23 OPERATIONS MANUAL

SAMSUNG

MagicLAN SWL-2100

User Manual

Notice 1

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Notice 2

The SWL-2100N/E and SWL-2100P complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions.

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

Note: The SWL-2100N/E and SWL-2100P have been tested and found to comply with the limits for a Class B digital device and a low power transmitter, according to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to resolve the problem by one or more of the following measures;

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an output on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Important Safety Information

- Read these simple guidelines. Breaking the rules may be dangerous or illegal. SAMSUNG will not be responsible for any damages caused by breaking the rules.

- Wireless LAN Card described in this document is approved for use in a wireless local area network.

- Remember to make backup copies of important data.

- Samsung Wireless PCMCIA LAN card supports 3.3V Notebook computers only.

- When you are transferring data, keep your laptop computer stationary. Roaming between access points (APs) may break the connection.

- Only qualified service personnel must repair the equipment.

- All wireless devices may get interference, which could affect performance.

- Use approved accessories only. Do not connect incompatible products.

- Use only accessories approved by the wireless LAN Card manufacturer for use with this particular wireless LAN Card. The use of any other types will invalidate any approval or warranty applying to the wireless LAN Card, and may be dangerous.

- Use only the region settings appropriate for the area where the wireless LAN Card is used at the present time. Using the card in any other region or with an incorrect region setting is prohibited and may be illegal.

- Operation of any radio transmitting equipment, including a Wireless LAN Card, may cause interference with the functionality of inadequately protected medical devices.

- Do not use the wireless LAN Card on aircraft.

- Do not use the wireless LAN Card at a refueling point.

- Do not use the wireless LAN Card near inflammable materials or chemicals.

- Do not use the wireless LAN Card where blasting is in progress.

- Do not use the wireless LAN Card when the use of wireless device may cause interference or danger.

- Do not use the wireless LAN Card where the use of cellular terminals is prohibited.

- Microwave oven degrades the performance of wireless LAN drastically. So do not use the wireless LAN card in the environment where Microwave oven is being used.

Specifications

Product Name	MagicLAN SWL-2100N/E	MagicLAN SWL-2100P	MagicLAN AP SWL-2100AP
General			
Type	PC Card Type II N: Internal ANT E: Antennaless, with 2 MMCX Connectors	PCI 2.0	Dual Antenna
Coverage Area** Open Space Office Environment		Up to 500m at 2Mbps / Up to 400m at 11Mbps Up to 70m at 2Mbps / Up to 50m at 11Mbps	
Operating voltage	3.3V +/- 5%, 5V +/- 5%	5V +/- 5%	9V +/- 5%
Current consumption	Tx: Max. 350mA Rx: Max. 200mA	Tx: Max. 390mA Rx: Max. 220mA	Max. 1A
Data Rates		1,2,5.5, and 11Mbps	
Certifications		FCC part15, ETSI ETS 300.328 and CE in Europe	
Security		WEP 40bits encryption	
Warranty		1 Year	
Network Specifications			
Network architecture	Ad-hoc, infrastructure		Infrastructure
Wireless standard		IEEE 802.11b	
Operating System		Win 95 OSR2/98, Win NT supported Win 2000/ Win CE (to be supported)	
Roaming	IEEE 802.11 compliant with enhanced roaming features		
Radio Data			
Frequency band	2.400~2.471 GHz (US, Canada, and ETSI), 2.471~2.497 (Japan)		
Wireless medium		Direct Sequence Spread Spectrum	
Modulation Techniques		CCK, BPSK, QPSK	
Sensitivity		Min. –90dBm at 2Mbps/ Min. –84dBm at 11Mbps	
Output power	Max. 100mW (Typ. 16dBm)		Max. 20dBm
Environmental Specifications			
Temperature		0 °C to 55 °C in operation/ -25 °C to 70 °C in storage	
Humidity		95% non-condensing	
Physical Characteristics			
Dimension	113 × 54 × 6 (mm)	141 × 91 × 7 (mm)	180 × 220 × 40 (mm)
Weight	37g	100g	700g
Optional Antenna			
Patch Antenna, 3″ / 5″ Stub Antenna, Yagi Antenna Available			

**The operating environment may affect coverage

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1. MagicLAN Installation

1.1 Introduction

Thank you for your purchase of SAMSUNG MagicLAN (SWL-2100X) Wireless LAN Adapter. This new Adapter series includes two different models: SWL-2100N/E for PCMCIA-compatible computers and SWL-2100P for PCI-compatible computers. Installing either card allows the computer to join a wireless network based on the IEEE 802.11b (High Data Rate) wireless LAN standard. You will be surprised how easy for you are a part of the network with no bother of twisted cables.

1.2 Technical Background

• What is IEEE 802.11?

The IEEE 802.11 specification is a wireless LAN standard developed by the IEEE (Institute of Electrical and Electronic Engineering) committee in order to specify an *over an air* interface between a wireless client and a base station or Access Point (AP), as well as among wireless clients. Like other IEEE 802 families, IEEE 802.11 specification addresses both Physical (PHY) layer and Media Access Control (MAC) layer.

• IEEE 802.11 Physical (PHY) Layer

At the PHY layer, IEEE 802.11 defines three physical characteristics for WLAN: diffused infrared, direct sequence spread spectrum (DSSS), and frequency hopping spread spectrum (FHSS). While the infrared PHY operates at the baseband, the other two PHYs operate at the 2.4GHz ISM (Industrial, Scientific, and Medical) band, which can be used for operating wireless LAN devices without the need of end-user licenses. In order for wireless devices to be interoperable, they have to be conforming to the same PHY standard.

• IEEE 802.11 Media Access Control (MAC) Layer

The IEEE 802.11 MAC Layer is mainly concerned with the rules for accessing the wireless medium. There are two network architectures defined: Ad-hoc Network and Infrastructure Network.

• Ad-hoc Network

Ad-hoc Network is an architecture that supports mutual communication among wireless clients only. Since Ad-hoc Network does not support access to wired networks, it does not need an Access Point to be a part of the network. You can use the network immediately after setting up the operating mode by installing the supplied network driver.
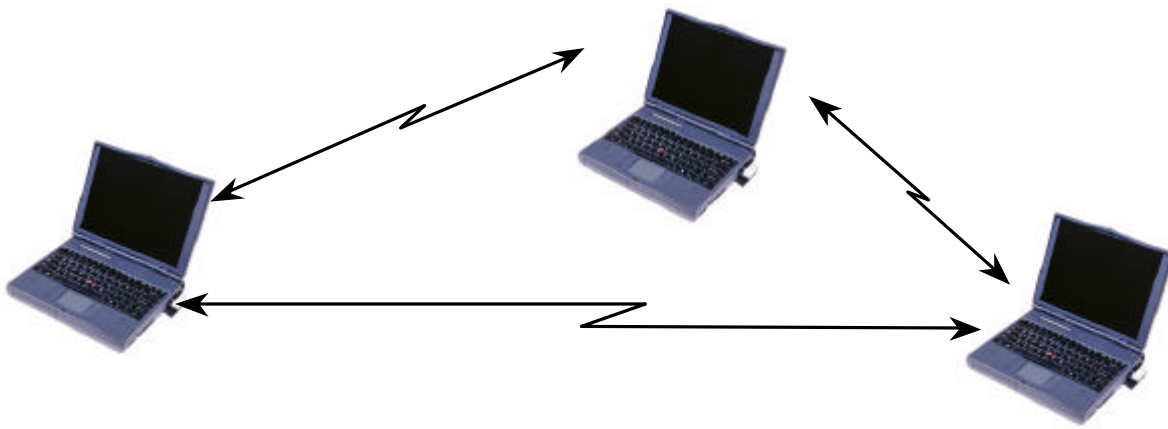
• Infrastructure Network

Infrastructure Network is architecture that provides communication between wireless clients and wired network resources. An Access Point (AP) and the associated wireless clients define the transition of data. So a wireless client can access all the services that are available for a regular wired LAN by using an AP.

Server

BSS A

BSS B
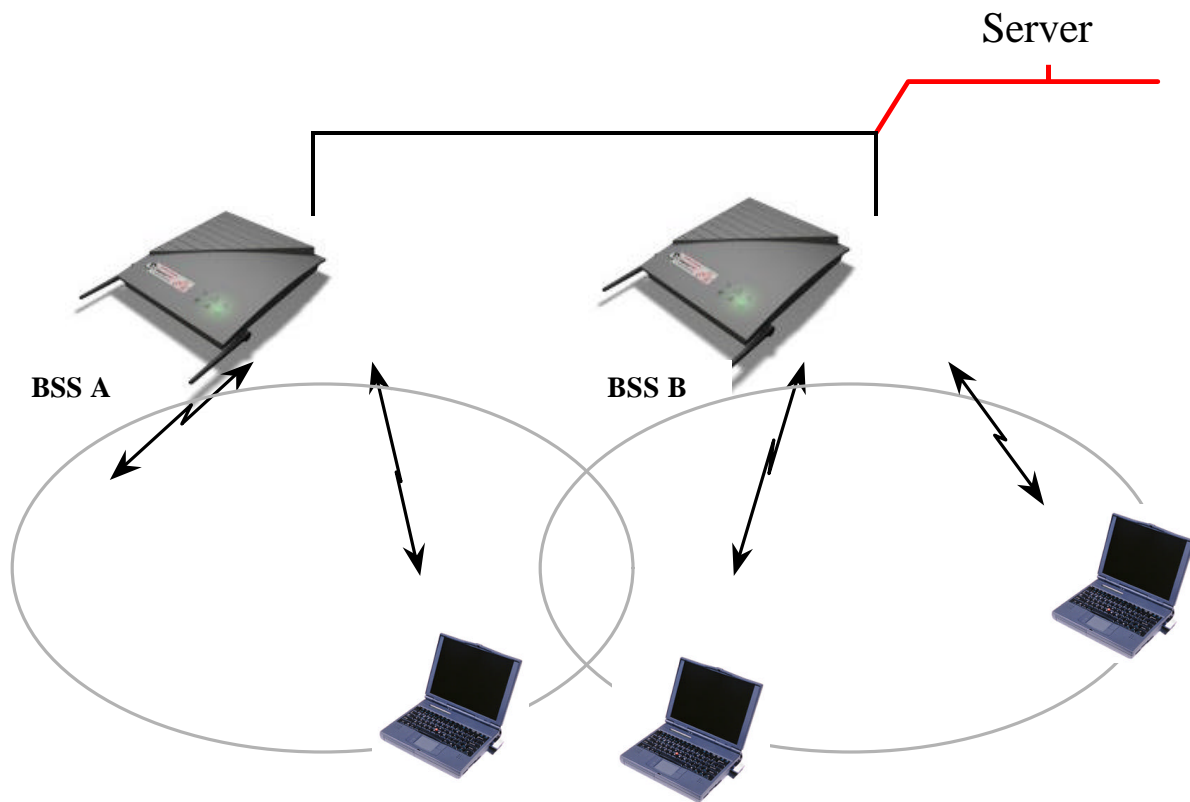
• Roaming

Roaming is a service that allows wireless clients to use the network in motion by automatically changing the connection from an old Access Point to a new Access Point when the clients enter in a new cell. During roaming the clients may observe the loose connection or delay in accessing the resources of the network.

• Scanning, Beaconing & ESS ID

When a wireless client is initialized, it is necessary for it to find and communicate with the correct group of wireless devices, including AP. At this point, it may search for all the frequency channels and this process is called *scanning*.

There may be multiple APs and networks operating at the same time. It may be necessary to ensure that the station joins with the correct network during the scanning process. To achieve this, each AP is assigned to be part of a logical group called the Extended Service Set (ESS). The name of this logical group is the ESS ID. When roaming is operating, there may be several Access Points as part of the same ESS.

After the power on, wireless clients will listen on its default frequency channel. It will be listening for *beacons* sent by another wireless station or AP. Beacon is a short message containing the ESS ID that will be broadcast roughly ten times a second. When the wireless station hears a beacon and the ESS ID in the beacon matches its own, the client knows that it is on the correct channel and can communicate with its group. If no beacons are seen, or if the ESS ID does not match, the wireless client may move to the next frequency channel and repeat this listening procedure.

In case of direct sequence spread spectrum (DSSS) physical layer, this scanning process occurs at start up and may also occur when the client roams between APs.

1.3 MagicLAN Overview

• The MagicLAN SWL-2100P (for Desktop PCs) and SWL-2100N/E (for Notebook PCs) are wireless LAN adapter cards that provide wireless connection between computers.

• The MagicLAN is designed to operate with IEEE 802.11 (wireless LAN International Standard) wireless compliant radio cards and uses a CSMA/CA (Collision Sense Multiple Access with Collision Avoidance) algorithm as the media access scheme, which makes high speed communication (with minimal collision probability) possible.

• The MagicLAN supports DSSS (Direct Sequence Spread Spectrum) physical layer. This is a radio technique, which scrambles the data prior to transmission and uses a correlation technique on receiver to improve the signal to noise ratio and makes it possible to communicate in the office having a wall and a compartment.

• The function of the MagicLAN SWL-2100AP (Access Point) is to transfer information from

a wired LAN to a wireless LAN and vice versa. When operating, the MagicLAN AP is invisible to most users (Normally, unless the user is an administrator, the MagicLAN AP cannot be seen or accessed by users on the network).

- The SWL-2100N/E for Notebook PC is small and portable as a roaming function is provided for users who need network services while maintaining mobility.

- The MagicLAN Adapter (only PCMCIA) has an LED (Light Emitting Diode) on the part of the card. The yellow LED will illuminate when the power is supplied and the card is inserted properly.

- The MagicLAN supports various network software. The network driver is provided to support network software such as Windows 95(OSR2)/98, and Windows NT 4.0.

- To install the Samsung MagicLAN Wireless LAN Card for Win 2000 and Win CE Operating Systems (OS), please visit our website at http://www.magiclan.com to download the respective drivers.

2. Before the Installation

The following section will assist you in installing your wireless LAN Adapter successfully. You will first install software (driver) and then will insert the SWL-2100P or SWL-2100N/E wireless LAN card, and finally set the network properties to accommodate resource sharing and select the type of wireless network that you wish to install. The MagicLAN can easily be installed and used, without bothering to connect cables for keeping your computer to use network resources, as in case of a wired LAN.

2.1 What is in Your Package?

Please check the contents of the box to make sure everything is included and ready for use. Here is the list of what you should have in your package:

- SWL-2100N/E (PCMCIA Card) Adapter or SWL-2100P (PCI Card) Adapter
- SWL-2100X Installation CD
- External Antenna (for SWL-2100P only)

2.2 System Requirement

- Operating System: MS Windows 95(OSR2)/98, Windows NT 4.0
- Computer System (both Notebook and Desktop) with a CD-ROM drive
- For Desktop PC Adapter Card (SWL-2100P):
  The computer system should have two free (extra) IRQs and I/O address.
- For Notebook PC Adapter Card (SWL-2100N/E):
  The computer system should have PCMCIA Type II or Type III card slot. Notebook PC should also have an extra IRQ and I/O address.

Important: Notebook PC must support 3.3V Card. If you are not aware of this issue, please contact your dealer. Some old Notebook PCs may not support 3.3V Card.

3. MagicLAN Installation for Windows 95 (OSR2)/98

There are two types of WLAN Cards i.e. **PCMCIA** and **PCI** cards for **Notebook** and **Desktop** PCs respectively. Here we explain the procedure of installing both cards under **Windows 95(OSR2)/98** operating system (OS) one by one. We will explain the installation method for **SWL-2100N/E PCMCIA** adapter followed by the installation method for **SWL-2100P PCI** adapter.

3.1 Installation Overview

Here are some steps you will perform in establishing your wireless network connection:

- Install the Access Point (SWL-2100AP) at first. AP is needed in case of Infrastructure network mode.
- Install the software using the Installation CD.
- Now you should install the Wireless LAN Card (SWL-2100N/E or SWL-2100P).
- Install the network protocol(s) required to communicate on your network. Most likely you will need the TCP/IP protocol.

3.2 Installation Procedure of SWL-2100N/E PCMCIA Card

Important: Do not insert the PCMCIA card until you are asked to do so, failure of which may result in unsuccessful installation of your PCMCIA WLAN card.

Please follow the following steps one by one in order to install the PCMCIA card successfully.

1. Power on your computer and allow **Windows 95(OSR2)/98** to load fully.
2. Be sure that there is no **PCMCIA** adapter inserted yet.
3. Insert the given **Installation CD** in the **CD-ROM**. Select the *Software Installation* from the menu and then click on the **Install**.
4. Accept the *license agreement*.
5. Give the path of the destination folder. To set the path of your choice click on **Browse** and then click **Next**.
6. Select the type of card. As you are preparing to install the PCMCIA card, select the **PC CARD** type and click on **Next**.
7. Select the **ESSID.** Default ESSID is **ANY**. You can change this later also using the configuration utility or network configuration. Click on **Next**.
8. Select network type and click on **Next**. Default is **Infrastructure**.

9. Confirm the current settings of ESSID, Network Mode, and Utility directory and click on **Next**.

10. It takes a few seconds for copying the utility files and then click on **Finish** to complete the installation.

11. Insert the **PCMCIA** card. Illuminating **LED** and **Sound** confirms the detection of your PC card. Also you will see the PCMCIA Card icon on the right bottom of your screen.

12. Check for the **SAMSUNG 11Mbps Wireless PCMCIA LAN Card** by right clicking on **My Computer** using the mouse. Select the **Device manager** and then Network Adapters. If you find the **Yellow (?)** sign on the adapter, it shows the installation is not successful. Select the adapter and click on **Remove**. Restart your computer after uninstalling *(See the Uninstallation method in section 3.4)* the driver to make the changes effective. And refer to the **Troubleshooting** at the end of the manual.

13. Right click on the **Network Neighborhood** using the mouse.

14. Select **Properties** from the pop up menu. The network box appears and you see three main tabs: *Configuration*, *Identification* and *Access Control*.

15. Click on the **Configuration** tab and then click on the **Add** button. Select Network Component Type box appears. Click on the **Protocol** then click the **Add** button.

16. *Select Network Protocols* box appears. From the list of manufactures, click on **Microsoft**. From the list of network protocols list, select **NetBEUI**, then click **OK**.

17. The **NetBEUI** protocol is now installed. After clicking on **OK** return back to Network Component Type box.

18. Repeat the step 15 and 16 to add **IPX/SPX** protocol.

19. Repeat the step 15 and 16 to add **TCP/IP** protocol.

20. Click on the **TCP/IP** option for setting the **IP** address for your computer. You can select either **Static** or **DHCP** settings. If you use the static IP setup then enter the **IP** value, **Subnet** masking, **DNS, Domain/Workgroup** name, and **Gateway** Address values. After setting these parameters appropriately, click **OK** to return to Network Component Type and you can select the **File and Printer Sharing** options as well as the **Access** to your computer by other users connected to that network by setting the computer sharing options. Click on OK.

21. Screen message **do you want to restart your Computer** will pop up. Select **Yes**. It will shut down your computer and will restart.

3.3 Installation procedure of SWL-2100P PCI Card

Important: Do not insert the PCI card until you are asked to do so, failure of which may result in unsuccessful installation of your PCI card.

Please follow the following steps one by one to install the PCI card successfully.

1. Power on your computer.
2. Be sure that there is no PCI card inserted yet.
3. Insert the **Installation CD.** Select the *Software Installation* from the menu and click on **Install**.
4. Accept the *license agreement*.
5. Give the path of the destination folder. Click on **NEXT**.
6. Select the type of card as **PCI** card and click on **NEXT**.
7. Enter the **ESSID** default is **ANY**. You can change it later also using the configuration utility or network configuration.
8. Select the network mode either **Infrastructure** or **Ad-hoc** and click on **NEXT**.
9. Confirms the current settings of ESS ID, Network Mode, and Utility directory. Click on **Next**.
10. Click on **Finish** to complete the software installation.
11. Switch off your computer and insert the **PCI** card in the PCI slot.
12. Restart your computer and a message window pops up saying **New Hardware Found**.
13. It takes a few seconds in setting up the driver for the new hardware i.e. **SAMSUNG PCI/PCMCIA Bridge** and **SAMSUNG 11 Mbps PCI WLAN Card**.
14. Check for the **SAMSUNG 11Mbps Wireless PCI LAN Card** by clicking on the **Device manager**. If you find the **Yellow** sign on the adapter, it shows the installation is not successful. Select the Adapter and click on **Remove**. Restart your computer after uninstalling *(See the Uninstallation method in section 3.4)* the driver. And refer the troubleshooting at the end of manual.
15. Right click on the **Network Neighborhood** using the mouse.
16. Select **Properties** from the pop up menu. The network box appears and you see three main tabs: *Configuration*, *Identification* and *Access Control*.
17. Click on the configuration tab and then click on the add button. Select Network Component Type box appears. Click on the **Protocol** then click the **Add** button.
18. Select Network Protocols box appears. From the list of manufactures, click on Microsoft. From the list of network protocols list, select **NetBEUI**, then click **OK**.
19. The **NetBEUI** protocol is now installed. After clicking on **OK** return back to Network Component Type box.
20. Repeat the steps 17 and 18 to add **IPX/SPX** protocol.
21. Repeat the steps 17 and 18 to add **TCP/IP** protocol.
22. Select the **TCP/IP** option for setting the **IP** address of your computer. You can

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select either static or dynamic settings. If you use the static **IP** setup then enter the **IP** value, **DNS, Domain/Workgroup** name, and **Gateway** Address values. After setting these parameters appropriately, click **OK** to return to Network Component Type and you can select the **File and Printer Sharing** options as well as the access to your computer by other users connected to that network by setting the appropriate options.

23. Screen message **do you want to restart your Computer** will pop up. Select **Yes**. It will shut down your computer and will restart.

3.4 Uninstallation Method:

If you want to uninstall the PCMCIA/PCI card under Win 95 (OSR2)/98, click on the **Start** at the left bottom of your screen. Select the **Programs**. Click on the **MagicLAN Utility** and click on **Uninstall**. Confirm message about removing the "**MagicLAN-uninstall**" and all of its components appear. Click on **Yes**. UninstallShield removes the software "**MagicLAN uninstall**" successfully. Click on **OK** to finish the uninstall procedure.

Important: Restart your computer to make the changes effective before you reinstall the driver.

4. MagicLAN Installation for Windows NT 4.0

4.1 Installation procedure of SWL-2100N/E PCMCIA Card

> *Important: Do not insert the PCMCIA card until you are asked to do so, failure of which may result in unsuccessful installation of your PCMCIA card.*

> *Important: Some notebook computers for Win NT 4.0 operating system that do not support 3.3V cards will not install your PCMCIA card successfully. You are advised to install the driver for PCMCIA Controller available from set manufactures or install the CardWizard program that will enable the notebook computers supporting 5.0V cards to support 3.3V cards also and will install your PCMCIA card successfully.*

Please follow the following steps one by one to install the **PCMCIA** card successfully. There are two cases: one is when there is no Windows NT networking Installed and the other is when the Windows NT networking is installed.

When Windows NT networking is not installed yet:

1. Power on your PC and allow the **Windows NT** to load fully.
2. Now insert the **Installation CD**. Select the *software Installation* and click on **Install**.
3. When there is no Windows NT networking installed yet. You should install your driver manually. To do so, click on start in task bar, go to Settings and then to **Control Panel**.
4. Under **Control Panel**, double click on **Network** icon.
5. Since there is no **Windows NT** networking installed yet, you will be asked if you want to install NT networking first. Click on **Next** and then you will be asked how will you access the network: *modem* or *LAN*. Check the proper selection and click on next. In network setup wizard box, click on select from list button.
6. In **Select Network Adapter** box click on **Have Disk** button.
7. In **Insert Disk** box, you may be asked to specify the necessary software directory. Insert the MagicLAN *Installation CD* into the CD-ROM drive. Type in **D:\nt40** (Where D is the CD-drive of your Notebook) in the blank and click on **OK**.
8. In **Select OEM Option** box, we will see **Samsung 11Mbps Wireless LAN Card** and click on **OK**.
9. We confirm the **Samsung 11Mbps Wireless LAN Card**.
10. Select the network protocols by clicking on the **Protocols**. And click on **TCP/IP**.
11. In the next box to choose network services to use, make sure that all the services you want to use are checked and click on **Next**.
12. In the next box it is confirmed that necessary NT networking components are selected.

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Click on **Next**. When you are asked to specify the directory that the necessary NT files are copied from; Insert your Windows NT CD and type in **D:\i386** in the location blank.

13. Some files from the **D:\i386** directory are copied and you may be prompted the same box to ask you to specify where NT files are once more.

14. Since it is looking for some files from the installation CD, insert your installation CD in CD drive and type **D:\nt40** in the blank location and click on continue.

15. **SAMSUNG 11Mbps Wireless LAN Card** setup box may appear. Set each parameter (I/O Address, Interrupt) for the proper system configuration set up and other parameters (network mode, ESS ID, and Tx Rate) for the proper LAN card configuration. If the resource allocation or I/O addresses conflicts with other devices, change the I/O address or Interrupt using the **Windows NT Diagnostic program**.

16. Next box will say network installation is done and network is ready to start. Click on **Next**.

17. If you select the **DHCP** option for **TCP/IP**, you do not need to set the values. If you select the **Static** option, enter the **IP** value, **Subnet** masking, **Gateway**, and **DNS** values respectively and then click on **OK**.

18. Add the services that you want to avail. You can add other protocols such as **NetBEUI**.

19. Now it is ready for installing networking. Click on **NEXT**.

20. You can assign the **Workgroup/ Domain** name. And click on **NEXT**.

21. Click on the **Finish** and it will ask you whether you want to restart your computer or not. Click on **Yes**.

22. Insert the **PCMCIA** card in the PCMCIA slot and restart your computer so that the changes may be placed in effect.

23. If your computer does not detect the PCMCIA WLAN Card or the card is not functioning properly, refer to the **Troubleshooting** at the end of the manual.

When Windows NT networking is installed already:

1. Power on your computer.

2. Now insert the **Installation CD**. Select the *Software Installation* and click on **Install.**

3. Right click on the **Network Neighborhood** using the mouse and select **Properties**.

4. Select the **Adapter**. And click on **Add**.

5. Since it is looking for the driver files, enter the path name **D:\nt40** (where D is the CD drive of your Notebook PC) and click on **Have Disk**. It copies the driver files. And you can see **Samsung 11Mbps Wireless LAN Card** is added in your list of adapters.

6. **Configure Wireless LAN Card** box may appear. Set each parameter (I/O base,

Interrupt) for the proper system configuration set up and other parameters (network mode, ESS ID, and Tx rate) for the proper LAN card configuration.

7. Click on **Bindings**.
8. Click on the **Protocol** to access the network and share the resources.
9. Select **TCP/IP** and you can select either **DHCP** or **Static** for the IP address. If you select DHCP, you do not need to specify the **IP** address. If you select the **Static** option, enter the **IP** value, **Subnet** masking, **Gateway**, and **DNS** values respectively. Also add the **Workgroup/ Domain** name
10. You can add the optional protocols such as **NetBEUI**.
11. After you add the **TCP/IP** protocol, it will ask you whether you want to restart your computer or not. Click on **Yes** to make the changes effective and insert the **PCMCIA** card in the PCMCIA slot. Now your network is established successfully, if your PCMCIA card is detected. If you encounter some problems during installation or your card is not functioning properly, please refer to the **Troubleshooting** at the end of the manual.

4.2 Installation procedure of SWL-2100P PCI Card

Important: Do not insert the PCI card until you are asked to do so, failure of which may result in unsuccessful installation of your PCI card.

Please follow the following steps one by one to install the **PCI** card successfully. There are two cases: when there is no Windows NT networking Installed and the other when the Windows NT networking is installed.

When Windows NT networking is not installed:

1. Power on your PC on and allow the **Windows NT** to load fully.
2. Now insert the **Installation CD**. Select the *software Installation* and click on **Install.**
3. Shut down your computer and insert the **PCI** card in the PCI slot and restart your computer.
4. Since there is no Windows NT networking installed yet. You should install your driver manually. To do so, click on start in task bar, go to Settings and then to **Control Panel**.
5. Under **Control Panel**, double click on **Network** icon.
6. Since there is no **Windows NT** networking installed yet (If you have already installed Windows NT networking, jump to the step 13 directly), you maybe asked if you want to install NT networking first. Click on **Next** and then you will be asked how will you access the network: *modem* or *LAN*. Check the proper selection and click on next.

In network setup wizard box, click on select from list button.

7. In **Select Network Adapter** box click on **Have Disk** button.

8. In **Insert Disk** box, you may be asked to specify the necessary software directory. Insert the MagicLAN *Installation CD* into the CD-ROM drive. Type in **D:\nt40** (Where D is the CD-drive of your Notebook) in the blank and click on **OK**.

9. In **Select OEM Option** box, we will see **Samsung 11Mbps Wireless LAN Card** and click on **OK**.

10. We confirm the **Samsung 11Mbps Wireless LAN Card**.

11. Select the network protocols by clicking on the **Protocols**. And click on **TCP/IP**.

12. In the next box to choose network services to use, make sure that all the services you want to use are checked and click on **Next**.

13. In the next box it is confirmed that necessary NT networking components are selected. Click on **Next**. When you are asked to specify the directory that the necessary NT files are copied from, insert your Windows NT CD and type in **D:\i386** in the location blank.

14. Some files from the **D:\i386** directory are copied and you may be prompted the same box to ask you to specify where NT files are once more.

15. Since it is looking for some files form the installation CD, insert your installation CD in CD drive and type **D:\nt40** in the blank location and click on continue.

16. **Configure Wireless LAN Card** box may appear. Set each parameter (I/O base, Interrupt) for the proper system configuration set up and other parameters (network mode, ESS ID, and Tx rate) for the proper LAN card configuration.

17. **TCP/IP** installation message will pop up. Select **NO** for **DHCP**.

18. If you select the **DHCP** option for **TCP/IP**, you do not need to set the values. If you select the **Static**, enter the **IP** value, **Subnet** masking, **Gateway**, and **DNS** values respectively and then click on OK.

19. Binding properties will pop up. Click on **NEXT**.

20. Add the services that you want to avail. You can add other protocols such as **NetBEUI**.

21. Now it is ready for installing networking. Click on **NEXT**.

22. Networking is confirmed. Click on **NEXT**.

23. You can assign **Workgroup/ Domain** name. And click on **NEXT**.

24. Click on the **Finish** and it will ask you whether you want to restart your computer or not. Click on **Yes**.

25. If your PCI card is not detected or not functioning properly, please refer to **Troubleshooting** at the end of the manual.

When Windows NT networking is already installed:

1. Power on your computer.
2. Now insert the **Installation CD**. Select the *Software Installation* and click on **Install**.
3. Shut down your computer and insert the **PCI** card and restart your computer.
4. Right click on the **Network Neighborhood** using the mouse and select **Properties**.
5. Select the **Adapter**. And click on **Add**.
6. Since it is looking for the driver files, enter the path name **D:\nt40** (where D is the CD drive of your Notebook PC) and click on **Have Disk**. It copies the driver files. And you can see **Samsung 11Mbps Wireless LAN Card** is added in your list of adapters.
7. **Configure Wireless LAN Card** box may appear. Set each parameter (I/O base, Interrupt) for the proper system configuration set up and other parameters (network mode, ESS ID, and Tx rate) for the proper LAN card configuration.
8. Click on **Bindings**.
9. Click on the **Protocols** to access the network and share the resources.
10. Select **TCP/IP** and you can select either **DHCP** or **Static** for the **IP** address. If you select **DHCP**, you do not need to specify the **IP** address. In case of **Static**, enter **IP** value, **Subnet** masking, **Gateway**, and **DNS** values respectively. Also enter the **Workgroup/Domain** name.
11. You can add the optional protocols such as **NetBEUI**.
12. After you add the **TCP/IP** protocol, it will ask you whether you want to restart your computer or not. Click on **Yes** to make the changes effective. Now your network is established successfully, if your **PCI** card is detected. If you encounter some problems during installation or if your card is not functioning properly, please refer to the **Troubleshooting** at the end of the manual.

4.3 Uninstallation Method:

If you want to uninstall the PCMCIA/PCI card under Win NT, right click on the **Network Neighborhood** using the mouse. Select **Properties** and click on **adapters**. You will see **SAMSUNG 11Mbps Wireless PCMCIA/PCI LAN Card**. Click on the card and then click on **Remove**. The **SAMSUNG 11Mbps Wireless PCMCIA/PCI LAN Card** will be removed and now you can remove it from the PC Card slot of your computer.

Important: Restart your computer to make the changes effective before you reinstall the driver.

5. Configuration Utility

During the installation of your SAMSUNG Wireless LAN Card, configuration utility is also installed. You can see the icon at the right bottom of your screen. Double clicking on that icon will show you the screen as shown below.
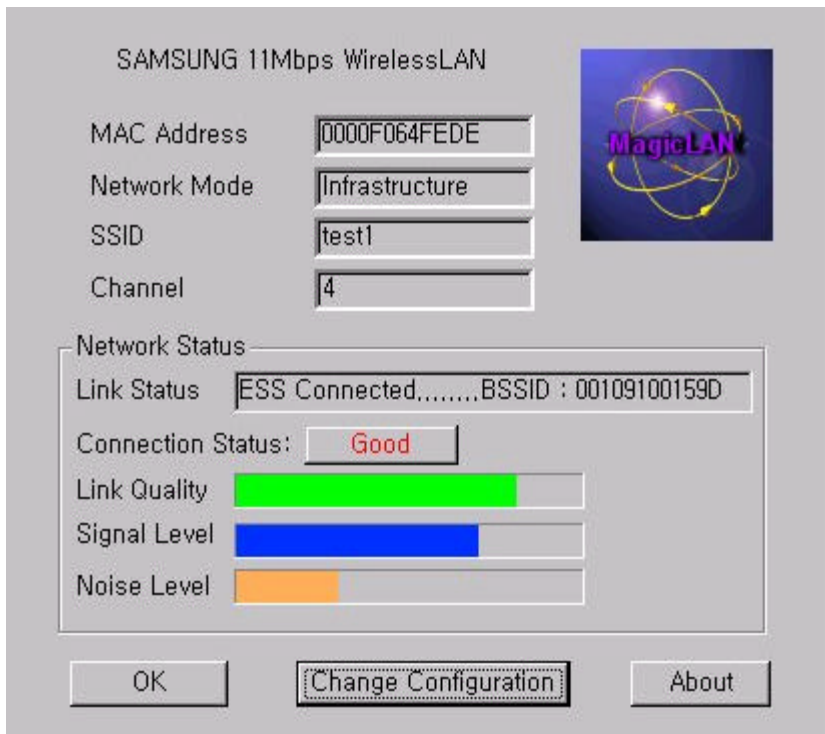
Here we explain the use and meanings of the various screen messages.

SAMSUNG 11Mbps Wireless LAN is the description of the vendor.

MAC Address: MAC Address is the unique identification number (6 bytes in size) for the card and is assigned to WLAN card during manufacturing.

Network Mode: This describes the topology of the network that a client/user is connected. The choice is between Infrastructure and Ad-hoc modes.

SSID: SSID is the identification address of the Access Point (AP). This can also be the ESSID of the Wireless LAN.

Channel: Channel number is the channel available for the communications between the clients and AP or between the clients only. In case of the Infrastructure Network Mode, the channel number is scanned automatically (Need not to worry about setting the channel number), while in case of the Ad-hoc Network Mode; the channel number is set by the client and can be changed by the client later.

Network Status: Network status explains the properties of the channel currently in use. It also explains whether the link between the two communicating clients or a client and an AP is *good*, *adequate* or *poor*.

Link Status: Link Status explains whether the client is connected to ESS or not. It also shows the identification MAC address of the BSS to which this is connected currently.

Connection Status: This explains whether the connection between communicating entities

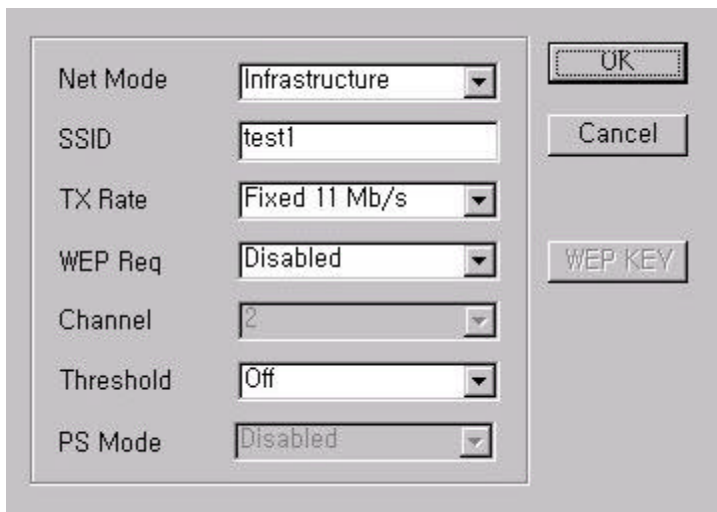i.e. AP or Client Stations, is *good*, *adequate* or *poor*.

Link Quality: This is the measure of the radio link. You can also visualize the connection status by seeing the following three different colors of *Link Quality*.

- **Green Color:** The connection status is *good*. And the clients or AP should be able to communicate without disturbance.

- **Yellow Color:** The connection status is *adequate*. In other words, you may experience some problems while communicating.

- **Red Color:** The connection status is *poor*. You may not communicate with the other clients or AP.

Signal Level: This is the measure of the signal level. The measured signal level gives the overall Link Quality and Connection Status.

Noise Level: This is the measure of the noise level.

You can change the configuration by clicking on the **Configuration Change**. When you click on the Configuration Change, you see the screen given below.

<u>**Configuration Change**</u> screen allows you to set the parameters as explained below.

Net Mode: You can set the Network Mode to Infrastructure or Ad-hoc.

SSID: The SSID can be changed to any value. But that should be the same that of AP. In case of Ad-hoc Mode, the SSID should be same for all clients.

TX Rate: The transmission rate at which the data packets are transmitted by the client or AP. You can set this to *Auto select 1 or 2Mbps*, *Fixed 1 Mbps*, *Fixed 2 Mbps*, *Fixed 5.5 Mbps*, *Fixed 11 Mbps* or *Full Auto (1 to 11 Mbps)*.

<u>Important</u>: You must know the TX Rate that your AP can support. Failure to which may

cause the undesired results.

WEP Required: WEP stands for Wired Equivalent Privacy. WEP is an encryption scheme that provides the secure wireless data communications to the users. WEP uses a 40-bit key to control the network access. In order to decode the data transmission, each wireless client on the network must use the identical 40-bit key. Please see the Security information for details about the use and generation of the WEP key.

Channel: You can change the channel number. In case of the Ad-hoc Network Mode, the change in the channel number is effective. In case of the Infrastructure Network Mode, changing the channel number is of no concern as the channel is scanned automatically. Please see the table for the requirements of different countries and the channel frequency.

Threshold: You can select either *Off* or *Hidden Stations*. Hidden stations are those clients that are associated with the AP but are not in range with each other.

PS Mode: PS stands for Power Saving Mode. Currently, the PS Mode is disabled.

After changing the settings in the Configuration Change Dialog box, click on **OK**. It takes a few seconds to set the changes that you made. Then you can visualize the Connection *Status*, *Link Quality*, *Signal* and *Noise* Levels respectively.

WEP Security:

To provide the secure communication over the wireless medium, we have provided the WEP (Wired Equivalent Privacy) key. There are two ways of generating this key. This key is an important in protecting the illegal access to the wireless networks.

You have to set the key at the Access Point also. And all the users who want to contact/share the resources must type the same key. The WEP key works in the infrastructure mode only. There are two options in case of the WEP. You can select either of **Disabled**, and **mandatory**. If you select Disabled, the communications between clients and clients and AP is not secure.

If you select mandatory, you need to setup the AP also and enter the same Key for communicating other clients associated with the AP or with AP itself.

WEP Key Generation:

There are two ways of generating the WEP key. The first is by entering any text in the Passphrase. And click on Generate. It will generate four WEP keys as Key 1, Key 2, Key 3, and Key 4. You can select any key for the security. If you do not select any key, Key 1 is selected, as it is default key. Then click on Write and it will update the registry and driver.

Another WEP key generation method is by inserting the Key values directly from the keyboard. And click on the Write to update driver and registry. Select the Key number and use that Key for accessing the Access Point. If the Key is not entered correctly, a dient cannot access the resources. This Key value protects the illegal access to the wireless network resources. As the wireless channel is more prone to the illegal access, WEP provides the users safe access.

> *__Warning__: Use of the WEP key makes your data secure but there is degradation in the throughput performance when we employ the WEP key.*

Table: Number of Operation Channels

Channel#	Frequency	FCC	Canada	ETSI	Spain	France	Japan
1	2412MHz						
2	2417MHz						
3	2422MHz						
4	2427MHz						
5	2432MHz						

6 ◗	2437MHz							
7 ◗	2442MHz							
8 ◗	2447MHz							
9 ◗	2452MHz							
10 ◗	2457MHz							
11 ◗	2462MHz							
12 ◯	2467MHz							
13 ◯	2472MHz							
14	2484MHz							

For the each Country/Standard mentioned in the Table, the ◯marked

Channels should be supported.

The user must select the **Region** while installing the **Samsung WLAN** card and should select the correct channel number as listed in the above Table. The use of non-listed channel number is illegal and is prohibited. In case of **Windows 95(OSR2)/98**, user should select the country/region using the Install shield while in case of **Windows NT**, user must select the user by clicking on the **Network Neighborhood** while installing the software.

6. Troubleshooting

To make the installation of SAMSUNG Wireless LAN Card more users friendly, we have suggested following the installation steps one by one as listed in the section 3 and section 4. Still you encounter some problems while installing the WLAN Card or you want to confirm whether your card is installed properly or not, we have listed the procedure for checking the various components after you have installed the card. In first part of **Troubleshooting**, we have suggested the users to check the various properties of the card to check the proper installation. In second section, we have listed the various problems that you may encounter during the installation and have also listed the possible solution. Check the first part to guess

the probable reason of unsuccessful installation.

6.1 Procedure to Check the Various Properties of Card after Installation:

<u>**For PCMCIA Card under Windows 95 (OSR2)/98:**</u>

Please check the followings if you encounter some problem while installing the PCMCIA card or your PCMCIA card is non-functional.

1. Click on the **Control Panel** and then on **PC Card**. Check whether it has **PCMCIA** card in one of the sockets or not. If you find **SAMSUNG 11Mbps Wireless PCMCIA LAN Card** in one of the sockets, it means the card is detected properly. If you see the **Yellow** sign of Question-mark (**?**), the resources are conflicting.

2. Right click on **My Computer** and the select **Properties**. Select the **Device Manager** and click on the **Network Adapter**. You will find **SAMSUNG 11Mbps Wireless PCMCIA LAN Card** if it is installed successfully. If you see the **Yellow** sign the resources are conflicting. Click on PCMCIA Card and then on PCMCIA Card Service, you can see the status of PCMCIA card. If there are yellow sign either on adapter or PCMCIA card, please check the followings.

    i)   Check if your Notebook supports **3.3V** Card.

    ii)   Check if your Notebook has a free **IRQ**. If not, make an IRQ free by assigning the same IRQ to some devices, for example COM 1, COM 2 can be assigned same IRQ values.

    iii)   Check that you have inserted the right card and have installed the proper driver.

For PCI Card under Windows 95/98:

Please check the following if you encounter some problem while installing the PCMCIA card or your PCI card is non-functional.

1. Click on the **Control Panel** and then on **PCMCIA Card**. Check whether it has **PCI** card in one of the sockets or not. If you find **SAMSUNG 11Mbps Wireless PCI LAN Card** in one of the sockets, it means the card is detected properly. If you see the

Yellow sign of Question-mark **(?)**, the resources are conflicting.

2. Right click on **My Computer** and the select **Properties**. Select the **Device Manager** and click on the Network Adapter. You will find **SAMSUNG 11Mbps Wireless PCI LAN Card** if it is installed successfully. If you see the yellow sign the resources are conflicting. Click on **PCMCIA** Socket and then you can see the **PCI/PCMCIA adapter**. If there are **Yellow** signs either on **PCI/PCMCIA Adapter** or **PCI** card, please check the followings.

      i)   Check whether you have two free **IRQ**s. If the resources are conflicting between **Samsung** driver and other devices, change the resources and make that free for Samsung driver.

      ii)   Check that you have installed the proper driver.

      iii)   If the above i) and ii) are already checked and are set properly, uninstall the driver, remove the PCI card and reinstall the driver.

For PCMCIA Card under Windows NT:

> *Important: Some notebook computers for Win NT 4.0 operating system that do not support 3.3V cards will not install your PCMCIA card successfully. You are advised to install the driver for PCMCIA Controller available from set manufactures or install the CardWizard program that will enable the notebook computers supporting 5.0V cards to support 3.3V cards also and will install your PCMCIA card successfully.*

Please check the followings if you encounter some problem while installing the PCMCIA card or your PCMCIA card is non-functional.

1. Check the **Windows NT Diagnostics**. You should find out whether there is any conflict in the **resource** allocation or the **I/O address**, **IRQ** allocations. If you find that the **IRQ** or **I/O** addresses are already assigned to some other devices, you must change that value. I/O address needs 40h byte length.

2. Event viewer will show you about the events such as PCMCIA, swld11 (driver name) and the status. If you find the **Red** or **Yellow** sign, there is some problem. Please refer to the **Troubleshooting** at the end of the manual.

3. Click on the **Control panel**. Double click on the **PC Card**. You will see

SAMSUNG 11Mbps WLAN Card. Double clicking on that will show you the **Card Information**, driver name and the driver file. You must confirm the name of the driver and the driver file as "**swld11**" and "**swld11.sys**". If you do not find the names as we listed before, there are some problems and the driver is not installed properly. Reinstall the driver.

Note: Check the PnP BIOS setup menu and select **no** in case of the Wireless LAN Card installation.

For PCI Card under Windows NT:

Please check the following if you encounter some problem while installing the PCMCIA card or your PCI card is non-functional.

1. Check the **Windows NT Diagnostics**. You should find out whether there is any conflict in the **Resource** allocation or the **I/O Base** address, **IRQ** allocation. If you find that the IRQ or I/O port address is already assigned to some other devices, you must change that.

2. **Event Viewer** will show you about the events such as **PCMCIA** Card type i.e. **PCMCIA** or **PCI,** driver file **swld11** and the **status**. If you find the **Red** or **Yellow** sign, there is some problem.

3. Click on the **Control panel**. Double click on the **PC Card**. You will see **SAMSUNG 11Mbps WLAN Card**. Double clicking on that will show you the **Card Information**, driver name and the driver file. You must confirm the name of the driver and the driver file as "**swld11**" and "**swld11.sys**". If you do not find the names as we listed before, there is some problems and the driver is not installed properly. Reinstall the driver.

4. Check that your computer has two **IRQ**s free. If not, make two IRQs free.

6.2 Probable Symptoms and their Diagnosis:

This section lists the problems you may encounter during the installation of your PCI or PCMCIA card.

Solving Problems

Symptom	Diagnosis
Windows 95/98 locks up after installing PCI card.	The installation procedures may not have been followed exactly. Turn off your PC and remove the PCI card. Restart your PC and run the installation program again as instructed in the installation guide.
The system tray wireless monitor is always red.	Make sure that all the clients have the same SSID. Set all clients to the same wireless channel in case of Ad-hoc network mode. Make it sure that you are with in the range of an Access Point (AP). If your PC can't be associated with any AP, it cannot communicate with other clients.
If you cannot connect to one of the clients in the network.	Make it sure that all clients are up and are running with a blue taskbar icon. Make it sure that the client that you want to communicate with is within the range of an AP. Make sure that your TCP/IP is set properly and correctly.
The NT event log lists the error: "Server Service terminated. Not enough Server Storage."	Reinstall the Windows NT service pack.
In Windows NT, there is no wireless monitor icon in the taskbar or the Samsung Adapter does not appear in the PC Card Control Panel applet.	Make sure the PCMCIA device is started as **Automatic** in the device applet of the Control Panel. Double click on the PC Card icon in Control Panel. Click on Samsung Adapter and then on the properties button. It should say the driver started correctly. Make sure the drivers were installed correctly. If all else fails, uninstall drivers and software through Add/Remove Program, remove the WLAN Card and reinstall the drivers following the manual.

You cannot connect to some computers in the Network Neighborhood.	Make sure a resource is shared among all computers connected to the same network. Click on OK on the MS Networking login box and OK on the following domain error. If you cannot share a device in NT, you may need to reinstall the NT service pack. You may wait for several minutes for all of the PCs to appear.
In case of the Windows NT, if there is no sound after you insert the Wireless LAN card.	You must check the resources of the sound card driver. If the resources are conflicting with Samsung Wireless (PCI/PCMCIA) LAN Card driver, you must change the resources.