network. Wait a few minutes and try again. If the problem persists, contact your service provider.
Connection failed. Temporary Network problem. Please try again. If the problem continues please contact your Service Provider.	This error indicates a PPP conversation started, but it was terminated because the remote server did not respond within an appropriate time. This can be caused by poor line quality or a problem with the server (ISP). This error can occur when your modem has connected to the ISP and has sent a username and password, but there is no response from the server. Wait a few minutes and try again.
Connection Failed. Not authorised to access network. Please contact your Service Provider.	Your service provider does not think you are authorised to access their network. Check the setting you have entered to create your connection. If you still get the error, contact your service provider and check your subscription.
Connection Failed. SIM is invalid for GPRS service. Please contact your Service Provider.	Contact your service provider and request the GPRS Internet subscription is activated for your SIM.
Connection Failed. Access to network not allowed. Please contact your Service Provider.	Your service provider is not allowing you to access their network. Check the setting you have entered to create your connection. If you still get the error contact your service provider and check your subscription.
Connection Failed. Roaming not allowed. Please contact your Service Provider.	Contact your service provider to get your roaming activated.
Connection Failed. Please try again. If the problem continues please contact your Service Provider.	You could not connect to the network. Wait a few minutes and try again. If the problem persists contact your service provider.

Connection Failed. Service not supported. Please try again. If the problem continues please contact your Service Provider.	Your service provider is not allowing you to access their network. Contact your service provider and check that you have the subscriptions required activated for your SIM.
Connection Failed. Network Problem. Please try again. If the problem continues please contact your Service Provider.	You could not connect to the network. Wait a few minutes and try again. If the problem persists contact your service provider.

Additional Information

Sony Ericsson Support Website

At www.SonyEricsson.com/support you can find help and tips in a few clicks. The support site gives you access to:

- the latest software updates
- tips on how to use your GC89 efficiently
- function guides
- additional help

Guidelines for Safe and Efficient Use

Please read this information before using your GC89.

Recommendations

- Always treat your product with care and keep it in a clean and dust-free place.
- Do not expose your product to liquid or moisture or humidity.
- Do not expose your product to extreme high or low temperatures.
- Do not expose your product to open flames or lit tobacco products.
- Do not drop, throw or try to bend your product.
- Do not paint your product.
- Do not use your product near medical equipment without requesting permission.
- Do not use your product when in, or around aircraft, or areas posted “turn off two-way radio”.
- Do not use your product in an area where a potentially explosive atmosphere exists.
- Do not place your product or install wireless equipment in the area above your car’s air bag.
- Do not attempt to disassemble your product. Only Sony Ericsson authorised personnel should perform service.

Antenna

Only use an antenna that has been specifically designed by Sony Ericsson for your GC89. Use of unauthorised or modified antennas could damage your GC89 and may violate regulations, causing loss of performance and SAR levels above the recommended limits (see below).

Efficient Use

Do not cover the antenna when in use, as this affects call quality and may cause the GC89 to operate at a higher power level than needed, thus shortening talk and standby times.

Radio Frequency (RF) Exposure and SAR

Your PC Card is a low-power radio transmitter and receiver (transceiver). When it is turned on, it emits low levels of radio frequency energy (also known as radio waves or radio frequency fields).

Governments around the world have adopted comprehensive international safety guidelines, developed by scientific organizations, e.g. ICNIRP (International Commission on Non-Ionizing Radiation Protection) and IEEE (The Institute of Electrical and Electronics Engineers Inc.), through periodic and thorough evaluation of scientific studies. These guidelines establish permitted levels of radio wave exposure for the general population. The levels include a safety margin designed to assure the safety of all persons, regardless of age and health, and to account for any variations in measurements.

Specific Absorption Rate (SAR) is the unit of measurement for the amount of radio frequency energy absorbed by the body when using a transceiver. The SAR value is determined at the highest certified power level in laboratory conditions, but the actual SAR level of the transceiver while operating can be well below this value. This is because the transceiver is designed to use the minimum power required to reach the network.

Variations in SAR below the radio frequency exposure guidelines do not mean that there are variations in safety. While there may be differences in SAR levels among mobile phones, all Sony Ericsson PC Cards are designed to meet radio frequency exposure guidelines.

Before a PC Card is available for sale to the public, it must be tested and certified to the FCC that it does not exceed the limit established by the government-adopted requirement for safe exposure. The tests are performed in positions and locations as required by the FCC for each model. For body worn operation, this PC Card has been tested and meets FCC RF exposure guidelines for fixed and mobile use when the PC Card is installed in a PCMCIA card slot of a standard Laptop PC with the original antenna.

Sony Ericsson has not measured, and makes no representation about, the body worn SAR levels when the PC Card is used in any portable host equipment or when any changes to the original product has been made.

More information on radio frequency exposure and SAR can be found on: www.SonyEricsson.com.

Personal Medical Devices

PC Card may affect the operation of cardiac pacemakers and other implanted equipment. If a minimum distance of 15 cm (6 inches) is kept between the GC89 and the pacemaker, the risk of interference is limited. If you have any reason to suspect that interference is taking place, immediately turn off your GC89. Contact your cardiologist for more information.

For other medical devices, please consult the manufacturer of the device.

Children

DO NOT ALLOW CHILDREN TO PLAY WITH YOUR GC89 OR ITS ANTENNA. THEY COULD HURT THEMSELVES OR OTHERS, OR COULD ACCIDENTALLY DAMAGE THE GC89 OR ANTENNA. YOUR GC89 OR ITS ANTENNA MAY CONTAIN SMALL PARTS THAT COULD BE DETACHED AND CREATE A CHOKING HAZARD.

Disposing of the Product

Your GC89 should not be placed in municipal waste. Please check local regulations for disposal of electronic products.

Emergency Calls

PC Cards manufactured by Sony Ericsson do not support voice calls, hence their use for essential communications (e.g. medical emergencies) is not possible.

Inserting and removing the SIM card – precautions against electrostatic discharge (ESD)

Do not touch the SIM card connectors. As a precaution, always make sure that the GC89 is already in your hand before you insert or remove the SIM card.

Technical Specifications

Product name	GC89
System	WLAN 2.4GHz ISM band GSM 850 E-GSM 900 GSM 1800 GSM 1900
PC Card Type	Type II, 32-bit Cardbus
Services supported	WLAN: 802.11b/g GSM: CSD, GPRS/EDGE, SMS Speech services are not supported
SIM Card	SIM Lock supported Regular (non-GPRS-aware) and GPRS-aware SIMs supported Standard, GPRS-aware and USIM (2G functionality) 1.8v & 3v
Type Number	FAF-1051011-BV

Exterior Description

Size	32-bit PCMCIA PC Card, Type II. Card part: 85.6 mm x 54.0 mm x 5.0 mm Extension part: 15.4 mm x 55.0 mm x 10.5 mm
Weight	44g including antenna, excluding SIM card
Battery	Powered via the PC card slot i.e. uses laptop battery
Antenna	50 ohm interface; Antenna supplied
Antenna Connector	MMCX connector (for optional external GSM antenna)

Ambient Temperatures

Operating	-10 to 55 degrees C
Storage	-20 to 65 degrees C

Operating System Support

Supported Operating Systems	Microsoft Windows® 98 (SE) Microsoft Windows® Me Microsoft Windows® 2000 (SP4) Microsoft Windows® XP (SP1)
Minimum PC Specification	Processor size as recommended by Microsoft for the version of Windows® PC Card slot 30 MB free disk space

Electrical Characteristics

Supported Voltages	3.3V ± 10%
Nominal Operating Voltage	3.3V
Average Standby Current/Power (Inserted, not active)	< 30mW
Average Idle Current/Power (GSM attached, WLAN disabled)	< 150mW
Data Transfer Current/Power (Worst case GSM xfer and WLAN active)	< 2.8W

GSM Performance and technical characteristics

Dimension	GSM 850	GSM 900 E-GSM 900	GSM 1800	GSM 1900
Frequency Range	TX: 824 – 849 MHz RX: 869 – 894 MHz	TX: 880 – 914 MHz RX: 925 – 959 MHz	TX: 1710 – 1785 MHz RX: 1805 – 1880 MHz	TX: 1850 – 1910 MHz RX: 1930 – 1990 MHz
Channel Spacing	200 kHz	200 kHz	200 kHz	200 kHz
Number of Channels	124 Carriers * 8 (TDMA)	175 Carriers * 8 (TDMA)	374 Carriers * 8 (TDMA)	299 Carriers * 8 (TDMA)
Modulation	GMSK/8-PSK	GMSK/8-PSK	GMSK/8-PSK	GMSK/8-PSK

Power Classes	Class 4 (2W) for GSM/GPRS and EGPRS/MCS 1-4 (GMSK); Class E2 (0.5W) for EGPRS/MCS 5-9 (8-PSK)	Class 4 (2W) for GSM/GPRS and EGPRS/MCS 1-4 (GMSK); Class E2 (0.5W) for EGPRS/MCS 5-9 (8-PSK)	Class 1 (1W) for GSM/GPRS and EGPRS/MCS 1-4 (GMSK); Class E2 (0.4W) for EGPRS/MCS 5-9 (8-PSK)	Class 1 (1W) for GSM/GPRS and EGPRS/MCS 1-4 (GMSK); Class E2 (0.4W) for EGPRS/MCS 5-9 (8-PSK)
Transmitter Output Impedance	50Ω	50Ω	50Ω	50Ω
Transmitter Spurious Emission	According to GSM specification	According to GSM specification	According to GSM specification	According to GSM specification

GSM Features Supported

ME SIM Lock	Network, Network Subset, Service Provider and Corporate
Online Services (SIM-AT)	Class 2 with call control.
USSD	Support is provided via AT commands; No MMI is provided
Speech Coding	Not applicable (GC89 does not support speech services)

CSD technical data

Standards	AT commands industry standard ETSI 07.05, 07.07 and 07.10, V.25ter command set supported
CSD Data Rates	9.6 kbps or 14.4 kbps depending on the GSM network
Compression	MNP5 (Increases data rate up to 2x depending on data type) V.42bis (Increases data rate up to 4x depending on data type) GSM network support required for compression
Error Correction	End to End MNP2 and LAPM (V.42) RLP Requires GSM Network support
GSM/ISDN	According to V.110 and V.120

GPRS technical data

GPRS Specification SMG	SMG31bis
Data Rates	Multislot class 10 supported (see table below). Coding schemes: CS-1, CS-2, CS-3 and CS-4
Mode of Operation	Class B (attaches to both GSM and GPRS at the same time; data connection is established using CS (CSD or GPRS) The user may select CSD or GPRS modes via Dial-Up Networking configurations in Windows®)
Attach Modes	GPRS Attach GPRS Detach Combined Attach (CS+GPRS) (CCCH) Combined Detach (CCCH) Combined Attach (CS+GPRS) (PCCCH) Combined Detach (PCCCH)
Network modes	Network Mode 1 Network Mode 2 Network Mode 3
R Reference Point	Physical layer: RS232 virtual COM port Authentication mechanisms PAP and CHAP supported
IP Connectivity	PDP type IP is supported IPv4

SMS over GPRS	Mobile Originated and Mobile Terminated
QoS	Support for all 4 classes. QoS Negotiation
PDP Context	Up to 10 PDP context details are stored in GC89 memory. PDP Context description edited via supplied Wizard or AT command. Number of parallel PDP Context activated (both MO and MT):1 Number of PDP Context with traffic in parallel:1 PDP Context modification (e.g. QoS renegotiation). Network initiated PDP Context modification. Network initiated PDP Context deactivation. Collision of MS and Network initiated PDP Context activation.
SIM	Support for GPRS aware as well as non-GPRS-aware SIMs
Compression	TCP/IP Header Compression V42bis
GPRS Encryption	GEA1 GEA2
GPRS Frequency Hopping	Supported
GPRS IP allocation	Dynamic Static

GPRS Maximum Data Rates

		CS-1 9.05 kbps	CS-2 13.4 kbps	CS-3 15.6 kbps	CS-4 21.4 kbps
4 + 1	RX	36.2	53.6	62.4	85.6
	TX	9.05	13.4	15.6	21.4
3 + 2	RX	27.15	40.2	46.8	64.2
	TX	18.1	26.8	31.2	42.8

Speed achieved depends on the Coding Scheme supported by the GSM Network. The speeds given are maximums. Sony Ericsson cannot guarantee how fast your network will operate.

Data rate is the payload per slot: header plus data.

EDGE Technical Data

Modulation Coding Schemes	MCS-1 to MCS-9
EDGE features	Link Adaptation Incremental Redundancy Extended Uplink Temporary Block Flow (TBF) Single Phase Access on RACH

EDGE Maximum Data Rates

Coding Scheme	Data Rate per slot	4 + 1		3 + 2	
		Rx	Tx	Rx	Tx
MCS-1	10.60	42.40	10.60	31.80	21.20
MCS-2	13.00	52.00	13.00	39.00	26.00
MCS-3	16.60	66.40	16.60	49.80	33.20
MCS-4	19.40	77.60	19.40	58.20	38.80
MCS-5	24.05	96.20	24.05	72.15	48.10
MCS-6	31.25	125.00	31.25	93.75	62.50
MCS-7	47.45	189.80	47.45	142.35	94.90
MCS-8	57.05	228.20	57.05	171.15	114.10
MCS-9	61.85	247.40	61.85	185.55	123.70

Speed achieved depends on the Coding Scheme supported by the GSM Network. The speeds given are maximums, Sony Ericsson cannot guarantee how fast your network will operate.

Data rate is the payload per slot: header plus data.

SMS Technical Data

Concatenated SMS	Yes.
SMS Cell Broadcast	Supported in Wireless Manager and by AT Commands (excluding Cell ID).
SMS Immediate Display	Supported in Wireless Manager and by AT Commands.
SMS interface	Wireless Manager, Communications Suite, pocket PC Suite. AT Command

Software Upgrade

PC Card firmware upgrade	Via Internet, www.SonyEricsson.com or at Sony Ericsson Service Points
Wireless Manager upgrade	Internet download

Supported Languages

Product support

Quick Start Guide
PC Software
User's Guide (PDF)

GC89

English (EN)
Danish (DA)
Dutch (NL)
Finnish (FL)
French (FR)
German (DE)
Greek (EL)
Hungarian (HU)
Italian (IT)
Norwegian (NO)
Polish (PL)
Brazilian Portuguese (PB)
Portuguese (PT)
Russian (RU)
Spanish (ES)
Swedish (SV)
Thai (TH)
Turkish (TR)
Chinese Simplified (ZS)
Chinese Traditional (ZT)

AT Commands Manual

English

License Agreement

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Limited Warranty

Sony Ericsson Mobile Communications AB, S-221 88 Lund, Sweden, (Sony Ericsson), provides this Limited Warranty for your PC Card and original accessory delivered with your PC Card (hereinafter referred to as “Product”).

Should your Product need warranty service, please return it to the dealer from whom it was purchased, or contact your local Sony Ericsson Call Center (national rates may apply) or visit www.SonyEricsson.com to get further information.

Our Warranty

Subject to the conditions of this Limited Warranty, Sony Ericsson warrants this Product to be free from defects in design, material and workmanship at the time of its original purchase by a consumer, and for a subsequent period of one (1) year.

What We Will Do

If, during the warranty period, this Product fails to operate under normal use and service, due to defects in design, materials or workmanship, Sony Ericsson authorised distributors or service partners, in the country/region* where you purchased the Product, will, at their option, either repair or replace the Product in accordance with the terms and conditions stipulated herein.

Sony Ericsson and its service partners reserve the right to charge a handling fee if a returned Product is found not to be under warranty according to the conditions below.

Please note that some of your personal settings, downloads or other information may be lost when your Sony Ericsson Product is repaired or replaced. At present Sony Ericsson may be prevented by applicable law, other regulation or technical restrictions from making a backup copy of certain downloads. Sony Ericsson does not take any responsibility for any lost information of any kind and will not reimburse you for any such loss. You should always make backup copies of all the information stored on your Sony Ericsson Product such as downloads, calendar and contacts before handing in your Sony Ericsson Product for repair or replacement.

Conditions

1. The warranty is valid only if the original proof of purchase issued to the original purchaser by an, for this Product, Sony Ericsson authorised dealer, specifying the date of purchase and serial number**, is presented with the Product to be repaired or replaced. Sony Ericsson reserves the right to refuse warranty service if this information has been removed or changed after the original purchase of the Product from the dealer.
2. If Sony Ericsson repairs or replaces the Product, the repaired or replaced Product shall be warranted for the remaining time of the original warranty period or for ninety (90) days from the date of repair, whichever is longer. Repair or replacement may involve the use of functionally equivalent reconditioned units. Replaced parts or components will become the property of Sony Ericsson.
3. This warranty does not cover any failure of the Product due to normal wear and tear, or due to misuse, including but not limited to use in other than the normal and customary manner, in accordance with the Sony Ericsson instructions for use and maintenance of the Product. Nor does this warranty cover any failure of the Product due to accident, software or hardware modification or adjustment, acts of God or damage resulting from liquid.

A rechargeable battery can be charged and discharged hundreds of times. However, it will eventually wear out – this is not a defect. When the talk-time or standby time is noticeably shorter, it is time to replace your battery. Sony Ericsson recommends that you use only batteries and chargers approved by Sony Ericsson.

Minor variations in display brightness and color may occur between phones. There may be tiny bright or dark dots on the display. These are called defective pixels and occur when individual dots have malfunctioned and can not be adjusted. Two defective pixels are deemed acceptable.

Minor variations in camera image appearance may occur between phones. This is nothing uncommon and is not regarded as a defective camera module.

4. Since the cellular system on which the Product is to operate is provided by a carrier independent from Sony Ericsson, Sony Ericsson will not be responsible for the operation, availability, coverage, services or range of that system.
5. This warranty does not cover Product failures caused by installations, modifications, or repair or opening of the Product performed by a non-Sony Ericsson authorised person.
6. The warranty does not cover Product failures which have been caused by use of accessories or other peripheral devices which are not Ericsson or Sony Ericsson branded original accessories intended for use with the Product.
7. Tampering with any of the seals on the Product will void the warranty.
8. THERE ARE NO EXPRESS WARRANTIES, WHETHER WRITTEN OR ORAL, OTHER THAN THIS PRINTED LIMITED WARRANTY. ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY. IN NO EVENT SHALL SONY ERICSSON OR ITS LICENSORS BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS OR COMMERCIAL LOSS, TO THE FULL EXTENT THOSE DAMAGES CAN BE DISCLAIMED BY LAW.

Some countries/states do not allow the exclusion or limitation of incidental or consequential damages, or limitation of the duration of implied warranties, so the preceding limitations or exclusions may not apply to you.

The warranty provided does not affect the consumer's statutory rights under applicable legislation in force, nor the consumer's rights against the dealer arising from their sales/ purchase contract.

*** European Union (EU)**

If you have purchased your Product in an EU country you can have your Product serviced, under the conditions set out above, within the warranty period in any EU country where an identical Product is sold by an authorised Sony Ericsson distributor. To find out if your Product is sold in the EU country you are in, please call the local Sony Ericsson Call Center. Please observe that certain services may not be possible elsewhere than in the country of original purchase, for example due to the fact that your Product may have an interior or exterior which is different from equivalent models sold in other EU countries. It may not be possible to repair SIM-locked Products.

** In some countries/regions additional information is requested. If so, this is clearly shown on the valid proof of purchase.

Vendor warrants the media on which the Software is provided, to be free from defects in materials and workmanship under normal use for ninety (90) days after the date of your cash receipt/proof of payment. The Vendor's and its suppliers' entire liability and your exclusive remedy under this warranty will at Vendor's option be (and provided you return the Software to an authorized reseller/supplier together with a copy of your cash receipt/proof of payment), to replace the disc(s)/diskette(s) or refund the purchase price and terminate this Agreement including the License.

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Declaration of Conformity

We, **Sony Ericsson Mobile Communications AB** of

Nya Vattentornet

S-221 88 Lund, Sweden

declare under our sole responsibility that our product,

Sony Ericsson type FAF-1051011-BV,

and in combination with our accessories, to which this declaration relates is in conformity with the appropriate standards 3GPP TS 51.010-1, EN 301489-7, EN 300328, EN 301489-17 and EN 60950, following the provisions of, Radio Equipment and Telecommunication Terminal Equipment directive 99/5/EC with requirements covering EMC directive 89/336/EEC, and Low Voltage directive 73/23/EEC.

CE 0682

Research Triangle Park NC, April 2005

Place and date of issue



Anders Franzén

Corporate Vice President M2M Com

We fulfil the requirements of the R& TTE Directive (99/5/EC).

FCC Statement



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


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

FCC ID: PY7FF051011

IC: 4170B-FF051011

WiFi Certificate

Wi-Fi® Interoperability Certificate**Certification ID: W003238**



Wi-Fi
CERTIFIED
bg

This certificate represents the capabilities and features that have passed the interoperability testing governed by the Wi-Fi Alliance. Detailed descriptions of these features can be found at www.wi-fi.org/certificate

Certification Date: January 18, 2005
Category: External Card
Company: Sony Ericsson
Product: Sony Ericsson GC89 EDGE / Wireless LAN PC Card FAF-1051011-BV

This product has passed Wi-Fi certification testing for the following standards:

IEEE Standard	Security		
802.11b 802.11g	WPA™ - Personal WPA™ - Enterprise WPA2™ - Personal WPA2™ - Enterprise		

For more information: www.wi-fi.org/certified_products

Appendix A - Connection Parameters

General Connection Parameters for CSD and GPRS

Required	Useful information
Telephone number or Access Point Name (APN)	Number you need to dial to reach your service provider. Use the full number including country code and area code, e.g. +46 33 555 2525. Or The APN server resource to contact, for example, Interent.operator.net - to connect to the Internet via the mobile operator's or your corporate Intranet via a VPN.
Bearer capability: CSD or GPRS/EDGE?	You will need to know the bearer capability provided by your service provider, so you can select the appropriate option during set up.
CSD Network Speed	If you intend to create connections via CSD, contact your network operator and check the supported speeds.
Username	The username your service provider gave you when the account was set up. Some dial-up accounts do not require a Username. In this case, leave the field blank.
Password	Password associated with the username, given to you by the service provider. Some dial-up accounts do not require a Password. In this case, leave the field blank.
IP assignment: Server / Static	An 'address' that the service provider knows you by and uses to route information to and from your GC89. Your IP address will either be: Server - assigned by the service provider when you connect. Static - assigned once by the service provider or the IT Manager. If your IP address is Static, you must enter it into IP address fields which is available when you select Advanced in the Connection Wizard.
DNS assignment: Server / Static	This tells the GC89 where to find the service provider's DNS Service. DNS translates addresses such as www.SonyEricsson.com to the numeric IP address so that the information can be accessed. Like IP assignment above, the DNS can be static or allocated by the service provider when you connect. If static is selected, additional fields need to be completed containing the static information.

IP address	Only required if the IP assignment is static. Format example: 123.9.45.3. Do not enter any leading 0s when typing in IP address.
Primary DNS	Only required if the DNS assignment is static. Format example:123.9.45.2
Secondary DNS	Only required if the DNS assignment is static. Format example: 123.9.45.1
Access Point Name (APN)	If the APN is set to default you will have to enter the name of the access point your network operator is using.

CSD Specific Parameters

Required	Useful information
Preferred Connection Speed (bits/s)	Select your preferred network connection speed from the drop down list provided: 9600 or 14400.
Connection Mode	Select the method you want to use to connect to the network from the options provided: analogue, ISDN V.110 or ISDN V.120
Compression	Use to speed up data transfer. You can select to Enable Data Compression and Header Compression .
Callback Number	Enter the number the callback should be made to. You can only use Callback if you are connecting to a source that gives permission for callbacks to be made, for example your company server.

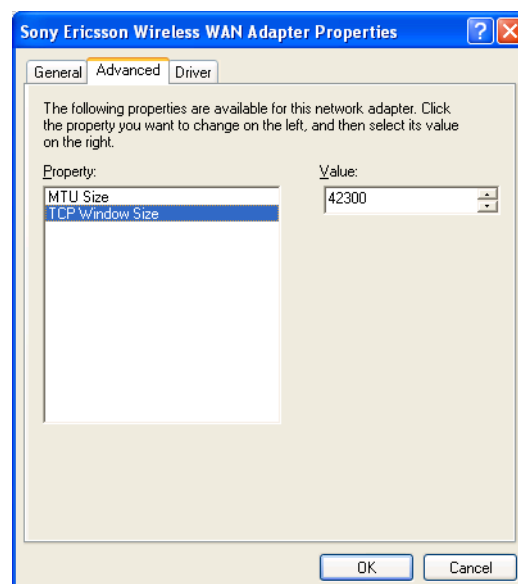
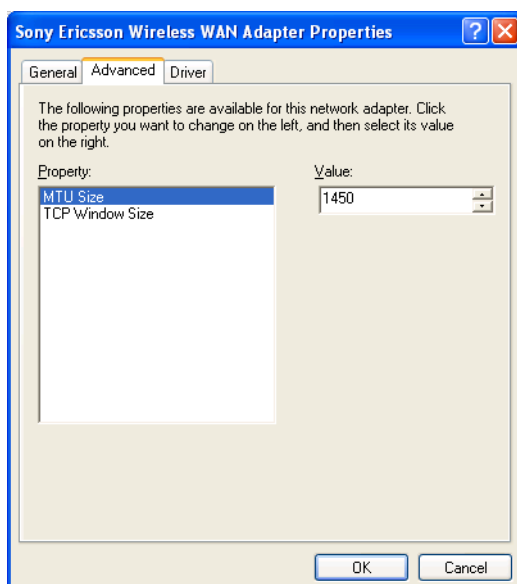
TCP/IP Optimisation

To take full advantage of the high bandwidth of the PC Card, the TCP/IP window size parameter TCPWindowSize should be changed from the default Windows[®] setting of 16k for Windows 2000, or 64k for Windows XP. Sony Ericsson recommends a TCP/IP packet size of 43200 for optimum performance with the PC Card. An MTU size of 1450 is also considered optimal for EDGE networks.

These settings are made automatically when the Wireless Manager is installed. They may be viewed and, if necessary, changed in the properties of the Sony Ericsson Wireless WAN network adaptor.

Select **Start** → **Settings** → **Network and Dial-up Connections**, locate the Sony Ericsson Wireless WAN adaptor in the list, right-click on it and select **Properties**.

Click **Configure** on the Advanced tab. If directed by your network operator, you may change the settings by selecting TCPWindowSize or MTU and changing the value. Changes to these settings require the network adaptor to be restarted. It is recommended that the laptop is rebooted.



If you have previously optimised TCPWindowSize, for example, as directed by a broadband internet service provider, then check whether that setting is global or specific to the network adaptor over which the broadband connection is made. It is preferable that all TCPWindowSize settings are specific to the network adaptor involved, since this ensures that each individual connection is correctly optimised.

In some cases it is necessary to set TCPWindowSize globally. Further information and a utility to do this is available at www.SonyEricsson.com/support.

Appendix B - Changing the GC89 Wireless LAN Adapter Properties

1. Click the **Start** button.
2. Select **Settings** → **Control Panel**.
3. Click **System**.
4. Select the **Hardware** tab.
5. Select **Device Manager** → **Network adapters** → **802.11g Network Adapter** → **Advanced**.

To change the value for any of the listed properties, click the property and then change the value in the **Value** box by either selecting a new value from the drop-down list or by typing in a new value, as appropriate.

Note:

It is strongly recommended that the values are only changed by network administrators or technicians with wireless LAN experience.

Item	Useful information
IBSS Channel Number	Selects the independent basic service set (IBSS) channel number on which to operate. The GC89 comes preset for use on channels 1-11. These values are legal in most countries. Some countries allow use on more channels. If you travel to one of these countries, you may change the value for IBSS Channel Number to 12 or 13.
Locale	Selects the operating characteristics that comply with the regulations that apply in a particular country. Before connecting to a wireless network, you should verify that the Locale value is correct. If you travel to different countries with your GC89, you should change the Locale value to suit. If the destination country is not listed, change the Locale value to Worldwide. Reset the Locale value after returning. Residents of both Canada and the United States should use the value USA. For details of an easier way of changing this value, see <i>GC89 Wireless Control menu</i> on page 56.
Radio Enable/Disable	Enables or disables the GC89 wireless LAN radio. This may be necessary at times to turn off the radio to comply with restrictions prohibiting the emission of radio signals, such as during take-off and landing onboard a commercial aircraft. For details of an easier way of changing this value, see <i>GC89 Wireless Control menu</i> on page 56.
Rate	Sets the transmission rate. The default value is Use best rate . This automatically adjusts the data rate to the optimal rate based on the capabilities of the other clients and access points.
Fragmentation Threshold	The threshold at which the IEEE 802.11 adapter breaks the packet into multiple frames.
Locally Administered MAC Address	This is used to override the MAC address of the GC89 wireless LAN network adapter.
PLCP Header	This is used to set the header type used for CCK rates. The type can be long, or auto (short / long).

Power Output	Sets the percentage of the maximum available output power to be used.
Power Save Mode	This is used to put the GC89-enabled computer into the IEEE 802.11 Power Save mode. In Power Save mode, the radio is periodically powered down to conserve power. When in Power Save mode, packets are stored in the AP until the PC comes on.
RTS Threshold	If the number of frames in the data packet is at or above the RTS Threshold, a request to send/clear to send handshake is turned on before sending the data packet. The default value is 2347.

Glossary

Bearer

Path over which data flows. Specifically in CSD the type of telephony link from the GSM network to the server - V PSTN or ISDN.

bps

Bits per second - rate of data flow.

COM Port

Defines a serial/RS-232 port within the Windows® environment. May be physical (COM1 port on the rear of the PC) or virtual (COM5 port communicating with a PC card modem)

CS

Circuit Switched. Connection from A to B which has a fixed bandwidth and is maintained over a period of time, for example a voice telephone call.

CS-1 to CS-4

Coding Scheme. Determines the data rate per timeslot in GPRS.

CSD

Circuit Switched Data. CSD is a GSM service providing a CS data connection at a rate of 9.6 or 14.4 kbps.

DUN

Dial-Up Networking.

EDGE

Enhanced Data rates for Global Evolution.

e-GSM

Extended GSM. New frequencies specified by the European Radio Communications Committee (ERC) for GSM use when additional spectrum is needed (Network-dependent). It allows operators to transmit and receive just outside GSM's core 900 frequency band. This extension gives increased network capability.

ETSI

European Telecommunications Standards Institute.
www.etsi.org

GGSN

Gateway GPRS Support Node.

GPRS

General Packet Radio Services.

GSM

Global System for Mobile Communications. GSM is the world's most widely-used digital mobile phone system, now operating in over 160 countries around the world.

GSM 850

Refers to a GSM system running in the 850MHz band. Used in the USA and Canada.

GSM 900

The GSM system family includes GSM 850, GSM 900, GSM 1800 and GSM 1900. There are different phases of roll-out for the GSM system and GSM phones are either phase 1 or phase 2 compliant.

GSM 1800

Also known as DCS 1800 or PCN, this is a GSM digital network working on a frequency of 1800 MHz. It is used in Europe and Asia-Pacific.

GSM 1900

Also known as PCS. Refers to a GSM system running in the 1900MHz band. Used in the USA and Canada.

HTML

HyperText Markup Language.

HTTP

HyperText Transfer Protocol.

ISDN

Integrated Services Digital Network. Can provide circuit-switched data connections in multiples of 64 kbps.

ISP

Internet Service Provider.

kbps

Kilobits per second - rate of data flow.

LAN

Local Area Network.

ME

Mobile Equipment.

MO

Mobile Origination. For example, an SMS message sent from a mobile terminal.

MMI

Man-Machine Interface.

MS

Mobile Station.

MT

Mobile Termination.

PC

Personal Computer.

PCS

Personal Communications Services, often used to describe GSM1900 networks.

PC Card

A card having physical and electrical characteristics specified by PCMCIA providing extra functionality when inserted into a laptop PC. Typical examples are modems and network cards. Type refers to the thickness of the card. The GC89 is type II.

PCMCIA

Personal Computer Memory Card International Association – defines specifications for PC Cards. www.pcmcia.org.

PDP

Packet Data Protocol.

Phone book

A memory in the SIM card where phone numbers can be stored and accessed by name or position.

PSTN

Public Switched Telephone Network, for example ordinary analogue phone line for speech and/or computer modem.

RADIUS

Remote Access Dial-In Service. Facility at the ISP or corporation to manage remote data connections.

RX

Receive

SC

Service Centre (for SMS).

Service Provider

A company that provides services and subscriptions to GC89 users.

SIM card

Subscriber Identity Module card – a card that must be inserted in any GSM-based mobile terminal. It contains subscriber details, security information and memory for a personal directory of numbers. The card can be a small plug-in type or credit card-sized, but both types have the same functions. The GC89 uses the small plug-in card.

SMS

Short Message Service. Allows messages of up to 160 characters to be sent and received via the network operator's message centre to a GC89.

TCP/IP

Transmission Control Protocol/Internet Protocol.

TCP/IPv4

TCP/IP Version 4. Most widely implemented form of TCP/IP today having a 4 byte address format such as 212.161.127.136.

TE

Terminal Equipment. Generic term for GSM terminals such as phones and PC cards.

Terminal Adaptor

Generic term for the equipment terminating a digital comms line such as an ISDN2 line. The GC89 is a Terminal Adaptor since it interfaces to GSM digital data services.

TLS

Transport Layer Security. Used by Web browsers, for example.

TX

Transmit

Type II

Refers to thickness of a PC Card as defined in the specification from PCMCIA.

URL

Uniform Resource Locator.

USSD

Unstructured Supplementary Services Data.
Narrow-band GSM data service. For example, entering *79*1234# might return the stock price for stock 1234.

V.110

ETSI standard for data over an ISDN circuit.

V.120

ETSI standard for data over an ISDN circuit.

VPN

Virtual Private Network.

WWW

World Wide Web.

XML

Extensible Markup Language.

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