**11M WLAN Access Point**

# FreePort Station

## User’s Manual

Rev 1.0

# Using this Manual

This section explains the symbols used in this manual.

## ■ Symbols

Caution

**Caution :** Items to which you must pay attention when handling the product. Failure to follow this mark may result in personal injury and/or damage to the equipment.

Note

**Note :** Supplementary information that you should know when handling the product.

Reference

**Reference :** Refers to the page of related subject.

Next

**Next :** Advises to which page you should continue next.

**Column :** Explanatory text with this mark explains convenient facts for you to know.

## ■ Glossary and Diacritical Marks Within the Text

- Text in bold indicates the names of menu options, buttons, text boxes, check boxes, software, and dialog boxes, etc., that you can select to perform operations.
- The AP is referred as Access Point through this manual.
- The personal computer to be used with the wireless LAN card is called the wireless LAN personal computer.
- The personal computer to be used with the Access Point settings is referred as the Settings Personal Computer.

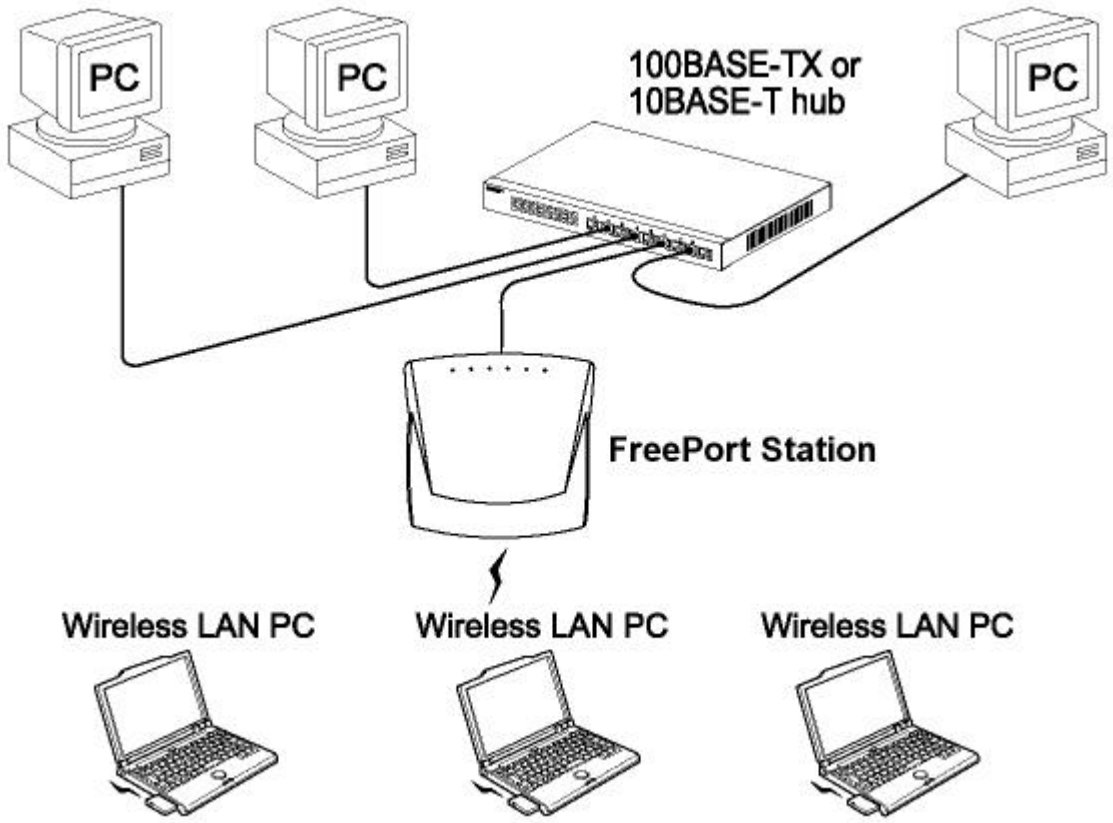
# *Communication between a wireless LAN and a wired LAN*

This section describes how to use an AP when communicating between a wireless LAN and a wired LAN.

## Network Configuration Illustration

Current Network Environment : Wired LAN Network

Desired Network : Network comprising wireless and wired LAN PCs.



# Table of Contents

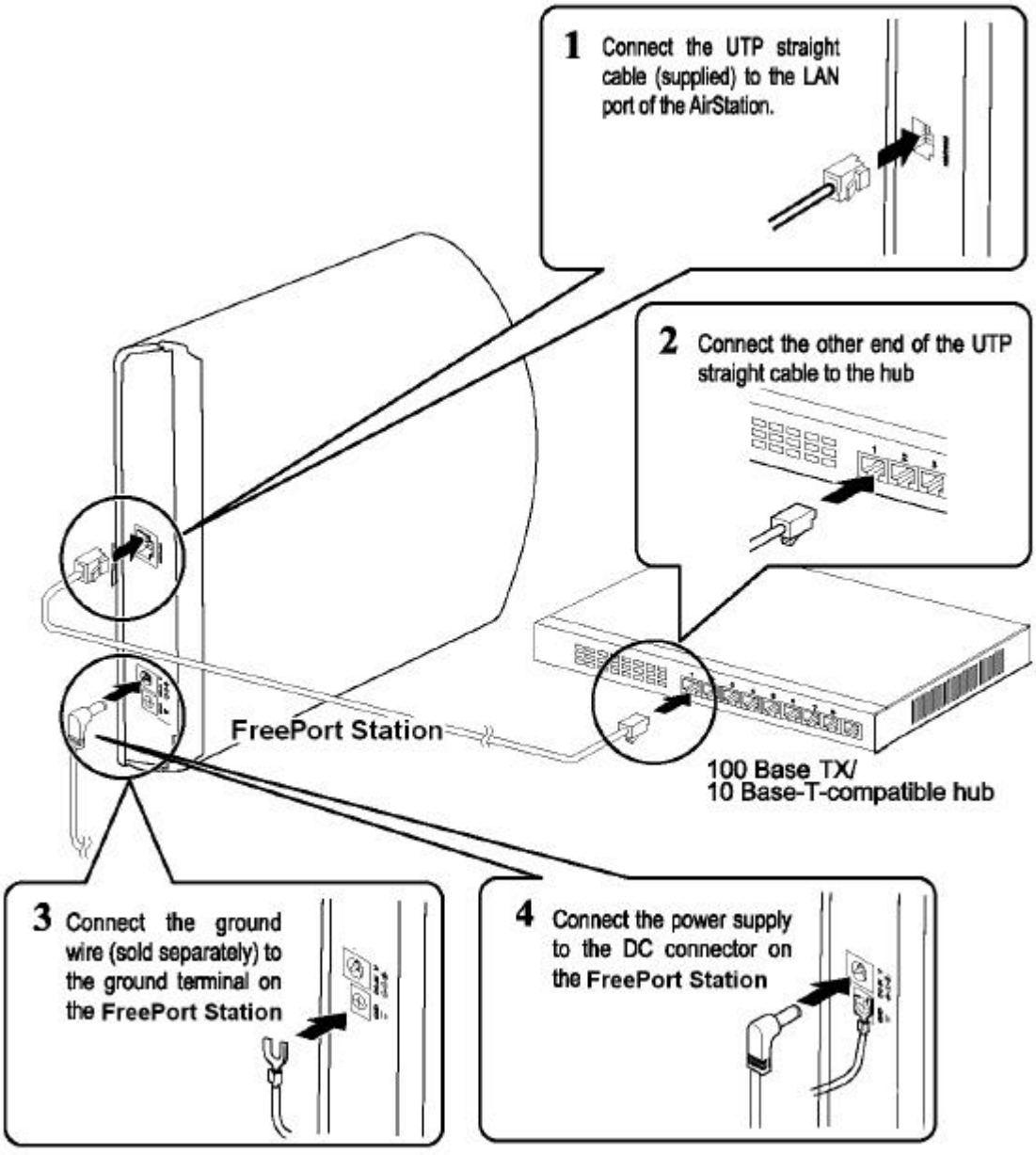
# 1. Communications Between Ethernet LAN and Wireless LAN

This section explains the procedure for enabling communication between personal computers on an Ethernet LAN and personal computers on a wireless LAN using AP.

## Installation

Connection to the AP, hub, ground wire, and Power supply is shown below.

Be sure to use the supplied AC adapter power supply.



# 2. Preparing the FreePort Station Settings

## (on the Personal Computer)

The AP settings are preformed using a personal computer on the Ethernet LAN. For the proper AP setting, make sure that the following software are installed in the personal computer (hereafter called the settings personal computer) on the Ethernet LAN.

TCP/IP protocol ..... Refer to the "TCP/IP Protocol Setting" section below.
FreePort Station Manager ..... Refer to "Installing the FreePort Station Manager".
Web browser (Microsoft Internet Explorer version 4.0 or later, or Netscape Navigator 3.0 or later):
..... Refer to the relevant Web browser manual. Microsoft Internet Explorer is installed as standard on Windows 98 and Windows 2000.

## TCP/IP Protocol Setting

The procedure for setting the proper TCP/IP protocol is depending on the OS used in the PC. Please refer to the following for the proper settings.

Note Before the setting, check the LAN port drivers are properly installed in the personal computer and it is connected to the network.

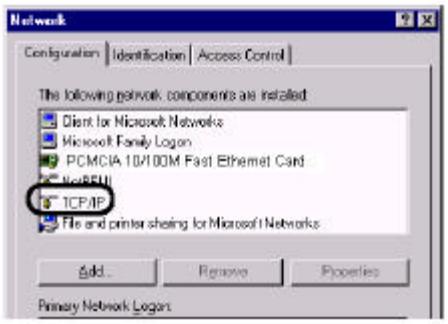
Windows 98/95: Refer to "On Windows 98/95" below.
Windows 2000: Refer to "On Windows 2000".
Windows NT 4.0: Refer to "On Windows NT 4.0".

## On Windows 98/95

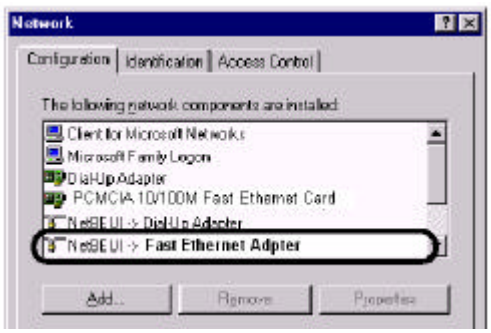
The TCP/IP protocol is set as follows.

1. Start your personal computer.
2. Click the **Start** button, and then select **Settings**, and then **Control Panel.**
3. Double-click the **Network** icon.
4. In the Network dialog box, check that TCP/IP is displayed in the following network components are installed:

Only 1 LAN board installed



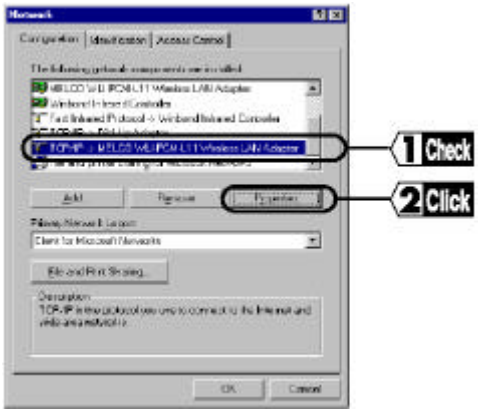

The dial-up adapter and the LAN boards are installed.




TCP/IP (LAN board driver name) is normally displayed in the following network components are installed:
[TCP/IP-> "LAN board driver name"]

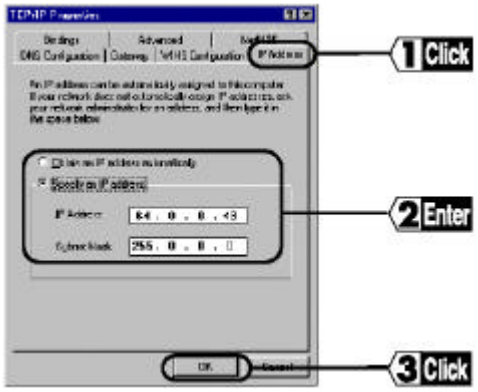
Note If no TCP/IP is displayed. Refer to "Adding TCP/IP Protocos (Windows 98/95)" section.

5




Select "TCP/IP" and click the Properties button.

6




Click the IP Address tab, set the IP Address and click OK

Caution Consult your network administrator for IP address settings for the configuration PC.

Note If there is a DHCP server in your network, select "Automatic IP address assignment".

7 Restart Windows 98/95.

This completes the configuration of the TCP/IP protocol for the configuration PC.

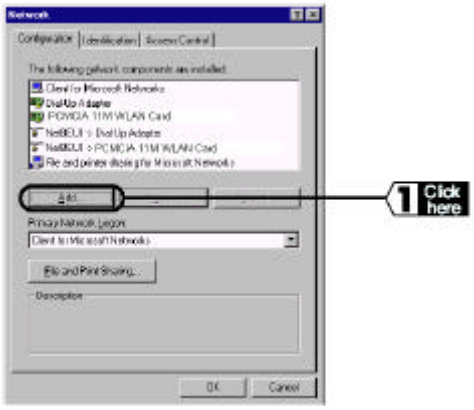
Next Go to "Installing FreePort Station Manager" section.

## Adding TCP/IP Protocols (Windows 98/95)

If the TCP/IP Protocol is not in added to the settings personal computer, add the protocol using the following procedure.

1 Click the **Start** button, and select **Settings, Control Panel**, and then **Network**.

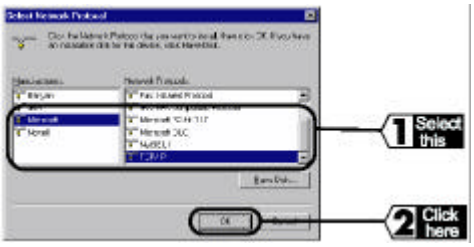
2



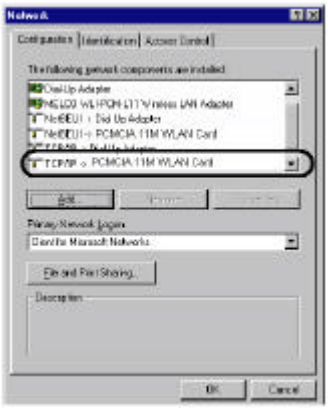

Click the **Add** button.

3 


Select **Protocol**, and click the **Add** button.

4 


In the Manufacturers field, select **Microsoft**, and in the Network Protocols field, select **TCP/IP** and click the **OK** button.

5 

The TCP/IP protocol is added.

This completes the TCP/IP protocol installation.

Next Continue to the “TCP/IP Protocol Settings” (On Windows 98/95) section procedure.

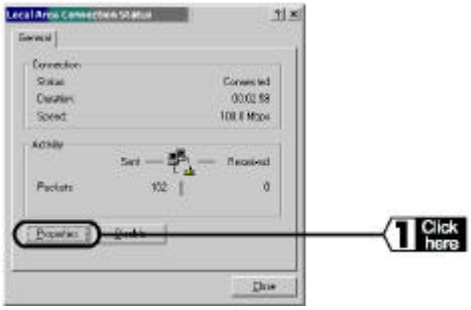
## On Windows 2000

The TCP/IP protocol is set on the settings personal computer using the following procedure.

1 Start Windows 2000, and log on using your logon name (e.g., Administrator with administrator access).

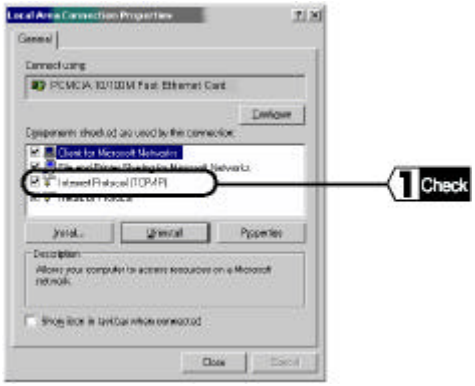
2 Click the **Start** button. Then select **Settings** and **Network and Dial-up Connections**.

3 Double-click the **Local Area Connection** icon.

4 


Click the **Properties** button.

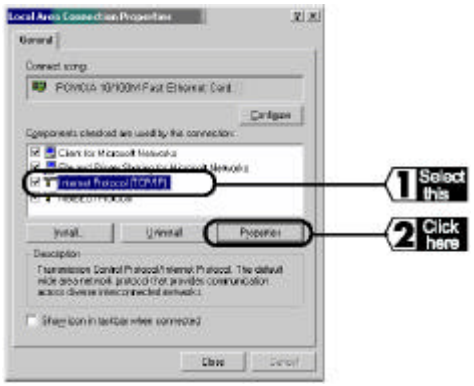
5




Check it Internet Protocol (TCP/IP) is displayed.

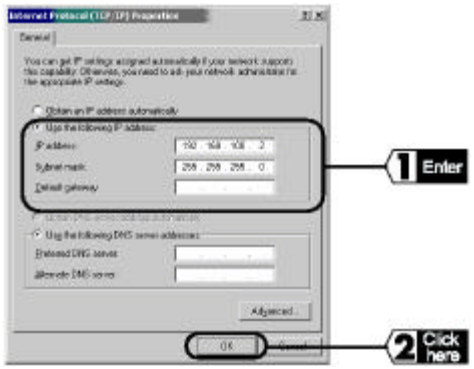
Note If Internet Protocol (TCP/IP) is not displayed, refer to "Adding the TCP/IP Protocols (Windows 2000)" section.

6




Select **Internet Protocol (TCP/IP)**, and click the **Properties** button.

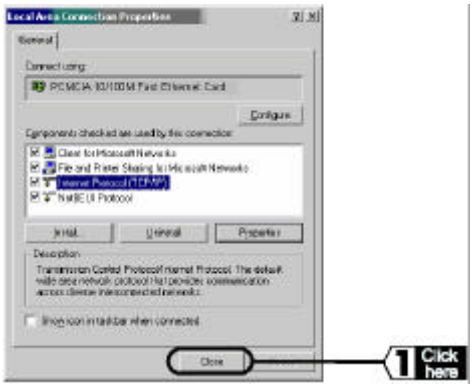
7



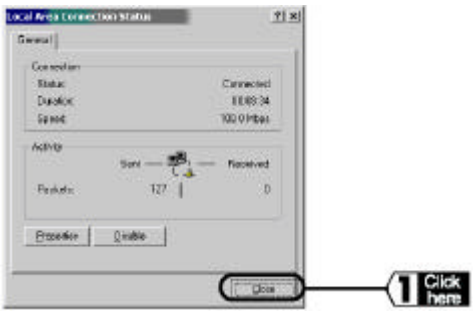

Set the IP address, and click the **OK** button.

Note If there is a DHCP server on the network, select "Obtain an IP address automatically".

8




Click the **Close** button.

9 


Click the **Close** button.

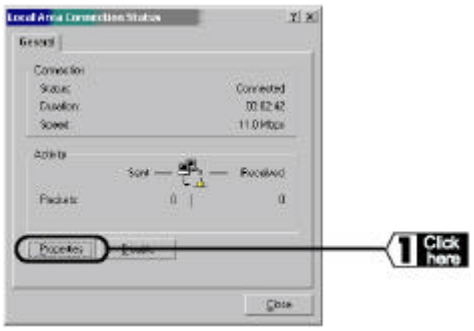
Next Go to "Installing FreePort Station Manager" section.

## Adding the TCP/IP Protocols (Windows 2000)

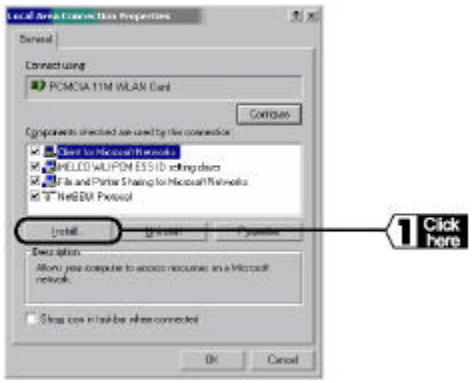
If the TCP/IP Protocol is not in added to the settings personal computer, add the protocol using the following procedure.

1 Click the **Start** button, and then select **Settings** and **Network** and **Dial-up Connections**.

2 Double-click the **Local Area Connection** icon.

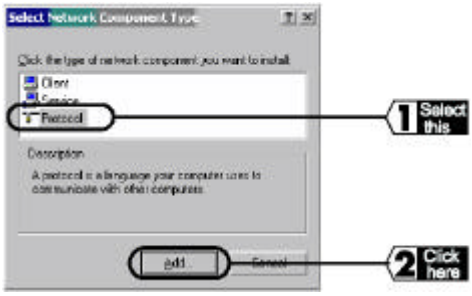
3 


Click the **Properties** button.

4 

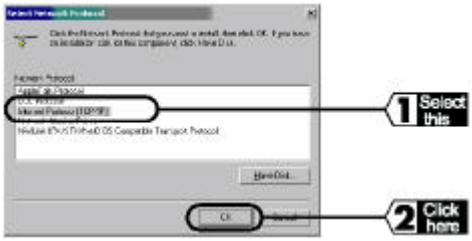

Click the **Install** button.

5



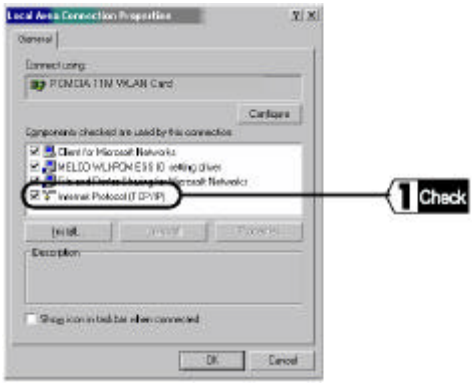

Select **Protocol**, and click the **Add** button.

6




Select Internet Protocol (TCP/IP), and click the **OK** button.

7




Check if the Internet Protocol (TCP/IP) is added.

This completes the TCP/IP protocol installation.

Next Continue to the “TCP/IP Protocol Settings” (On Windows 2000) section procedures.

## On Windows NT4.0

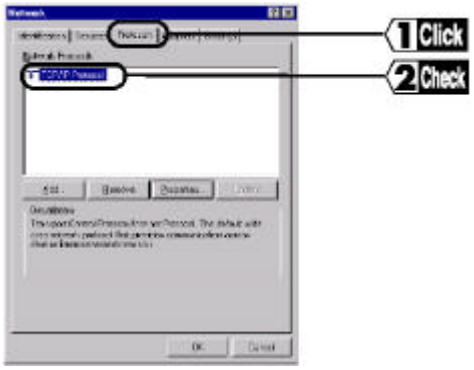
Follow the steps below to set the TCP/IP protocol for the configuration PC.

**1** Start the PC.

**2** Click **Start** and select **Settings** and then **Control Panel**.

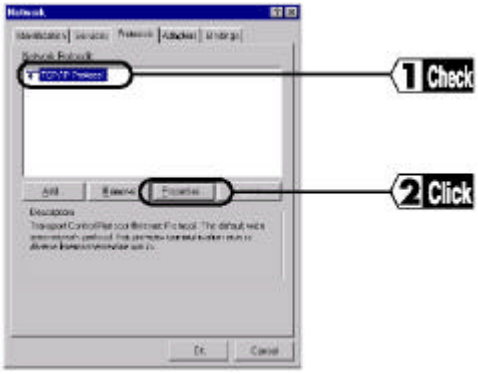
**3** Double-click the **Network** icon.

**4**



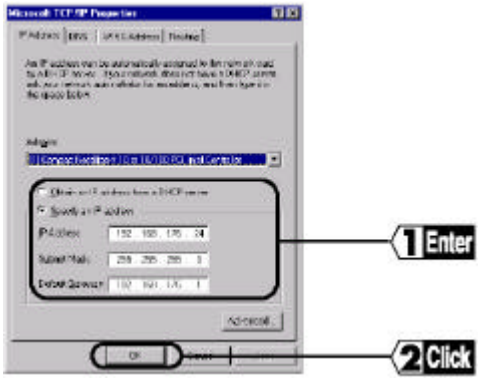

Click the **Protocol** tab and check that "**TCP/IP Protocol**" is listed in the Network Protocol field.

**5**




Select "**TCP/IP Protocol**" and click Properties.

**6**




Type in the IP addresses and click OK.

Caution Consult your network administrator for the IP address settings for the configuration PC.

Reference When there is a DHCP server in your network, select "Automatic IP address assignment".

**7** Restart Windows NT4.0.

This completes the configuration of the TCP/IP protocol for the configuration PC.

Next Go to "Installing FreePort Station Manager" section.

# 3. Installing FreePort Station Manager

Install the FreePort Station Manager in the settings personal computer using the following procedure.

1 Insert the Driver CD in the CD-ROM drive.

2 Click the **Start** button, and select **Run**...

3 


Enter **D:\AP\SETUP.EXE** (where **D** is the CD-ROM drive), and click the **OK** button.

4 


Click the **Next** button.

5 


Select the directory in which you want to install FreePort Station Manager, and click the **Next** button.

Note To change the default installation directory, select a new directory, and then click the **Next** button.

6 


Check the installation directory displayed, and then click the **Start** button. Windows will copy the file to the directory.

7 


Click the **OK** button.

Installation of the FreePort Station Manager is completed.

Note To remove FreePort Station Manager, click the **Start** button, and select **Programs**, **FreePort Station**, and **Uninstall FreePort Manager**, and then follow the instruction on screen.

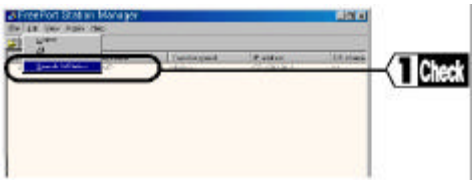
# Display FreePort Setting Screen

**Follow the steps below to display the FreePort Station setting screen.**

**1** Refer to " Installing FreePort Station Manager" to install the FreePort Station Manager.

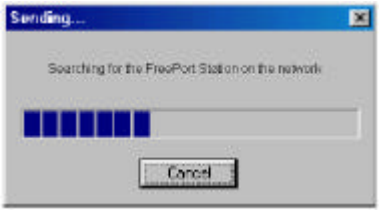
**2** Click **Start** and select **Programs**, **FreePort Station** and then **FreePort Station Manager**

**3**



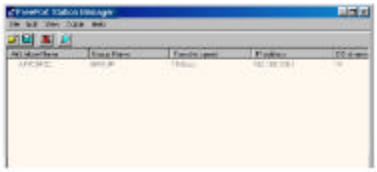

Click **Edit** and select **Search FreePort Station**.

**4**



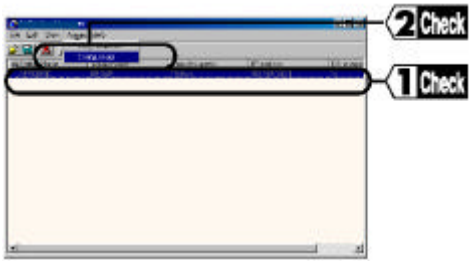

The computer starts searching for the FreePort Station.

**5**



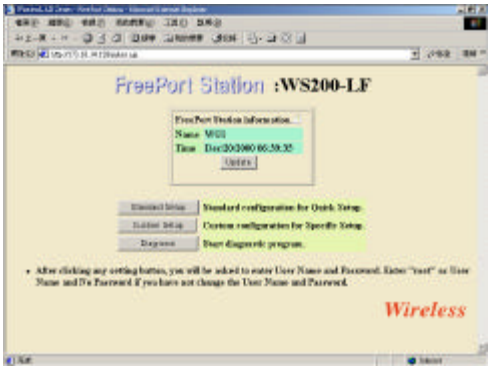
The FreePort Station appears in the list.

**6**




Select the FreePort Station, click **Admin** and select **Configure AS.**

**7**



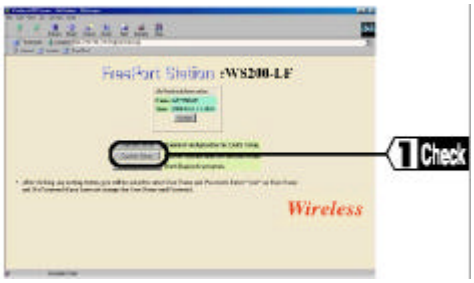

The Web browser starts to display the FreePort Station settings screen.

## Enabling / Disabling the Roaming Function

With the roaming function, an appropriate FreePort Station is automatically chosen according to the location of your PC. There is no need to change the FreePort Station' s settings when you move your PC to another room. Follow the steps below to set the roaming function.

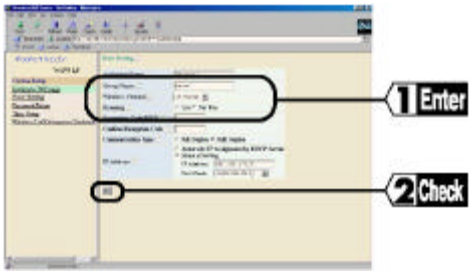
**1** Refer to " Installing FreePort Station Manager" to install the FreePort Station Manager.

**2**




Click **Custom** Setting.

**3**




Fill in the following fields.

**Group Name**: All FreePort Stations that are set up for roaming must have the same Group Name.

**Roaming option**: "Use"

After filling in the fields, click **Set**.

Follow the screen prompt.

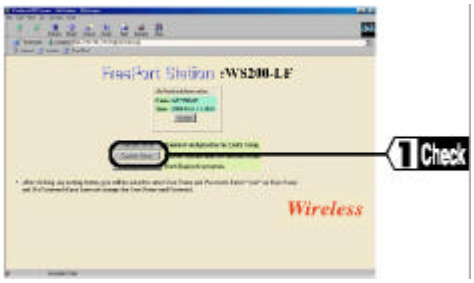
# Limiting connection from Wireless LAN PCs

Follow the steps below to limit the connection capability from wireless LAN PCs to the FreePort Station. The steps below will change settings so that no wireless LAN PCs other than those registered with the settings can connect to the wired LAN PCs.

## Setting procedure

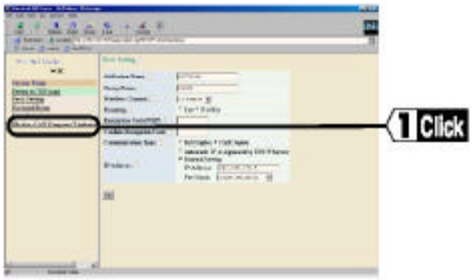
**1** Refer to " Installing FreePort Station Manager" to install the FreePort Station Manager.

**2**



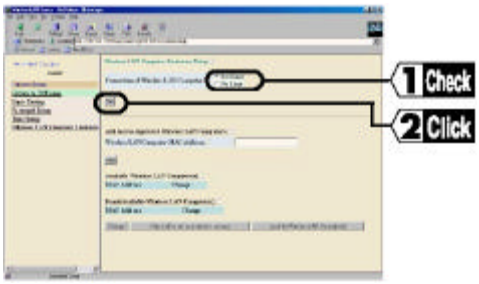

Click **Custom** Setting.

**3**



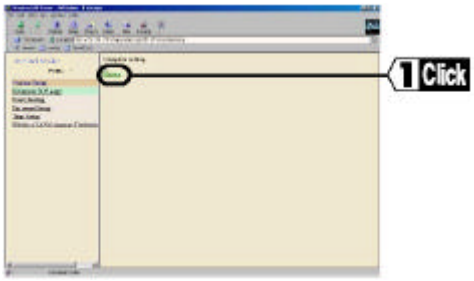

Click "**Wireless LAN Computer Limitation**".

**4**



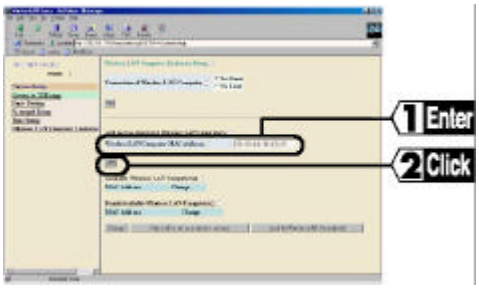

Select "**Set Limit**" for Wireless LAN Computer Limitation Setting and click **Set**.

**5**




When the message "**Settings Complete"** appears, click "**Return**".

**6**



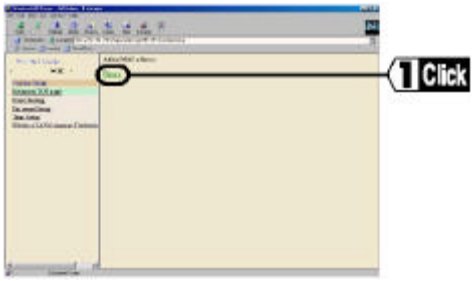

Type in a **MAC address** for the wireless LAN PC to be connected to the wired LAN PCs in the "**Wireless LAN Computer MAC Address**" field and click **Add**.

Note • Refer to the manual supplied with the wireless LAN PC for information about the MAC address.

• The MAC address should be separated every two digits by colons ( **:** ).

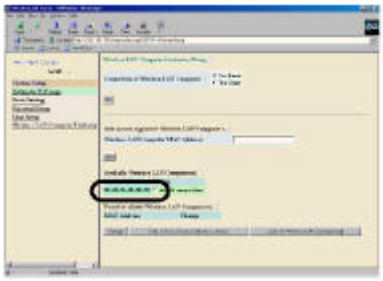
Note When the "**Unavailable wireless LAN computer(s)"** list includes a wireless LAN card which you want allow to connect to the Wired LAN PCs, tick the **"Enable**" check box for the relevant MAC address and click **Change**.

**7**




When the message "**MAC addresses added**" appears, click **Return**.

**8**



The added MAC address will appear in the "**Available Wireless LAN Computer(s)**" field.

Note Up to 256 MAC addresses can be registered.

No wireless LAN PCs other than those registered in the "**Available Wireless LAN Computers"** field can communicate with any wired LAN PCs. Communication between wireless LAN PCs via the FreePort Station is available.

Note To disable a registered wireless PC, tick the "**Disable"** check box for the relevant MAC address in the "**Available Wireless LAN Computers**" field and click **Change.**

# Ensuring Security by the WEP (Encryption) Function

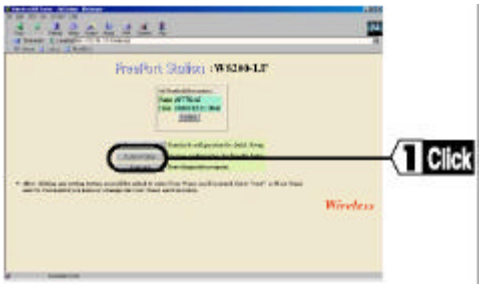
Follow the steps below to encrypt wireless packets so that they cannot be intercepted by a third party.

Note If the WEP function is set, communication between a Macintosh computer is not available.

## Setting procedure

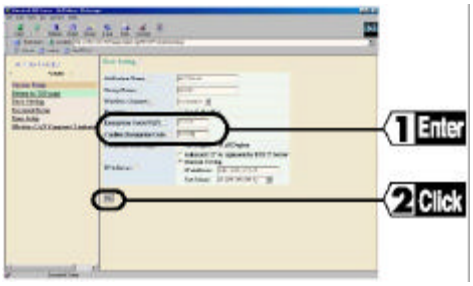
**1** Refer to " Installing FreePort Station Manager" to install the FreePort Station Manager.

**2**




Click **Custom** Setting.

**3**




Enter a **5-digit encryption key** in the "**WEP (encryption code)**" box. Enter the same encryption key again in the "**Confirm Encryption Code**" box for confirmation and click **Settings**.

Note The five characters can include alphanumeric characters and an under bar **"_"** .

**4** When the message "**Setting Complete**" appears, close the browser.

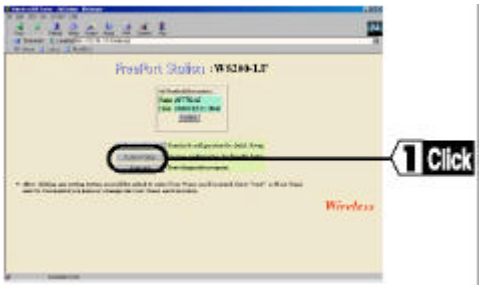
# Grouping Multiple FreePort Stations

If there are many FreePort Stations in the same area each having wireless LAN PCs connected, the overall data transmission speed may slowdown considerably. This could be the result of all the FreePort Stations using the same frequency radio wave. Assigning a different frequency (wireless channel) to each wireless LAN will improve the transmission speed. Follow the steps below to change wireless channel and differentiate the LANs.

## Setting procedure

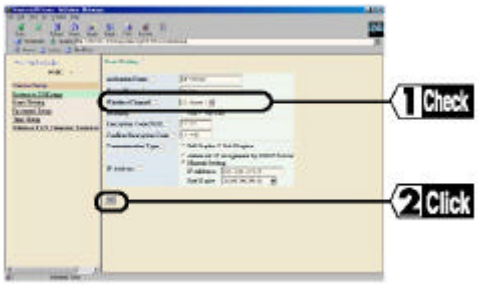
**1** Refer to " Installing FreePort Station Manager" to install the FreePort Station Manager.

**2**




Click **Custom** Setting.

**3**




Choose a wireless channel in the "**Wireless Channel**" box to assign it to the FreePort Station and click **Set.**

**4** When the message "**Setting Complete**" appears, close the browser.

Note

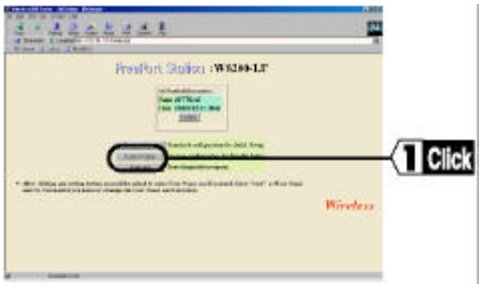
• Using close frequencies (channels) may cause interference. When using two or more channels, each channel should be spaced by two or three channels. (Changing the wireless channel may cause interference with other radio wave equipment.)

## Configuring the Transmission Mode

Follow the steps below to configure the transmission mode.

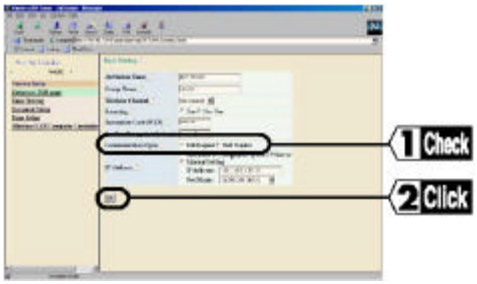
**1** Refer to " Installing FreePort Station Manager" to install the FreePort Station Manager.

**2**




Click **Custom** Setting.

**3**




In the "**Communication Mode"** field, select either **Full Duplex** or **Half Duplex** and click **OK**.

Note When the FreePort Station is set at Full Duplex, make sure that the hub is also set at Full Duplex. When the FreePort Station is set at Full Duplex Mode and the hub is set at Half Duplex or at Auto Detection, they cannot communicate with each other.

## Resetting FreePort Station Settings to Factory Defaults

**1** Power on the FreePort Station.

**2** Hold down the "**RESET**" button located at the rear of the FreePort Station for 3 seconds or longer to reset the FreePort Station to the factory default settings.

# 4. Self-Diagnostic

The FreePort Station performs self-diagnosis every time it is turned on or restarted.

When an error occurs, the "DIAG" lamp flashes a specific number of times identifying the error. The lamp flashing pattern is repeated until the FreePort Station is restarted or turned off.

## DIAG lamp Error Descriptions

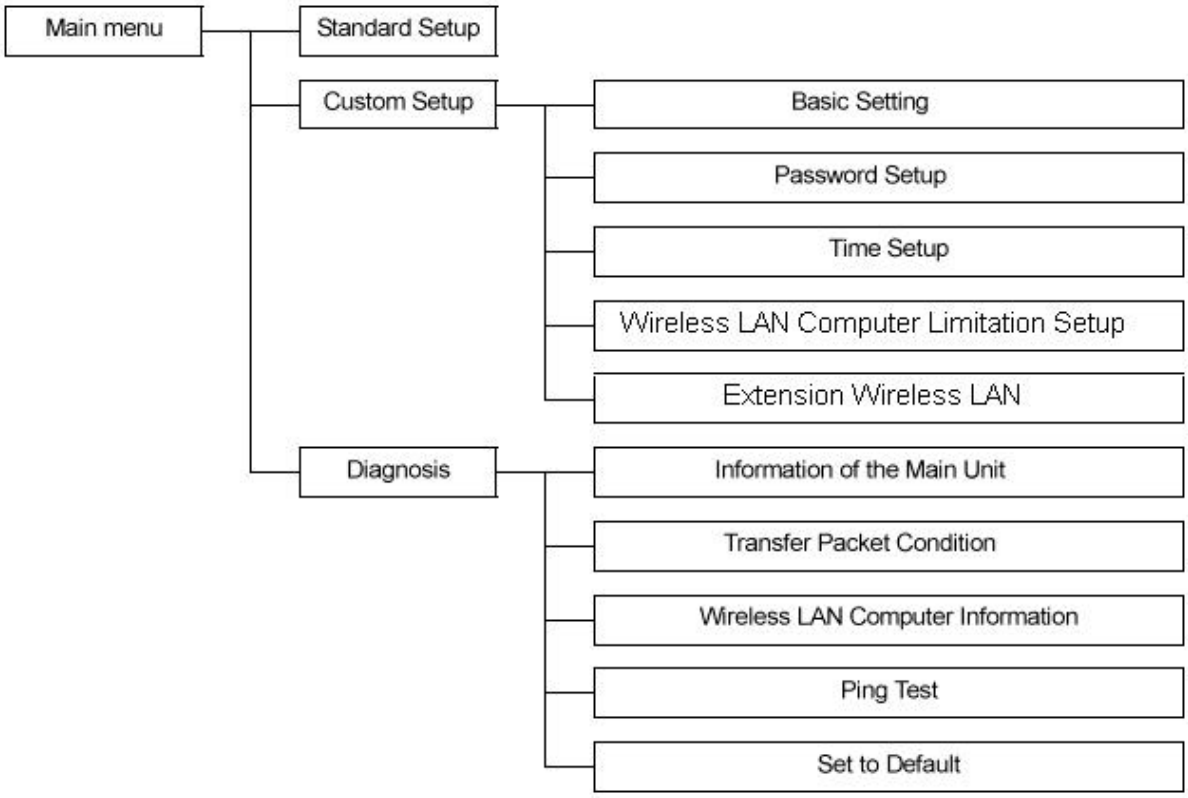
| Number of flashes | Error | Explanation |
|---|---|---|
| 1 | RAM check error | Cannot read/write the internal memory. |
| 2 | ROM check error | Cannot read/write the flash ROM. |
| 3 | Wired LAN error | Wired LAN controller malfunction. |
| 4 | Wireless LAN error | Wireless LAN controller malfunction. |
| 5 | Clock error | The clock is not set correctly, or the clock battery may be depleted. |
| 9 | Other errors | |

If one of the above errors is displayed, try removing the AC adapter from the socket to restart.

# 5. Setting Screens Tables

This section explains details of the setting screen tables.

## Setting Screen Configuration



# Setting Screens Explanation

Note

Items marked with an asterisk (*) can be set using the Standard Setup screen.

## Detailed Settings (Bridge Mode)

| Item | Explanation | Factory setting |
|---|---|---|
| Basic Setting | | |
| **FreePort Station Name *** | **Set the FreePort Station name. (See note 1)** | Last six digits of "AP" + MAC address |
| Group Name* | Set the group name. (See note 2) | GROUP |
| ESS ID | Set ESS ID. | Last six digits of MAC address + group name |
| Wireless Channel | Set the wireless channel (1 to 11). | Channel 11 |
| Roaming | Enable/disable wireless roaming function. | Not used |
| Encryption Code (WEP) | Set the keyword for encryption. (See note 3) | Not used |
| Confirm Encryption Code | Reenter the keyword for encryption. (See note 3) | - |
| Bit Rate | Set the bit rate. | Do not fix bit rate. |
| Communication type | Set the LAN board communications type | Half Duplex |
| IP Address | Set the **FreePort Station IP Address** | 1.1.1.1 |
| Password Setup | | |
| Administrator Name | User name to log on to the FreePort Station setting screens | root (cannot be changed) |
| New Password | Set password to log on to the FreePort Station setting screens. | None |
| Confirm Password | Reenter the password to confirm. | None |
| Wireless LAN Personal Computer Limit Setting | | |
| Connection to the Wireless LAN Computer | Enable the FreePort Station connection only from the specified LAN personal computer. | No Limit |

Note 1: Enter a maximum of 32 alphanumeric characters (case sensitive), and the underbar "_".

Note 2: Enter a maximum of 16 alphanumeric characters (case sensitive), and the underbar "_".

Note 3: Enter a maximum of 5 alphanumeric characters (case sensitive), and the underbar "_".

## Machine Diagnostics

| Item | Explanation |
|---|---|
| Information of the Main Unit | |
| Model name | Display the FreePort product name. |
| FreePort Station name | Display the FreePort Station name |
| Wireless module firm-ware | Display the wireless firmware name and version. |
| Group name | Display the group name. |
| MAC address of wired LAN | Display the FreePort Station Ethernet MAC address |
| MAC address of wire-less LAN | Display the FreePort Station wireless MAC address. |
| ESS-ID | Display ESS-ID. |
| Wireless roaming func-tion | Display whether wireless roaming function is enabled or disabled. |
| Encryption (WEP) function | Display whether Encryption (WEP) function is enabled or disabled. |
| DS channel | Display the wireless channel. |
| IP address Setting | Display the IP address setting method. |
| IP address | Display the AirStation IP address |
| Net mask | |
| Transfer Packet Condition | |
| Send number of packets | Display the number of packets sent. |
| Send number of error packets | Display the number of packets with send errors. |
| Receive number of packets | Display the number of packets received. |
| Receive number of error packets | Display the number of packets with receive errors. |

# 6. Glossary

This section explains the glossary of terms used in this manual that are required to configure the network.

## Wireless Channel

If there is more than one Wireless LAN network with different ESS-ID on the same floor, and they are communicating with each other, the baud rate may be slowed, due to the same radio frequency being used. If this happens, you can still communicate regardless of other LAN networks by using to use different frequencies (wireless channels).

Note: If they are communications using the wireless LAN, be sure to set all the Units the same wireless channel.

## DHCP Server

When configuring the network TCP/IP, be sure to set the IP address in each personal computer and other devices. When there is a DHCP server on the network, you can assign IP addresses automatically to the personal computers and the FreePort Station on the network. If there is Windows 2000, Windows NT, dial-up router, or other device with built-in DHCP server function on the network, the DHCP server function may start to operate. For the Windows NT server and dial-up router, or other DHCP server function, refer to the Windows 2000, Windows NT, or dial-up router manual, or consult the manufacturer. There should be no DHCP server problems for Windows 98/95 personal computers only on the network.

## ESS-ID

This ID is used to prevent cross-communication during communication between the FreePort Station and personal computers within the wireless LAN. The Wireless LAN personal computers that have the same ESS-ID as the FreePort Station can communicate with the FreePort Station. (ESS-ID is disabled when wireless LAN personal computers are communicating each other.) Set the FreePort Station ESS-ID as follows: Last six digits of MAC address

+ Group name. The ESS-ID is case sensitive. You can enter a maximum of 32 alphanumeric characters, and the underbar "_".

## LAN (Local Area Network)

Read as one word. A LAN is a network in a comparatively small area, such as campus or within a single building. The LAN baud rate varies from 10 Mbps to 100 Mbps.

## MAC Address (Media Access Control Address)

The MAC address is a physical address specific to each network card. The MAC address is configured from a total of six bytes as follows: A vendor code comprising the lead three bytes and a 3-byte user code. The vendor code is managed and assigned by IEEE. The user code is managed using a unique (unduplicated) number from the network card manufacturer. That is, the MAC address is assigned as a physical address unique throughout

the world. In an Ethernet LAN, the MAC address is used as a base to create a frame for sending and receiving.

## TCP/IP (Transmission Control Protocol/Internet Protocol)

TCP/IP is a protocol equivalent to the network and transport levels of the OSI reference model, and it is defined using RFC. Consequently, different terminals can communicate with each other using TCP/IP.

- Normally, TCP/IP includes the application protocols TELNET and FTP.
- TCP/IP is the standard internet protocol.

## WEP (Encryption)

By setting an encryption key in the FreePort Station, you can prevent wireless packets from being decrypted externally.

When connecting to the FreePort Station with the encryption key you must enter the encryption key from the FreePort manager.

## Windows 98/95 Identification Screen

**Displayed Screen**

Double-click the Network icon and click the "Identification" tab. The following screen will be displayed.

**Explanation of Screen Fields**

The boxes within the screen are as follows:

| | |
|---|---|
| Computer name: | The name used to identify the computer on the network. Set a unique name for each personal computer. |
| Workgroup: | The name used to identify the computer workgroup on the network. If there is no particular need to identify separate workgroups, set the same workgroup name for all the personal computers on the network. |
| Computer Description: | Use this box to enter additional explanation of the computer name. You can also leave this box blank. |

## Firmware

Firmware is the name given to the software (programs) built into hardware such as the router, modem, and

terminal adapter. This software is built into the hardware, so it can be said to be in-between hardware and software.

## Protocol

Protocols are the procedures and regulations for sending and receiving data between the network terminals. For example, if two computers are communicating, you can send the correct information according to the regulations by formatting all required information. The protocol such as which terminal sends first, what type of message, what type of message the receiving terminal should send in reply, the data format, and responses to communications errors are same of examples.

## Roaming Function

If using the roaming function and moving from one room to another room, you can switch the FreePort Station automatically. With the roaming function, you can easily move from the office to the conference room while maintaining access to the network.


## Ethernet LAN and Wireless LAN

The following terms are used in this manual to clarify the distinction between the wired 10/100 base LAN, and the wireless LAN.

Ethernet LAN: LAN connected using cables

Wireless LAN: LAN that uses wireless communications

The above terms are used for explanatory in this manual and they are not used generally.

# 7. Product Specifications

This chapter describes the specifications of the product and the LAN port connector.

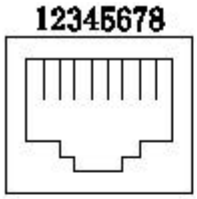
## Specifications

| | | |
|---|---|---|
| Wireless LAN interface | Conforming standards | IEEE802.11b (Wireless LAN standard protocol) |
| | | RCR STD-33, ARIB STD-T66 (Low power data communication system standards) |
| | Transmission method | DS-SS simplex (Half-duplex) |
| | Data transmission rate | 1 / 2 / 5.5 / 11 Mbps (Auto-sensing) |
| | Access Mode | Infrastructure mode |
| | Frequency range (Central frequency) | 2,412 – 2,483.5 MHz |
| | Transmission distance (depending on the surrounding environment) | 25m indoors, 50m outdoors for 11 Mbps<br>35m indoors, 70m outdoors for 5.5 Mbps<br>40m indoors, 90m outdoors for 2 Mbps<br>50m indoors, 115m outdoors for 1 Mbps |
| | Antenna | Diversity Type (Internal) |
| Wired LAN Interface | Conforming standards | IEEE802.3 (10BASE-T)<br>IEEE802.3u (100BASE-TX) |
| | Data transmission rate | 10 Mbps/100 Mbps (Auto-sensing only) |
| | Transmission mode | Half-duplex / Full-duplex (Manual Settings) |
| Power/Current consumption | 6.9 W (Max.) / 0.1 A (Max.) | |

# LAN Port Connector Specifications

The RJ-45 8-pole connector, specified ISO / IEC8877:1992.

**MDI Signal Assignment**




| Pin No. | MDI Signal | Signal Function |
|---|---|---|
| 1 | TD+ | Sending Data (+) |
| 2 | TD- | Sending Data (-) |
| 3 | RD+ | Receiving Data (+) |
| 4 | (Not used) | Not used |
| 5 | (Not used) | Not used |
| 6 | RD- | Receiving Data (-) |
| 7 | (Not used) | Not used |
| 8 | (Not used) | Not used |

**NOTICE**

The information in this manual is subject to change without notice.

## Federal Communications Commission Notice

This equipment has been tested an found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residental instration. 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, 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 the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.