

Wireless Outdoor Bridge

User Guide

Before operating the unit, please read this manual and retain it for future use

FCC Interference Statement

This equipment has been tested and 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 radio interference in a commercial environment. This equipment can generate, use and radiate radio frequency energy and, if not installed and used in accordance with the instructions in this manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures are necessary to correct the interference.

Notice : The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IMPORTANT NOTICE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be fixed-mounted on outdoor permanent structures with a separation distance of at least 1.5 meter from all persons and must not be co-located or operating conjunction with any other antenna or transmitter. No change to the antenna or the device is permitted. Any change to the antenna or the device could result in the device exceeding the RF exposure requirements and void user's authority to operate the device.

CE Declaration of Conformity

This equipment complies with the requirements relating to electromagnetic compatibility, ETS300/328, ETS 301/489-17 and EN 60950. This meets the essential protection requirements of R&TTE Directive 99/5/EEC on the approximation of the laws of the member states relation to electromagnetic compatibility.

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Chapter 1 Introduction

Thank you for choosing the outstanding wireless bridge for wireless point-to-point bridging applications. This wireless bridge offers a low-cost alternative to installing cable or dedicated telephone lines. You can connect two or more buildings quickly and easily with no expensive, time-consuming cable installation and no monthly service fees (unlike leased 56K, ISDN or T1 lines). The wireless bridges establish radio links between two or more networks up to 25 km and transmit data between buildings faster than T1 lines allowing users to gain Internet access, email and network resources located in different buildings easily and efficiently.

This wireless bridge radio operates in the 2.4 GHz frequency band and uses advanced Direct Sequence Spread Spectrum technology to provide high-speed and secure connectivity between multiple locations. This wireless bridge uses a browser-base management system. The system settings are on web pages. Before you install and use this product, please read this manual carefully for fully functions of this product.

1.1 Features and Benefits

Feature	Benefit
Point-to-Point, Multipoint-to-multipoint connectivity	Lets users transfer information between two buildings or multiple buildings across the area
Lightning Protector (Surge Arrester)	Include 3 lightning protected factor locate in power amplifier, DC-Converter and DC-Injector and a lightning protector.
Watertight and Weatherproof	Avoid water invade and weather corrode
Excellent range with antenna options	Provides wireless link up to 25km(16miles) using antennas and power amplifier
IEEE 802.11 b Compliant	Fully interoperable with IEEE 802.11 b compliant products
Two built-in 10/100Mbps Switch Ports	Scalability, able to extend your network
64 /128-bit WEP data encryption	Powerful data security
Web-based configuration	Helps administrators to remotely configure or manage the AP with web browser
MAC address filtering	Ensures secure network connection
Power Amplifier Upgradeable	Flexibility and cost-effective
NetBEUI support	Allows access intranet via My Network Place
SNMP management	Simplified management by Network Management Programs

1.2 Packing List

1. Ethernet Inline Power Injector
2. 30m Ethernet Cable
3. AC Power Adapter
4. Quick Installation Guide
5. Wall and Mast Mounting Bracket
6. U-bolts
7. Enough Screws
8. Installation CD
9. Lightning Protector
10. Grounding Wire
11. N Type(Mu)-N Type(Mu) RF Cable
12. 6dBi Omni Direction Antenna

Chapter 2 Hardware Installation

2.1 Panel Layout

2.1.1 Panel of DC-Converter

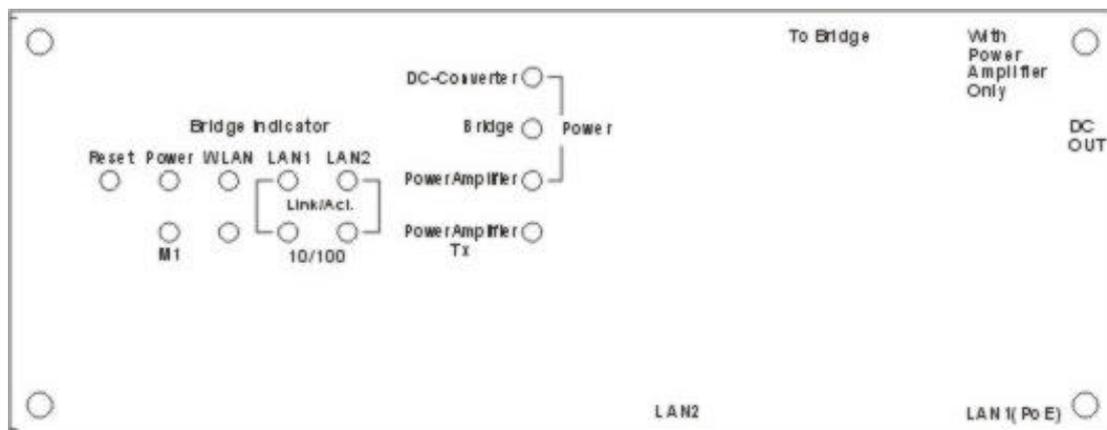


Figure 2-1 DC-Converter

DC-Converter Indicator:

Function	LED	Color	Status	Description
POWER	DC-Converter	Green	On	Power has being applied to DC-Converter.
	Bridge	Green	On	Power has being sent from DC OUT.
	Power Amplifier	Green	On	Power has being applied to Power Amplifier. Only functionally when the Power Amplifier has been set into this device.
Tx	Power Amplifier Tx	Red	Blinking	Data has been sent via Power Amplifier. Only functionally when the Power Amplifier has been set into this device.

Table 2-1

Bridge Indicator:

LED	Function	Color	Status	Description
POWER	Power indication	Green	On	Power has being applied to this product.
M1	System status	Red	Blinking	This product is functioning properly.
WLAN	Wireless activity	Green	Blinking	Sending or receiving data via wireless.
LAN1 LAN2 Link/Act.	Link status	Green	On	An active station is connected to the corresponding LAN port.
			Blinking	The corresponding LAN port is sending or receiving data.
10/100	Data Rate	Green	On	Data is transmitting in 100Mbps

LED	Function	Color	Status	Description
				on the corresponding LAN port.

Table 2-2

Port:

Port	Description
RESET	To reset system settings to factory defaults, please follow the steps: 1. Power off the device, 2. Press the reset button and hold, 3. Power on the device, 4. Keep the button pressed about 5 seconds, 5. Release the button, 6. Watch the M1 LED, it will flash 8 times and then M1 flash once per second.
To Bridge	Two ports (LAN1 and LAN2) connect with the bridge module board. Refer to the 2.1.3 Side Panel of Bridge for more detail.
With Power Amplifier Only	This item include two sub-items (To Power Amplifier and To Bridge) only use in when the power amplifier has been used. Refer to the 2.1.2 Side Panel of DC-Converter for more detail.
DC OUT	DC connector transmits 12 voltage power which connects with DC-IN in the side panel of bridge.
LAN1 (PoE)	LAN port connects to the DC-Injector which uses PoE (Power over Ethernet) technology. This port has the physical connection to the LAN1 port which locates in the side panel of DC-Converter.
LAN2	LAN port uses to connect to the other bridge has the physical connection to the LAN2 port which locates in the side panel of DC-Converter.

Table 2-3

2.1.2 Side Panel of DC-Converter



Figure 2-2 Side Panel of DC-Converter

Port	Description
To Power Amplifier	Connects to the power amplifier use the SMA to SMA cable.
To Bridge	Connects to the Bridge's module board use the SMA to SMA cable.
LAN1	Connects to the LAN1 port which locates in the side panel of bridge.
LAN2	Connects to the LAN2 port which locates in the side panel of bridge.

Table 2-4

2.1.3 Side Panel of Bridge



Figure 2-3 Side Panel of Bridge

Port	Description
DC IN	DC connector comes with 12 voltage power which connects with DC-out in the DC-Converter.
LAN1	Connects to the LAN1 port which locates in the side panel of DC-converter.
LAN2	Connects to the LAN2 port which locates in the side panel of side panel of DC-converter.

Table 2-5

2.1.4 Front Panel of DC-Injector

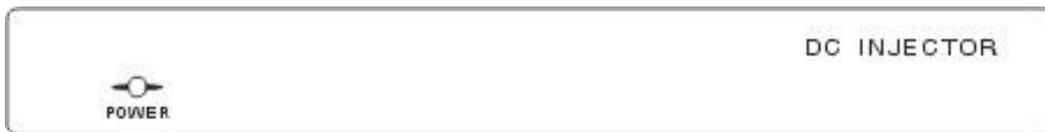


Figure 2-4 Front Panel of DC-Injector

LED	Function	Color	Status	Description
POWER	Power indication	Green	On	Power has being applied to this product.

Table 2-6

2.1.5 Rear Panel of DC-Injector



Figure 2-5 Rear Panel of DC-Injector

Port	Description
DC IN 48V	Connects with a power code which attached by the package.
To LAN	Connects to the existed network. The cable connection should be straight Ethernet when connect this unit to the HUB/SWITCH and the crossed cable when connect it directly to a PC Network Interface Card (NIC).
To Bridge	Connects to the DC-Converter's LAN1 (PoE) port.

Table 2-7

2.2 Procedure of Hardware Installation

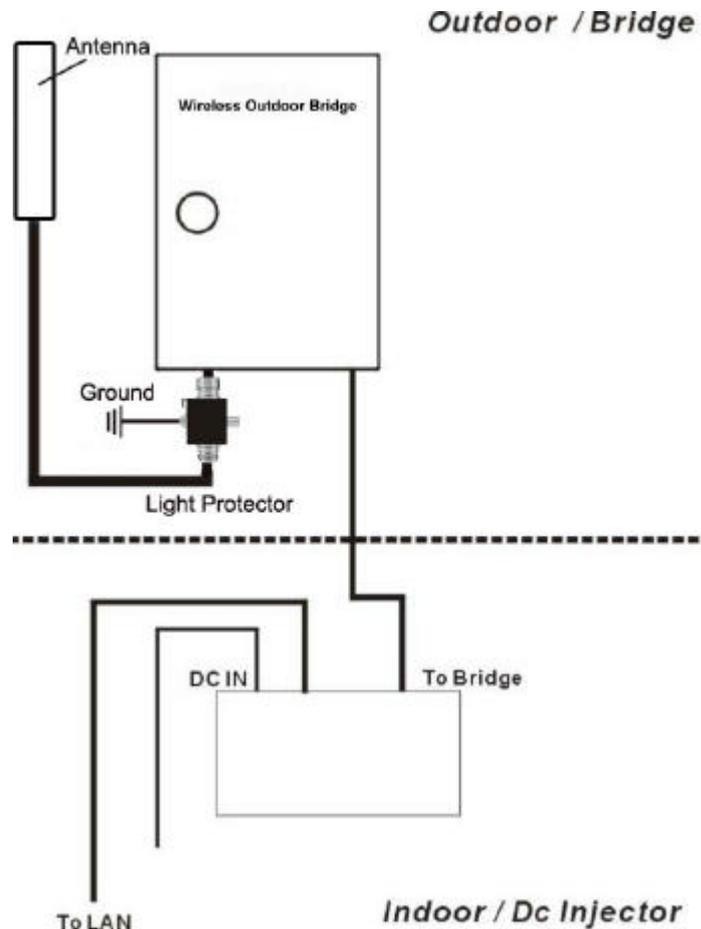


Figure 2-6

1. Decide how to place Bridge

Because this product is a radio device works in the 2.4 GHz frequency range. For optimum utilization, installing this product away from microwave ovens or other devices, operating in the 2.4 GHz frequency range, which can cause signal interference. Otherwise, install this product's antenna in an area where the trees, buildings and large steel structures such as file cabinet and bookshelves do not obstruct the signal to and from the antenna. In conclusion, the antenna should be located in the higher direct line-of-sight space.

2. Lightning Protection

Radio transmitters, receivers and RF cables require protection when attacked by lightning strikes.

The surge protectors contain fast response gas filled arrestors to provide low let through voltage for fast rise time transients. The device is configured to minimize circuit capacitance and the performance can be assured up to 2GHz. Standard models provide protection for receivers and transmitters up to a 1KW power level.

Installing this device in outdoor may be subject to lightning strikes. To properly protect your equipment, you should install the lightning arrestor to

prevent an electrical surge from traveling through the antenna cable and into the building. Lightning protection for a building is more forgiving than protection of electrical devices. A building can withstand up to 100,000 volts, but electrical equipment may be damaged by just a few volts.

Direct earth grounding of the antenna and the Lightning Protector is necessary to protect the installation from lightning and the build-up of static electricity.

The ground terminal is located on the lightning protector that attached with this unit. Connect one end of the grounding cable to the Ground terminal and the other end to a good ground connection.

The package content contains a lightning arrestor, and should be installed and grounded at the point **where the cable enters the antenna**.

3. Connect the Antenna and Lightning Protector

The bridge connects to a Lightning Protector directly and the Lightning Protector connects to the outdoor antenna with a standard N(Mu)-N(Mu) type low-loss cable. A longer cable may decrease the distance achievable between antennas.

The picture of lightning protector is shown in **Figure 2-7**.

4. Antenna Mast Requirements

To accommodate the outdoor antennas, the antenna mast must satisfy the following requirements:

- The construction of the mast must be of a sturdy, weatherproof and no corrosive material like for example galvanized or stainless steel construction pipe.
- Typical diameter of the mast should be between 35 mm (1.4 in.) and 41 mm (1.625 in.). Subject to the type of antenna that you intend to install other diameters may be possible as well.
- The height of the antenna mast must be sufficient to allow the antenna to be installed at least 1.5 m (5 ft.) above the peak of roof. If the roof is metal, then the height of the antenna should be a minimum of 3 m (10 ft) above the roof.
- The mast or wall-bracket must be free from any substance that may prevent a good electrical connection with the antenna; for example, paint.

5. Connecting the Ground Wire

Direct earth grounding of the antenna and the Lightning Protector is necessary to protect the installation from lightning and the build-up of static electricity.

The Ground terminal is located on the lightning protector that attached with this unit as shown in **Figure 2-7**. Connect one end of the grounding cable to the Ground terminal and the other end to a good ground connection.

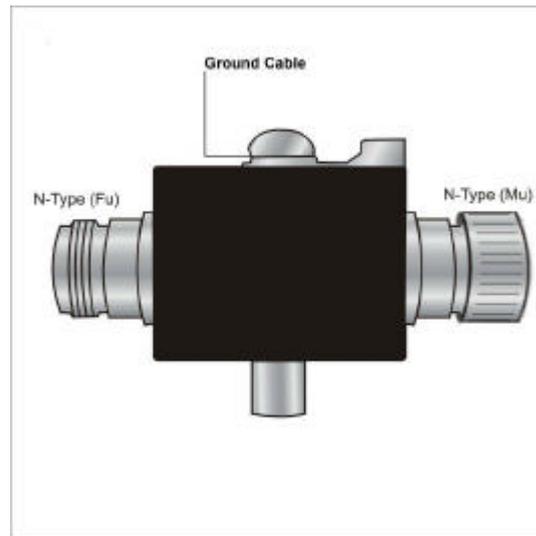


Figure 2-7 Lightning Protector

6. Connect the Ethernet and Power Cable

- Connect the power code to the DC-IN port on the rear panel of the DC-Injector.
- Connect an Ethernet cable to the RJ-45 port (To LAN) on the rear panel of the DC-Injector. Use the straight cable to connect to the HUB/SWITCHA or use the crossed cable to connect to the PC's Network Interface Card (NIC).
- Connect an Ethernet cable to the other RJ-45 port (To Bridge) on the rear panel of the DC-Injector and connect the other end to the LAN1 (PoE) port on the side of DC-Converter.

7. The Internal Connection of Bridge

a. Without Power Amplifier

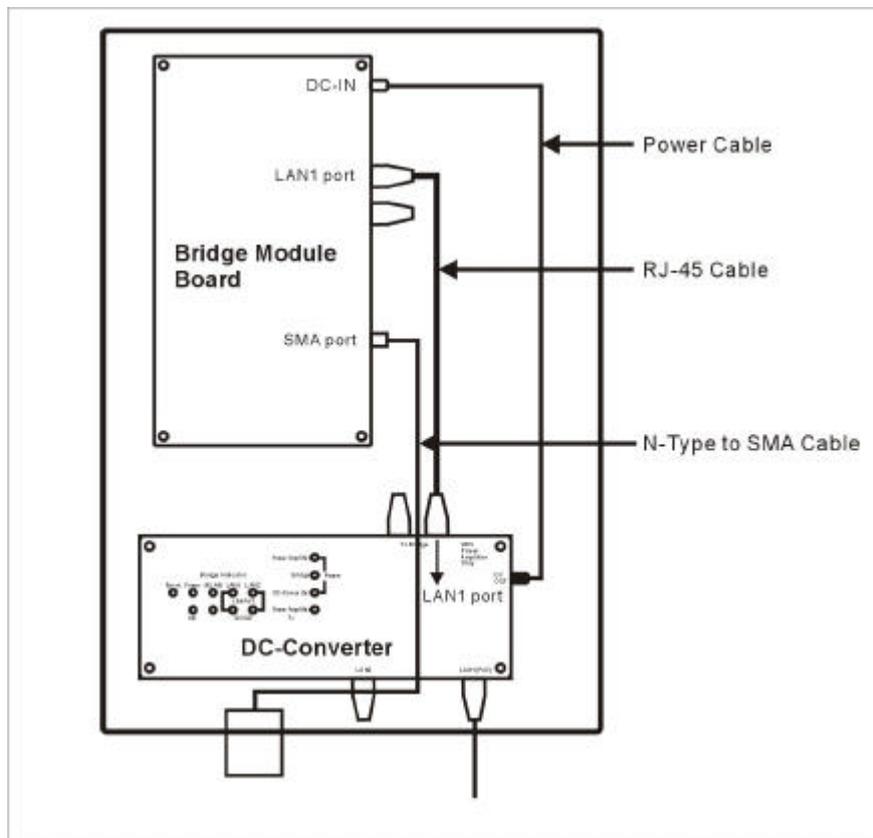


Figure 2-8 Internal Construction without Power Amplifier

- Connect **DC-OUT** of the **DC-Converter** to **DC-IN** which locates in the **side panel** of the **Bridge Module Board** with a **Power Cable** (320mm).
- Connect **DC-Converter** and **Bridge Module Board** on each **LAN1 port** with a **RJ-45 Cable**.
- Connect the **N-Type(Fu) to SMA(Mu) Cable** to the **SMA port (Fu)** which locates in the **side panel** of the **Bridge Module Board**.

b. With Power Amplifier Inside

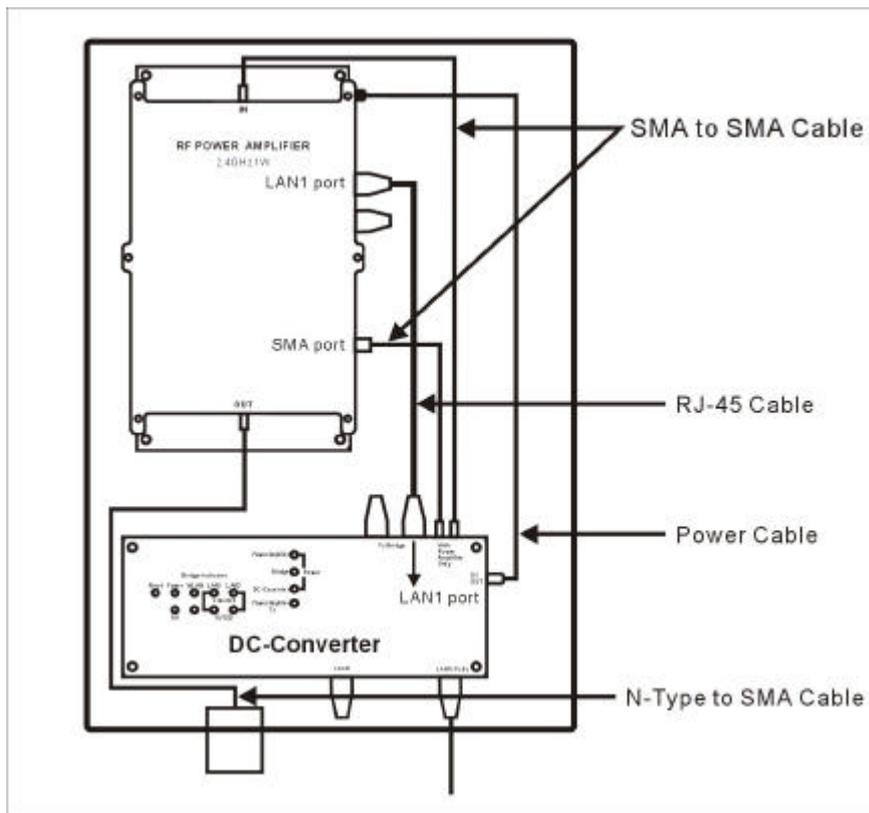


Figure 2-9 Internal Construction with Power Amplifier

- Connect the **SMA port (Fu)** of the DC-Converter (To Power Amplifier) to the **SMA port (Fu)** of the **Power Amplifier (IN)** with a longer **SMA (Mu) to SMA (Mu) Cable** (330mm).
- Connect the **SMA port (Fu)** of the **Bridge Module Board** (Under the Power Amplifier) to **DC-Converter** (To Bridge) with a shorter **SMA (Mu) to SMA (Mu) Cable** (100mm).
- Connect **DC-Converter** and **Bridge Module Board** on each **LAN1 port** with a **RJ-45 Cable**.
- Connect **DC-OUT** of the **DC-Converter** to **DC-IN** which locates in the **side panel** of the **Bridge Module Board** with a **Power Cable** (320mm).
- Connect the **N-Type (Fu) to SMA (Mu) Cable** to the **SMA Out port (Mu)** which locates in the **bottom** of the **power amplifier**.

Without Additional DC-Injector

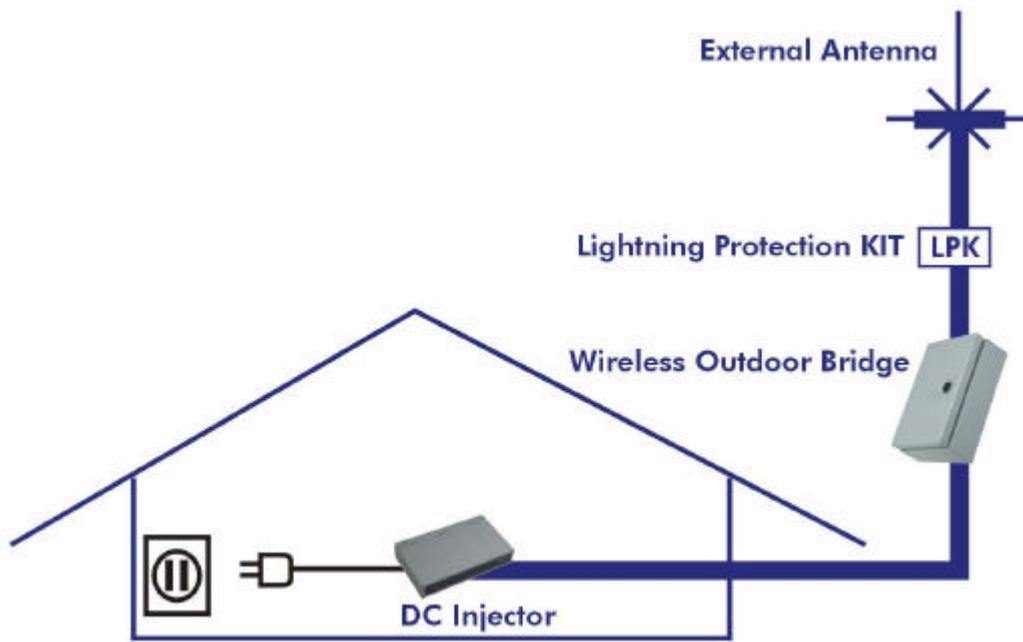


Figure 2-11

8. Installing the Outdoor Bridge

a. Mounting Bracket on the wall

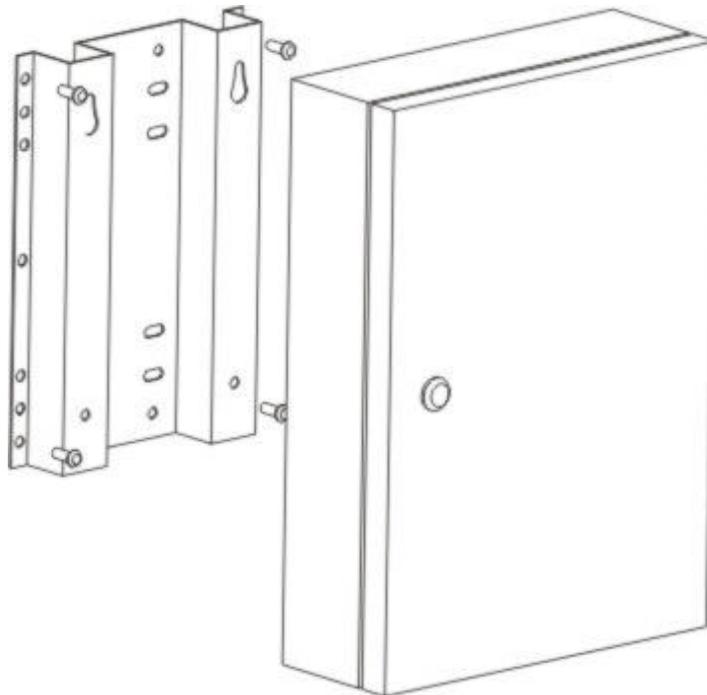


Figure 2-13

b. Mounting Bracket on the Mast with the U-blots

The mast must (not provided) be constructed of sturdy, weatherproof, non-corrosive material such as galvanized or stainless steel construction pipe.

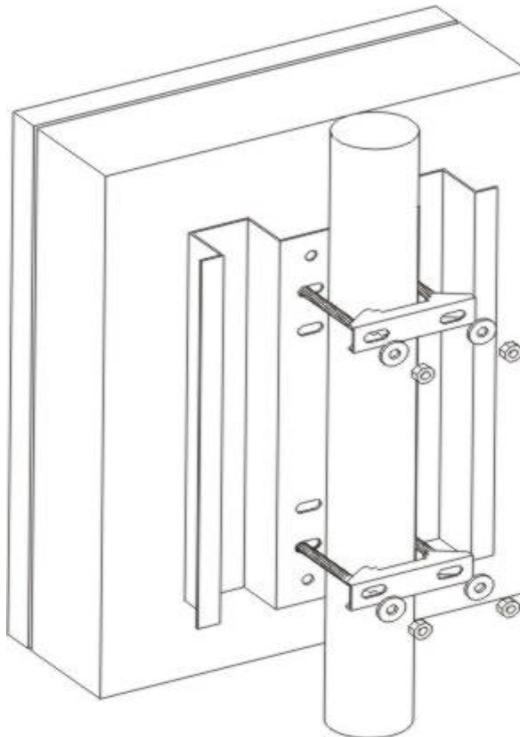


Figure 2-14

9. Connect to the other Bridge

For some special reasons, you may need to install two bridges as a wireless repeater to lengthen the coverage range. Connect two bridges using a crossed cable and plug into the LAN2 port in the side panel of the DC-Converter as shown in **Figure 2-2**. Refer to the **Chapter 3.3** for creating two of Bridges as a wireless repeater.

10. Antenna Alignment

In case Bridge A is connecting with network IP 192.168.123.100. Bridge B is connecting with network IP 192.168.123.101.

1. Figure out the rough direction/ location for both of the communication stations A and B by map finding or by experience in using GPS/ compass/ telescope first!!
2. Connect both station stations A and B, roughly fix the Antenna and pointing to the station direction for each other.
3. In DOS Mode, Ping A computer to B computer. (command : ping 192.168.123.101 -t).
4. Stay B ANT. in the same direction, Fine tune A Antenna only with small angle (less than 5 degree) in up/down/right/left direction, please check the result of IP being ping, make sure the system in linking condition as well as the time out possibility and response time as low as possible, if the system been tuned to this condition, it is time to fix the A Antenna.
5. If the A Antenna has been fixed, please tune and fix the B Antenna according to procedure 4. (Command for B computer to Ping A computer: ping 192.168.123.100 -t).
6. If the link quality and the signal strength not in reasonable performance, please repeat step 4 and 5 until optimum condition.

Chapter 3 Create a Bridge Network Environment

3.1 Bridge Configuration

1. Login this device with the administrator's password as "admin" (default).
2. Select Primary Setup.
3. In the Primary Setup page, make sure the Mode is Bridge.
4. Enter the address into IP Address field which is in the same subnet with your network environment.
5. Set the "Channel" and "SSID" of this device and another one which you want to connect in the same channel and SSID.
6. Save the settings above and then reboot this device.

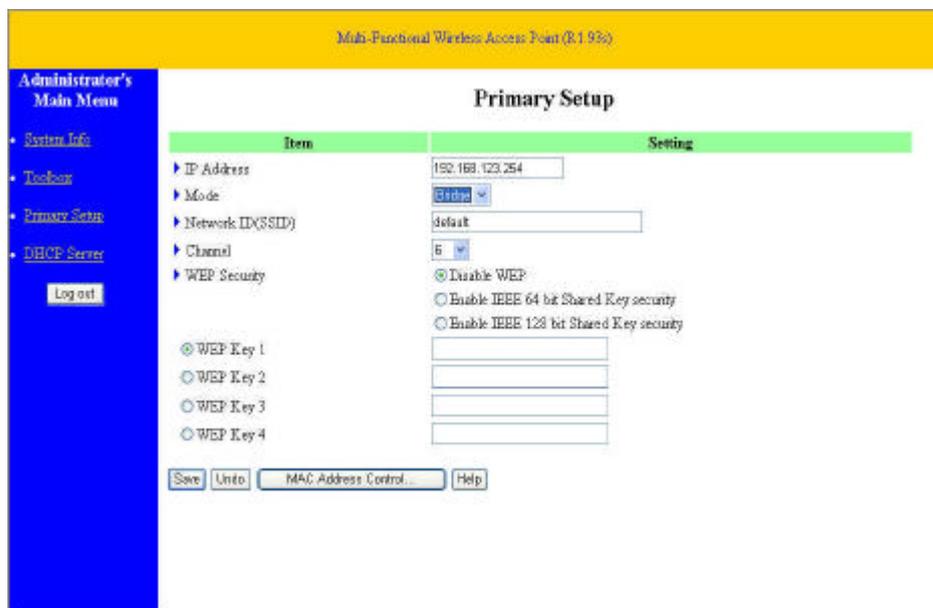


Figure 3-1

3.2 Create a Bridge Network Environment

The bridge supports external gain antennas with omni-directional or directional capabilities. Omni-directional antennas are suited for systems requiring a signal distribution in more than one direction. High-gain directional antennas are best suited for longer coverage range in a fixed direction.

Due to the differences in placement and physical environment, every network application has their unique installation. Before installing multiple bridges, you should implement a testing of each site to determine the optimum networking components and to maximize coverage range and network performance.

Think about the operating and environmental conditions of following when implement this testing:

1. Multipath propagation

Transmitted signals can combine with reflected ones to corrupt the signal detected by the receiver. The PATH between two antennas is a straight line as shown in **Figure 3-2**. Any obstacle in this PATH can redirect parts of the transmitted signal as shown in **Figure 3-3**. The best propagation path is a clear line of sight with good clearance between the PATH and any physical obstacle.

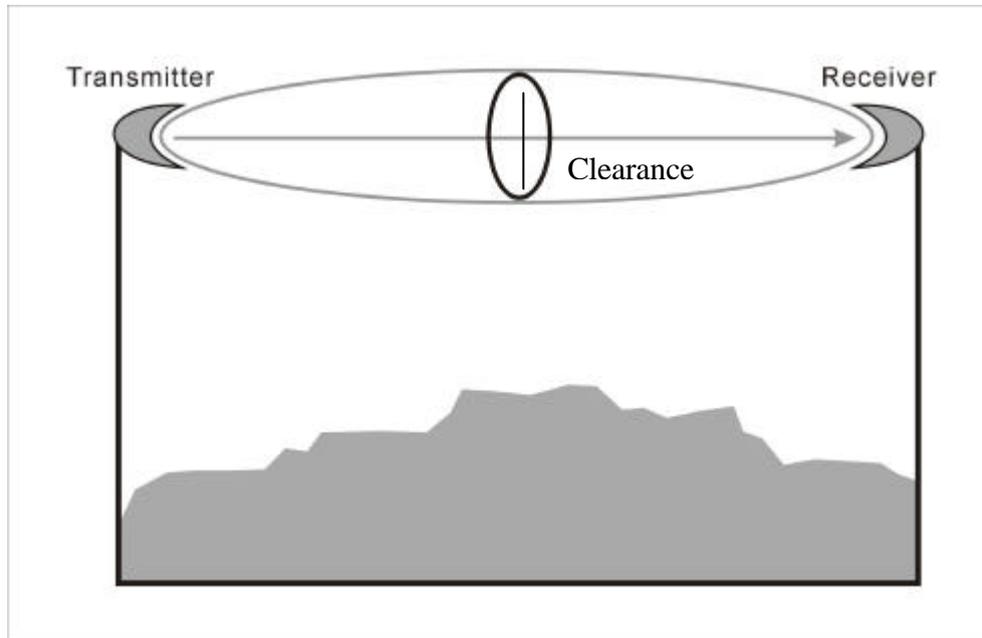


Figure 3-2

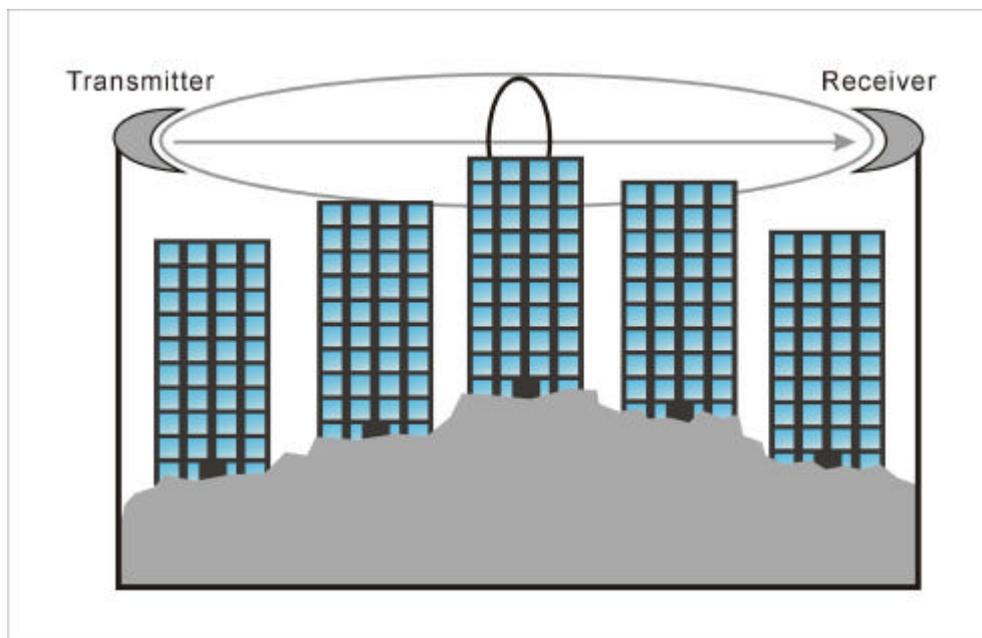


Figure 3-3

2. Path loss

Path loss between the transmitter and receiver is a key consideration when designing a wireless LAN solution. Expected levels of path loss, based on the range between the transmitter and receiver, provide valuable information when determining requirements for transmit power levels, receiver sensitivity and signal-to-noise ratio. Actual path loss depends on the transmit frequency, and it grows exponentially as the distance increases between the transmitter and receiver. In addition, path loss is minimized when there exists a clear line of sight and is lower when antennas are positioned higher. Refer to the potential obstacles to Line of Sight as shown in **Figure 3-4**, **Figure 3-5** and **Figure 3-6**.

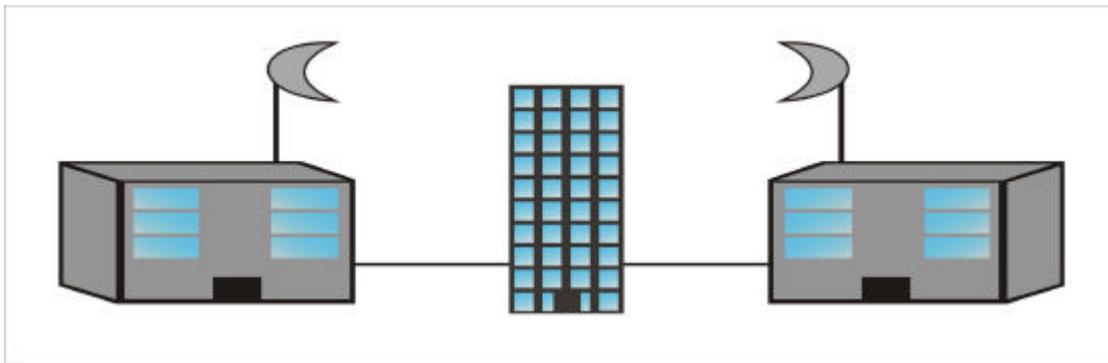


Figure 3-4

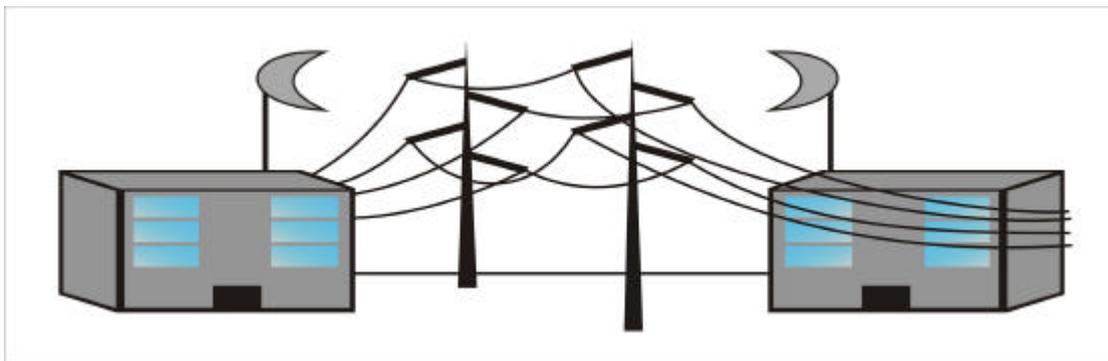


Figure 3-5



Figure 3-6

3. Physical environment and Obstructions

Open areas provide better coverage range than closed areas. Also, the obstructer such as steel buildings or trees can block or decrease communication between bridges. To avoid this situation, the antennas should be located in where is no or few obstruction between the sending and receiving antennas.

4. Rooftop Installation

Rooftop installations offer several advantages such as **Fewer obstacles in path, Increasing the range of antenna, reducing multipath problems** and **Improving performance due to greater height**. But please notice that Rooftop Installations are extremely dangerous! Incorrect installation way may cause in serious injury or death. Such installations should be performed by the professional installer.

5. Throughput of Data

Coverage range is inversely proportional to data rates. The maximum radio range is achieved at the lowest workable data throughput.

3.3 Connect Buildings by using Bridges

Wireless point-to-point networks use technologies very similar to wireless LANs. A radio-based wireless point-to-point network as shown in **Figure 3-7** and **Figure 3-8** is currently the most common method for providing connectivity within a metropolitan area. All of these bridges have to use highly directional antennas to focus the signal power in a narrow beam, in order to maximizing the transmission distance. The actual transmission distance of a particular product, depends on environment conditions and terrain. Rain, for example, causes resistance to the propagation of radio signals, decreasing the effective range. A mountainous area will also hamper the transmission range of the signals. Refer to **Chapter 3.2** for determining how to set up the wireless bridge environment.

3.3.1 Point to Point Configuration

In point-to-point configuration, a pair of bridges is set up to communicate only with each other. In a typical point-to-point application, the bridge acts as a data channel, providing a wireless link between sites separated by considerable distances. Actual distance attained depends on the antennas used and their installation. Both voice and data can be transmitted between sites.

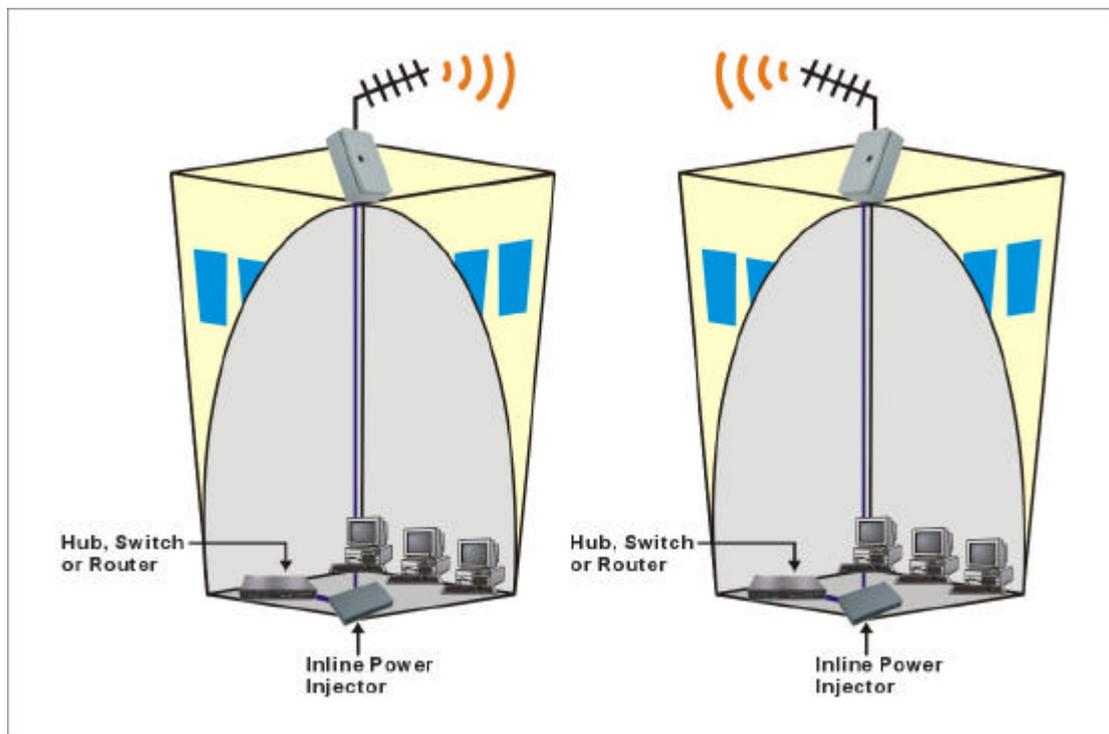


Figure 3-7

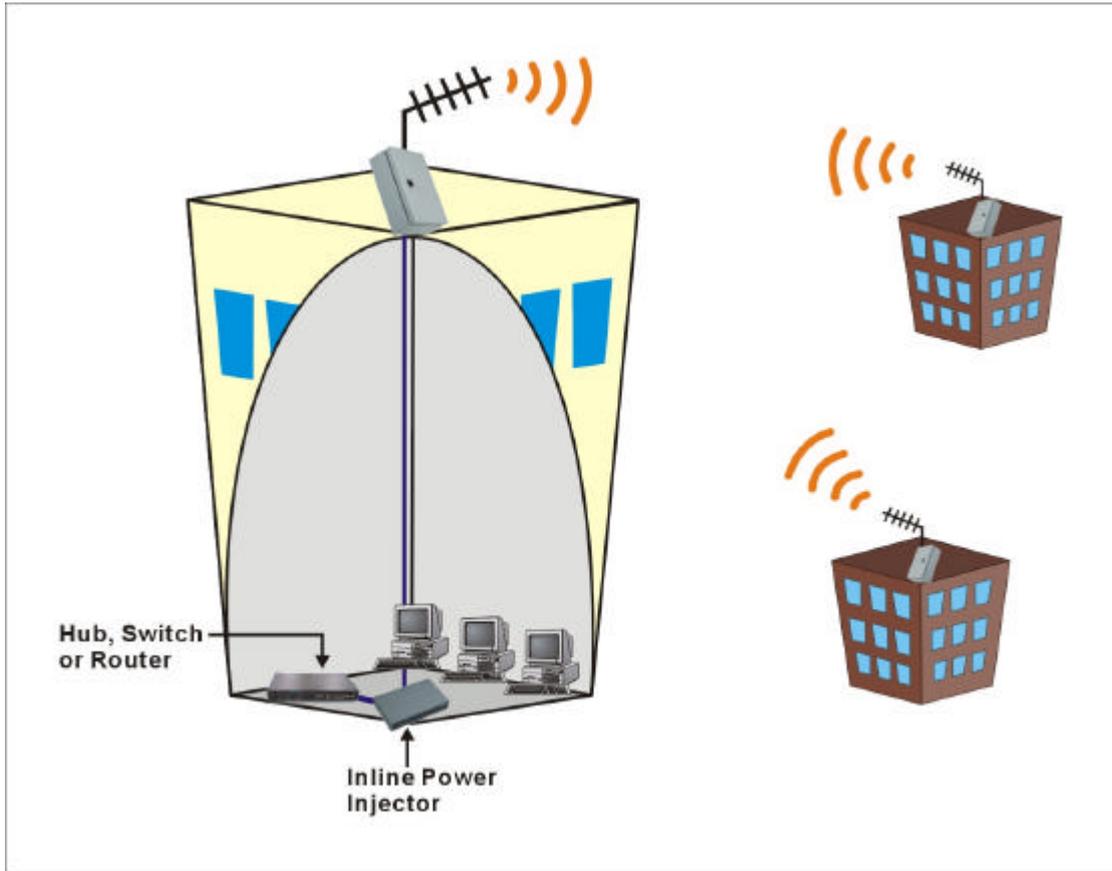


Figure 3-8

3.3.2 Repeater Configuration

The repeater configuration extends maximum communication range beyond the radio horizon. An additional pair of bridges is set up at an intermediate site, one oriented towards each of the end points. Transmissions from one end point are received by the intermediate bridge facing it, passed by wire to the other intermediate bridge, and retransmitted to the other end point. This configuration normally requires directional antennas for maximum range.

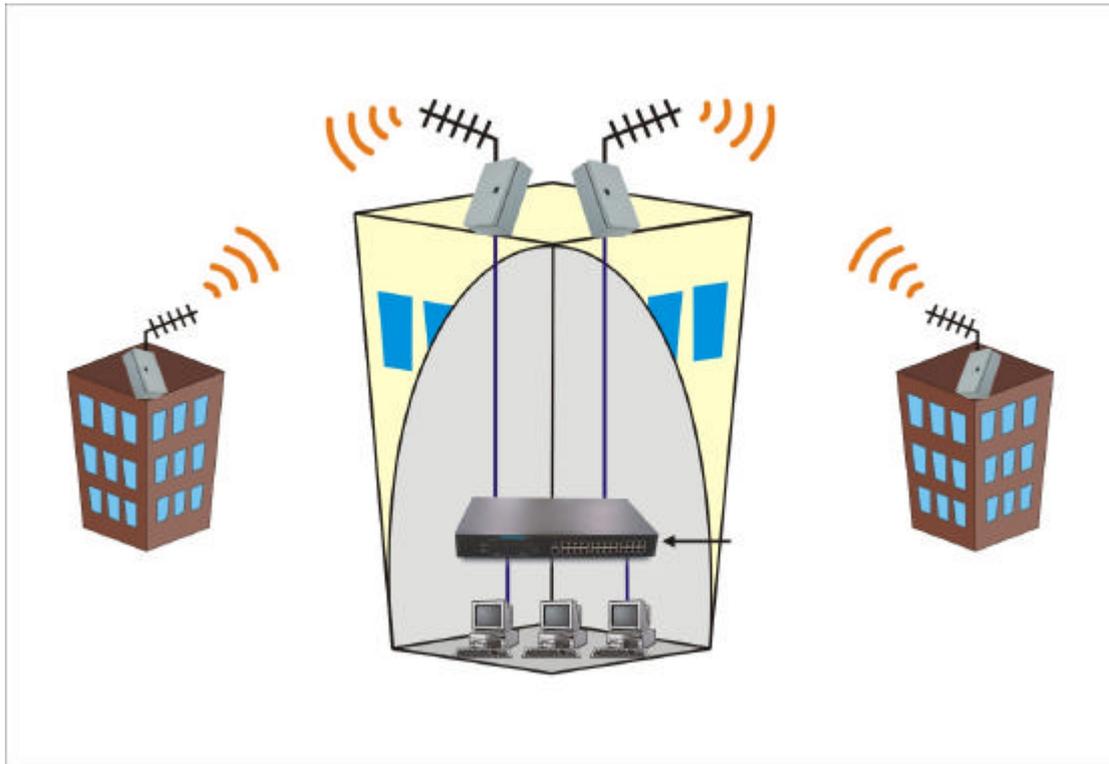


Figure 3-9

NOTE: To minimize the influence of obstacles, signal interference or reflections, install the antennas at least 2 meters (6 feet) away from all other antennas. Use the straight cable (RJ-45) to connect to the HUB/SWITCH or use the crossed cable to connect to the PC's Network Interface Card (NIC).

Chapter 4 General Configuration

4.1 Log in and Start up

This product provides a web based configuration scheme, make possible to configure by web browser such as Netscape Communicator or Internet Explorer.

1. Start the web browser, and *disable the proxy* or *add the IP address of this product into the exceptions of Proxy setting*. Then, type this product's IP address (the default setting is **192.168.123.254**) in the *Location* (for Netscape) or *Address* (for IE) field and press ENTER.
2. You will see the web user interface after the connection is established. To log in as an administrator, enter the system password (the default setting is " *admin* ") in the *System Password* field and click on the **Log in** button. If the password is correct, the web appearance will change to Administrator's Main Menu.

4.2 Inspect System Information

Check system information with click the System Info in Administrator's Main Menu.

- A. *Network ID (SSID)*: The current setting of SSID
- B. *Firmware Version*: The current firmware version on this device
- C. *MAC Address*: The MAC address of this device
- D. *Printer*: The possible kinds of printer status include 'Ready', 'Not ready', 'Printing...', and 'Device error'.

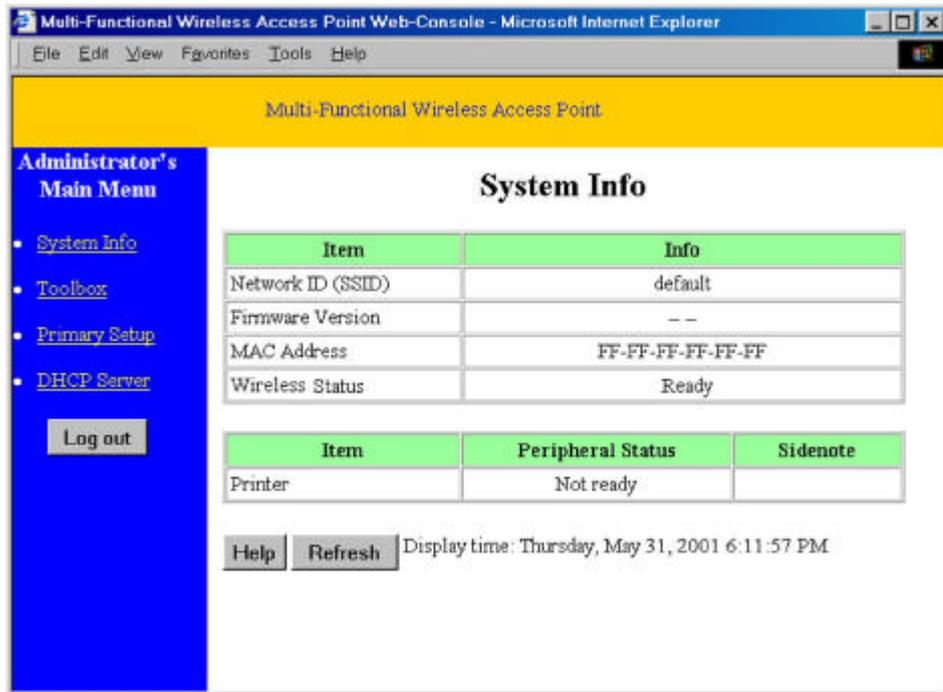


Figure 4.1

When this device is printing, there may appear a “Kill Job” button on the Sidenote column. You can click this button to cancel the current printing job manually.

4.3 Tool Box

This option enables you to change the administrator password.

There are some useful buttons in this page:

Item	Function
View Log	View the system logs
Reboot	Reboot this device
Backup Setting	You can backup your settings by clicking this button and save it as a bin file. Once you want to restore these settings, please click Firmware Upgrade button and use the bin file you saved
Reset to Default	Reset the settings of this device to the default values
Firmware Upgrade	Prompt the administrator for a file and upgrade it to this device

NOTE: we strongly recommend you to change the system password for security reason.

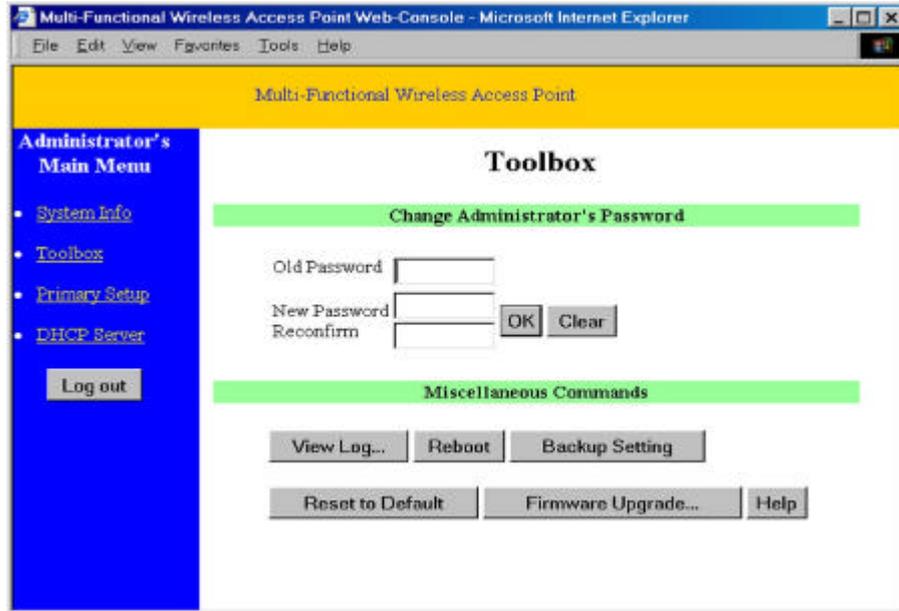


Figure 4.2

4.4 Primary Setup

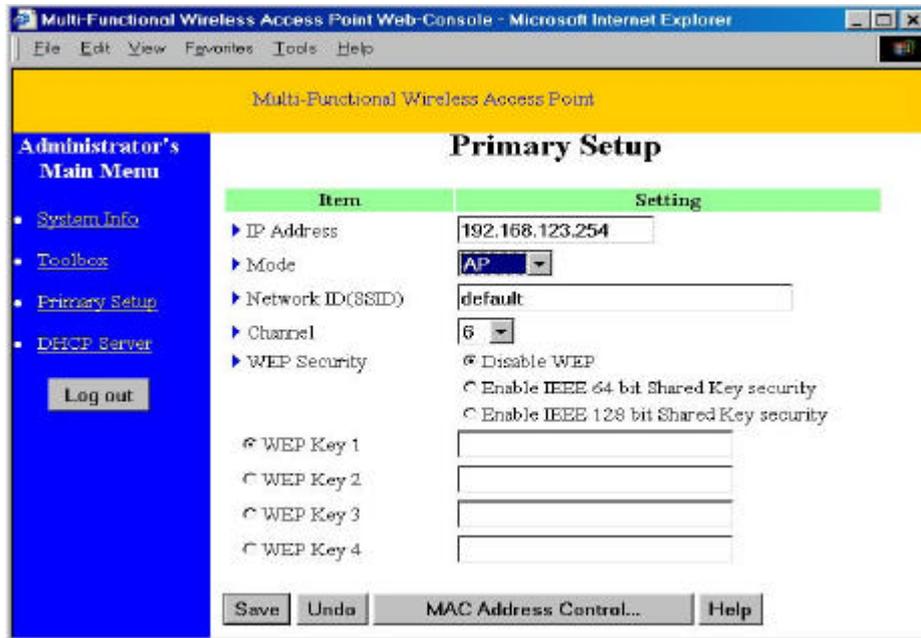


Figure 4.3

This option is primary to enable this product to work properly.

1.IP Address: the IP address of this device.

2.Mode: the operating mode of this device. The default mode is “Bridge”, which

is the normal operation mode of a Bridge. Users can change it to the “AP” mode if you want this product to work as a **wireless access point**.

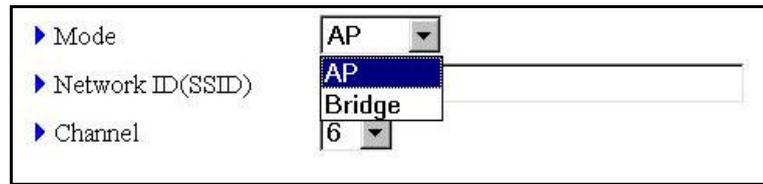


Figure 4.4

3. Network ID (SSID): Network ID is used for identifying the Wireless LAN (WLAN). Client stations can roam freely over this product and other Access Points that have the same Network ID. (The factory setting is “*default*”).

Note: This item won't take effect in “Bridge” mode.

4. Channel: The radio channel number. The permissible channels depend on the Regulatory Domain.

The factory setting is as follows:

Countries	Channel
USA/Canada	1 - 11
Europe/Australia (ETSI)	1 - 13
Japan (All)	1 - 14
Singapore, France	10 - 13
Israel	3 - 8

5. WEP Security: Select the data privacy algorithm you want. Enabling the security can protect your data while it is transferred from one station to another. The standardized IEEE 802.11 WEP (64-bit or 128-bit) is used here.

6. WEP Key 1, 2, 3 & 4: After enable the 64-bit or 128-bit WEP key security, please select one WEP key to be used in default setting and then input 10 or 26 hex-decimal (0-9, A-F) digits.

7. MAC Access Control: Setup MAC addresses to control which wireless clients can associate to the wireless LAN and this device or connect to this device.

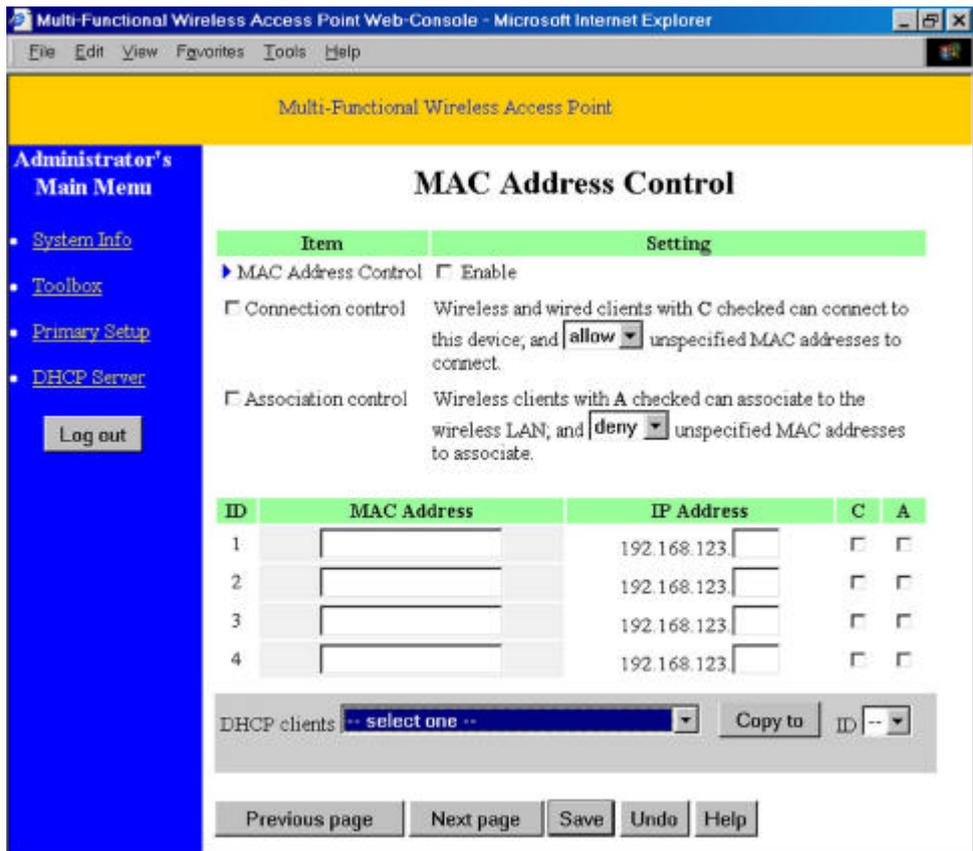


Figure 4.5

MAC Address Control allows only client devices with specified MAC addresses to associate and pass data through this device.

Item	Function
MAC Address Control	Check "Enable" to enable the "MAC Address Control". All of the settings in this page will take effect only when "Enable" is checked.
Connection control	Check "Connection control" to enable the controlling of which wired and wireless clients can connect to this device . If a client is denied to connect to this device, it means the client can't access to the Internet either. Choose "allow" or "deny" to allow or deny the clients, whose MAC addresses are not in the "Control table" (please see below), to connect to this device.

Association control	Check "Association control" to enable the controlling of which wireless client can associate to the wireless LAN. If a client is denied to associate to the wireless LAN, it means the client can't send or receive any data via this device. Choose "allow" or "deny" to allow or deny the clients, whose MAC addresses are not in the "Control table", to associate to the wireless LAN.
Control table	"Control table" is the table at the bottom of the "MAC Address Control" page. Each row of this table indicates the MAC address and the expected IP address mapping of a client. There are four columns in this table as shown in the below Table.

Item	Function
MAC Address	MAC address indicates a specific client.
IP Address	Expected IP address of the corresponding client. Keep it empty if you don't care its IP address.
C	When " Connection control " is checked, check " C " will allow/deny the corresponding client to connect to this device.
A	When " Association control " is checked, check " A " will allow/deny the corresponding client to associate to the wireless LAN.

In this page, we provide the following Combobox and button to help users to input the MAC address.

The screenshot shows a user interface element for DHCP clients. It consists of a label 'DHCP clients' followed by a combobox with the text '-- select one --' and a dropdown arrow. To the right of the combobox is a button labeled 'Copy to ID' followed by another dropdown arrow.

Figure 4.6

Select a specific client in the “DHCP clients” Combobox, and then click on the “Copy to” button to copy the MAC address of the client you select to the ID selected in the “ID” Combobox.

Previous page and **Next Page** To make this setup page simple and clear, we have divided the “Control table” into several pages. You can use these buttons to navigate to different pages.

Chapter 5 System Troubleshooting

Problem and Indication	Possible Solution/ Answer
What is this bridge's default IP Address?	This bridge's default IP address is 192.168.123.254
I reset this bridge to factory defaults but the IP address hasn't changed.	Resetting this device to factory defaults does not reset the device's IP address to 192.168.123.254
I can't exchange data over a Point to- Point link.	<p>Check the following steps:</p> <ol style="list-style-type: none"> 1. Ensure that each device has the same Channel and SSID. 2. Confirm that both devices have Bridge Mode enable. 3. Make sure that all obstructions and possible sources of interference were considered when designing the path.
Lots collisions on my network have increased dramatically after I installed this device?	If these devices in your installation have a poor radio link, then this can increase the number of collisions on the network. Improve the radio link between each device to reduce the number of collisions.
What antenna should I use with this bridge?	This device does not ship with an antenna. You should order an antenna additionally. Antenna selection depends on the requirements of your microwave path. Refer to the Table 3-1 to get the recommendation of the antennas.
I can't ping a remote site from across the wireless link.	This device is only valid over the Ethernet interface and will not respond to ping requests from across the radio link.
No Power to device, Power LED is off.	<ol style="list-style-type: none"> 1. Power cord is not properly connected. Please verify power cord to connect to this device and to the power outlet. 2. Power supply is defective. Please replace the power supply.
Wireless link has established,	1. Check that the LINK LED is lighted Green. If

Problem and Indication	Possible Solution/ Answer
but there is no Ethernet activity.	<p>this is not the case, the port is inactive. Try another port on the hub or another UTP cable.</p> <ol style="list-style-type: none">2. Ensure that Ethernet port in unit is working. Ping this device to confirm Ethernet connection.3. Verify that you are using a cross-over UTP cable (pins 1 & 3, 2 & 6) if connected directly to workstation, or a straight-through cable if connected to a hub.

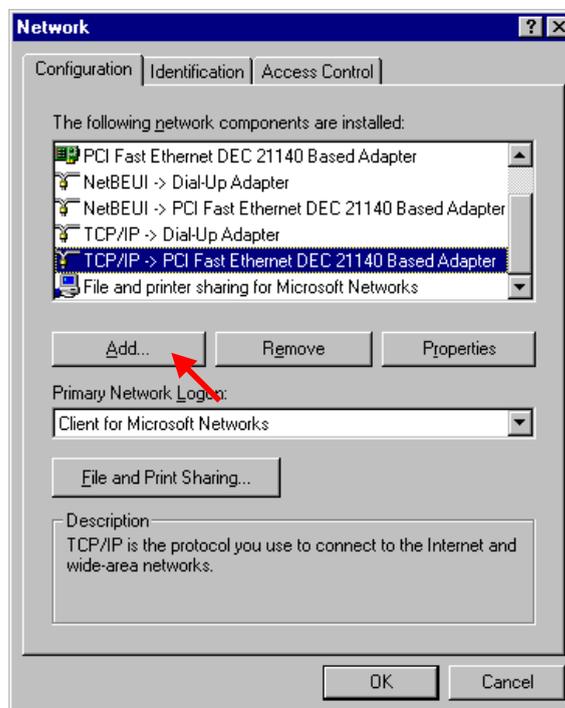
Appendix A TCP/IP Configuration for Windows

95/98/ME/2000/XP

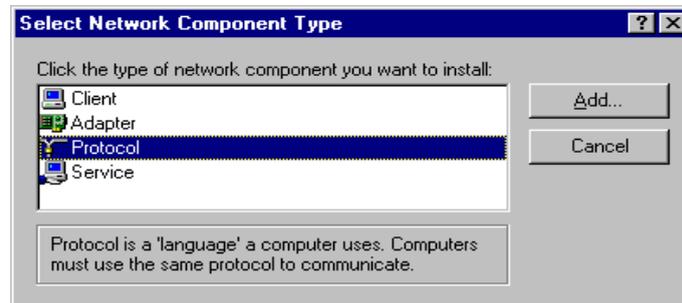
This chapter will introduce how to install the TCP/IP protocol in the personal computer and using the TCP/IP setting to connect this device correctly.

A.1 Configure Windows 95/98/ME Platforms for working with this device

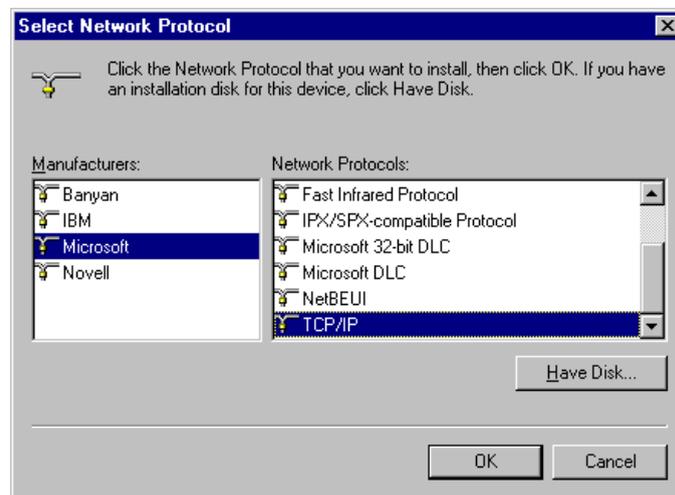
1. Connect this device to a computer by general network cable.
2. On the Windows 95/98/ME Platforms, click *Start* button and choose *Settings*, then click *Control Panel*.
3. Double click *Network* icon and select *Configuration* tab in the Network window.
4. Click *Add* button to add network component into your PC.



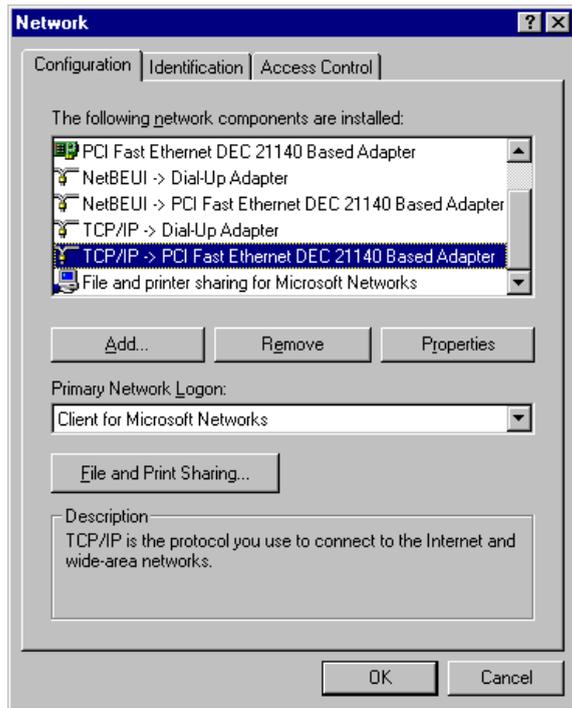
5. Double click **Protocol** to add TCP/IP protocol.



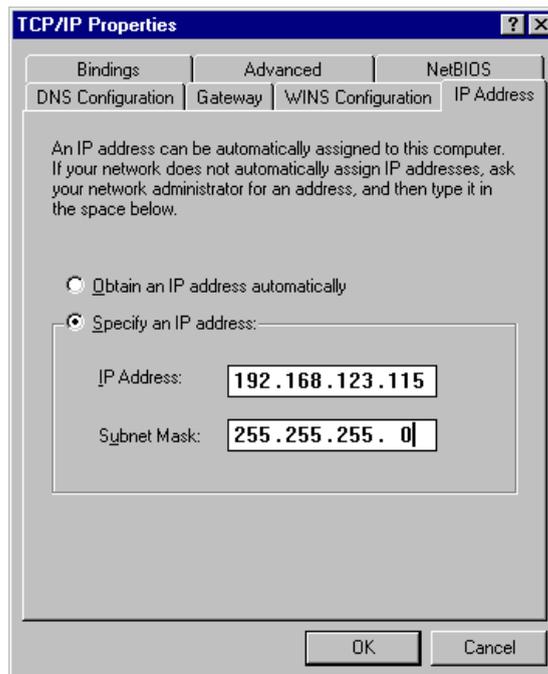
6. Select **Microsoft** item in the *manufactures* list. Then choose **TCP/IP** in the *Network Protocols* list. Click **OK** button to return to Network window.



7. The TCP/IP protocol shall be listed in the Network window. Click **OK** to complete the install procedure and restart your PC to enable the TCP/IP protocol.
8. After rebooting, click **Start** button and choose **Settings**, then click **Control Panel**.
9. Double click **Network** icon. Select the TCP/IP line that has been associated to your network card in the **Configuration** tab of the Network window.
10. Click **Properties** button to set the TCP/IP protocol for this device.



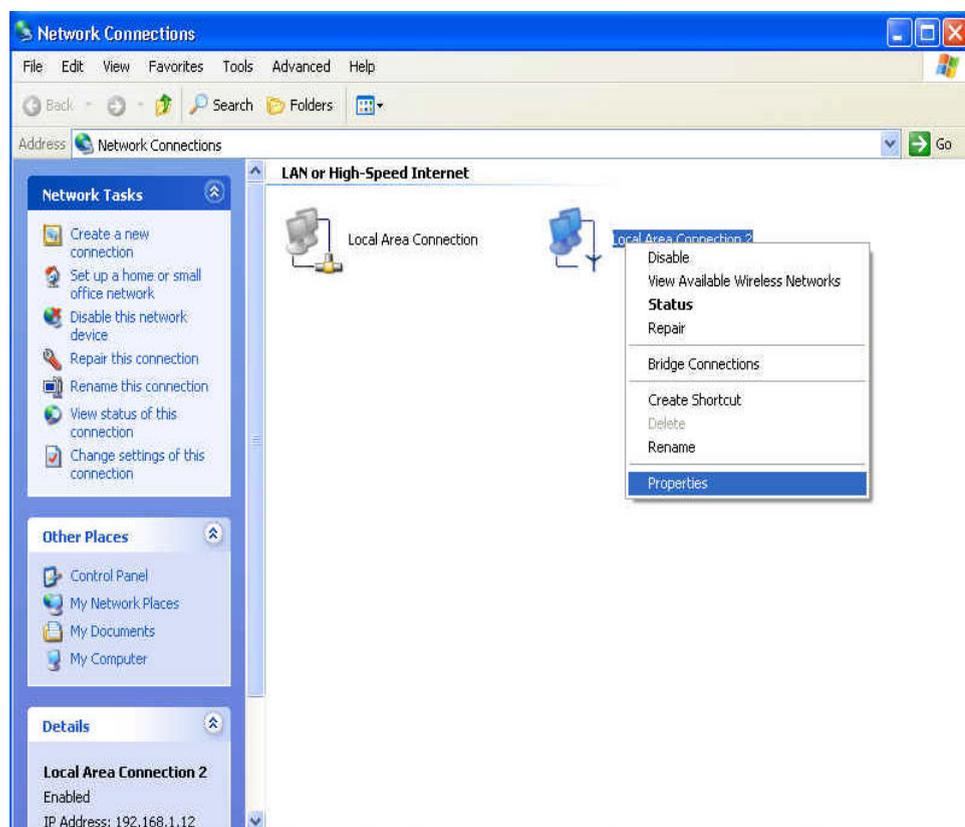
11. Select *Specify an IP address* in the *IP Address* tab. The default IP address of this product is 192.168.123.254. So please use 192.168.123.xxx (xxx is between 1 and 253) for *IP Address* field and 255.255.255.0 for *Subnet Mask* field.



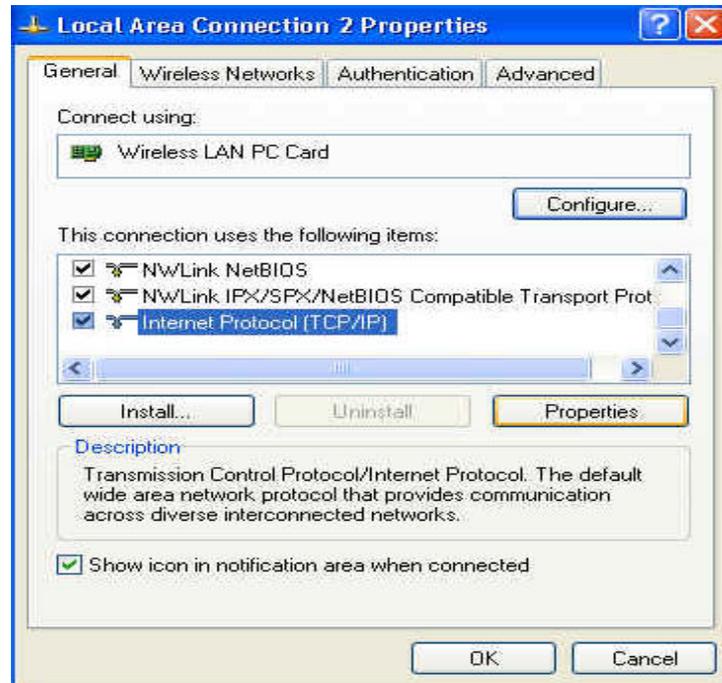
12. In the *Gateway* and *DNS* tab, do not put anything.
13. Click OK button to finish the TCP/IP setting and restart the computer.

A.2 Configure Windows 2000/XP Platforms for working with this device

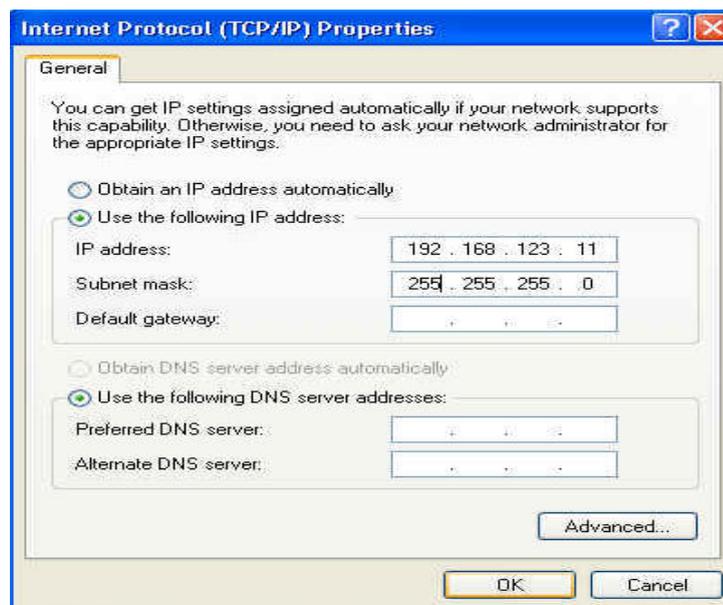
1. After complete installation the windows 2000/XP, the system will automatically install the TCP/IP protocol.
2. Connect this device to a computer by general network cable.
3. On the Windows 2000/XP platform, right click *My Network Places* on the desktop then select *Properties*.
4. In the *Network Connections* dialogue window, right click the network connection icon of *Wireless LAN PC Card* and select *properties*.



5. In the *General* tab, choose *Internet Protocol (TCP/IP)* and click the *properties* button.



6. In the *General* tab, select *Use the following IP address* and set a IP address which is in the same subnet with this product(default is 192.168.123.254).
7. Do not put anything in the *Default gateway* and *DNS* field.



Click the *OK* button to complete TCP/IP setting.

Appendix B Technical Specifications

General

Data Transfer Rate	11, 5.5, 2 and 1 Mbps, Auto Fall-Back
Range (open environment)	11 Mbps –300m/450m (23 dBm output power) 5.5 Mbps –400m/600m (23 dBm output power) 2 Mbps – 500m/750m (23 dBm output power) 1 Mbps –800m/1200m (23 dBm output power)
Antenna Connector	N-Type
LED Indicator	Power, Bridge and RF activity
WEP Data Encryption	64/128-bit
Regulation Certifications	FCC Part 15/UL, ETSI 300/328/CE

Network

Interface	Two 10/100Mbps RJ-45 Switch Port ,
Security	MAC address filtering
Management	Web-based configuration

Radio

Frequency Band	2.400 2.484 GHz
Radio Type	Direct Sequence Spread Spectrum (DSSS)
Operation Channels	11 for North America, 14 for Japan, 13 for Europe, 2 for Spain, 4 for France
Modulation	11 Mbps / 5.5 Mbps CCK ; 2 Mbps: DQPSK ; 1 Mbps: DBPSK

