



2.4 GHz WIRELESS LAN CARD **SL-1105** Instruction Manual

■ Document Conventions

The following notational conventions are used in this manual:

- The names of utilities, applications, windows (screens) are enclosed in square brackets ({ }).
- The names of utilities, applications, windows (screens), tabs, menus, text boxes, and check boxes are enclosed in square brackets ([]).
- The names of and the names of command buttons within dialog boxes are enclosed in less-than and greater-than signs (< >).

■ Description of the setup screens in this manual

The setup screens used in this manual are for the SL-1100. Please read those parts written with SL-1100 as for the SL-1105.

■ System Requirements

Card slot: Use this LAN card with a computer having a Type \pm U PC card slot that is CardBus compliant and supports PCMCIA 2.0 (or later versions).

⇒ This LAN card is designed for use with PCMCIA card slots that operate at 5.0V.

Operating system: Use this LAN card with a computer running Windows 95 (OSR2 or later), Windows 98 (including the second edition), Windows NT 4.0 (Service Pack 3 or later), or Windows 2000.

Memory: At least 16MB of RAM is recommended.

■ Items Required for Installation

- A computer satisfying the system requirements described above.
- The CD-ROM for the operating system used (Windows 95, Windows 98, Windows 2000 or Windows NT 4.0).
- The SL-1105 wireless LAN card.
- The two floppy disks labeled "Instruction Manual (1/2)" and "Instruction Manual (2/2)."
- The two floppy disks labeled "Utility Software (1/2)" and "Utility Software (2/2)."
- Four blank 3.5-inch floppy disks (for backing up the Instruction Manual and Utility Software disks).

■ About This Manual

If you are using Windows NT 4.0 or Windows 2000, see Instruction Manual (2/2).

- ☞ If you are using Windows 95, follow the instructions provided in "3 Using in a Windows 98 Environment." The settings utility does not support Windows 95. Use the setting screen described in "3-4 SL-1105 Settings" to perform settings for the SL-1105 LAN card when using Windows 95.

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■ Trademark Information

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Windows is a registered trademark of Microsoft Corporation in the United States and/or other countries.

The screen shots that appear within this text are used with permission of Microsoft Corporation.

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1 Safety Precautions

CAUTIONS

NEVER expose the LAN card to rain, snow or any liquids.

DO NOT use or place the LAN card in areas with temperatures below 0 °C (+32 °F) or above +55 °C (+122 °F) or, in areas subject to direct sunlight.

AVOID placing the LAN card in excessively dusty environments.

AVOID the use of chemical agents such as benzene or alcohol when cleaning, as they damage the LAN card surfaces.

Place unit in a secure place to avoid inadvertent use by children.

For U.S.A. only (FCC information)

CAUTION: Changes or modifications not expressly approved by Icom Inc. could void the user's authority to operate this LAN card.

Class B digital device users

This equipment has been tested and found to comply with the limits for Class B digital devices, pursuant 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 instruction manual, 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 try to correct the interference by one or more of the following measures:

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

IMPORTANT RF SAFETY WARNING:

To comply with FCC RF exposure compliance requirements, the following device operating configuration must be satisfied:

The antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

For Canada only

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

■ Be sure to read these precautions in order to operate the LAN card safely.

- These precautions are intended to ensure that the LAN card is operated safely and correctly. Follow these instructions to avoid property damage and prevent personal injury to yourself (user) or others in the vicinity.
- Before reading the rest of this manual, read and understand the precautions listed under "Warning" and "Caution" below.
- This manual includes precautions regarding both the SL-1105 and the entire computer system with which the SL-1105 is being used.
- After reading this manual, store it in a convenient place for future review.

WARNING

Failure to observe the precautions listed here could result in serious or fatal injury to the user or those near the user.

- Be sure to turn off the power to the computer and the peripheral equipment before inserting or removing the LAN card into or from the card slot.
Otherwise fire, electric shock, or equipment failure may result.
- Keep the LAN card out of the reach of children when inserting, removing, or storing the LAN card.
Otherwise injury or electric shock may result.
- Do not insert wire or other metal parts into the connector portion of the LAN card.
Otherwise fire, electric shock, or equipment failure may result.
- Do not disassemble or modify the LAN card or attempt to repair it yourself.
Otherwise fire, electric shock, or equipment failure may result.
- Do not allow the LAN card to become wet.
Otherwise fire, electric shock, or equipment failure may result.

- Do not touch the LAN card with wet hands while it is in use.
Otherwise electric shock may result.
- Discontinue use immediately if the LAN card emits smoke, an abnormal odor, or an abnormal noise.
Otherwise fire, electric shock, or equipment failure may result.
Turn off the power to the computer and remove the LAN card from the card slot.
Confirm that the smoke, odor, or noise stops as a result of these actions. Then contact your dealer or our service department.

CAUTION

Failure to observe the precautions listed here could result in personal injury or property damage.

- Be sure the correct side of the LAN card is facing upward when inserting the card.
Otherwise equipment failure may result.
- Do not remove the LAN card from the card slot while the computer is running.
Otherwise equipment failure may result and data may be lost or damaged.
- Do not remove or insert the LAN card from or into the card slot while the operating system is booting up.
Otherwise equipment failure may result.
- Do not drop, apply severe physical shock to, or twist the LAN card.
Otherwise personal injury may result and the LAN card may be damaged.
- Do not stand, sit, or place heavy objects on the LAN card. Do not pinch the LAN card.
Otherwise the LAN card may be damaged.
- Do not place the LAN card in humid, dusty, or poorly ventilated locations.
Otherwise fire, electric shock, or equipment failure may result.
- Do not use near televisions or radios.
The LAN card may disrupt the signal reception of such devices and such devices may disrupt the signal reception of the LAN card.
- Do not use paint thinner or benzene to clean the LAN card.
Otherwise the case material may degrade and the paint may peel. Use a soft cloth to clean the LAN card. If particularly dirty, dampen the cloth slightly with a neutral cleaning agent that has been diluted with water.
- Remove the LAN card from the card slot when it will not be used for a long period of time.

therwise heat emission, fire, or equipment failure may result.

- Do not place the computer with which the LAN card will be used on a slanted or unstable surface.

Otherwise the computer may fall or turn over, resulting in personal injury or equipment failure.

- Avoid locations exposed to strong magnetic fields or static electricity and locations exposed to temperatures or humidity levels that exceed the specifications listed in the manual for the computer. Also, do not use in locations where condensation occurs. Otherwise equipment failure may result.

■ General precautions

- Be sure to make backup copies of the disks (LAN Card Utilities) included with this LAN card. Use the backup disks instead of the originals for general use.
- Observe the instructions provided in the manuals included with the computer and other peripheral devices.
- Before installing new software or changing the settings (evenly slightly) of your computer, make backup copies of all data stored in the computer to keep potential damages to a minimum.
- ICOM Inc. assumes no responsibility whatsoever for any damages or lost profits resulting from opportunities for voice or signal communications being missed because of the failure, malfunction, poor condition, damage, disassembly, or data loss of the LAN card or because of such external causes as power failure; nor will ICOM assume any responsibility for demands made by a third party.

2 COMPONENTS AND FUNCTIONS



1. Transmission lamp (Red)

Flashes during data transmission.

2. Reception lamp (Green)

Flashes during data reception.

This lamp remains illuminated (without flashing) when the LAN card is not recognized or other trouble occurs.

3. PCMCIA connector

Connects with the PC card slot provided on your computer

➤ Make sure no metal fragments or dust particles are on the connector before inserting the card into the card slot.

➤ This LAN card is designed for use with PCMCIA card slots that operate at 5.0V.

3 Using in a Windows 98 Environment

3-1 Checking the PC Card Driver

■ Restrictions

The following restrictions apply when using the SL-1105 with Windows 98:

The SL-1105 will not operate unless there is an available IRQ (sharing of an IRQ is not allowed). Secure an IRQ before installing the LAN card driver. If you do not know how to secure an IRQ, consult with the manufacturer of the computer you are using.

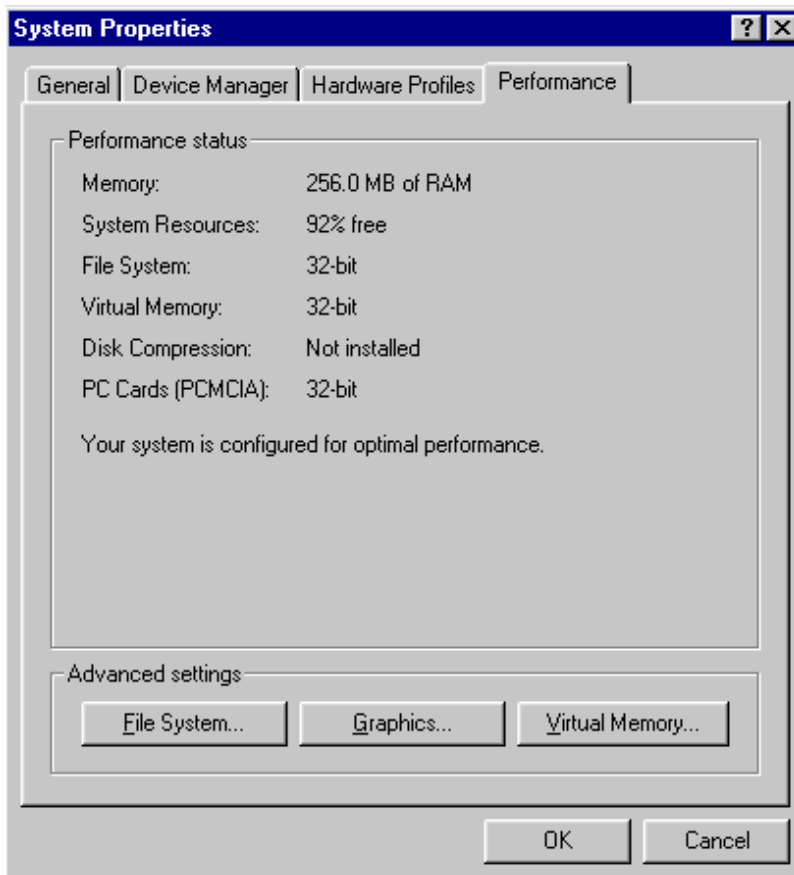
➤ Before the wireless LAN card driver can be installed, the 32-bit PC card driver must be installed correctly.

■ Checking the 32-bit PC card driver

1. Boot up the computer with which you will use the SL-1105.
2. Click <Start> and select [Control Panel] from the <Settings> menu.
3. Click the [System] icon on the {Control Panel} screen.
4. Select the [Performance] tab.

Make sure {32-bit} is shown next to [PC Cards (PCMCIA)].

➤ If {MS-DOS compatible mode} or {Not installed} is shown, install the 32-bit PC card driver for Windows 98.



5. Click <OK> and close the {System Properties} screen.

3 Using in a Windows 98 Environment

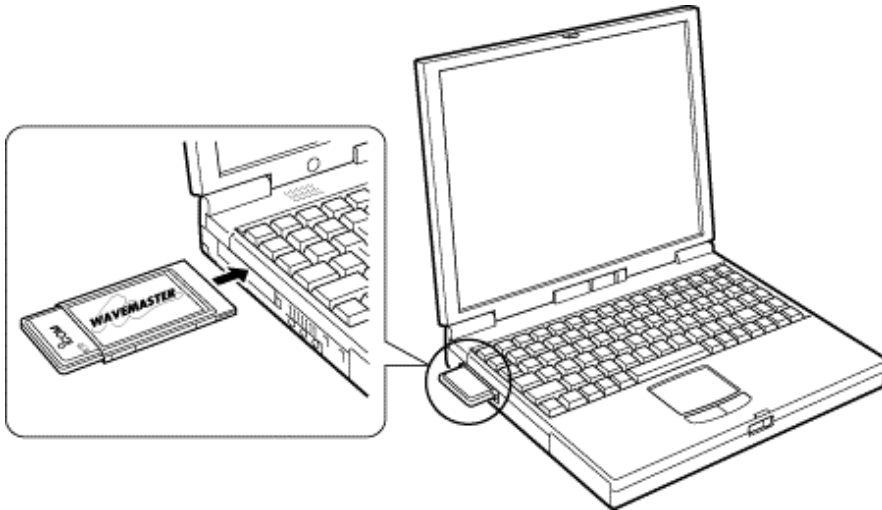
3-2 Installing the LAN Card Driver

Install the driver using the LAN Card Utility Software disks.

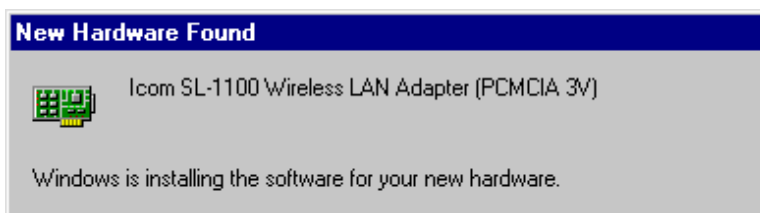
[IMPORTANT]

Make backup copies of the {SL-1105 LAN Card Utility Software} disks and use the backup disks for the operations described in this manual.

- 1.** Make sure the computer is turned OFF.
- 2.** Insert the wireless LAN card (hereinafter called "LAN card") into the PCMCIA slot of the computer with the WAVEMASTER label facing upward.
 - ⇒ The orientation of the slot may vary depending on the model of computer.



- 3.** Turn the computer on and startup Windows 98.
- 4.** The following message will appear automatically when the computer boots up and recognizes the LAN card.



- 5.** The {Add New Hardware Wizard} is displayed. Insert the backup disk containing the LAN card driver into the floppy disk drive (hereinafter called Drive A). Also, if you have a Windows 98 CD-ROM, insert it into the CD-ROM drive. Then click <Next>.



- 6.** Select [Search for the optimum driver for the new device (Recommended)] and click <Next>.



- 7.** The screen shown below is displayed. Select [Specify location] and enter the name of the directory (A:¥Win98) where the LAN card driver is located.



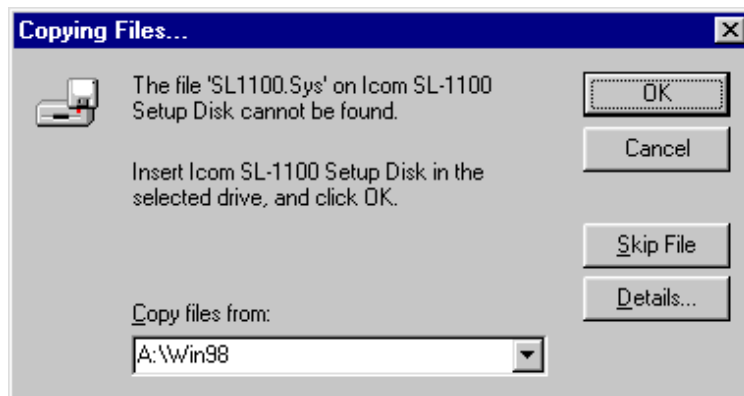
8. Click <Next> to begin searching for the driver. If the driver cannot be located, click <Back>, select [Specify location], and enter "A:¥" as the directory where the driver is located. Then click <Next> to repeat the search.



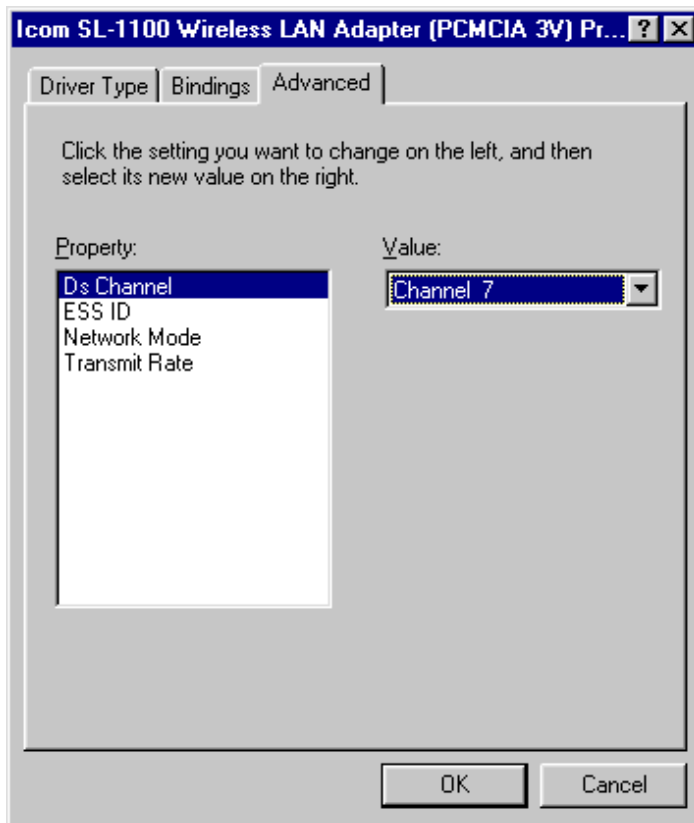
9. When the driver has been located, the screen shown below will be displayed. Click <Next>.



- 10.** Installation of the driver begins. When the {Copy Files} screen is displayed, enter A:\Win98 again as the copy source. Then click <OK>.

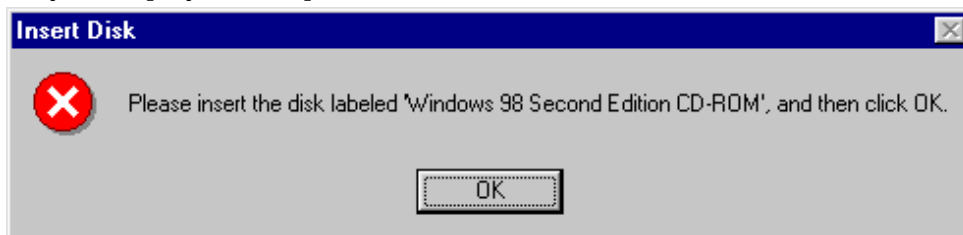


- 11.** After the driver has been copied, the {ICOM SL-1105 Wireless LAN Adapter (PCMCIA) Properties} screen is displayed. The default settings can be changed either now or after the installation. To change a setting value, click the corresponding text box. After changing settings (or to proceed without changing settings), click <OK>.
- ➡ When the SL-1105 Utility is used, other settings (in addition to those shown here) can also be changed and it is not necessary to restart the computer to activate the changes.



⇒ See ■ [Descriptions of SL-1105 setting items](#) for details regarding the setting items of the above Properties screen.

12. Depending on the configuration of the computer network, the {Insert Disk} screen may be displayed to request that the Windows 98 CD-ROM be inserted.



→ If this screen appears, click <OK> and the same screen as shown in Step 10 will be displayed. Enter the directory D:\win98 (where "D" designates the CD-ROM drive) for the copy source and click <OK>.

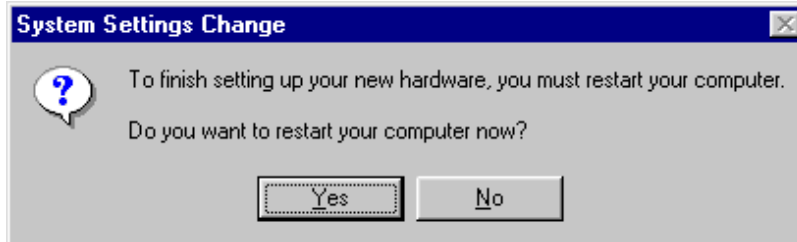
13. The screen shown below is displayed after the files have been copied and the database updated. Click <Finish>.



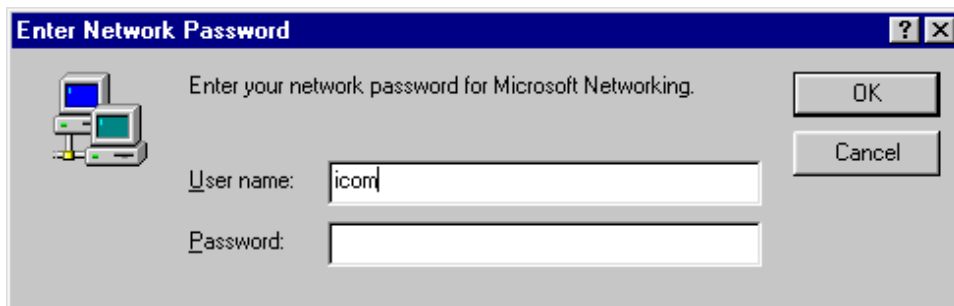
- 14.** Remove the backup disk containing the driver from the floppy disk drive.

Click <Yes> on the screen shown below.

The computer will restart to activate the settings.



- 15.** The screen shown below will be displayed after the computer restarts. Enter the user name and password in the text boxes.



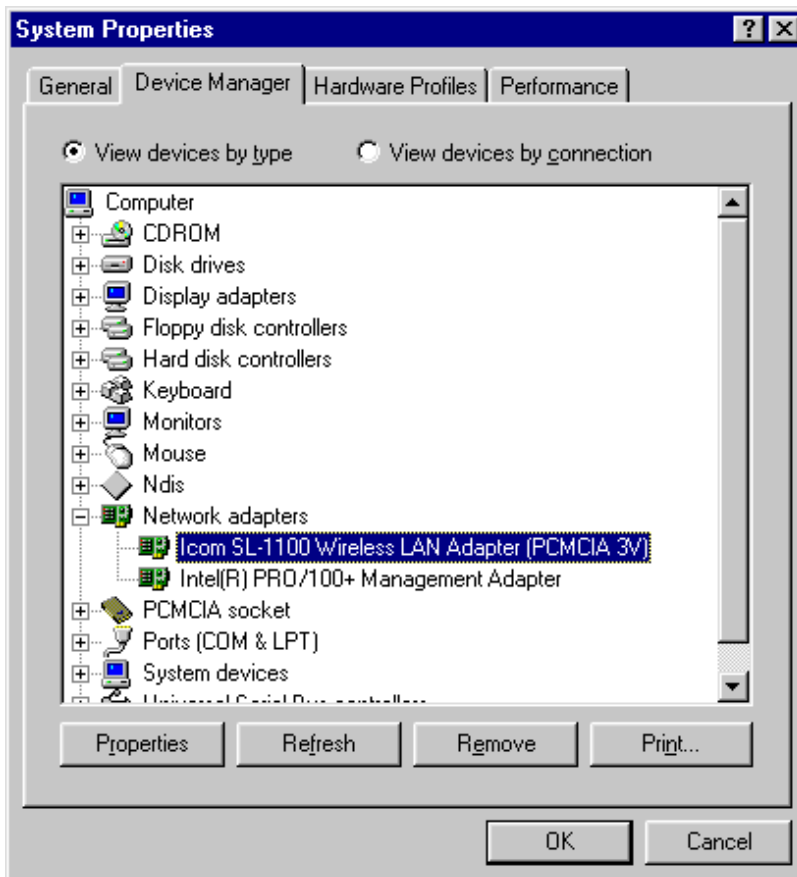
3 Using in a Windows 98 Environment

3-3 Checking the LAN Card Driver and System Resources

After installing the software, check for resource conflicts to make sure the SL-1105 is functioning properly on your computer.

- 1.** Click <Start> and select [Control Panel] from the [Settings] menu. Double-click the [System] icon and select the [Device Manager] tab.
- 2.** Double click [Network adapters].

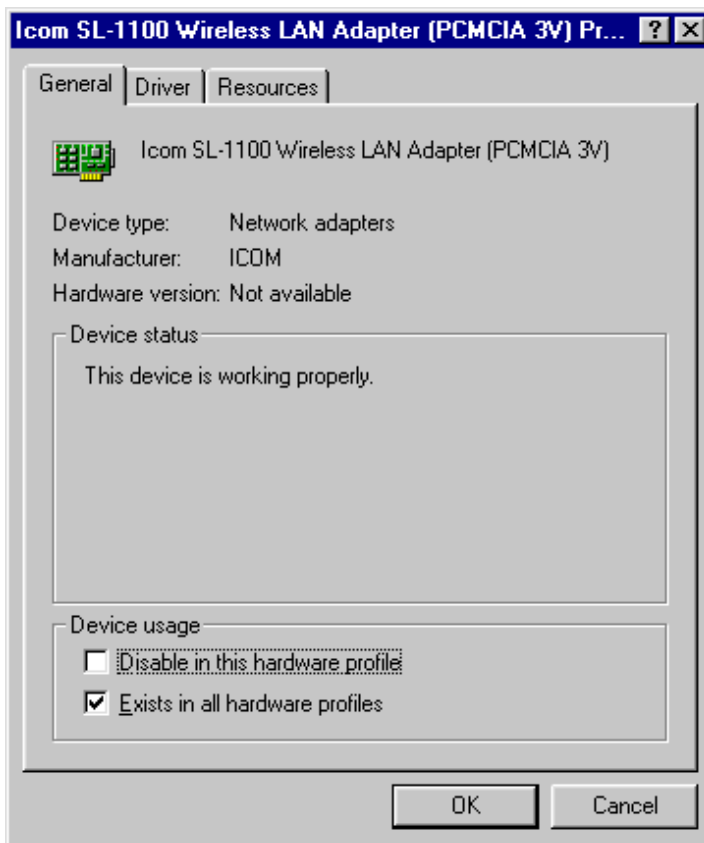
If the LAN card driver is installed correctly, {ICOM SL-1105 Wireless LAN Adapter (PCMCIA)} will appear as shown below.



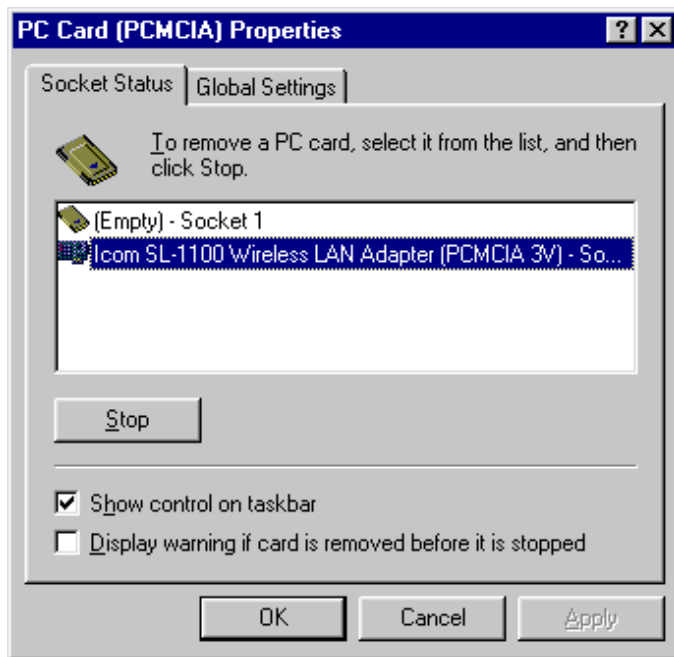
- 3.** If {Icom SL-1105 Wireless LAN Adapter (PCMCIA)} is displayed as shown above, proceed to Step 4. Otherwise check the following:

 - If {Icom SL-1105 Wireless LAN Adapter (PCMCIA)} is displayed under {Other devices} instead of {Network adapters}, uninstall the driver (Icom SL-1105 Wireless LAN Adapter (PCMCIA)) according to procedure described in {3-9 Uninstalling the LAN Card Driver.} Then reinstall the driver.
 - When software for a different wireless LAN card has already been installed, delete the driver for that LAN card and try installing only the driver for the SL-1105.
- 4.** Double click {Icom SL-1105 Wireless LAN Adapter (PCMCIA).} in the screen as in Step 2.

 - Make sure "This device is working properly" appears under [Device status] on the [General] tab of the Properties screen.



5. Click <Start> and select [Control Panel] from the [Settings] menu. Then double-click the [PC Card (PCMCIA)] icon.
 - If {Icom SL-1105 Wireless LAN Adapter (PCMCIA)} appears on the [Socket Status] tab as shown below and the reception lamp on the SL-1105 is flashing, the card is functioning properly.

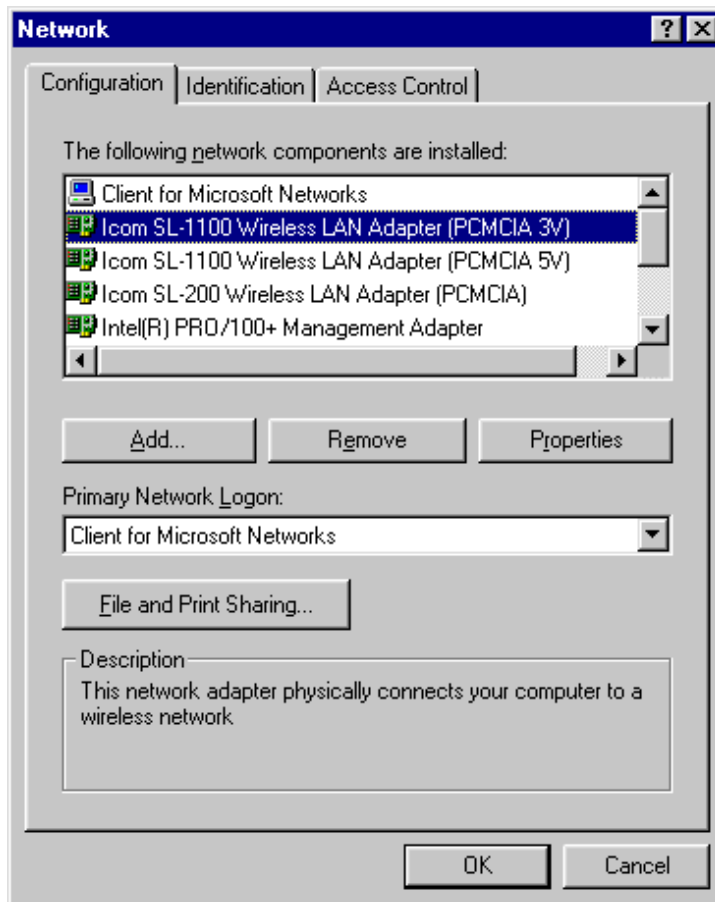


3 Using in a Windows 98 Environment

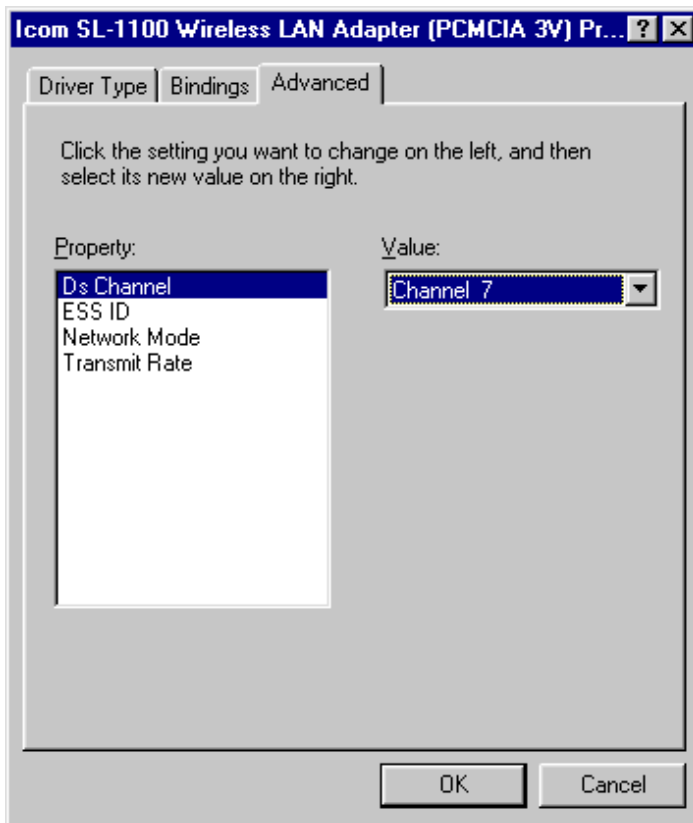
3-4 SL-1105 Settings

After making sure the SL-1105 is functioning properly, adjust the communication and security settings of the SL-1105.

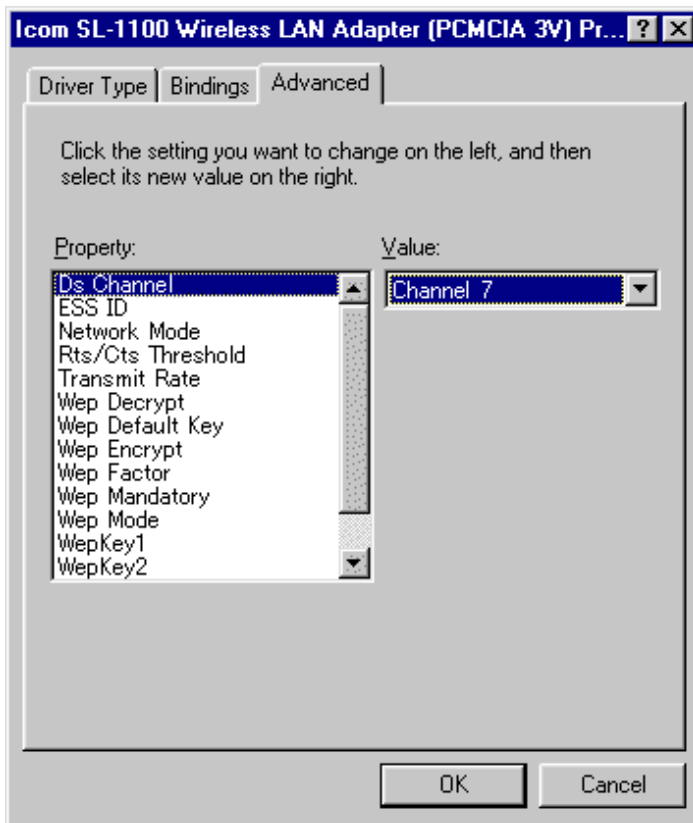
1. Click <Start> and select [Control Panel] from the [Settings] menu. Double-click the [Network] icon.



2. Double-click {Icom SL-1105 Wireless LAN Adapter (PCMCIA)} in the list of installed network components. Click the [Advanced] tab to display the screen shown below.
 - **Windows98**



- **Windows95**



3. To change a setting (property), click the name of the setting you wish to change.

- Then select the new value from the text box under [Value].

■ Descriptions of SL-1105 setting items

The settings encountered in {3-4 SL-1105 Settings} are described.

[Ds Channel]:default value = Channel 7

This setting item is the wireless transmission channel used for wireless network communications. It is valid when [Network Mode] is set to "Adhoc." Select the same channel as the other members of your wireless network group. The communication speed may decline when multiple wireless network groups (e.g., peer-to-peer) having different ESS IDs are configured within the same wireless transmission area.

This problem can be avoided by having each wireless network group use a

different channel, thus eliminating interference between groups. However, since interference may continue to occur when closely neighboring channels are used, select channel settings that are at least four channels apart when using multiple wireless network groups.

⇒ When adjusting channels, be sure to select channels that will not interfere with the signals other wireless devices.

⇒ When [Network Mode] is set to "Infrastructure", Channels 1 to 14 are scanned sequentially.

[ESS ID]: default value = LG

This setting item serves as an arbitrary name for identifying a group within the wireless network. It is used when multiple wireless network groups (e.g., peer-to-peer) are configured within the wireless transmission area and there is network information that should not be viewed by other wireless network groups. Enter the same name as the other members of your wireless network group.

⇒ When entering the ESS ID, use up to 32 alphanumeric characters. Upper and lower case are distinguished.

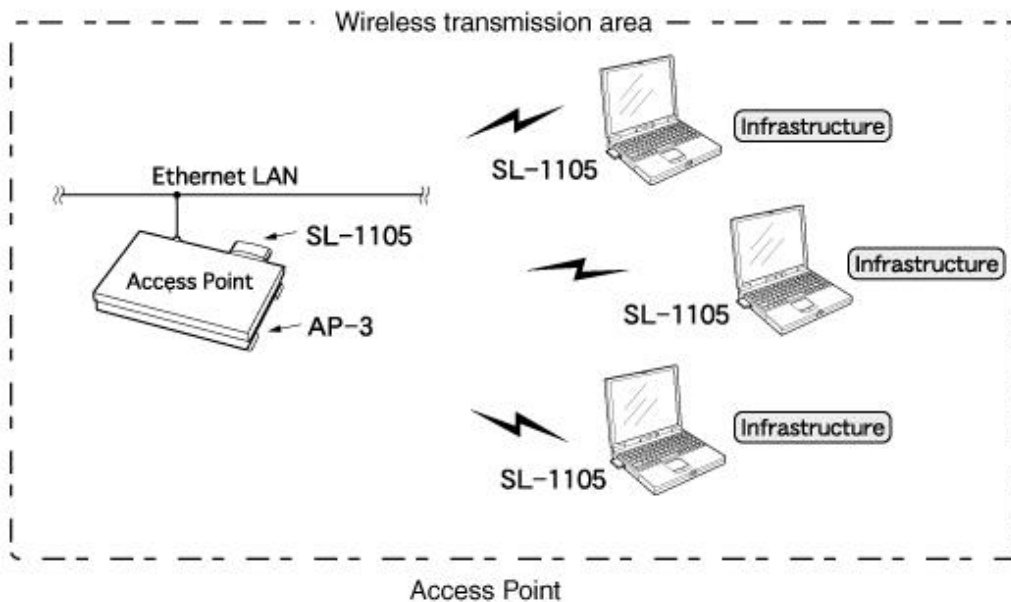
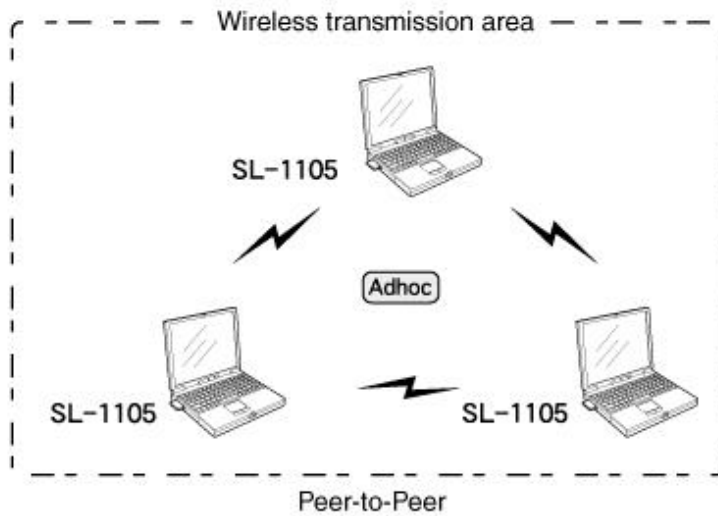
⇒ The ESS ID is distinguished from the "Workgroup Name" setting used on the wired network, but we recommend using the same name if possible.

[Network Mode]: default value = Infrastructure

This setting item establishes what kind of communication arrangement your computer will use to connect with the wireless network using the SL-1105. Refer to the figures below and select the appropriate connection method.

- Adhoc : peer-to-peer connection
- Infrastructure : connection via access point

■ Communication arrangements



➔ See "[4-5 Relationship between the Wireless Network and Station Type](#)" for details regarding the Network Mode.

[Transmit Rate]:default value = Automatic

This setting item is used to set the wireless transmission rate used when the LAN card transmits data.

The transmission range is approximately 50 m indoors and 150 m in an open space.

When the transmission rate is set to 11 Mbps, the transmission range is approximately 30 m indoors and 70 m in an open space.

☞The LAN card can receive wireless data transmissions at rates of 1 to 11 Mbps regardless of the value of this setting.

[Rts/Cts Threshold]:default value = No Rts/Cts

This setting item is used to establish whether or not RTS/CTS (request to send/clear to send) negotiations are conducted before data is exchanged with another computer.

When negotiations are conducted, data transmission begins when the other party responds.

For example, if this setting item is set to 500 bytes, then when the amount of data to be sent exceeds 500 bytes, the size of one packet of data sent for the purpose of negotiations is 500 bytes.

☞This item is only displayed when Windows 95 is used.

[Wep Decrypt]:default value = No

This setting item establishes whether or not encrypted packets will be decrypted when they are received.

☞This item is only displayed when Windows 95 is used.

[Wep Default Key]:default value = 1

This setting item is used to select the key number (WepKey1 to WepKey4) used for encrypted transmission.

☞This item is only displayed when Windows 95 is used.

[Wep Encrypt]:default value = No

This setting item is used to select whether or not packets to be sent will be encrypted.

☞This item is only displayed when Windows 95 is used.

[Wep Factor]:default value = 0

This setting item is used to establish the security level. "0" indicates the highest degree of security.

{0} = updates internal encryption key for every packet.

{1} = updates internal encryption key every five packets.

{2} = updates internal encryption key every ten packets.
{3} = updates internal encryption key every fifty packets.

☞ This item is only displayed when Windows 95 is used.

[Wep Mandatory]: default value = No

This setting item is used to establish whether or not a received packet will be destroyed if it is not encrypted.

☞ This item is only displayed when Windows 95 is used.

[Wep Mode]: default value = 64-bit encryption

This setting item is used to select the number of encrypted bits.

☞ This item is only displayed when Windows 95 is used.

[WepKey1-WepKey4]: default value = 0000000000...

For this setting item, enter a string of base-16 numerals (0 to F) with a length corresponding to the number of bits selected for [Wep Mode].

☞ This item is only displayed when Windows 95 is used.

3 Using in a Windows 98 Environment

3-5 Connecting to a Wireless Network

■ Example of settings for peer-to-peer connection

After completing the SL-1105 settings, it is necessary to specify information (i.e., computer name and workgroup name) that identifies your computer within the network. The procedure is explained briefly here, but see the explanation regarding networks in Windows 98 First Step Guide for details.

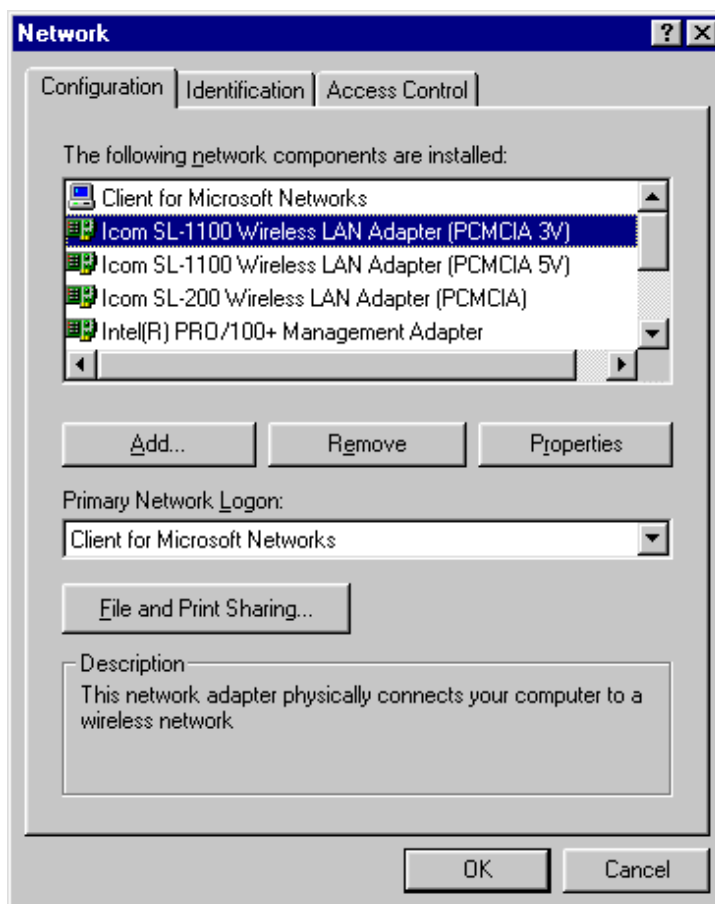
A. Checking and adding protocol

If the LAN card driver has been installed correctly, the following protocols will have been installed in the computer:

- "TCP/IP"
- "Client for Microsoft Networks"

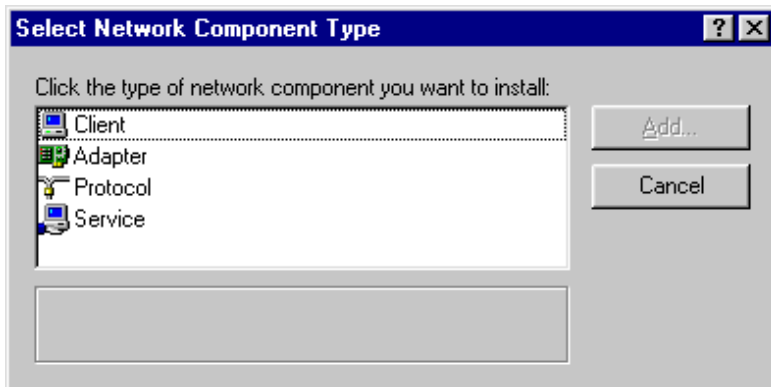
[How to check the protocol]

1. Click <Start> and select [Control Panel] from the [Settings] menu. Then double-click the [Network] icon. The screen will appear as follows:



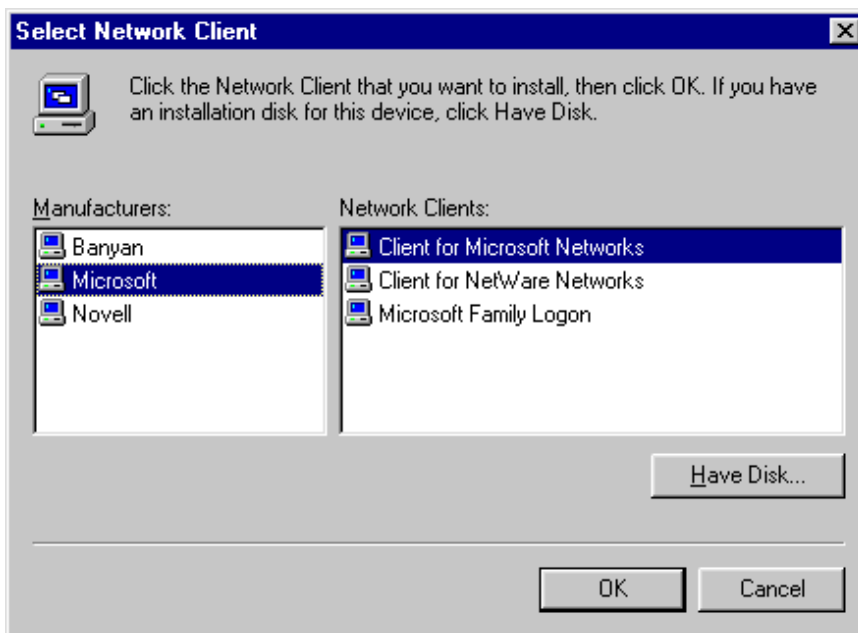
2. If the previously mentioned protocols are not in the list of installed network components, click [Add].
3. The {Select Network Component Type} screen is displayed. To install a client for Microsoft Networks, double-click [Client]. To install TCP/IP protocol, double-click

[Protocol].

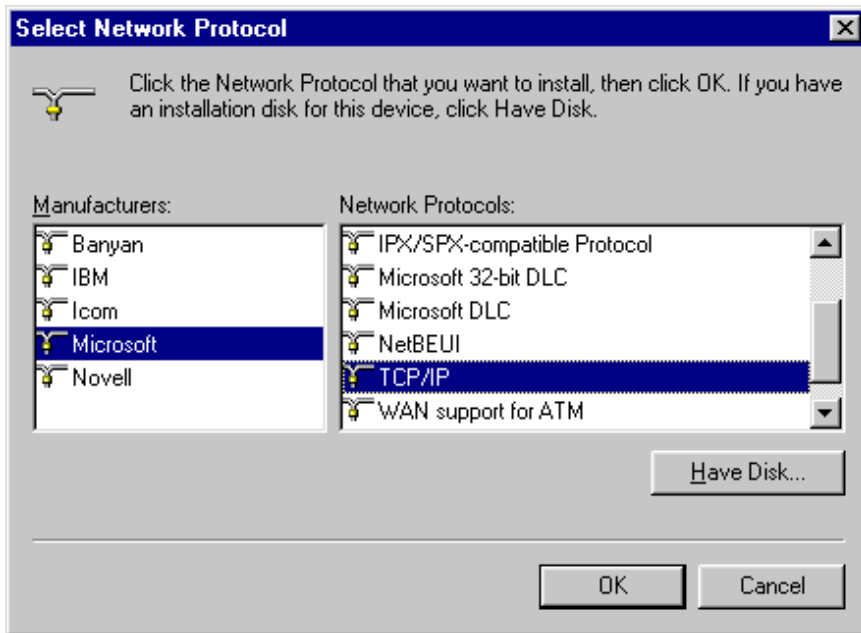


4. One of the following two screens is displayed. For either case, select [Microsoft] as the manufacturer.

- **Client installation**



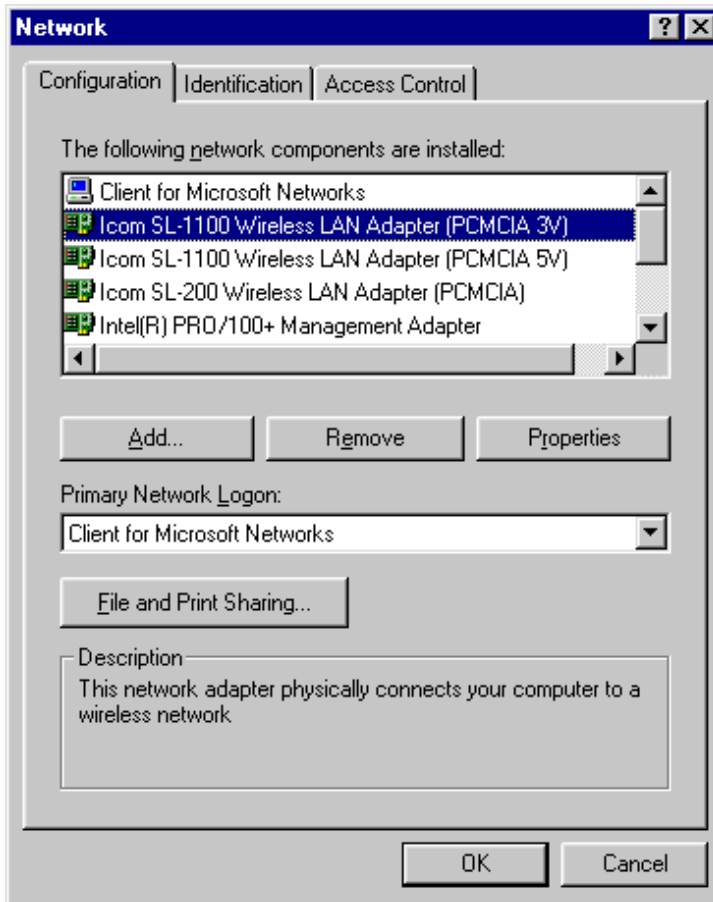
- **Protocol installation**



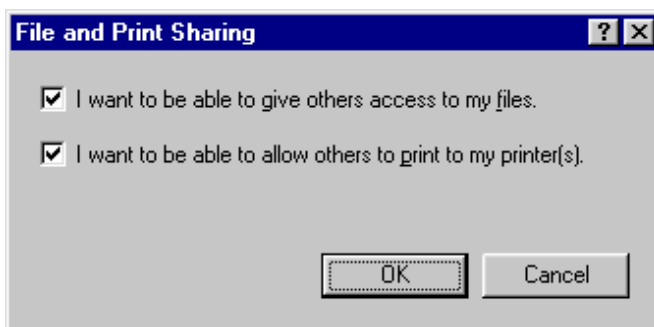
- 5.** When installing a client, select {Client for Microsoft Networks} under [Network Clients]. When installing a protocol, select {TCP/IP} under [Network Protocols].
- 6.** Click [OK].
- 7.** Click [OK] on the {Network} screen.
- 8.** Restart your computer.

B. Adding Microsoft Network Sharing Service

- 1.** Click <Start> and select [Control Panel] from the [Settings] menu. Then double-click the [Network] icon. The screen will appear as follows:



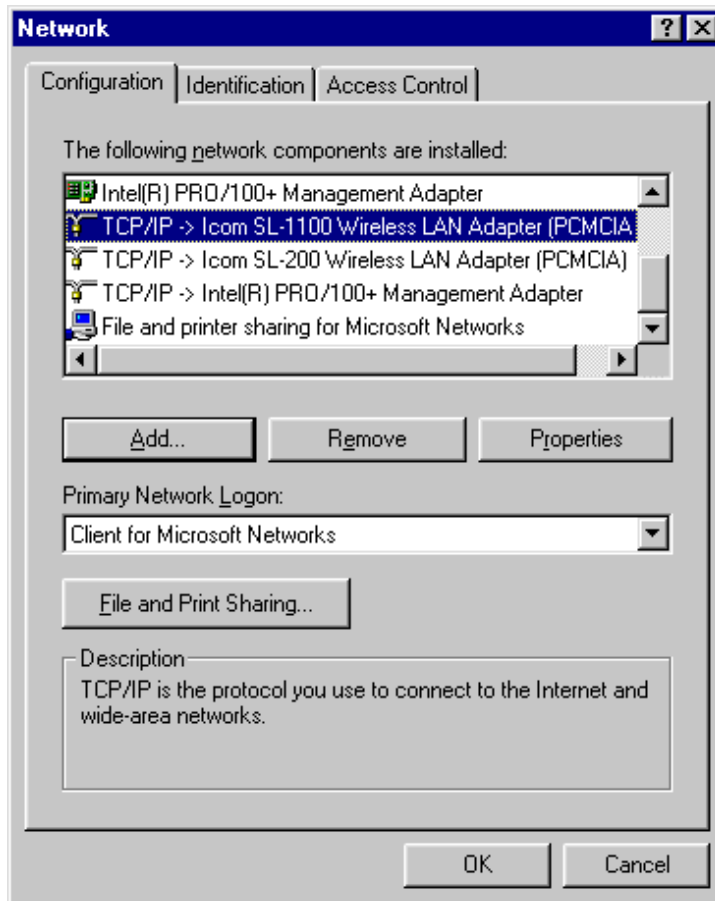
2. Click <File and Printer Sharing...>.
3. Select both check boxes and click <OK>.



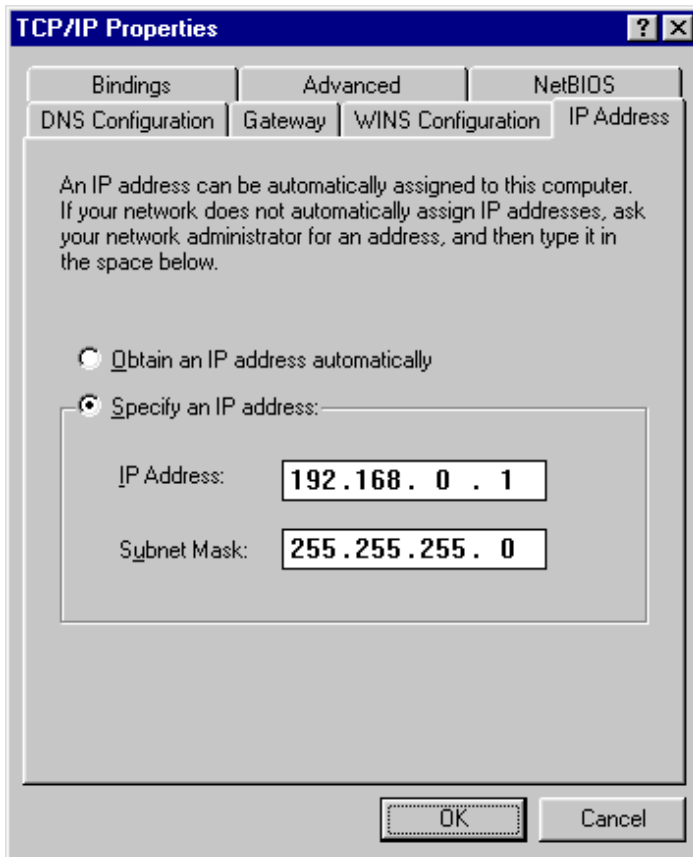
4. Make sure that {Microsoft Network Sharing Service} appears in the list of installed network components.

C.TCP/IP settings

1. Click <Start> and select [Control Panel] from the [Settings] menu. Then double-click the [Network] icon. The screen will appear as follows:



2. Double-click {TCP/IP -> Icom SL-1105 Wireless LAN Adapter (PCMCIA)} in the list of installed network components.
3. The screen shown below is displayed. Select [Specify an IP address] and enter the appropriate numerals next to [IP Address] and [Subnet Mask].



4. Click <OK> and close the screen.

[NOTE]

The IP address comprises four values ranging from 1 to 255 separated by periods. The first part (network address) and the last part (broadcast address) of the IP address are handled as special addresses. Do not assign a value for these two parts of the IP address.

Also, do not assign the same IP address as any other device in the network.

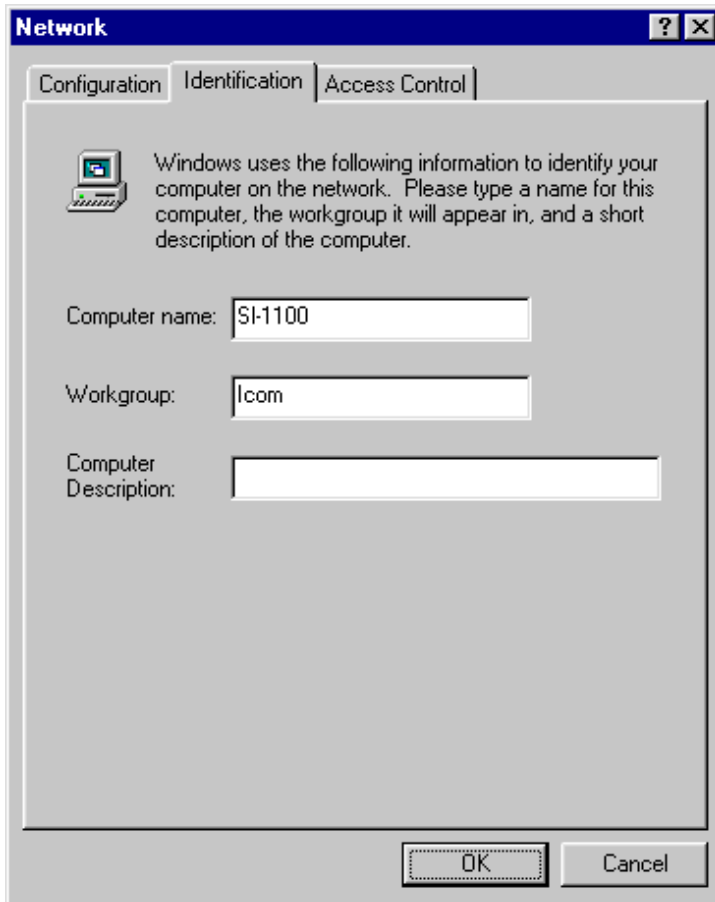
The subnet mask comprises four values (0 and 255) separated by periods.

Assign the same value for the subnet mask as is used by all other devices in the network.

D. Identification settings

1. Click <Start> and select [Control Panel] from the [Settings] menu. Then

double-click the [Network] icon and select the [Identification] tab. The screen will appear as follows:



2. Enter the appropriate character string values into the text boxes under [Computer Name], [Workgroup], and [Computer Description].
The values can be any combination of 32 alphanumeric characters.

[Computer name]

This setting item is used to establish a name to identify each computer in the network. Do not use the same name as any other computer in the same network group.

[Network group]

All computers in the same network group must enter the same name for this setting item.

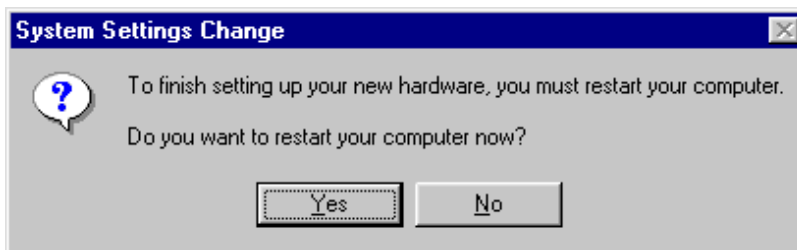
- When a wireless network ESS ID is used, use the same name for the ESS ID of all

computers on the same network group. (See "3-4 SL-1105 Settings.")

[Computer description]

If necessary, enter a brief description of your computer.

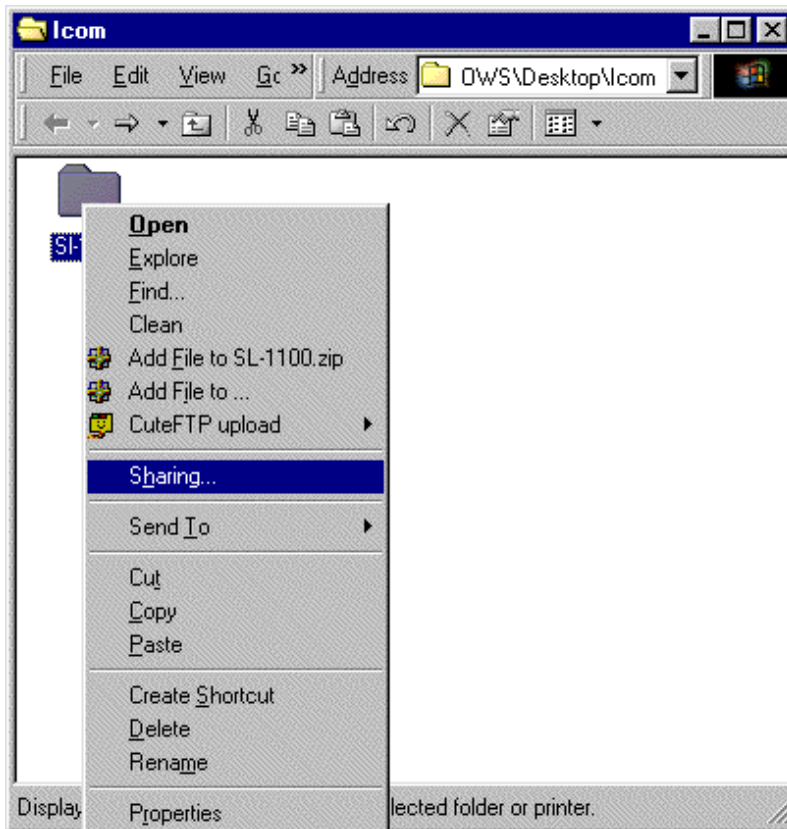
- 3.** Click <OK> and close the screen.
- 4.** When the following message appears, click <YES> to restart the computer.



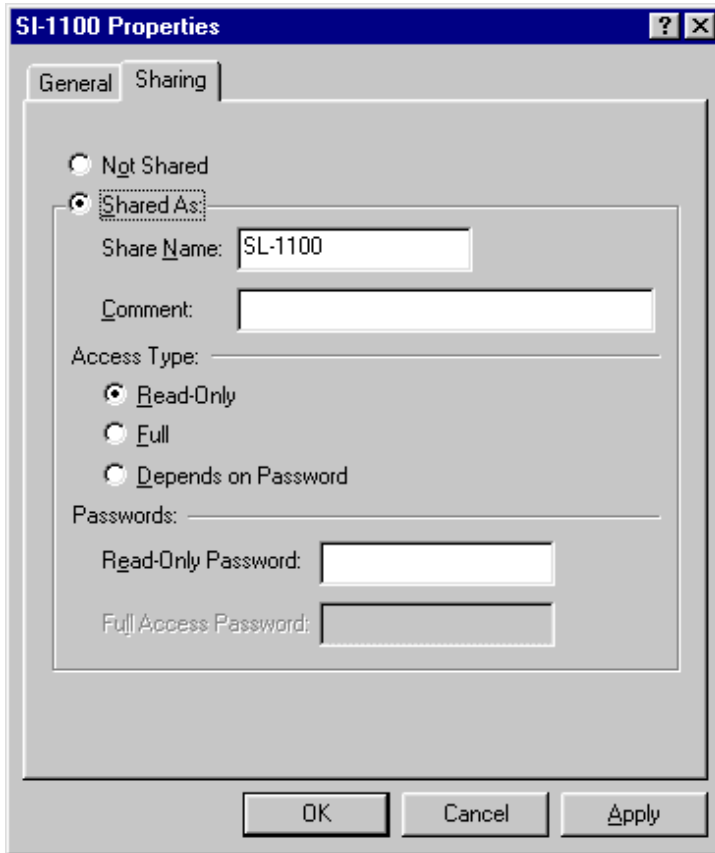
- ⇒ When the computer restarts, a dialog box requesting your network password will appear. Enter your user name and password.

E. Sharing folders

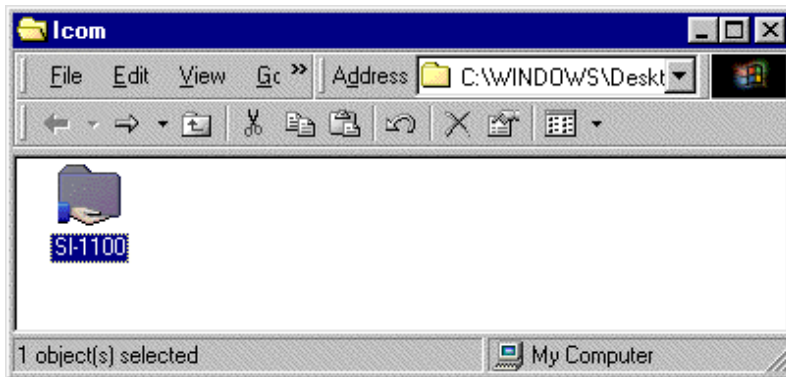
- 1.** Open the window, such as [My Computer] (whose icon is located on the desktop), containing the folder you wish to share.
- 2.** Right click the folder.
- 3.** Select [Share] from the shortcut menu.



4. Select [Share] and check or change the setting values for [Shared name], [Comments], [Access type], and [Password]. Then click <OK>.



5. The hand image on the SL-1105 folder indicates its status as a shared resource.

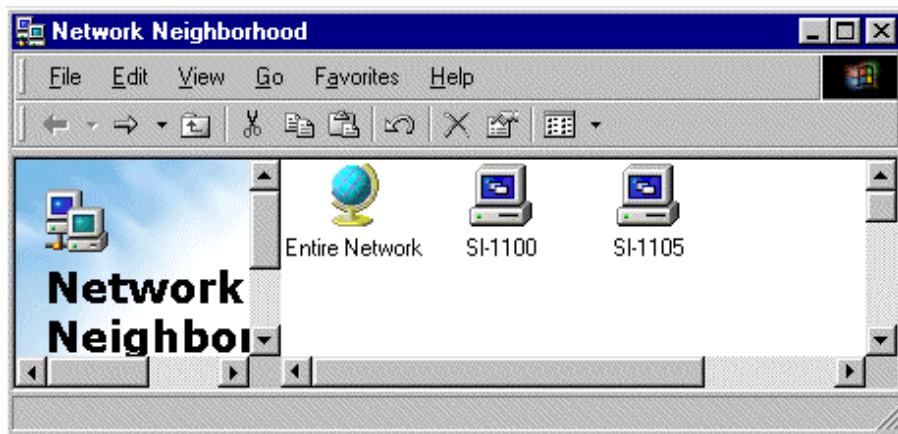


3 Using in a Windows 98 Environment

3-6 Checking the Wireless Network Connection

After completing the settings needed for connecting to the network, check if you can access the shared folders located in the other computers of your workgroup. Double-click the [Network Computer] icon and display the screen shown below. You have a good connection with the network if the screen includes each of the following: the [Entire Network] icon, an icon for your computer, and icons for the other members of your workgroup.

- Use the [Entire Network] icon to view a list of other computers that are connected to network groups to which your computer does not belong (i.e., network groups with a different workgroup name). However, the list does not include computers belonging to network groups using different ESS IDs than the network group to which your computer belongs. Adjust the ESS ID appropriately for each network group when it is necessary to prevent some groups from viewing information regarding other groups.



[NOTE]

It takes a few moments for the icons of the other computers in your workgroup to appear when [Network] is selected. Similarly, it takes a few moments for the network list to appear when [Entire Network] is selected. If all of the icons do not appear, open the {Network} screen again. If the complete list still does not appear, try reviewing the information provided in the next section ("3-7 What to Do When the Other Computer(s) Cannot Be Recognized") or consult with the network manager.

3 Using in a Windows 98 Environment

3-7 What to Do When the Other Computer(s) Cannot Be Recognized

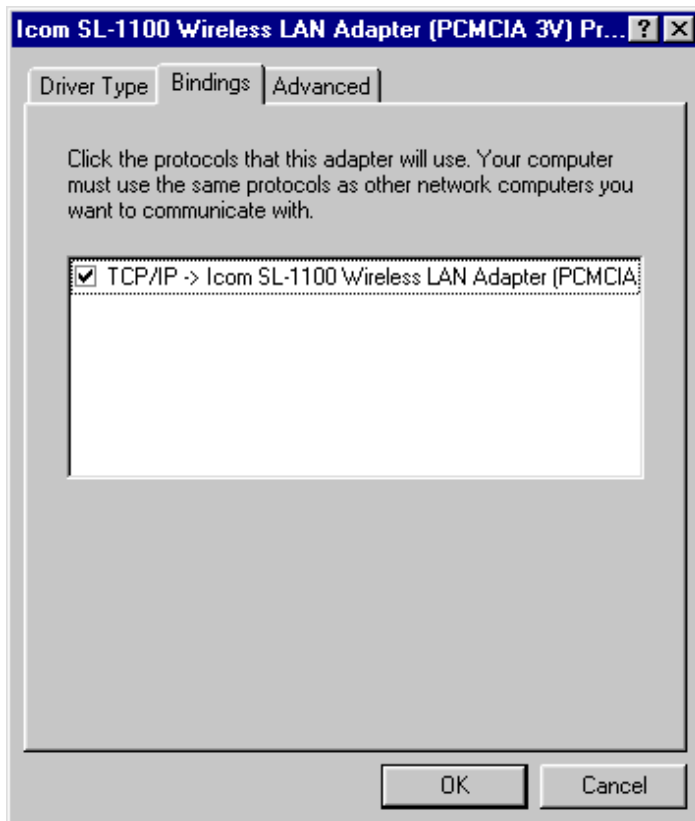
Compare the settings with those of the other computers in the network as follows:

- Check if the other computers in your network are using the same protocol.

[How to check]

Click <Start> and select [Control Panel] from the [Settings] menu. Double-click the [Network] icon. Then double-click [TCP/IP-> Icom SL-1100 Wireless LAN Adapter (PCMCIA)] in the list of installed components.

Click the [Bindings] tab and make sure the check boxes for the protocols you are using are selected.



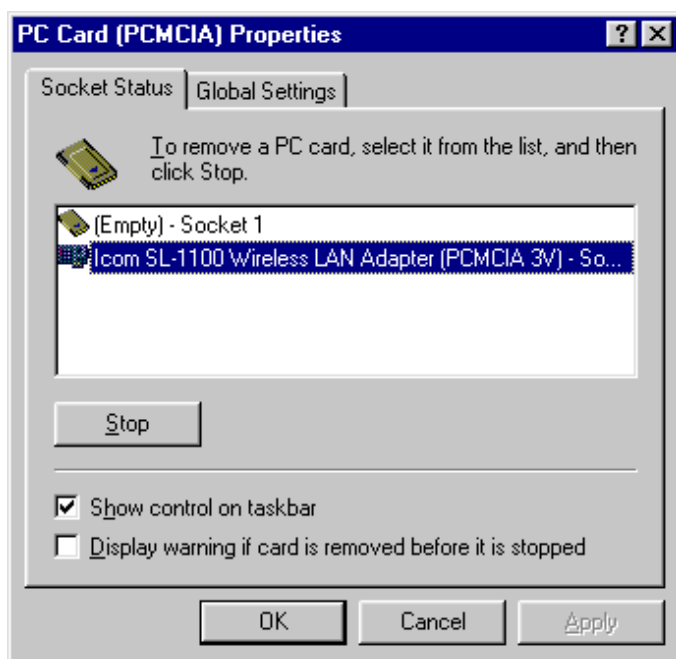
- If the computers are being used as clients for Microsoft Networks, check if the Microsoft Network Sharing Service is installed.
- Check if the computers in your workgroup are using the same ESS ID (make sure upper and lower case letters match).
- Check if the network mode is set properly.
- Check if the computers in your workgroup are using the same DS channel.
- Check if the computers in your workgroup are using the same workgroup name.
- Check if settings have been made which give your computer the right to access (share with) the other computers belonging to your workgroup and other workgroups.
- Check if the other computers belonging to your workgroup and other workgroups are using security (encryption) settings. (The security setting can be viewed and changed using the SL-1105 Utility.)
- If you are using TCP/IP, check if IP addresses for each computer are correct.
When the IP addresses are obtained from a DHCP server or a DNS server, the server must also be able to connect with the wireless network used by the SL-1105.
- For other possible causes, see "Troubleshooting" in the Windows 98 Help menu.

3 Using in a Windows 98 Environment

3-8 Removing the SL-1105 from the Card Slot

Follow the procedure below to remove the SL-1105 correctly. Otherwise the system may run out of control.

1. Click <Start> and select [Control Panel] from the [Settings] menu. Then double-click the [PC Card (PCMCIA)] icon.



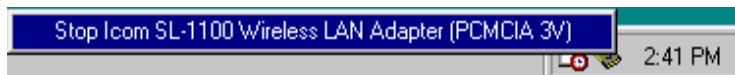
2. Click {Icom SL-1105 Wireless LAN Adapter (PCMCIA)} and then click <Stop>.
3. The message shown below is displayed after a few moments. Click <OK> and remove the SL-1105 from the card slot. Then click <OK> on the {PC Card (PCMCIA) Properties} screen.



[NOTE]

If you select the check box next to "Show control on task bar" on the [PC Card (PCMCIA) Properties] screen, the [PC Card] icon will be displayed in the task tray on the bottom right of the desktop screen.

You can arrive at the message shown in Step 3 above by clicking this icon and clicking the appropriate item from those displayed.



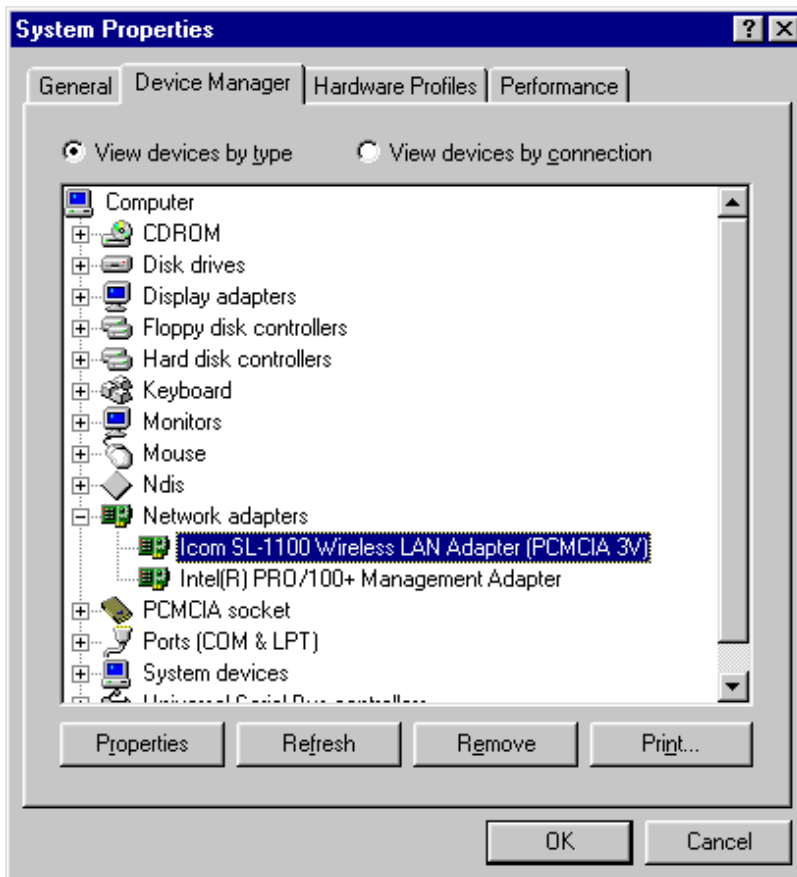
3 Using in a Windows 98 Environment

3-9 Uninstalling the LAN Card Driver

■ Deleting the driver using the My Computer icon

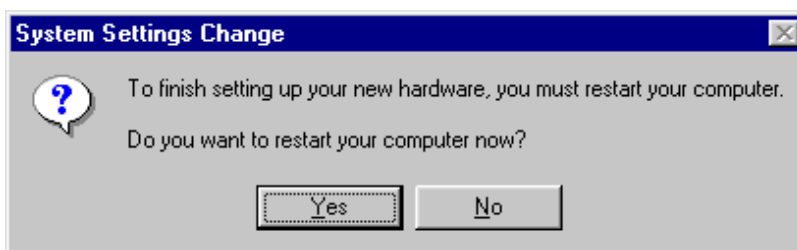
Follow the procedure below to delete the LAN card driver from the Properties screen of My Computer (located on the desktop).

- 1.** Click <Start> and select [Control Panel] from the [Settings] menu. Double-click the [System] icon and select the [Device Manager] tab.
- 2.** Double-click {Network adapters} and select {Icom SL-1100 Wireless LAN Adapter (PCMCIA)}.



3. Click <Remove>. The message "Restart computer now?" is displayed. Click <Yes>.

The computer restarts and the uninstallation is complete.



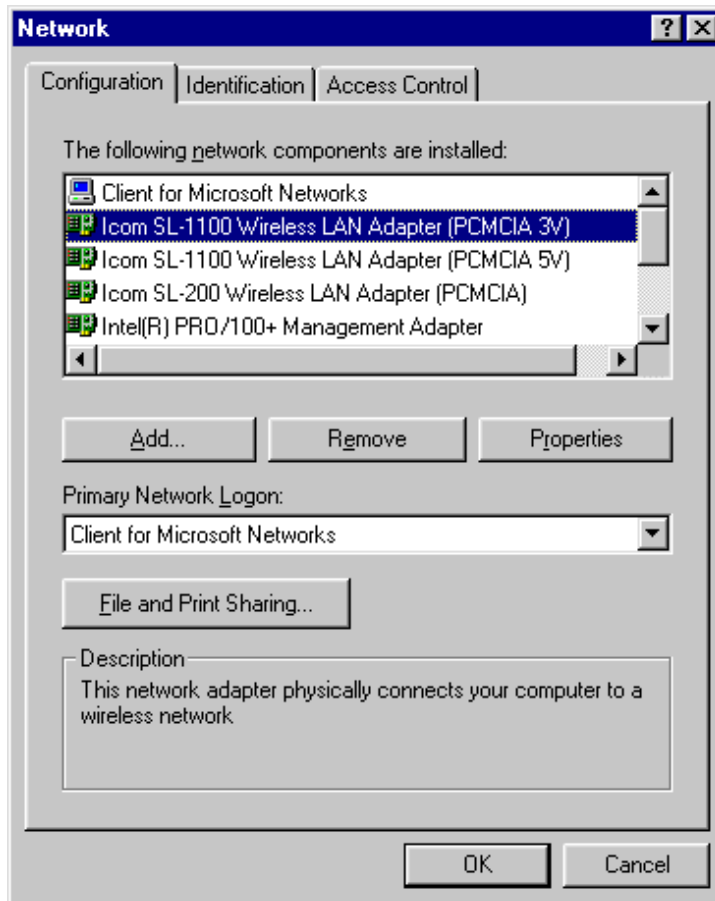
■ Deleting the driver using the Network icon

Follow the procedure below to delete the LAN card driver from the Network screen of Control Panel.

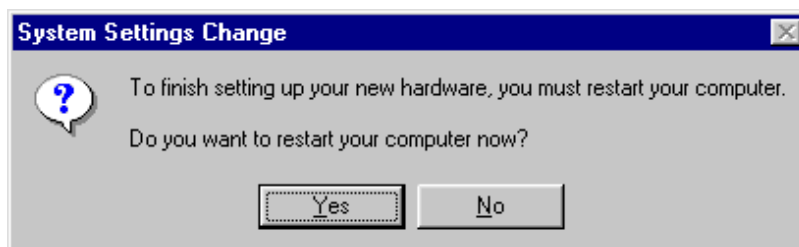
1. Click <Start> and select [Control Panel] from the [Settings] menu. Double-click the

[Network] icon.

2. Double-click {Network Adapters} and select {Icom SL-1105 Wireless LAN Adapter (PCMCIA)}.



3. Click <Remove> and follow the instructions on the screen. When the message "Restart computer now?" is displayed, click <Yes>. The computer restarts and the uninstallation is complete.



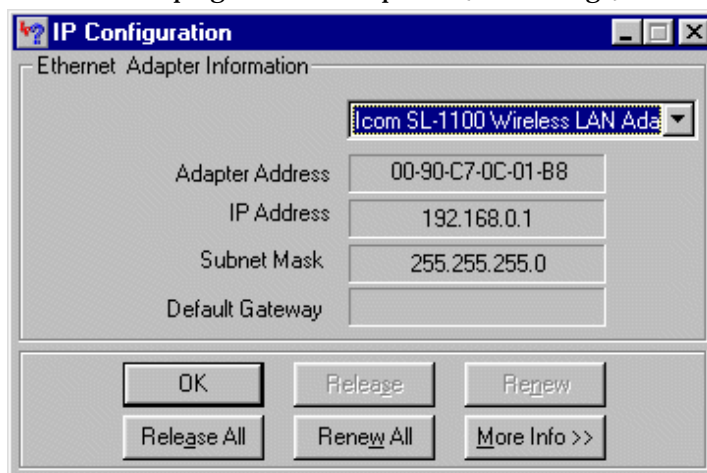
3 Using in a Windows 98 Environment

3-10 Checking the Network Setting Values

Follow the procedure below to check the IP address. The IP address can be checked or reacquired by executing "winipcfg.exe," which is located in the Windows folder.

[How to start winipcfg.exe]

1. Click <Start> and select <Run>.
2. Type "winipcfg" in the command box and press the Enter key.
 - When winipcfg.exe starts up, the {IP Settings} screen will be displayed:



3. Click the [Down Arrow] on the right side of the text box and select "Icom SL-1105 Wireless LAN Adapter." The setting values are displayed.
 - Adapter address : MAC address of the computer
 - IP address : IP address of the computer
 - Subnet mask : Net mask associated with the IP address of the LAN side of the computer

4 Using the Settings Utility

4-1 About the ICOM SL-1105 Utility

The ICOM SL-1105 Utility can be used to change the settings of the SL-1105 without restarting your computer and to monitor the settings and communication status of the computers operating in the wireless network group area.

➤ **Windows 95 does not support this utility.**

4-2 Installing the ICOM SL-1105 Utility

Install the driver using the LAN Card Utility Software disks.

[IMPORTANT]

Make backup copies of the {SL-1105 LAN Card Utility Software} disks and use the backup disks for the operations described in this manual.

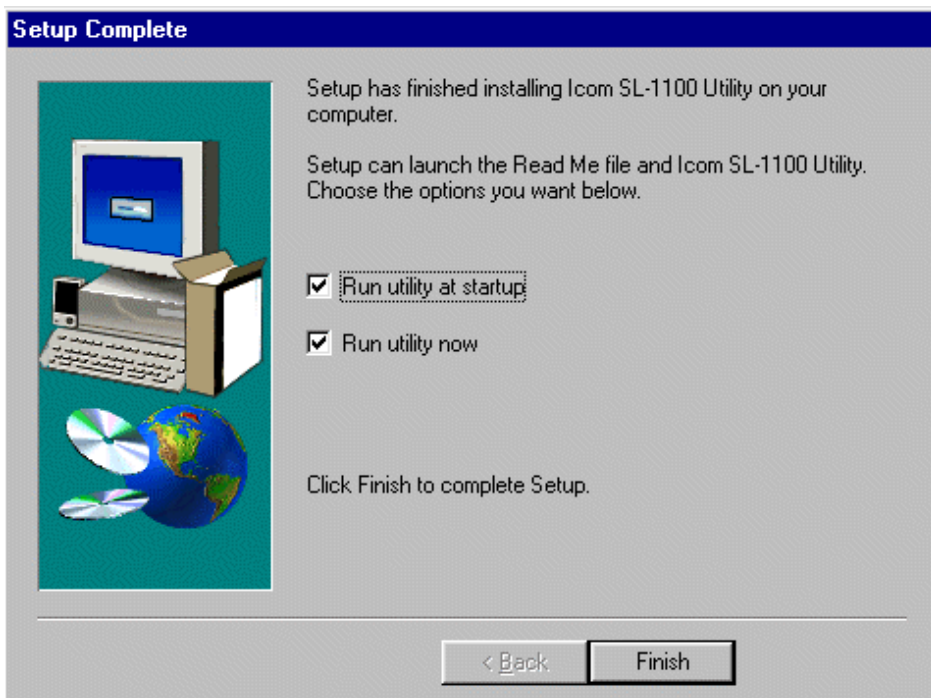
- 1.** Close all applications that are running on your computer.
- 2.** Insert the backup disk containing the {SL-1105 LAN Card Utility Software} into the floppy disk drive (Drive A).
- 3.** Click <Start> and select [Run].
- 4.** Enter {A:¥Utils¥Setup.exe} in the command box and press the Enter key. When the setup program starts up, the screen shown below will be displayed. Follow the instructions on the screen.



5. Click the check boxes to adjust the optional settings as desired.

Then click [Finish].

- If you select [Run automatically after Windows starts up], the Utility will be registered in the Windows Startup folder and will start up simultaneously with the operating system.



4 Using the Settings Utility

4-3 Starting and Terminating the ICOM SL-1105

Utility

1. Make sure the SL-1105 is inserted in to the PCMCIA card slot.
2. Click <Start> and select [Icom SL-1105 Utility] from the [Program] menu. The Utility starts up and an icon indicating that the Utility is running is displayed on the task bar.

■ One of the following three icons is displayed to indicate the status of the card.



→ This icon indicates that the SL-1105 is inserted into the card slot and the [Network Mode] is set correctly.

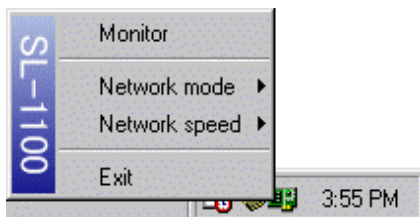


→ This icon indicates that the computer cannot recognize the SL-1105. Possible causes include the driver being installed incorrectly.



→ This icon indicates either that the [Network Mode] is not set correctly for the wireless network being used or that the SL-1105 is outside the wireless transmission area.

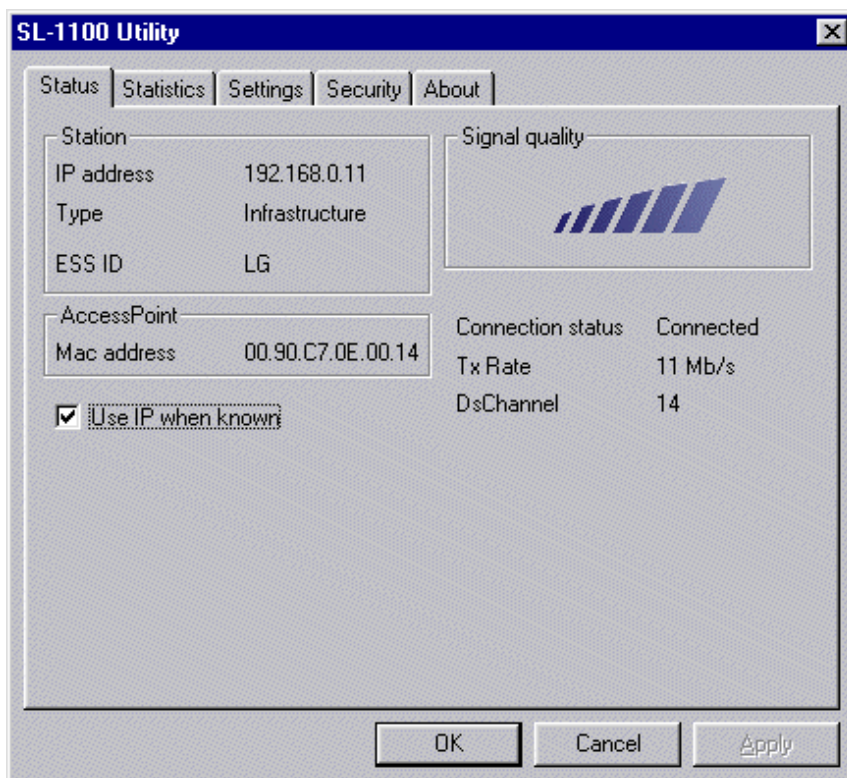
3. Right-click the SL-1105 Utility icon on the task bar.
Select "Display Monitor" from the menu that appears.



- When the {Icom SL-1105 Utility} is running in the computer, the icon mentioned above will be displayed on the task bar.

The {Icom SL-1105 Utility} will start up even if the LAN card is not inserted, but the settings on the [Communication Settings] tab cannot be changed.

4. When communications are already in progress, the screen appears as follows:



5. Click <OK> to close the SL-1105 Utility screen.
6. To shut down the [Icom SL-1105 Utility], right-click the SL-1105 Utility icon on the task bar and select "Shut Down" from the menu that appears.
 - The SL-1105 Utility icon disappears and the utility shuts down.

■ Button descriptions

<OK> → Saves the setting changes and closes the screen

<Cancel> → Closes the screen without changing the settings

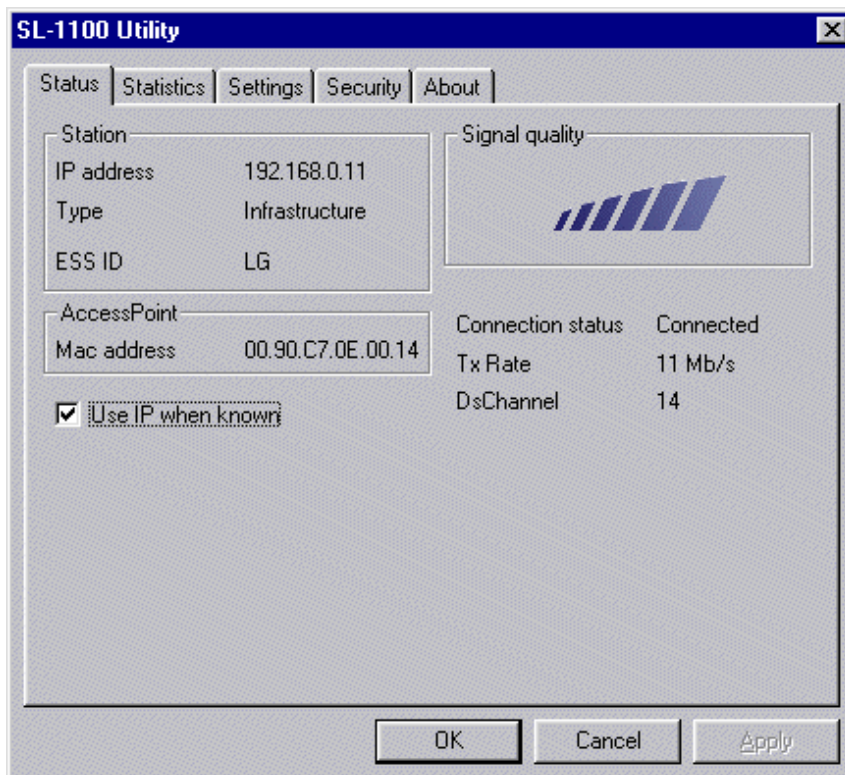
<Apply> → Saves the setting changes without closing the screen

4 Using the Settings Utility

4-4 Description of the ICOM SL-1105 Utility

Screen Tabs

■ [Communication Status] tab



[Station] tab

This area displays information (IP address, network mode, ESS ID, MAC address) regarding the SL-1105 installed in your computer.

- When the IP address is unknown, the MAC address of the LAN card installed in the card slot is displayed.

Signal quality (strength)

This area displays the strength of the signal received from the coordinator.

- When using peer-to-peer communications, the signal strength is always indicated at the maximum level because the beacon signal emitted from your own station is received.

Access point

This area displays information (MAC address or IP address) regarding the access point that can be accessed by the SL-1105.

- The status of the check box next to "Display IP address" determines whether the MAC address or the IP address is displayed. When the check is removed, the MAC address is displayed.

Display IP address

When the check is removed from the check box, both the station and access point addresses are indicated as a MAC address. When the IP address is unknown, the IP address cannot be displayed and the MAC address is displayed by default.

Communication status

This item indicates the current communication status.

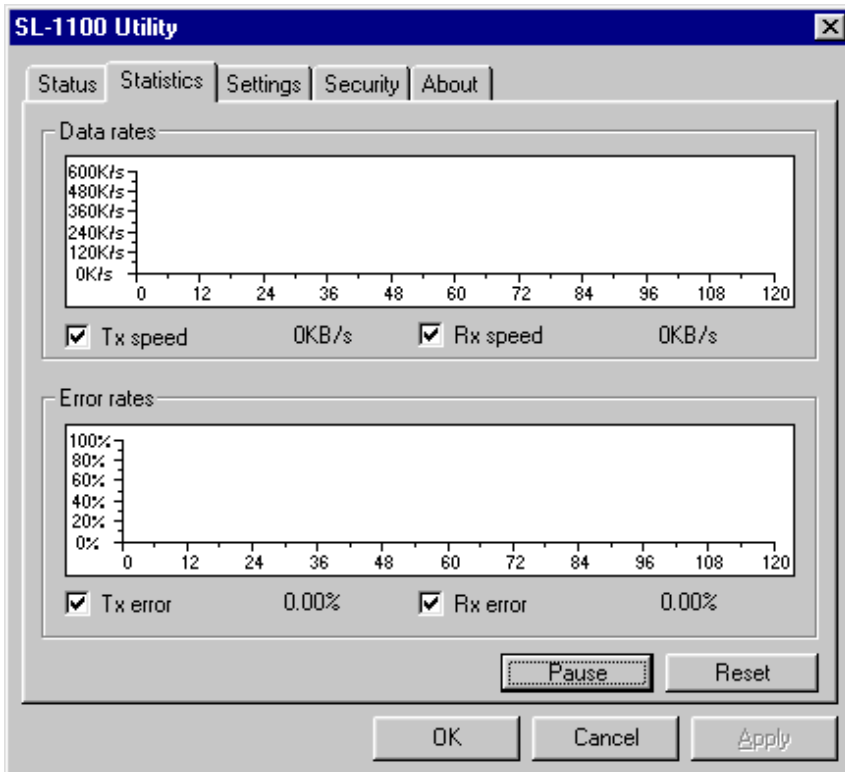
Transmission speed

This item indicates the current transmission speed setting.

DS channel

This item indicates current DS (direct spread) channel setting.

- [Communication Statistics] tab



<Stop Diagnostics> → This button stops displaying the graphs of the diagnostic results.

<Start Diagnostics> → This button starts displaying the graphs of the diagnostic results.

<Reset Statistics> → This button clears the graphs.

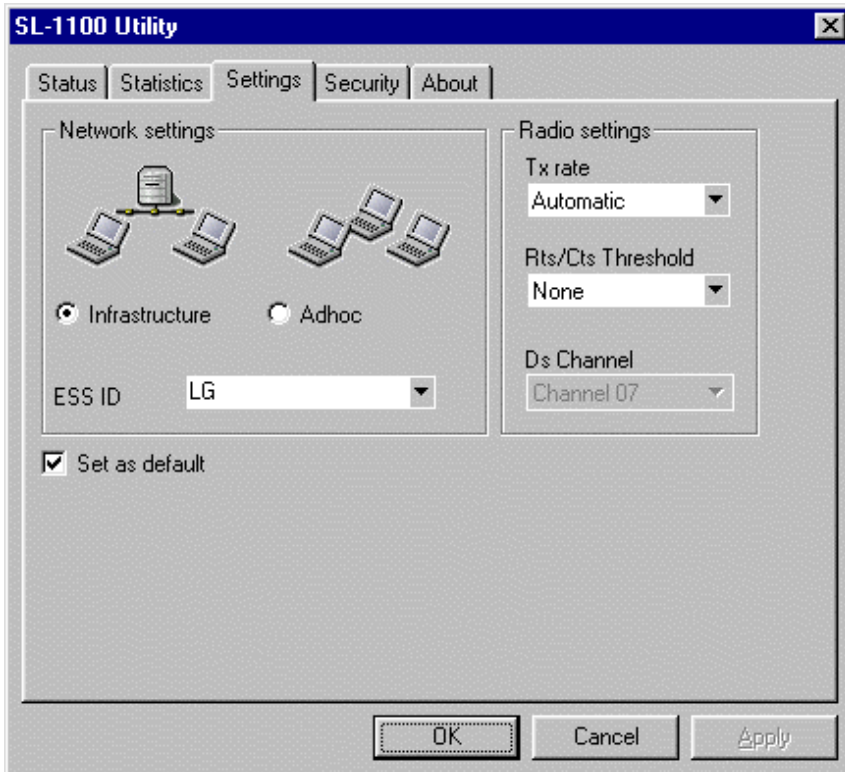
Transmission speed → When this check box is selected, the data transmission speed is displayed as an amount of data per second.

Reception speed → When this check box is selected, the data reception speed is displayed as an amount of data per second.

Transmission error → When this check box is selected, the percentage of data transmitted incorrectly each second is displayed.

Reception error → When this check box is selected, the percentage of data received incorrectly each second is displayed.

■ [Communication Settings] tab



Network settings

This area is used to set the [Network Mode] and [ESS ID] of the SL-1105 inserted in the card slot of the computer.

➤ See ■ [Descriptions of SL-1105 setting items](#) for details regarding the [Network Mode] and the [ESS ID].

Communication settings

This area is used to adjust settings related to data transmission.

[Rts/Cts Threshold] is used to establish whether or not RTS/CTS (request to send/clear to send) negotiations are conducted before data is exchanged with another computer.

When negotiations are conducted, data transmission begins when the other party responds.

For example, if this setting item is set to 500 bytes, then when the amount of data to be sent exceeds 500 bytes, the size of one packet of data sent for the purpose of negotiations is 500 bytes.

➤ See ■ [Descriptions of SL-1105 setting items](#) for details regarding the [Transmission Speed] and [DS Channel].

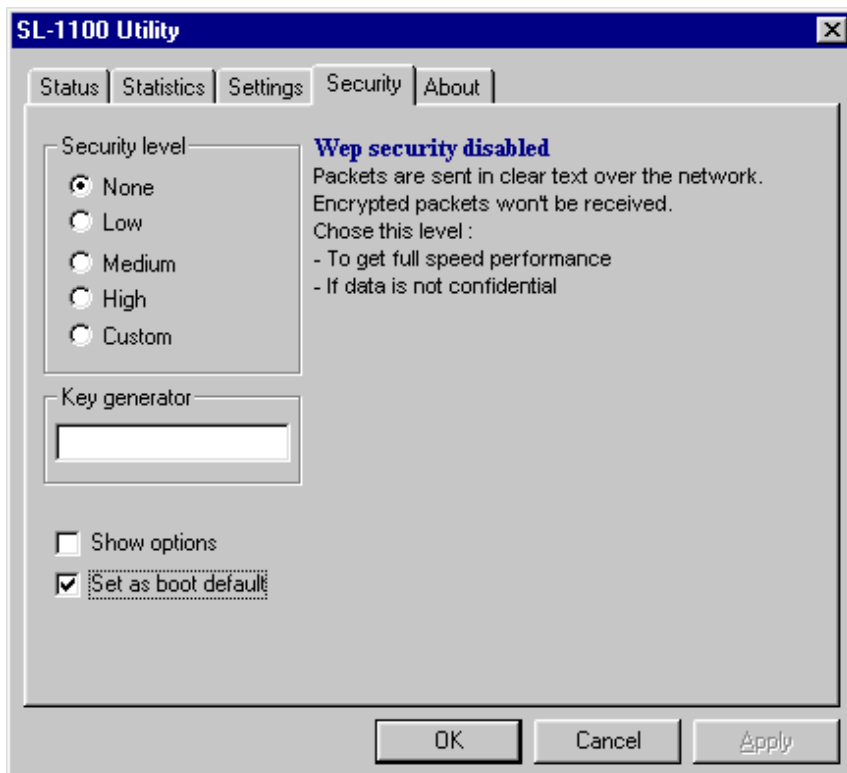
Save as default settings

When this check box is selected, the setting changes will remain valid after the

computer has been restarted.

When the check is removed from this check box, the changed settings will only be valid until the computer is turned off or restarted. After the computer is restarted, the previous setting values will be reinstated.

■ [Security] tab



Security level

This area is used to set the degree of encryption used to protect the data transmitted over the network.

The SL-1105 uses the WEP (Wired Equivalent Privacy) encryption format.

Optional Advanced settings related to the selected level (Low, Middle, High) can be accessed by selecting the [Show options] check box.

➤ We recommend using the same security level as the other computers with which you are communicating.

However, it is possible for a computer having a security level setting of {Low} to communicate with another computer having a security level setting of {Middle}.

Key generator

This area is used to set a character string for generating the key used for encryption

and decryption.

- ☞ Use the same character string (arbitrary combination of alphanumeric characters and symbols for which upper and lower case letters are distinguished) as the other computers with which you are communicating.

If different character strings are used, the encrypted data cannot be decrypted.

ShowDisplay options

When this check box is selected, the optional setting screen is displayed.

The settings shown on the optional setting screen and the level selected from the [Security Level] area are linked. If the settings automatically determined in the optional setting screen after a certain security level had been selected match the settings made from the optional setting screen, then the check box for the corresponding security level will be selected automatically.

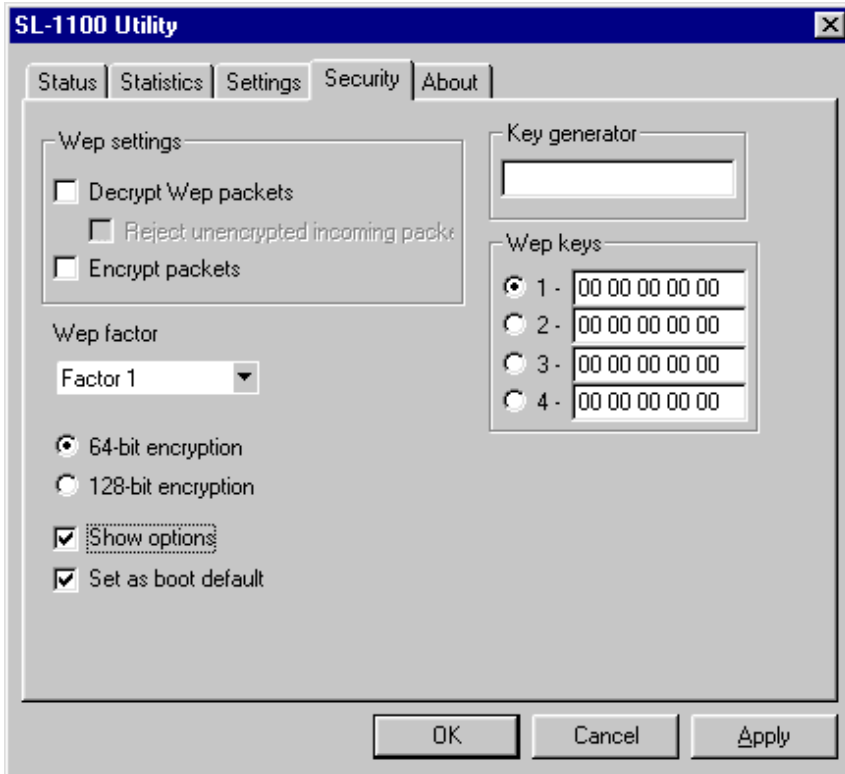
Save as default settings

When this check box is selected, the setting changes (including optional settings) will remain valid after the computer has been restarted.

When the check is removed from this check box, the changed settings will only be valid until the computer is turned off or restarted. After the computer is restarted, the previous setting values will be reinstated.

■ [Security] tab (optional settings)

this tab is used to perform advanced settings when {Custom} is selected under [Security Level].



WEP settings

This area is used for settings related to the encryption and decryption of data transmitted to and received from the wireless network.

WEP key

When 64-bit encryption is selected, the keys generated from the character string entered into the [Key Generator] text box are displayed in text boxes 1, 2, 3, and 4 in 40-bit segments (base 16, 10 characters). When 128-bit encryption is selected, the keys are displayed in 104-bit segments (base 16, 26 characters). (The leading 24 bits are not displayed.)

Only the selected key (1, 2, 3, or 4) is used for encryption.

Decryption can only be accomplished when the other computer is using one of the keys shown here (1, 2, 3, or 4) for encryption.

➤ The keys can also be entered directly into the WEP key text boxes (1, 2, 3, and 4).

When this is done, a character string is not displayed in the [Key Generator] text box. Only the selected keys

WEP factor

This setting item is used to establish the security level. "0" indicates the highest degree of security.

Each encryption level is defined as follows:

- {0} = updates internal encryption key for every packet
- {1} = updates internal encryption key every five packets
- {2} = updates internal encryption key every ten packets
- {3} = updates internal encryption key every fifty packets

64-bit encryption

Select this setting to conduct 64-bit encryption.

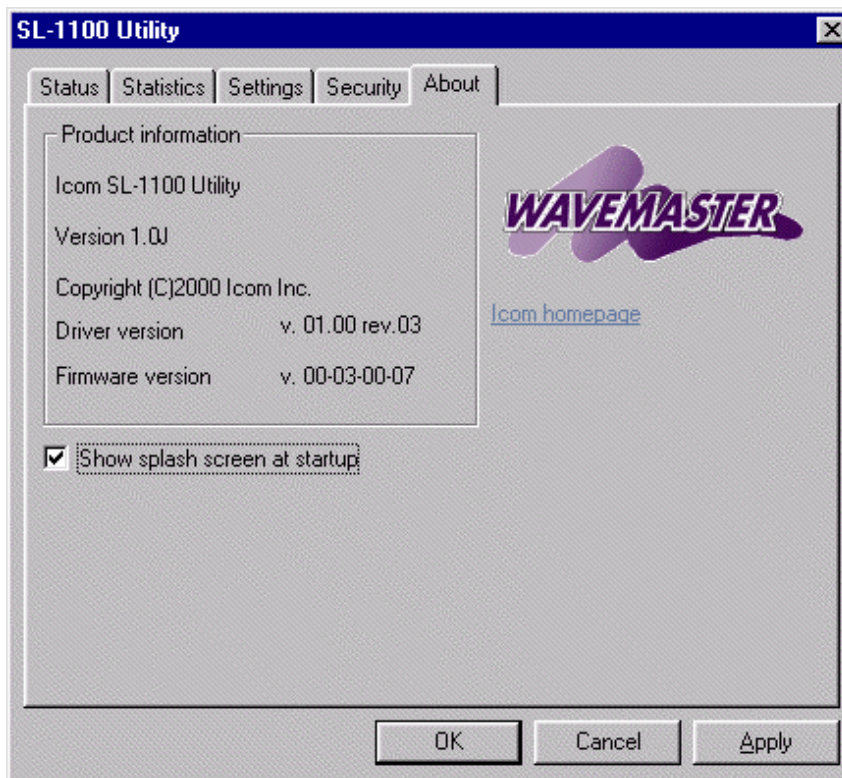
The last 40 bits (base 16, 10 characters) are shown in the WEP key text boxes.

128-bit encryption

Select this setting to conduct 128-bit encryption.

The last 104 bits (base 16, 10 characters) are shown in the WEP key text boxes.

■ [About SL-1105 Utility] tab



Product information

This area provides information regarding the SL-1105 Utility software.

Display banner

Select this check box to display the "WAVEMASTER" image file when the Utility is started up.

To ICOM homepage

Click this link to start up your browser and go to the ICOM homepage.

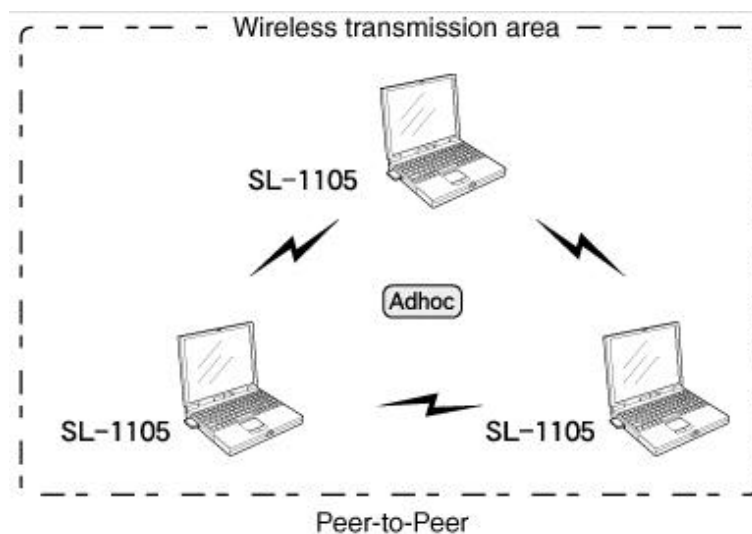
4 Using the Settings Utility

4-5 Relationship between the Wireless Network and Station Type

■ Adhoc mode

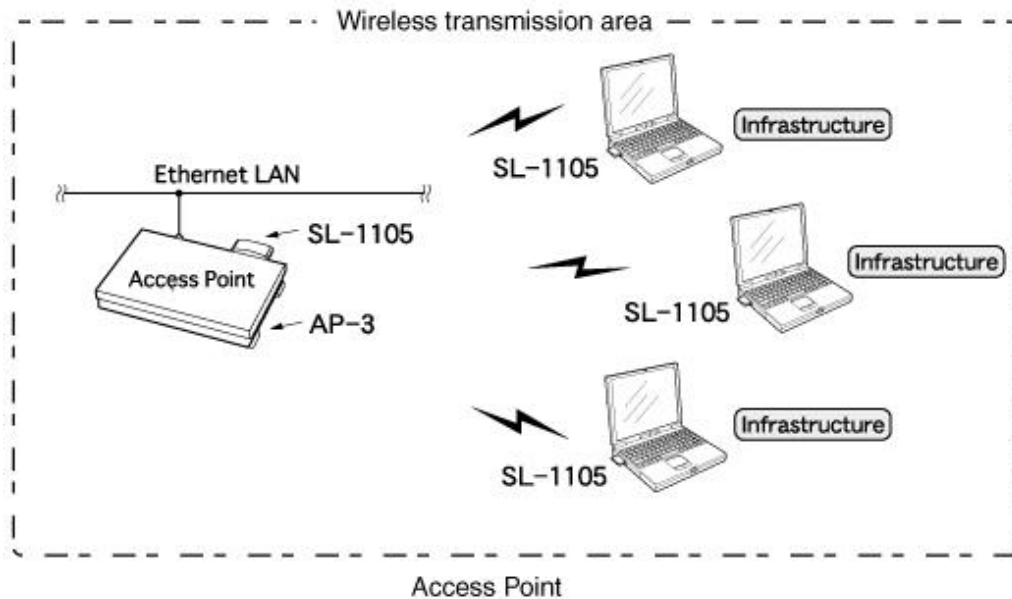
In this mode, individual stations communicate with one another directly without using a common access point.

This kind of arrangement is also called "peer-to-peer." Wireless transmission area Peer-to-Peer



■ Infrastructure mode

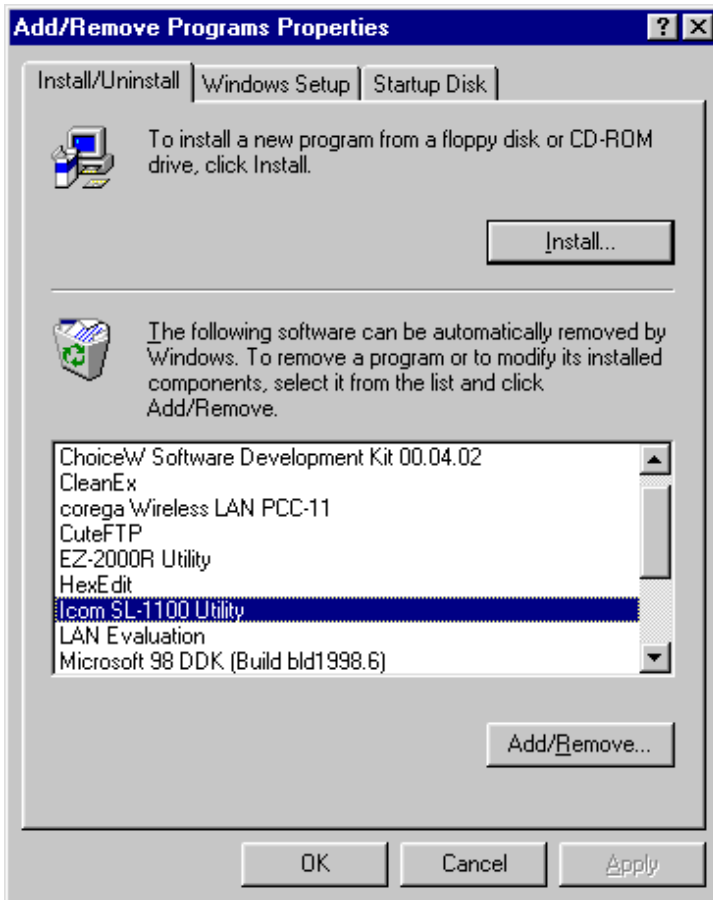
In this mode, stations communicate with one another via an access point. Wireless transmission area (sold separately) Access Point



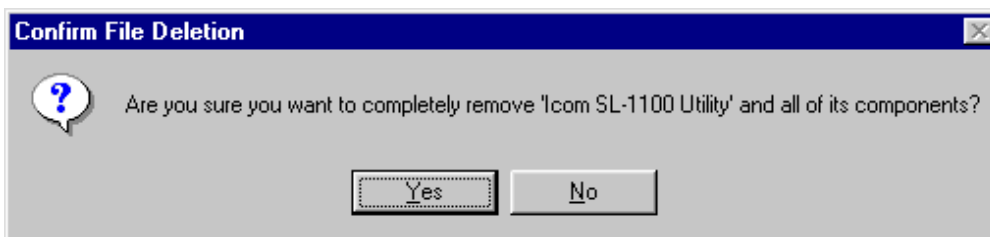
4 Using the Settings Utility

4-6 Uninstalling the ICOM SL-1105 Utility

1. Click <Start> and select [Control Panel] from the [Settings] menu. Then double-click [Add/Remove Programs]. The {Add/Remove Programs} screen is displayed.
 - The following explanation is based on Windows 98.
 - For other operating systems, follow the same procedure used to uninstall any other program.



2. Click {Icom SL-1105 Utility} in the list of programs and click <Add/Remove>.
3. When the following message is displayed, click <Yes>.



4 Using the Settings Utility

4-7 Updating the Firmware

■ About firmware

"Firmware" refers to programs written into the flash memory of the SL-1105 at the factory. These programs help the SL-1105 operate.

- New versions of these programs are sometimes created to expand or improve the functions of the product.

By updating these programs, you can add functions and keep your LAN card operating at its peak potential.

- You can check the version of your firmware using [\[About SL-1105 Utility\] tab](#) of the SL-1105 Utility screen.

■ About the latest version

Our homepage provides information about firmware updates.

- Check our homepage regularly at [\[http://www.icomamerica.com/\]](http://www.icomamerica.com/)
- See the file attached to the downloaded data for instructions on how to update your firmware.

Before downloading, read the license agreement for using our homepage.

5 Troubleshooting with the Ping Command

If the IP address of each station (terminal) is set correctly, then you can check if the IP packets are arriving correctly at their destination by pinging the station of the other computer.

To troubleshoot by pinging, open the MS-DOS window and enter the following command:

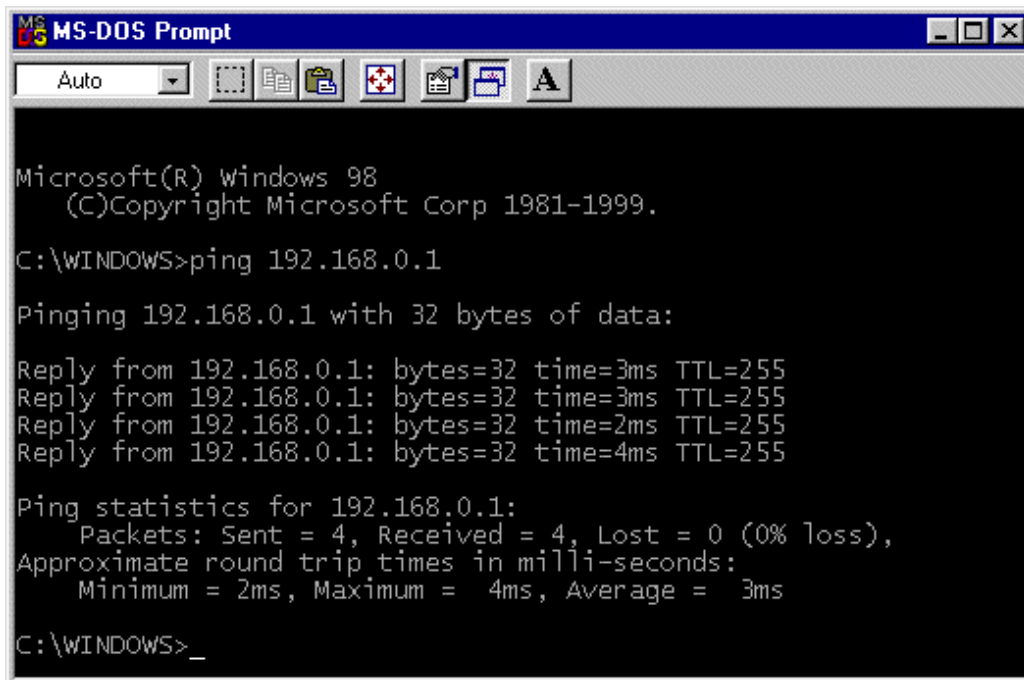
"ping xxx.xxx.xxx.xxx"

where "xxx.xxx.xxx.xxx" is the IP address for the other station (transmission destination).

By executing the ping command, four pings (echo requests) are transmitted and a reply message should be received for each ping.

If a reply is not received, check the protocol setting, Network Mode, and ESS ID of the station. If the IP address and subnet mask of the two stations are not set correctly, the message "destination unreachable" will be displayed.

■ [Example of ping command execution](normal case)



The image shows a screenshot of an MS-DOS Prompt window. The title bar reads "MS-DOS Prompt" and includes standard window controls (minimize, maximize, close). The window contains the following text:

```
Microsoft(R) Windows 98
(C)Copyright Microsoft Corp 1981-1999.

C:\WINDOWS>ping 192.168.0.1

Pinging 192.168.0.1 with 32 bytes of data:

Reply from 192.168.0.1: bytes=32 time=3ms TTL=255
Reply from 192.168.0.1: bytes=32 time=3ms TTL=255
Reply from 192.168.0.1: bytes=32 time=2ms TTL=255
Reply from 192.168.0.1: bytes=32 time=4ms TTL=255

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 4ms, Average = 3ms

C:\WINDOWS>_
```

- The response time and other numerical values displayed on the screen will vary depending on the operating environment.

6 Maintenance and Specifications

■ Servicing

● Warranty

At the time of purchase, the retailer will provide a warranty sheet complete with the details of the purchase (date of purchase, name of store). Make sure the information is correct and keep the warranty in a safe place for future use.

● Requesting servicing

Refer to the instruction manual and check the settings of the computer and the LAN card. If you cannot solve the problem, request servicing according to the following terms:

[During the warranty period]

Contact the store where you purchased the product.

The retailer will service the product in accordance with the warranty. Have your warranty ready at the time of request.

[After the warranty period]

Contact the store where you purchased the product.

If the product is serviceable, the retailer will repair the product for a fee.

■ SPECIFICATION

- Wireless Medium : Direct Sequence Spread Spectrum (DSSS)
- Network Standard : Based on IEEE 802.11b
- Frequency Band : 2400 – 2483.5 MHz
- Number of channels : 11
- Modulation : DBPSK at 1 Mbps
DQPSK at 2 Mbps
CCK at 5.5 and 11 Mbps
- Encryption : 64-bit or 128-bit WEP
- Output Power : 20 mW
- Frequency stability : ±20 ppm (0°C to +50°C; +32°F to +122°F)

- Antenna : Dual pattern antenna with diversity support
- Sensitivity : More than -76 dBm (FER 8% at 1024 octets data)
- Power supply requirement : 5 V DC \pm 5% (negative ground)
- Current drain : Transmit 290 mA (typical)
Receive 210 mA (typical)
- Usable temperature range : 0°C to +50°C; +32°F to +122°F
- Range : Approx. Indoor 50 m, Outdoor 150 m
Approx. Indoor 30 m, Outdoor 70 m (at CCK 11 Mbps)
- Dimensions (projections not included) : 110.5 (W) \times 5.0 (H) \times 54.0 (D) mm;
4 ¹¹/₃₂ (W) \times ³/₁₆ (H) \times 2 ¹/₈ (D) in
- Weight : Approx. 40 g; 1.4 oz
- Approval standard : FCC Part 15, Sub Part B, Class B, Part 15.247
- Media Access Protocol : Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)
- Host interface : PCMCIA Type II slot
- Network operating system : Microsoft® Windows® 2000/NT/98/95 (Driver)

- All stated specifications are subject to change without notice or obligation.
- Transmission distance may differ depending on computer environment.
- Data speed will slow with the addition of other computers to the Network.
- 40 to 50 computers can be accommodated on to one Network group, but for a Network that regularly uses computers simultaneously, a maximum of 10 computers will provide most effective operations.