

XI-1510-IP

Industrial Access Point

V2.89.18



FCC Information

This equipment has been tested and found to comply with the limits for Class digital devices pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

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 communication.

Operation of this equipment in residential area is likely to cause harmful interference in which case the user will be required to correct the interference at this own expense.

The user should not modify or change this equipment without written approval from company name. Modification could void authority to use this equipment.

For the safety reason, people should not work in a situation which RF Exposure limits be exceeded. To prevent the situation happening, people who work with the antenna should be aware of the following rules:

1. Install the antenna in a location where a distance of 20 cm from the antenna may be maintained.
2. While installing the antenna in the location, please do not turn on the power of wireless card.
3. While the device is working, please do not contact the antenna.

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About This Manual

The purpose of this manual is for the setup of the 11Mbps Wireless LAN Inter-Building Access Point. This manual, revised as version 2.89.18 in 2004, includes procedures assisting you in avoiding unforeseen problems.

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1. XI-1510-IP introduction

The next-generation wireless LAN device – 11Mbps Wireless Inter-building Access Point, XI-1510-IP are specially designed for Point-to-Point and Point-to-Multipoint applications, offering campus-wide connections between buildings at a speed of up to 11Mbps. The new features and benefits are: support POE(power over Ethernet); support testlink ,use this utility, you can place the antenna in the best place .Fully compliant with IEEE802.11b standard, the Wireless Inter-building Access Point provides powerful features such as the Windows-based configuration utility, MAC address filtering, WEP security and more.

1.1. features and benefits

-
- Creates a Point-to-Point connection linking two LANs, using 2 Inter-Building Access Point;
 - Creates a Point-to-Multipoint system using three or more Inter-Building Access Point.
 - Detachable antenna allows you for the use of external high gain antenna.
 - With a data rate of 11Mbps and 5.5Mbps, the system is faster than an E1/T1 data link.
 - Features 11Mbps data rate by incorporating Direct Sequence Spread Spectrum technology.
 - Fully IEEE 802.11b compatible. Allow inter-operation among multiple vendors.
 - Technique operating in the unlicensed 2.4Ghz ISM band.
 - Seamless roaming within the 802.11 & 802.11b wireless LAN infrastructure.
 - Provides user authentication to enforce tight security.
 - MAC address control.
 - Highly efficient antenna provides a range of operation up to 240 meter in free space.
 - Easy to install and friendly to user, just plug and play!
 - Provides Window-based configuration utility.
 - Tight design with lightweight, compact size, and low power consumption.
 - Support power over Ethernet.
 - Waterproof and can place into outdoor directly.
 - Support routing.
 - Testlink utility, help you place your antenna at the best place.

1.2. Applications

The 11Mbps Wireless LAN products offer a fast, reliable, cost-effective solution for wireless client access to the network in applications like these:

1.2.1. Remote Access to Corporate Network Information

E-mail, file transfer and terminal emulation.

1.2.2. Difficult-to-Wire Environments

Historical or old buildings, asbestos installations, and open area where wiring is difficult to deploy.

1.2.3. Frequently Changing Environments

Retailers, manufacturers and those who frequently rearrange the workplace and change location.

1.2.4. Temporary LANs for Special Projects or Peak Time

- C1- Trade shows, exhibitions and construction sites where a temporary network will be practical.
- C2- Retailers, airline and shipping companies need additional workstations during peak period.
- C3- Auditors requiring workgroups at customer sites.

1.2.5. Access to Database for Mobile Workers

Doctors, nurses, retailers, accessing their database while being mobile in the hospital, retail store or office campus.

1.2.6. SOHO (Small Office and Home Office) Users

SOHO users need easy and quick installation of a small computer network.

1.2.7. High Security Connection

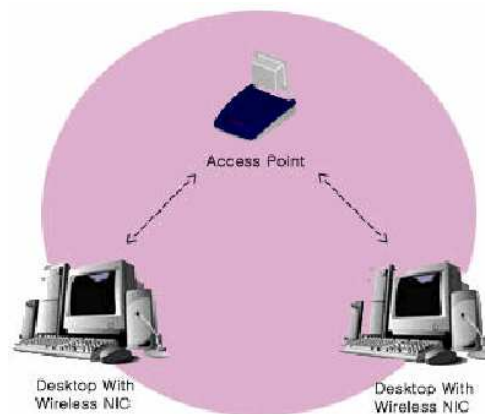
The secure wireless network can be installed quickly and provide flexibility. (Please refer to page 14 for more information on encryption configuration.)

1.3. System Configurations

The 11Mbps Wireless Inter-Building Access Point can be configured in a variety of network system configurations.

1.3.1. Wireless Infrastructure

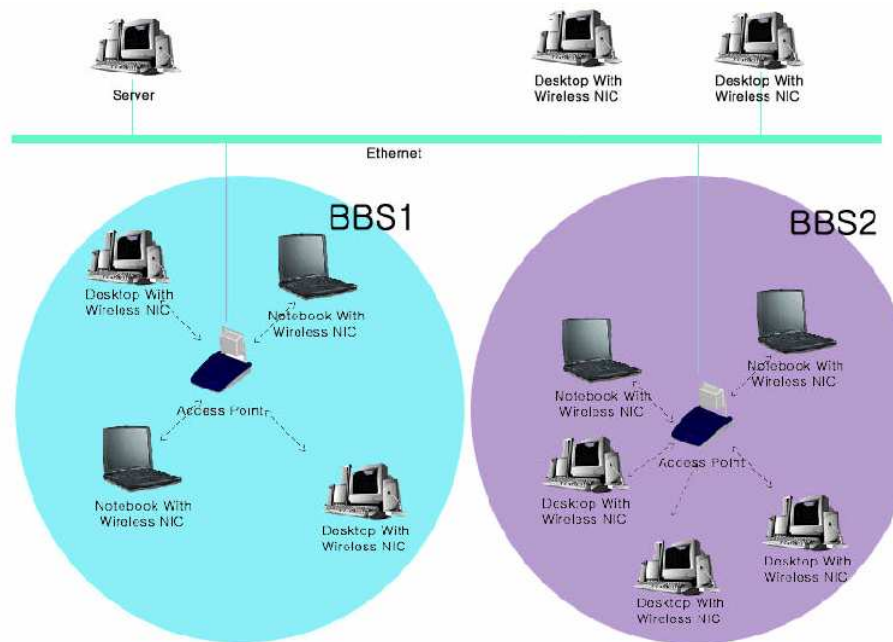
In a wireless infrastructure, the Inter-Building Access Point acts as a bridge. The Inter-Building Access Point connects the wireless clients together. The Inter-Building Access Point acts as a center point for all wireless communications. This would increase efficiency of the communications since the wireless adapters do not need to be within direct range of each other.



1.3.2. Wireless Infrastructure with Stations Attaching to a Wired LAN

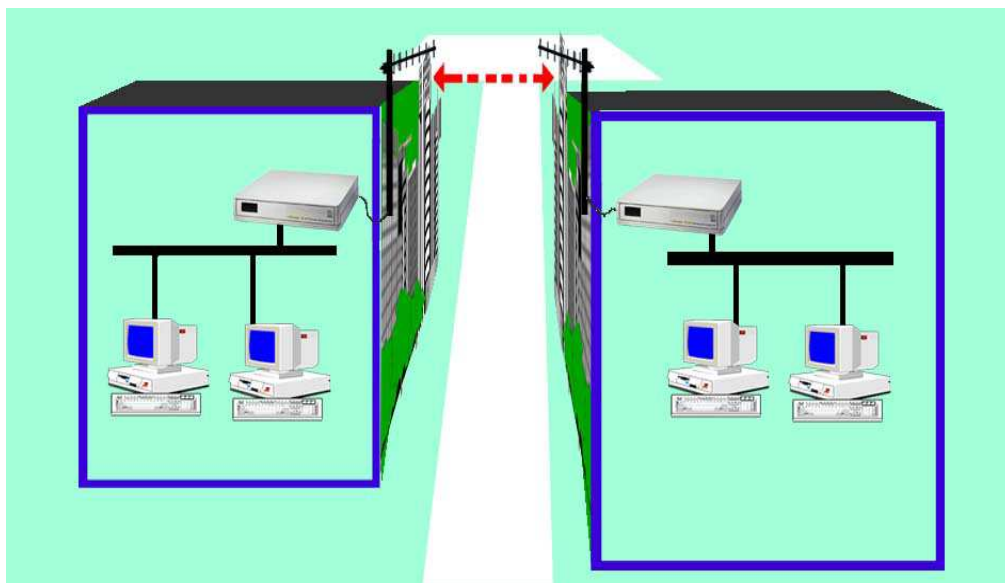
The 11Mbps Wireless LAN Inter-Building Access Point will provide an access to the local LAN. An integration of wireless and wired LAN is called an Infrastructure configuration. A group of wireless LAN PC users and an Inter-Building Access Point construct a Basic Service Set (BSS). Each wireless PC in this BSS can talk to each other on your network via the Inter-Building Access Point.

o



1.3.3. Inter-Building or Point to Point function

11Mbps Inter-Building Access Point can connect to LAN, either wireless network or wired network. By using specific antenna and booster, you can connect two LAN away from 30 kilometers.



2. hardware installation

This chapter describes initial setup of the Inter-Building Access Point.

2.1. Product Kit

Before installation, make sure that you the following items:

- **The 11Mbps Wireless LAN Inter-Building Access Pointx1**



- **Quick Start Guide.....x1**
- **Power Adapter.....x1**



- **Product CD.....x1**
- **Fixed setting.....x1**

If any of the above items are not included or damaged, please contact your local dealer for support.

2.2. System Requirements

Installation of the 11Mbps Wireless LAN Inter-Building Access Point requires:

- A 175~265V, 45~65Hz/24V 1A Power Adapter, which supplies the power for the Inter-Building Access Point.
- A 10/100 Base-T (UTP) Ethernet cable drop.

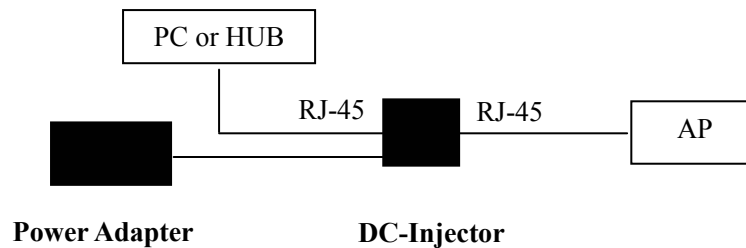
2.3. Mechanical Description

2.3.1 Power module

input of power module be any ,and output be two way :one to AP and one to terminal

2.3.1.1. Ethernet port (MDI)

11Mbps wireless Inter-Building Access Point integrate one Ethernet port: RJ45 MDI interface, connect AP interface of power module.



Connect figure

2.4. Hardware Installation

Take the following steps to set up your Inter-Building Access Point.

2.4.1. Site Selection



2.4.2. fixation

first you should fix your AP ,the following figure show it:



2.4.3. Connect the Ethernet Cable

The 11Mbps Wireless LAN Inter-Building Access Point supports 10/100M Ethernet connection. Attach your UTP Ethernet cable to the RJ-45 connector on the Inter-Building Access Point. Then connect the other end of the RJ-45 cable to a hub or a station. Please note that, use the cross-over cable when you desire to connect the Access Point to a PC.

- Put your UTP cable through the water-joint



- Make the crystal head (**straight cable**)



- Plug water-joint into XI-1510-IP



- Close the water-joint



3. Configuring the Inter-Building Access Point

The 11Mbps Wireless LAN Inter-Building Access Point is shipped with default parameters, which will be suitable for the typical **infrastructure wireless LAN**. Just simply install the Inter-Building Access Point, power it on, and it is now ready to work. Nevertheless, you can still adjust configuration settings depending on how you would like to manage your wireless network. The 11Mbps Wireless Inter-Building Access Point allows for configuration either via the configuration utility, known as Access Point Manager, TCP/IP (Telnet) connection or Web Management.

3.1. Using the Inter-Building Access Point Utility

Installed on your Windows 95/98/NT/ME/2000 desktop computer, the Windows-based utility “***Access Point Manager***” provides a user-friendly interface. The Access Point Manager enables you to configure all of your Inter-Building Access Points on the network more easily than ever before. The following gives instructions guiding you through the installations of the Access Point Manager utility.

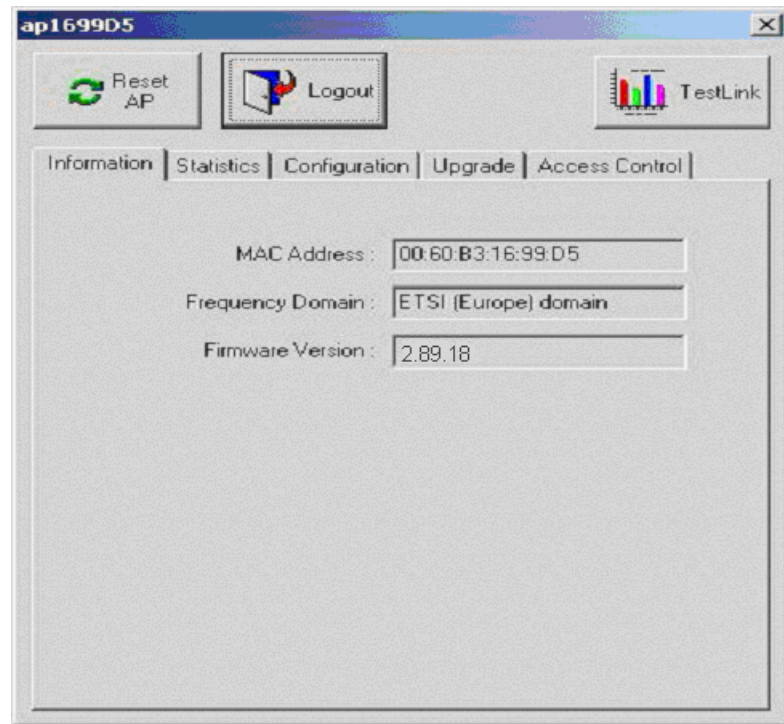
- Insert the Software and Documentation CD into the CD-ROM drive .
- Find the setup program file , and run it.
- Follow the on-screen instructions to install the Access Point Manager.
- Upon completion, go to **Program Files** and execute the Access Point Manager. It will begin to browse all the Inter-Building Access Points available on the network.



- Double click an Inter-Building Access Point icon to access its property dialog box. Enter the password in the entry field. The default password is “**default**”.



- After entering the correct password, a configuration window appears. You will see the basic information of the Inter-Building Access Point, such as MAC Address, Frequency Domain and Firmware Version.
- **Information**



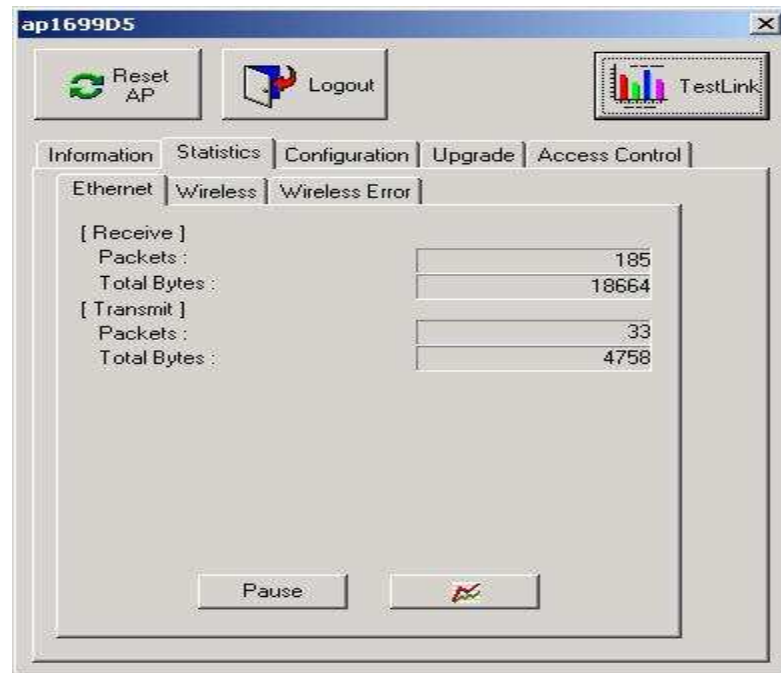
MAC Address: It is a hardware identification number that distinguishes the unit from others. You will see the number on the label located on the bottom of the Inter-Building Access Point.

Frequency Domain: The regulated operating frequency per country.

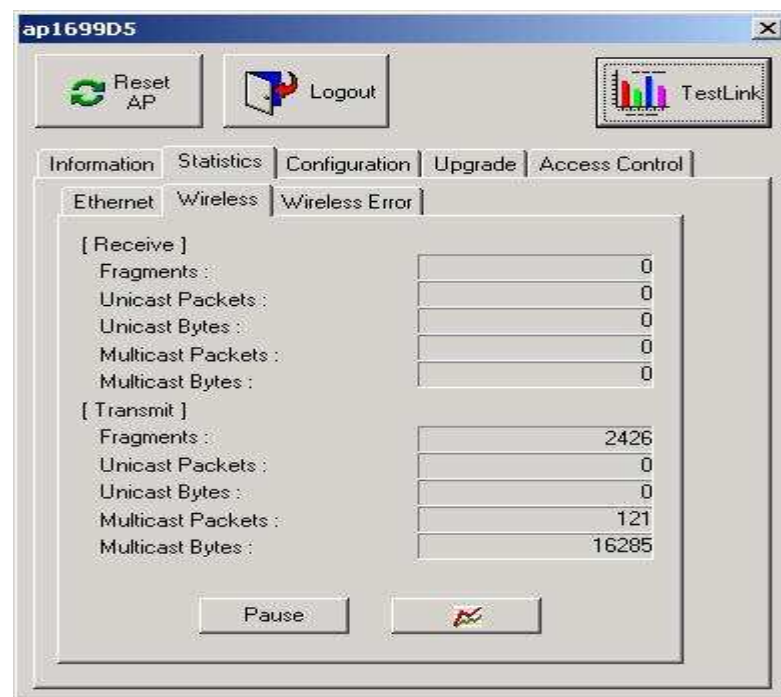
Firmware Version: Displays the firmware version that is equipped with your hardware.

- **Statistics:** The statistics tab contains three of the following items for you to monitor the Ethernet and Wireless network traffic.

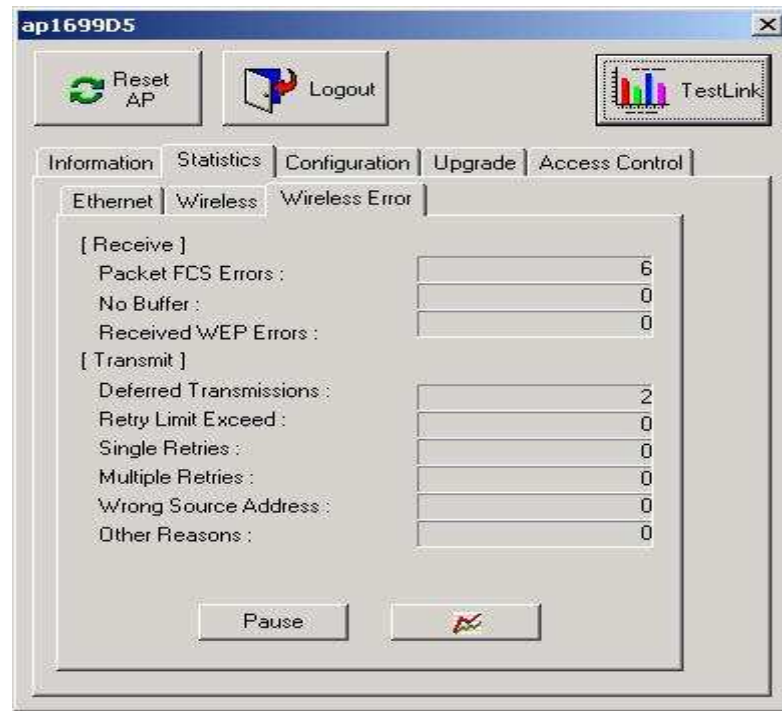
Ethernet: You may monitor the TX/RX on the wired network.



Wireless: You may monitor the TX/RX of the wireless network.



Wireless Error: This item offers detailed information on error wireless packets that the AP receives and transmits.



Receive:

Packet FCS Errors: The number of wireless packets that fail during FCS transmission (Frame Check Status when accessing the wired network.)

No Buffer: The number of wireless packets that the AP ignores due to insufficient memory.

Received WEP Errors: The number of wireless packets that have WEP encryption errors.

Transmit:

Deferred Transmission: The number of packets delayed transmission due to the medium is busy.

Retry Limit Exceed: The number of packets that are not sent due to the reason that the packets exceed the retry limits.

Single Tries: The number of packets that are successfully sent on the first retry.

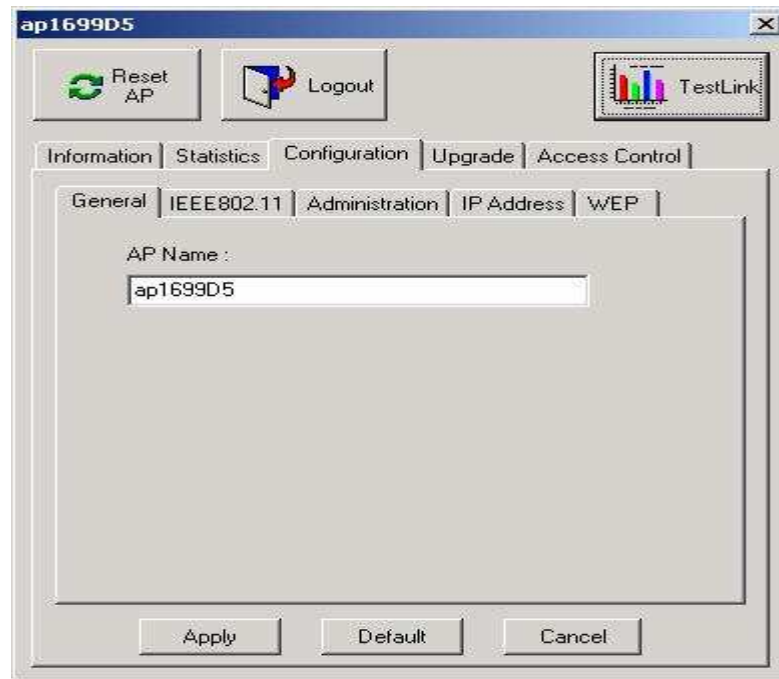
Multiple Retries: The number of packets that are successfully sent after several retries.

Wrong Source Address: The number of packets that are ignored by the Inter-Building Access Point because the source client is not in its BSS.

Other reasons: Other reasons that cause errors.

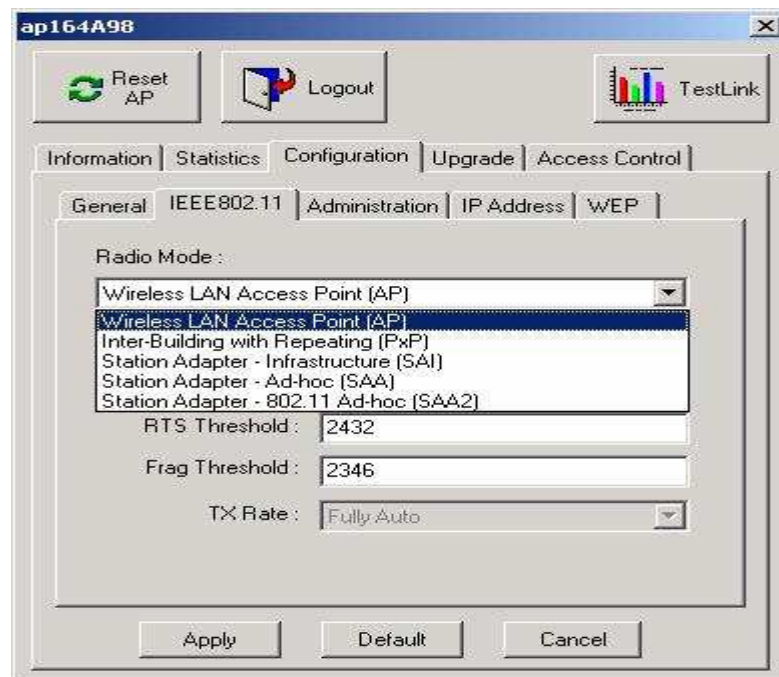
➤ Configuration: XI-1510-IP configuration

General:



AP name: In this entry field, you may enter any name. This will enable you to manage your Inter-Building Access Points with more ease if you have multiple Inter-Building Access Point on the network.

IEEE802.11:



Radio mode: select the work mode. The default of XI-1510-IP is AP.

Wireless LAN Access Point (AP): Served as a transparent Media Access Control (MAC) bridge connecting wireless network and the backbone network.

Inter-Building with Repeating (PxP) : Connect two or more separated networks with the Inter-Building Access Point.

ESSID: The ESSID is a unique ID given to the Inter-Building Access Point. Wireless clients associating to the Inter-Building Access Point must have the same ESSID. The ESSID can have up to 32 characters.

Channel: You may select any of the available channels as an operational channel for your Inter-Building Access Point.

RTS Threshold: RTS Threshold is a mechanism implemented to prevent the “Hidden Node” problem. “Hidden Node” is a situation in which two stations are within range of the same Inter-Building Access Point, but are not within range of each other. Therefore, they are hidden nodes for each other. When a hidden station starts data transmission with the Inter-Building Access Point, it might not notice that another station is already using the wireless medium. When these two stations send data at the same time, they might collide when arriving simultaneously at the Inter-Building Access Point. The collision will most certainly result in a loss of messages for both stations. Thus, the RTS Threshold mechanism will provide the solution to prevent data collisions. When the RTS is activated, the station and its Inter-Building Access Point will use a Request to Send/Clear to send protocol (RTS/CTS). The station will send an RTS to the Inter-Building Access Point, informing that it is going to transmit the data. Upon receipt, the Inter-Building Access Point will respond with a CTS message to all station within its range to notify all other stations to defer transmission. It will also confirm to the requesting station that the Inter-Building Access Point has reserved the channel for transmission.

Fragmentation Threshold: Fragmentation mechanism is used for improving the efficiency when there is high traffic within the wireless network. If you transmit large files in a wireless network, you can enable the Fragmentation Threshold and specify the packet size.

The mechanism will split the packet into the packet size you set.

TX Rate: you can select the following rate: Fully Auto, Fixed 1Mb/, Fixed 2Mb/s, Auto Select 1M 、 2M, Fixed 5.5Mb/s, and Fixed 11Mb/s. “Fully Auto” is your best choice.

Administration:

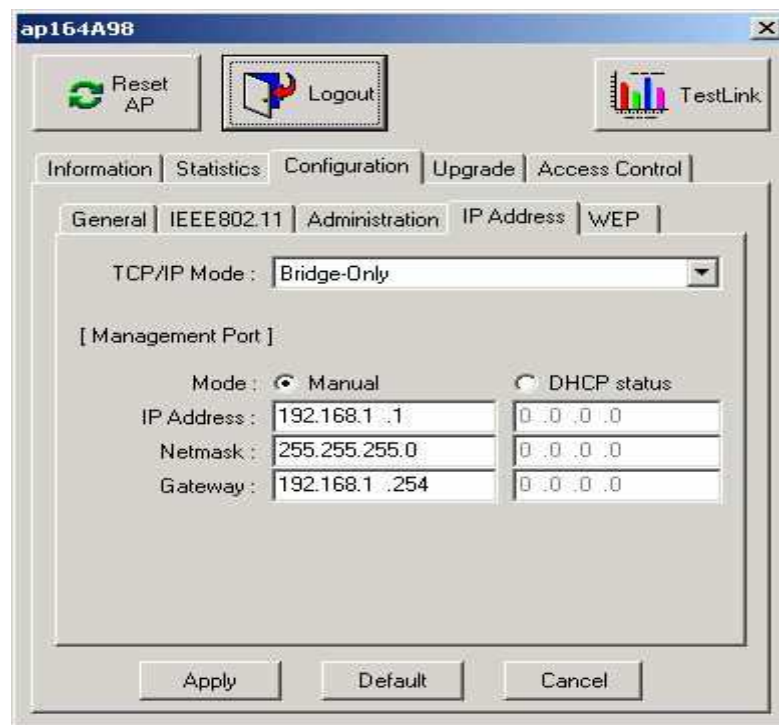
You may change the default password by entering the new password. Enter the new password in the Confirm Change field to make the new setting take affect.

IP Address:

To enable remote access to the Inter-Building Access Point using Telnet or Web Management, you must assign an IP address to the Inter-Building Access Point. You may also assign other related Internet addressing options, such as subnet mask or gateway address. Consult your network administrator to obtain an available IP address.

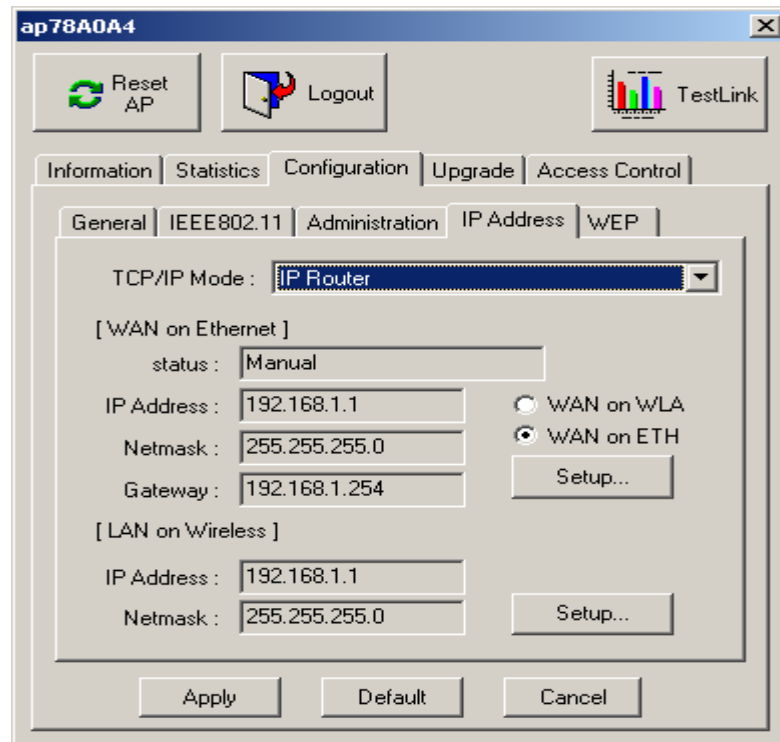
.Bridge-Only mode

if you want to via telnet or web to access the AP please select” bridge-only”, at this mode the AP work as bridge .you should specify the ip address or auto obtain form DHCP server :



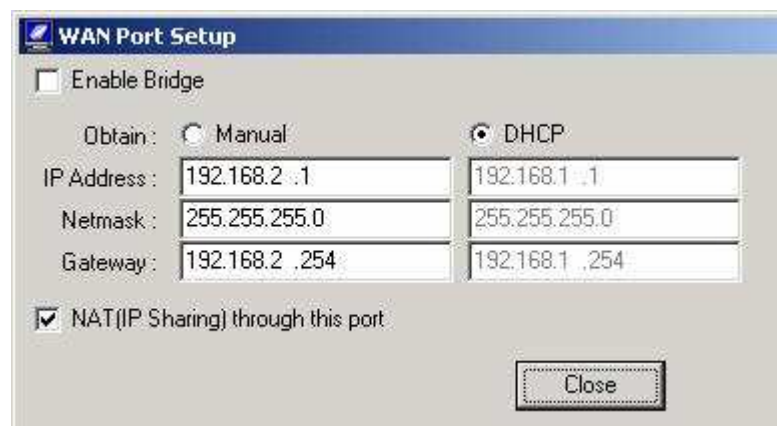
IP Router mode

As ip router mode , the AP work as router .it can route between wireless network and wired network. For example, AP connect with broadband via Cable/DSL, all wireless terminals have their own subnet and own ip address, the wireless terminals can access Internet via the AP.

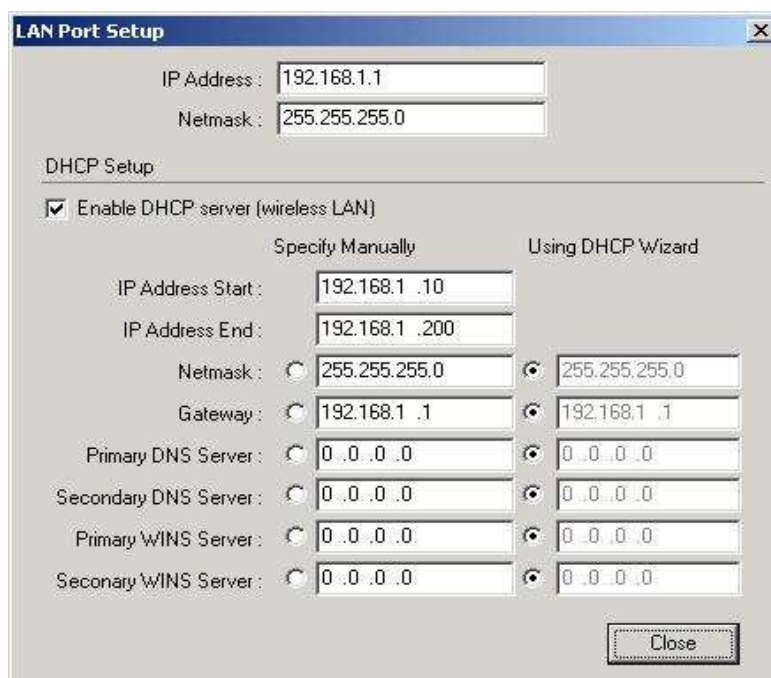


CLICK “**Setup**”, you can begin advanced configuration of Ethernet Port (WAN) and Wireless LAN Port:

Ethernet Port (WAN): at IP-Router mode, AP can work as DHCP client, auto obtain ip address. also can specify ip address. enable NAT (IP Sharing) through this port to ip share. again, you can enable “Enable Bridge”, make the AP work as network bridge.



Wireless LAN port: default IP address of LAN port is 192.168.1.1. click “**Enable DHCP server** (wireless LAN) “and config IP Address Start、IP Address End etc。Parameter of Netmask, Gateway, DNS server, WINS server etc, can specify or auto obtain from DHCP server.



LAN Port Setup

IP Address : 192.168.1.1
 Netmask : 255.255.255.0

DHCP Setup

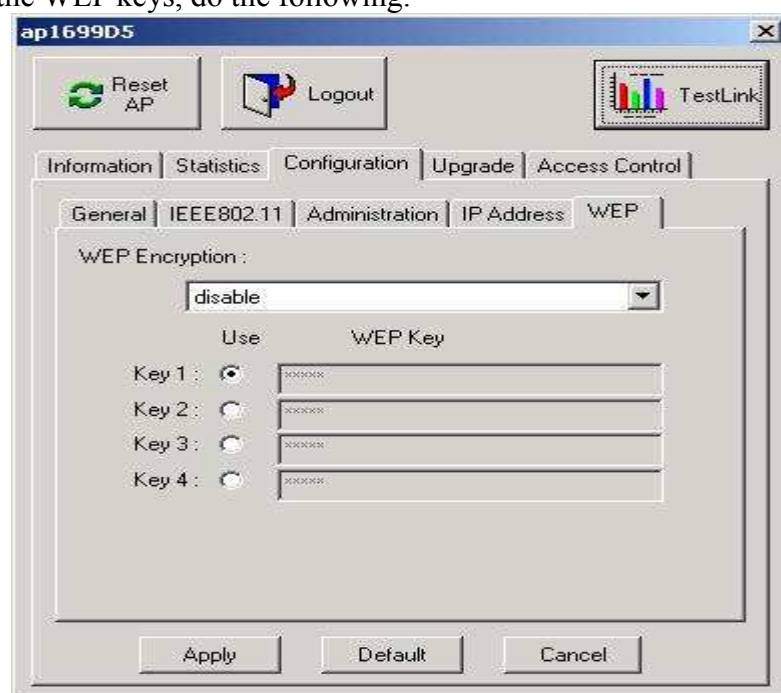
☒ Enable DHCP server (wireless LAN)

	Specify Manually	Using DHCP Wizard
IP Address Start :	192.168.1 .10	
IP Address End :	192.168.1 .200	
Netmask :	☐ 255.255.255.0	☒ 255.255.255.0
Gateway :	☐ 192.168.1 .1	☒ 192.168.1 .1
Primary DNS Server :	☐ 0 .0 .0 .0	☒ 0 .0 .0 .0
Secondary DNS Server :	☐ 0 .0 .0 .0	☒ 0 .0 .0 .0
Primary WINS Server :	☐ 0 .0 .0 .0	☒ 0 .0 .0 .0
Secondary WINS Server :	☐ 0 .0 .0 .0	☒ 0 .0 .0 .0

Close

WEP:

The 11Mbps Wireless LAN Inter-Building Access Point allows you to create up to 4 data encryption keys to secure your data from being eavesdropping by unauthorized wireless user. To activate and set the WEP keys, do the following:



ap1699D5

Reset AP Logout TestLink

Information Statistics Configuration Upgrade Access Control

General IEEE802.11 Administration IP Address WEP

WEP Encryption :

disable

Use WEP Key

Key 1 : ☒ XXXXXX

Key 2 : ☐ XXXXXX

Key 3 : ☐ XXXXXX

Key 4 : ☐ XXXXXX

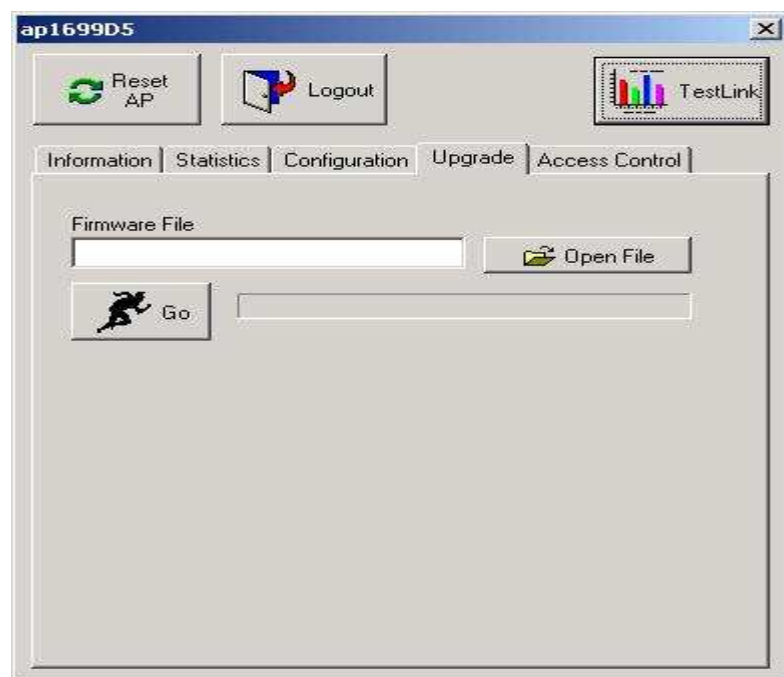
Apply Default Cancel

Disable –Allows wireless adapters communicate with Inter-Building Access Points without any data encryption.

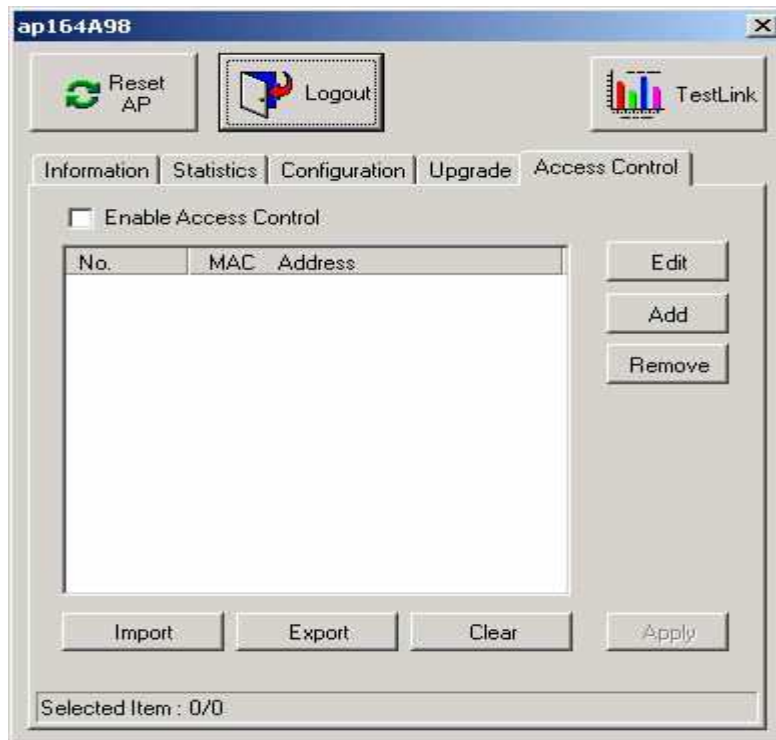
WEP40 –Requires wireless stations to use data encryption when communicating with the Inter-Building Access Point.

When WEP40 is selected, type five alphanumeric characters in the range of “a-z”, “A-Z” and “0-9” (e.g. MyKey) in the WEP Key 1 entry field. Alternatively, you may enter 10 digit hexadecimal values in the range of “A-F” and “0-9”, preceded by the characters “0x” values (e.g. 0x11AA22BB33). You can also enter WEP keys in the Key 2, Key 3 and Key 4 if you wish. WEP will only use 1 Key. You will have to select one WEP key as an active key before enabling use of encryption.

- **Upgrade:** click “Open File” and select the upgrade software to update the firmware.



- **Access Control:** With the Access Control Table enabled, you can authorize wireless units to access the Inter-Building Access Point by identifying the MAC address of the wireless devices that are allowed access to transmit data.



note : that when you enable the Access Control Table without any MAC address in the table, no access is allowed to communicate with the Inter-Building Access Point.

Use the following buttons to manage the Access Control Table:

Add –to enter MAC addresses of authorized wireless devices one at a time.

Edit –to change the entries in the table if you enter the incorrect MAC address.

Remove –to remove MAC addresses one at a time.

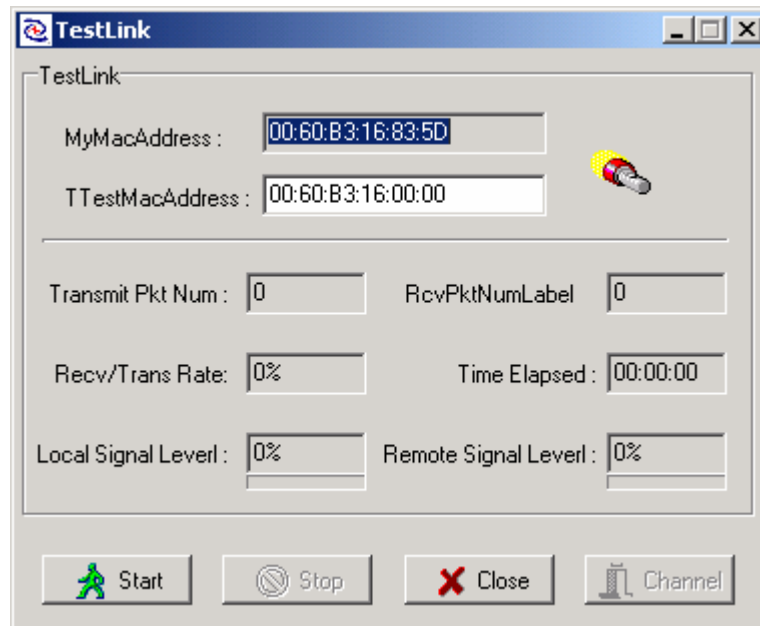
Clear –to remove all MAC addresses in the table.

Import –to import an existing Access Control Table.

Export –to save the current Access Control Table to a location on your computer. You may save the file as a text document.

➤ **testlink**

click “**Testlink**” to testlink mode



MyMacAddress—show MacAddress of local AP.

TTestMacAddress—fill MacAddress of remote AP.

Transmit Pkt Num—display the number of frame be sended.

RcvPktNumLabel—display the number of frame be received.

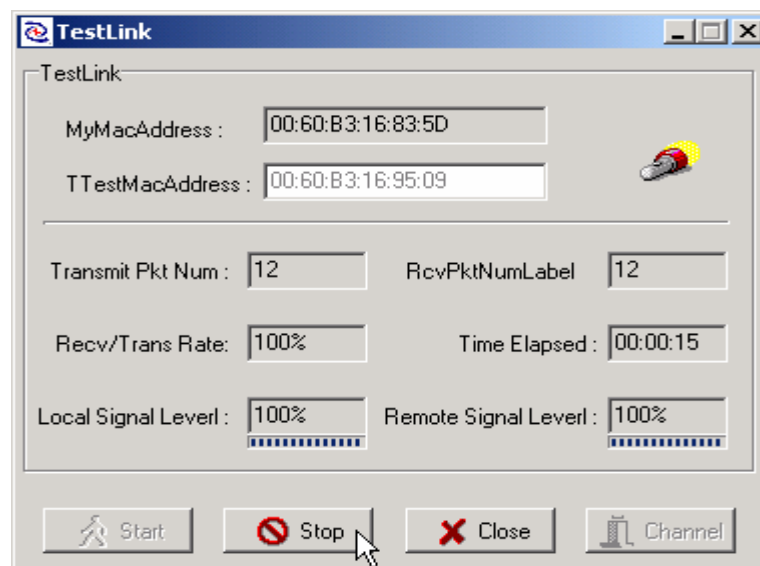
Rcv/Trans Rate—display the successful rate of transmitting.

Time Elapsed—show the time cost of sending data.

Local Signal Level—show local signal level.

Remote Signal Level—show remote signal level.

Start—click it will begin testlink:

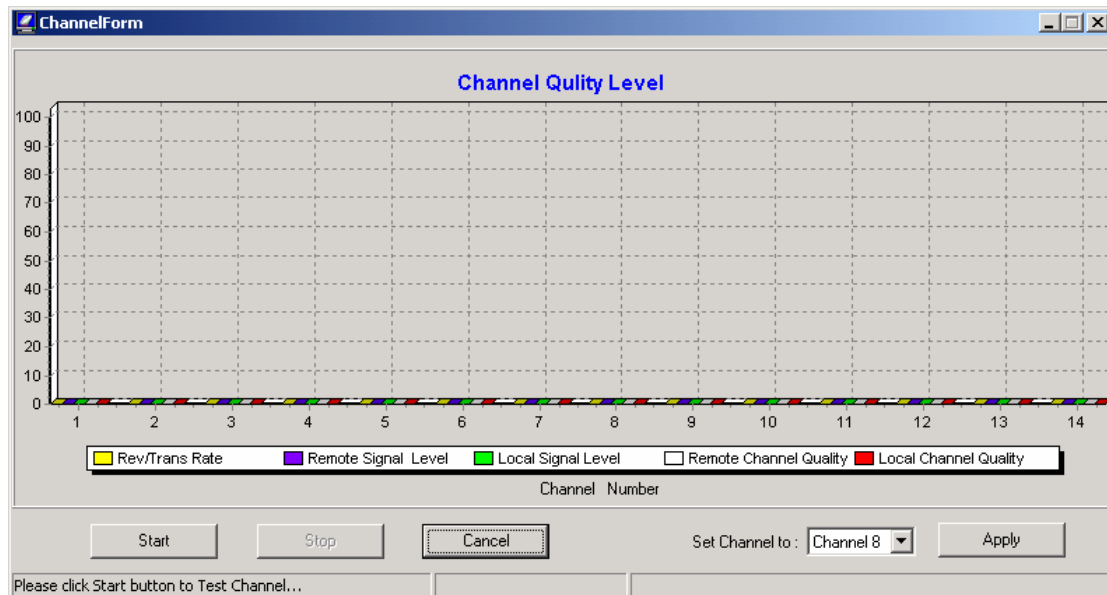


Stop—click it to stop testlink.

Close—click to stop testlink.

Channel—test the channel quality.

note: channel quality test must be perform after TX/RX data in gear, click ”stop” and the “channel” will be enable, click it to enter test window , be sure the MACaddress of remote AP is right.



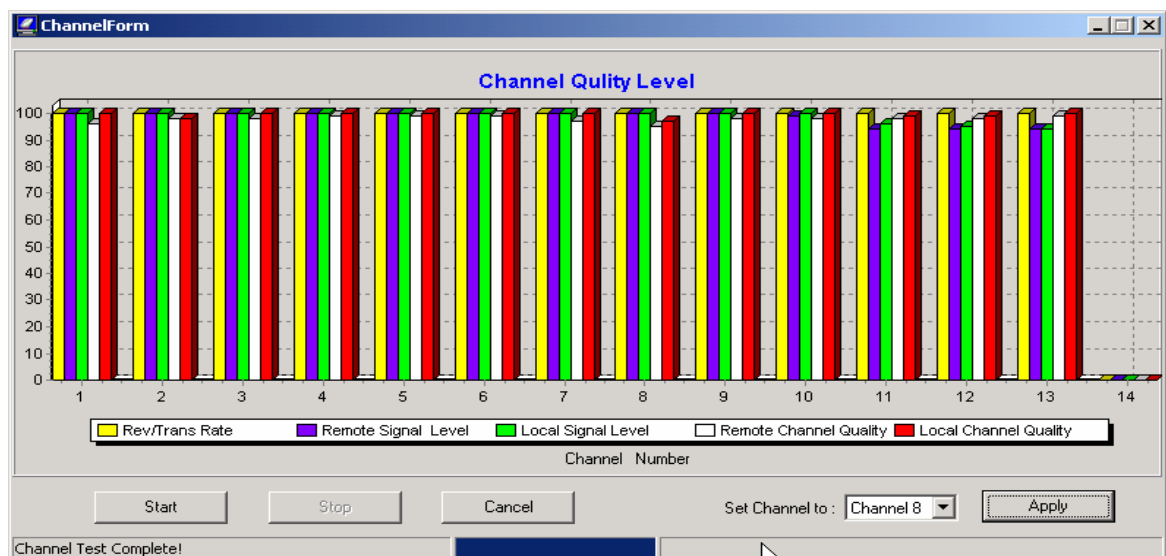
Start—click it start channel quality test .

Stop—click stop channel quality test .

Cancel—cancel test

Set Channel—set the channel to the best one, remember click “Apply”

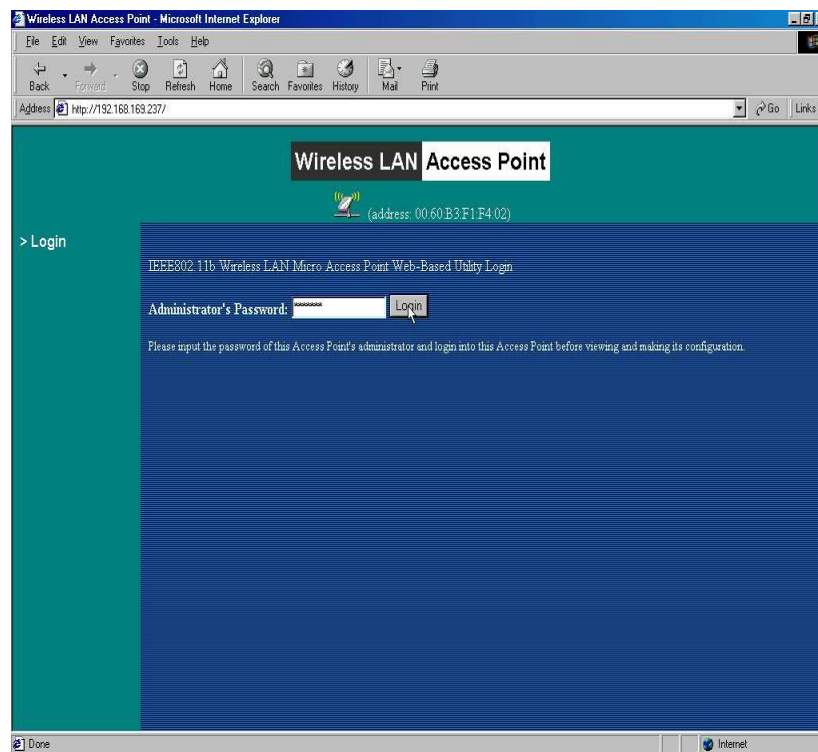
Note : two AP’S channel will be reset.



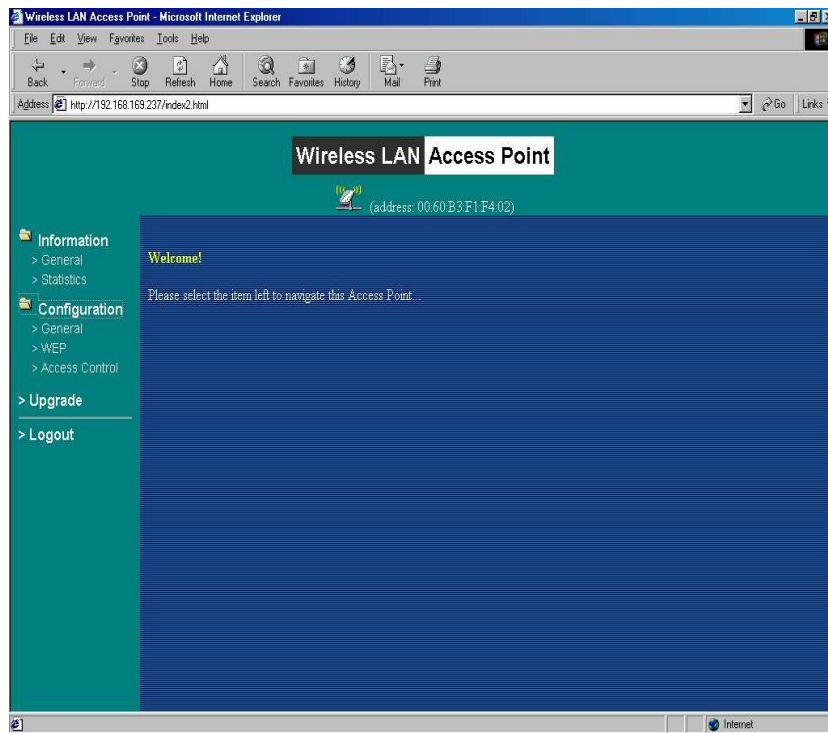
3.2. Using the Web Management

The built-in Web Management provides you with a user-friendly graphical user interface (web pages) to manage your Inter-Building Access Points. An AP with an assigned IP address (e.g. <http://192.168.1.1>) will allow you via web browser (e.g., Netscape Navigator 3.0 ~ 4.5 or MS Internet Explorer 4.0) to monitor and configure the Inter-Building Access Point.

- Run Web explorer.
- Enter the IP address of your Inter-Building Access Point in the Address field (e.g. <http://192.168.1.1>). You will have access to the **Inter-Building Access Point Web Pages** of the Inter-Building Access Point.



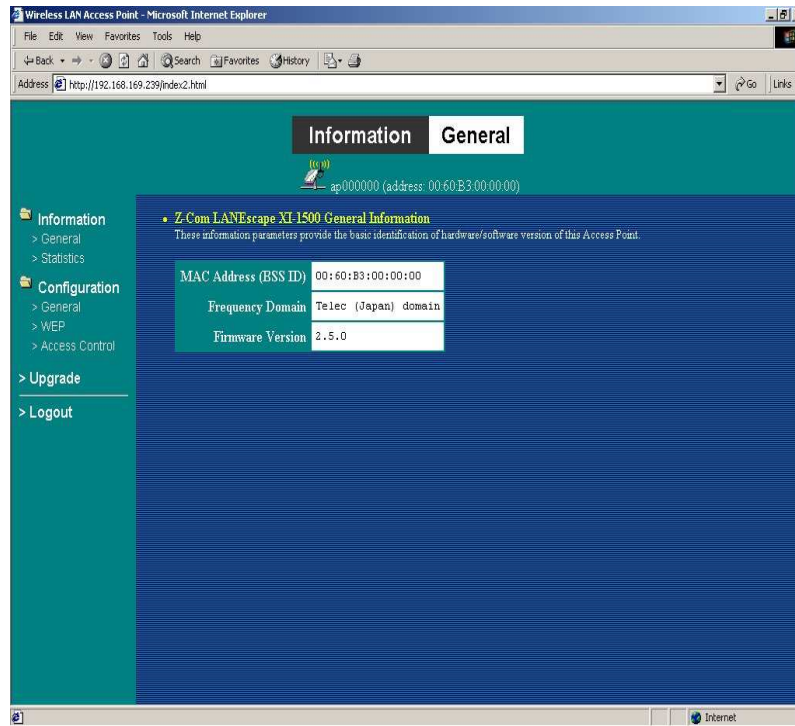
Enter the password to login to the Inter-Building Access Point. The default password is **default**. The main page will show up.



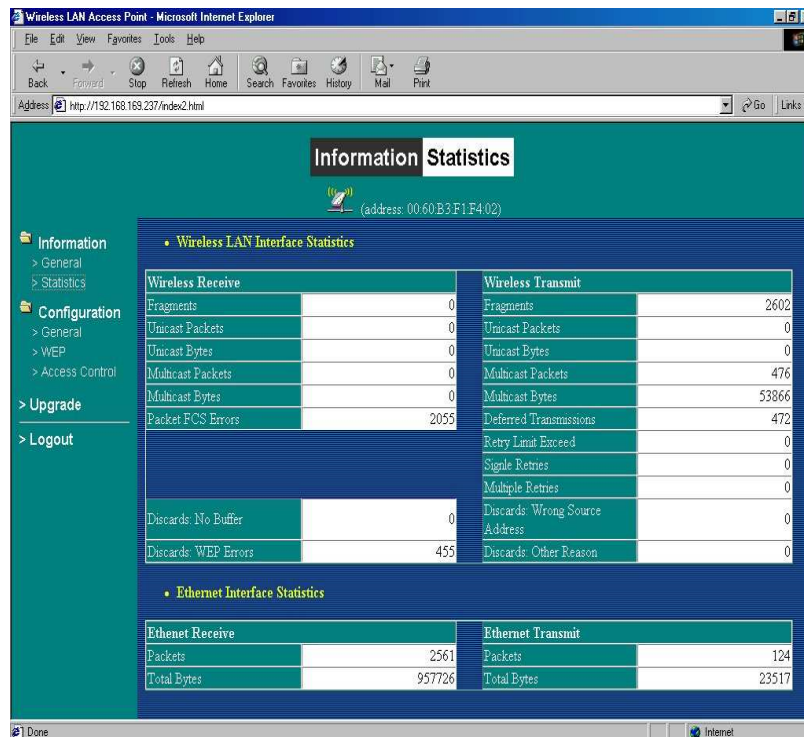
The Inter-Building Access Point main page contains two items for you to manage your Inter-Building Access Point.

3.2.1. Information

- **General:** This item displays the general information of the Inter-Building Access Point such as the MAC address, Frequency Domain, and Firmware Version.

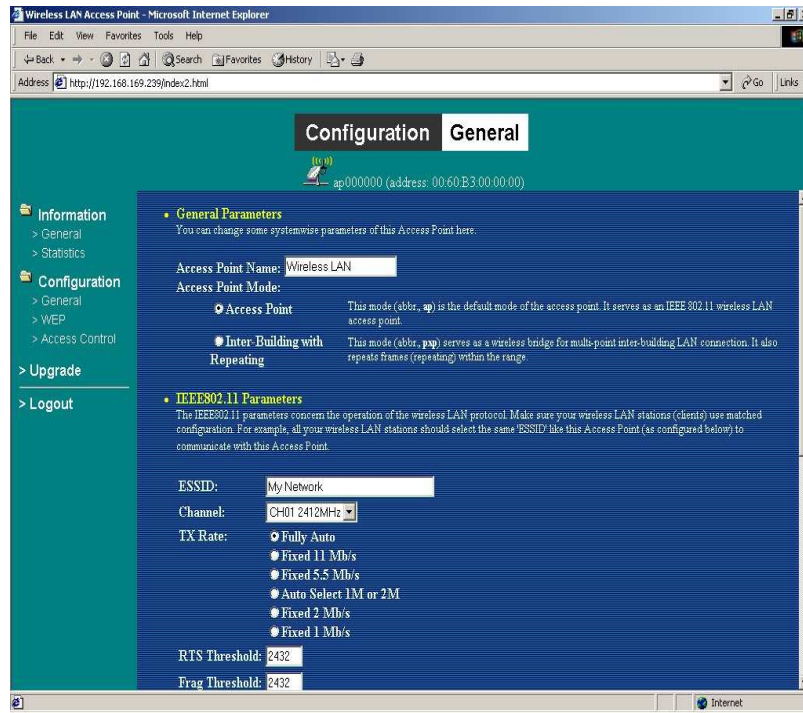


- **Statistics:** This item displays the Ethernet and wireless network traffic.

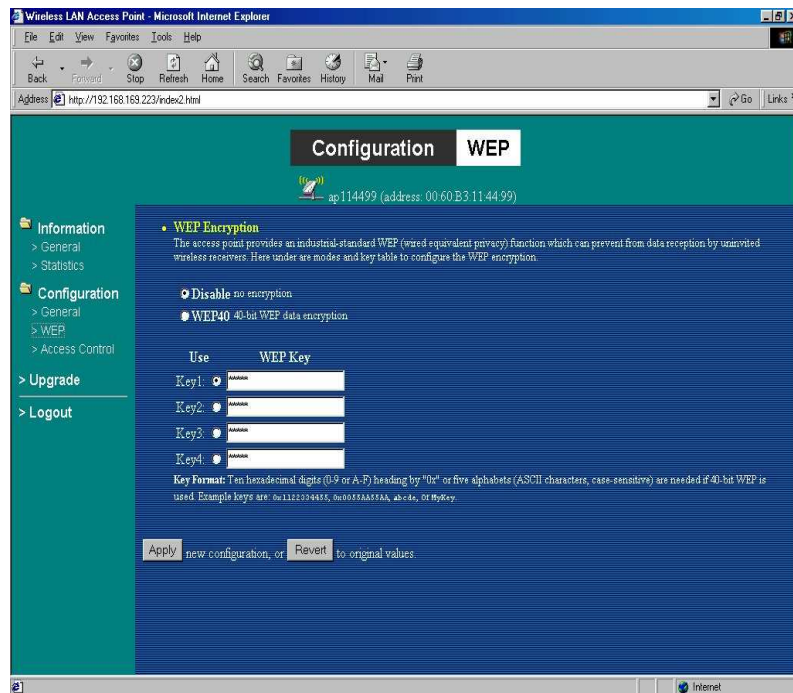


3.2.2. Configuration

General: You may make the settings on the Inter-Building Access Point such as AP mode, ESSID, channel, RTS threshold, fragment threshold and password.



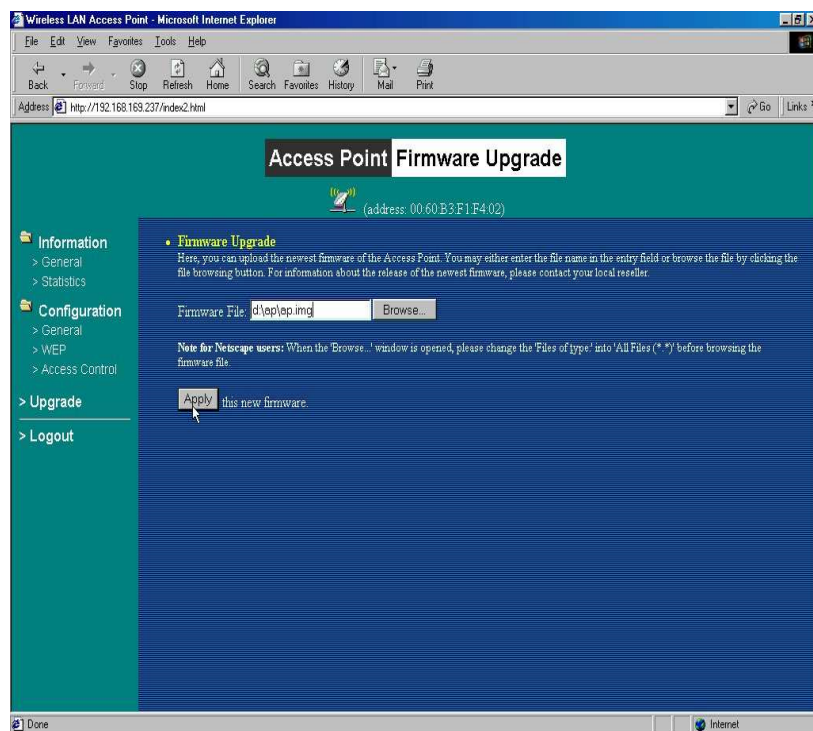
- **WEP:** To prevent unauthorized wireless stations from accessing data transmitted over the network, the 11Mbps Wireless LAN Inter-Building Access Point offers WEP (Wired Equivalency Privacy). You can set up 4 encryption keys but choose one key to encrypt your data.



- **Access Control:** The Access Control Table enables you to restrict wireless stations accessing the Inter-Building Access Points by identifying the MAC address of the wireless devices.

3.2.3. Upgrade

Here, you can upload the newest firmware of the Inter-Building Access Point. You may either enter the file name in the entry field or browse the file by clicking the **Browse** button.



4. Troubleshooting

If you have trouble using the 11Mbps Wireless LAN Inter-Building Access Point, the starting point to troubleshoot the problem with your Inter-Building Access Point is looking at the LED activity of the Inter-Building Access Point. The following is “LED Error Table” provided to assist you in diagnosing and solving operational problems.

WEP key): **If data encryption is activated, always remember to set WEP keys exactly the same on the Inter-Building Access Point as are on the wireless stations.**

Access Contr): **Make sure that the MAC address of your Inter-Building Access Point**

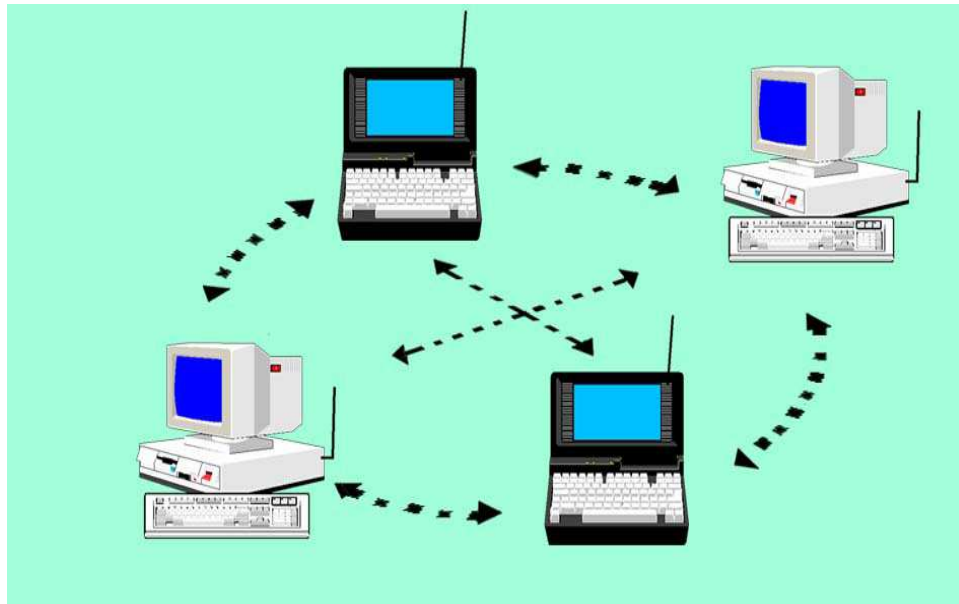
is not included in the Access Control table of other wireless devices.

5. Appendix A Network Configuration

The 11Mbps Wireless LAN products support the same network configuration options of the legacy Ethernet LANs as defined by IEEE 802 standard committee.

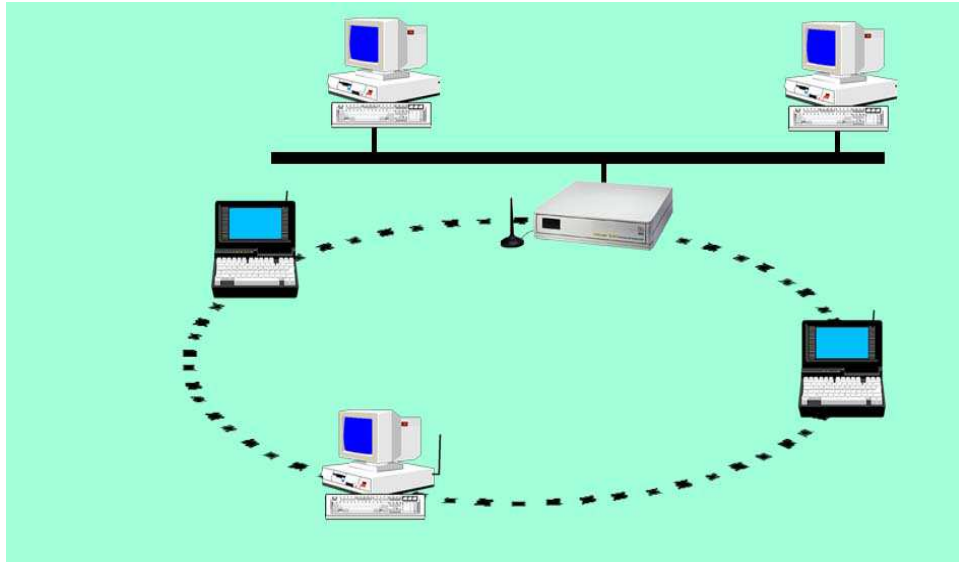
- Ad-Hoc for departmental or SOHO LANs
- Infrastructure for enterprise LANs
- LAN-Interconnection for point-to-point link as a campus backbone.

5.1. Network Topology



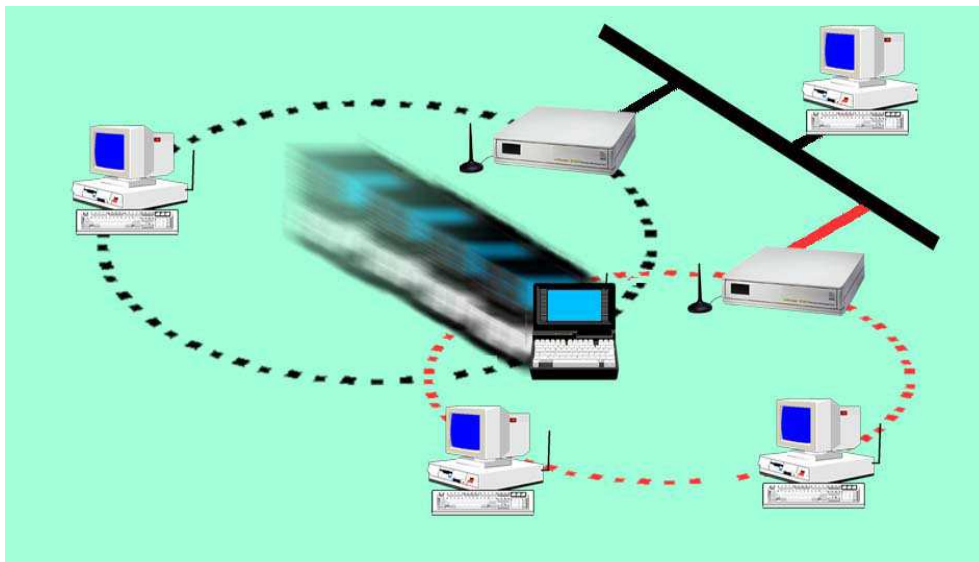
An Ad-Hoc wireless LAN is a group of computers, each equipped with one wireless adapter, connected as an independent wireless LAN. Computers in a specific Ad-Hoc wireless LAN must be configured at the same radio channel.

5.2. Infrastructure

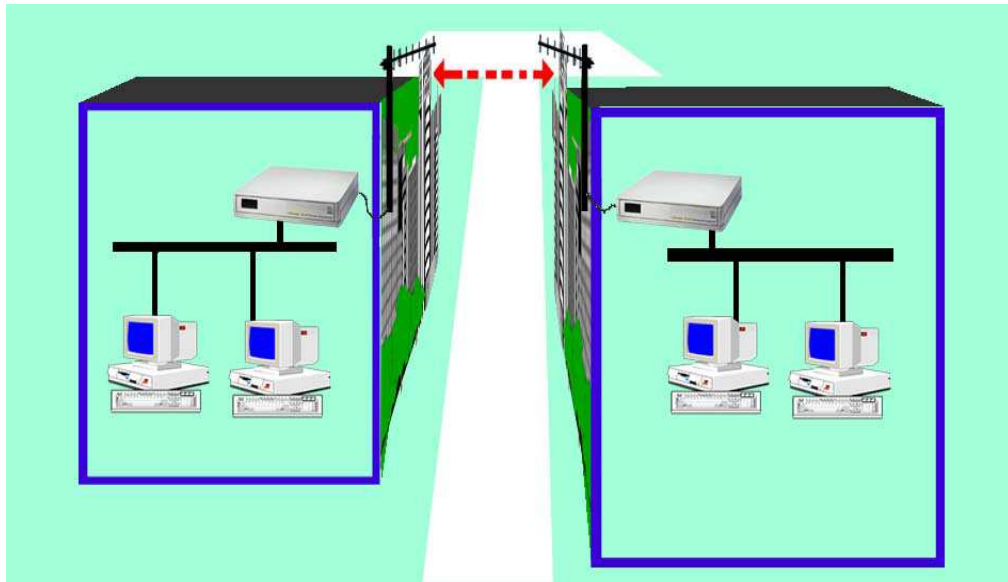


The 11Mbps Wireless LAN devices provides access to a wired LAN for wireless workstations. An integrated wireless and wired LAN is called an Infrastructure configuration. A group of wireless LAN PC users and an Inter-Building Access Point construct a Basic Service Set (BSS). Each wireless-equipped PC in this BSS can talk to any computer in the wired LAN infrastructure via the Inter-Building Access Point.

Infrastructure configuration will extend the accessibility of a wireless station to the wired LAN. Multiple Inter-Building Access Points will allow roaming and it will increase the transmission range. The Inter-Building Access Point is also able to forward data within its BSS. The effective transmission range in an infrastructure LAN is doubled.



5.3. Inter-Building or Point to Point



11Mbps Inter-Building Access Point can connect two LAN, either wireless network or wired network. By using specific antenna and boost, you can connect two LAN away from 30 kilometers.

6. Appendix B: Specifications of XI-1510-IP

Product	11Mbps Wireless LAN Inter-Building Access Point
Wired Interface	10/100 base T (RJ-45)
Wireless Interface	11Mbps Wireless LAN
Modulation	DSSS (CCK, DQPSK, DBPSK)
Operation Frequency	N. America/FCC: 2412~2.462 GHz (11 channels) Europe CE/ETSI: 2.412~2.472 GHz (13 channels) Japan: 2.412~2.484 GHz (14 channels) France: 2.457~2.472 GHz (4 channels) Spain: 2.457~2.462 GHz (2 channels)
Speed Options	11M/5.5M/2M/1M, also support Auto Rate Selections
RF Technology	Direct Sequence Spread Spectrum
Power Supply	Power Over Ethernet
RF throughput	100mw
Sensitivity	-90dBm @ 11Mbps, PER < 8* 10-2

XI-1510-IPD VERSION

Version with 2 antennas N connectors (Diversity mode)

This model is recommended in outdoor and metallic environments.

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