

# **Wireless LAN Device Series**

**WLAN Outdoor AP**

## **RAD 500 User Manual**

**Version. 1.3.0.9a (2006.07.12)**

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# Notice

**Warning :** Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**NOTE :** 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 harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to 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 receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is needed.
- Consult the dealer or an experienced radio/TV technician for help.

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

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Shielded interface cables must be used in order to comply with emission limits.



**CAUTION :**

1. The antenna(s) used for this transmitter must be fixed-mounted on outdoor permanent structures with a separation distance of at least 2 meters from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.
2. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
3. This equipment is only allowed to be professionally installed.

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 to provide reasonable ☐ protection against harmful interference in a residential installation. This equipment generates, uses and ☐ can radiate radio frequency energy and, if not installed and used in accordance with the installation. , ☐ May cause harmful interference to radio communication. However, there is no guarantee that ☐ interference ☐

Will not occur in a particular installation. if this equipment does cause harmful interference to radio or ☐ television reception, which can be determined by turning the equipment off and on, the user is ☐ encouraged to try to correct the interference by one or more of the following measures: ☐

- Reorient or relocate the receiving antenna ☐
- Increase the separation between the equipment and 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 ☐

☐

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled ☐ environment. This equipment should be installed and operated with a minimum distance of 20 ☐ centimeters between the radiator and your body. ☐

# Preface

This guide is for the networking professional who installs and manages the RADMAX RAD 500 product hereafter referred to as the “device”. To use this guide, you should have experience working with the TCP/IP configuration and be familiar with the concepts and terminology of wireless local area networks.

# Ch 1. RAD 500 Installation

## RAD 500

### Packing List

Before you start to install the IA, make sure the package contains the following items :

- Wireless IA AP unit \* 1
- Mounting Kit \* 1
- Power Over Ethernet Kit \* 1
- Ground Wire \* 1
- 2.5" U bolts \* 2
- Waterproof Connector \* 1

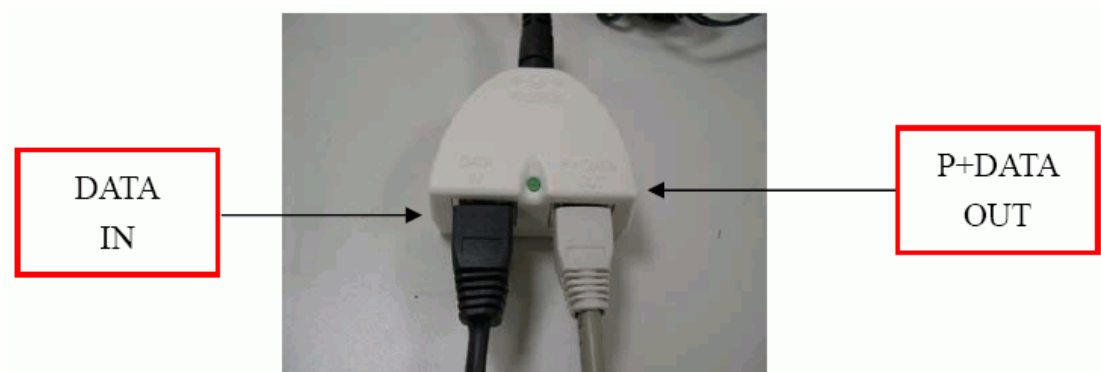
Once you check off everything from the package, you can start to install the IA.  
You can mount to a pipe. The steps are showed in the following :

1. You must mount the IA into the bracket first.
2. You can use the 2.5 inches U bolt to mount on the pipe. The two U bolts must be mounted tightly. Be aware of not over-tighten the U bolt.
3. After checking the IA is mounted well, you can connect the RJ-45 network cable to Ethernet port of IA.





4. Plug the other end of the RJ-45 network cable to “P+ DATA OUT” port of PoE device. The PoE device is guaranteed only in indoor environment.



---

**Caution: DON'T plug the power cord into PoE device before you finish install the antenna and Ground wire to ensure the safety.**

---

Make sure the maximum length of the RJ-45 cable is shorter than 100M (about 109 yards) for normal operation under IEEE 802.3 standards.

When you plug the regular RJ-45 cable into the PoE device, you should use the regular RJ-45 cable to plug into the “DATA IN” of “Power Over Ethernet Kit” to connect to hub/switch or use the crosslink RJ-45 cable (Not included in the Packing List) to connect with user's PC.

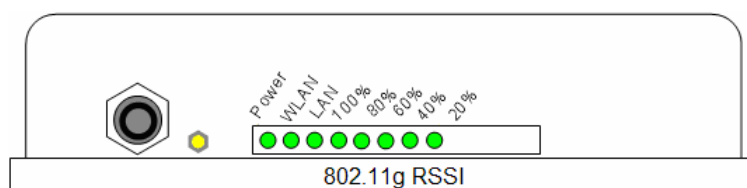
The RJ-45 network cable must be connected to the “P+DATA OUT” port.

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**Caution: Be careful! Don't plug the two cables inversely. It will damage the devices! And you have to use our PoE (included in the packing list) to guarantee that power supply is normal.**

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## LED Panel



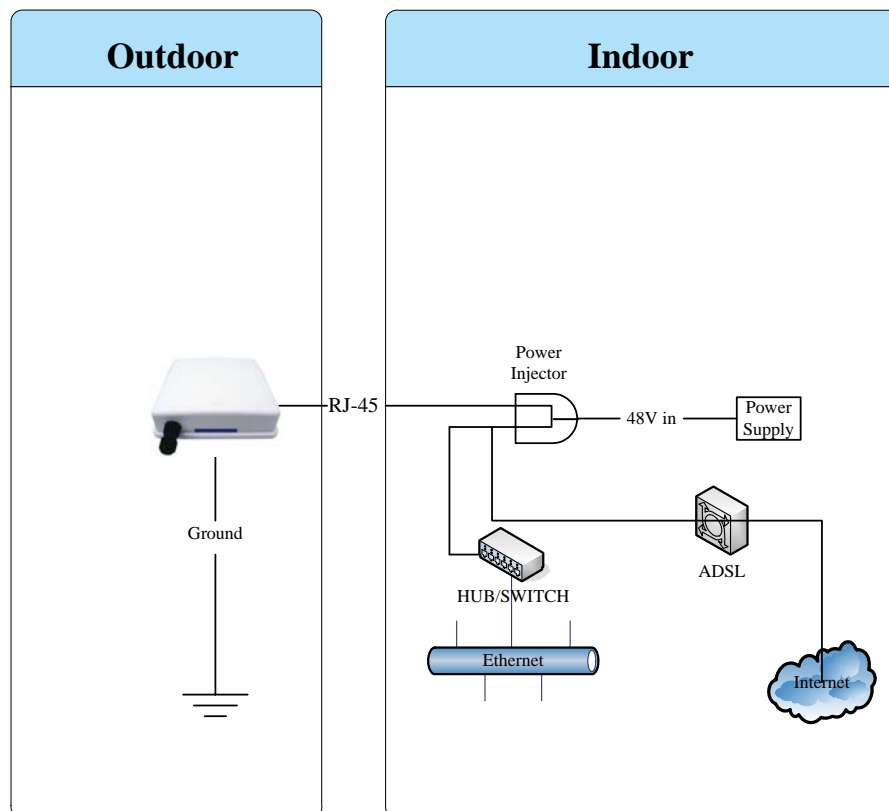
LED	State	Description
Power	Off	No Power
	On	System ready
WLAN	Off	No Power
	On	Wireless system ready
	Flashing	Transmitting data through WLAN
LAN	Off	No Power or connection
	On	Has physical connection to a Fast Ethernet (100 Mbps) network
	Flashing	Transmitting or receiving data thru Ethernet wire
RSSI 20%~100%	All On	Reset button triggered to Reboot this device
	All Flashing very quickly	Reset button triggered over 5 seconds to Reset to the default setting
	All Flashing (slower)	In AP Client mode and scanning Wireless signal
RSSI 20%	Off	Wireless signal strength is 0%
	On	Wireless signal strength is more than 1%
RSSI 40%	Off	Wireless signal strength less than 21%
	On	Wireless signal strength is more than 21%
RSSI 60%	Off	Wireless signal strength less than 41%
	On	Wireless signal strength is more than 41%
RSSI 80%	Off	Wireless signal strength less than 61%
	On	Wireless signal strength is more than 61%
RSSI 100%	Off	Wireless signal strength less than 81%
	On	Wireless signal strength is more than 81%

---

**Note:** While using Aiming Tool, the device will utilize the flashing frequency to display the signal strength. About the detail, please refer to Ch4. Advanced Configuration – Aiming tool.

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We recommend you refer to the following illustration as a guideline for hardware installation.

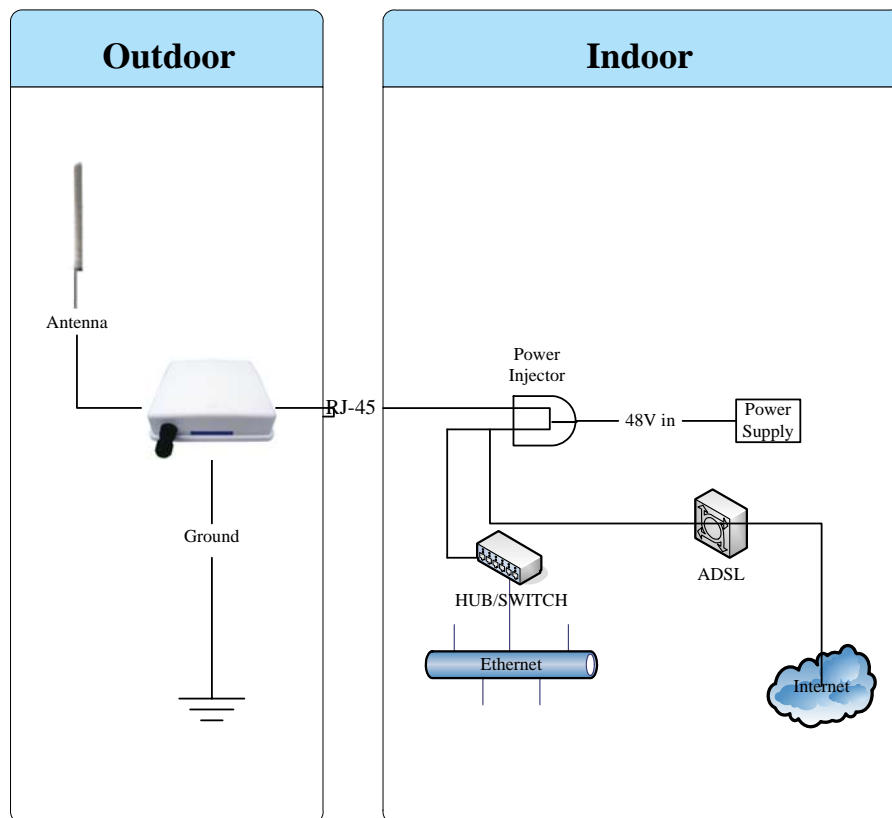


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**Note:** While using Aiming Tool, the device will utilize the flashing frequency to display the signal strength. About the detail, please refer to Ch4. Advanced Configuration – Aiming tool.

---

We recommend you refer to the following illustration as a guideline for hardware installation.



# Ch 2. First Time Configuration

## Before Start to Configure

There are two ways to configure the device, one is through web-browser, and the other is through Secure Shell CLI interface. To access the configuration interfaces, make sure you are using a computer connected to the same network as the device. The default IP address of the device is 192.168.2.254, and the subnet-mask is 255.255.255.0.

The device has three operation modes (Router/Bridge/WISP). In bridge mode, also known as AP Client, you can access the device by both WLAN (Wireless Local Area Network) and wired LAN. And in router/WISP modes, the device can be accessed by both WLAN and WAN. The default IP addresses for the device are 192.168.2.254(for LAN), 172.1.1.1(for WAN), so you need to make sure the IP address of your PC is in the same subnet as the device, such as 192.168.2.X (for LAN), 172.1.1.X (for WAN).

Please note that the DHCP server inside the device is default to up and running. Do not have multiple DHCP servers in your network environment, otherwise it will cause abnormal situation.

We also provide an auto-discovery tool which is for finding out the IP of the device. In case, you've forgot the IP of the device or the IP of the device has been changed, you can use the tool to find out the IP of the device even your PC is not in the same subnet as the device is.

## Knowing the Network Application

The device can act as the following roles, and it supports WDS (Wireless Distribution System) function.

- Access Point
- WDS (Wireless Repeater)
- Bridge/Router
- WISP
- AP Client

The device provides 3 different operation modes and the wireless radio of device can act as AP/Client/WDS. The operation mode is about the

communication mechanism between the wired Ethernet NIC and wireless NIC, the following is the types of operation mode.

### **Router**

The wired Ethernet (WAN) port is used to connect with ADSL/Cable modem and the wireless NIC is used for your private WLAN. The NAT is existed between the 2 NIC and all the wireless clients share the same public IP address through the WAN port to ISP. The default IP configuration for WAN port is static IP. You can access the web server of device through the default WAN IP address 172.1.1.1 and modify the setting base on your ISP requirement.

### **Bridge**

The wired Ethernet and wireless NIC are bridged together. Once the mode is selected, all the WAN related functions will be disabled.

### **WISP (Wireless ISP)**

This mode can let you access the AP of your wireless ISP and share the same public IP address from your ISP to the PCs connecting with the wired Ethernet port of the device. To use this mode, first you must set the wireless radio to be client mode and connect to the AP of your ISP then you can configure the WAN IP configuration to meet your ISP requirement.

The wireless radio of the device acts as the following roles.

### **AP (Access Point)**

The wireless radio of device serves as communications “hub” for wireless clients and provides a connection to a wired LAN.

### **AP Client**

This mode provides the capability to connect with the other AP using infrastructure/Ad-hoc networking types. With bridge operation mode, you can directly connect the wired Ethernet port to your PC and the device becomes a wireless adapter. And with WISP operation mode, you can connect the wired Ethernet port to a hub/switch and all the PCs connecting with hub/switch can share the same public IP address from your ISP.

### **WDS (Wireless Distribution System)**

This mode serves as a wireless repeater; the device forwards the packets to another AP with WDS function. When this mode is selected, all the wireless clients can't survey and connect to the device. The device only allows the

WDS connection.

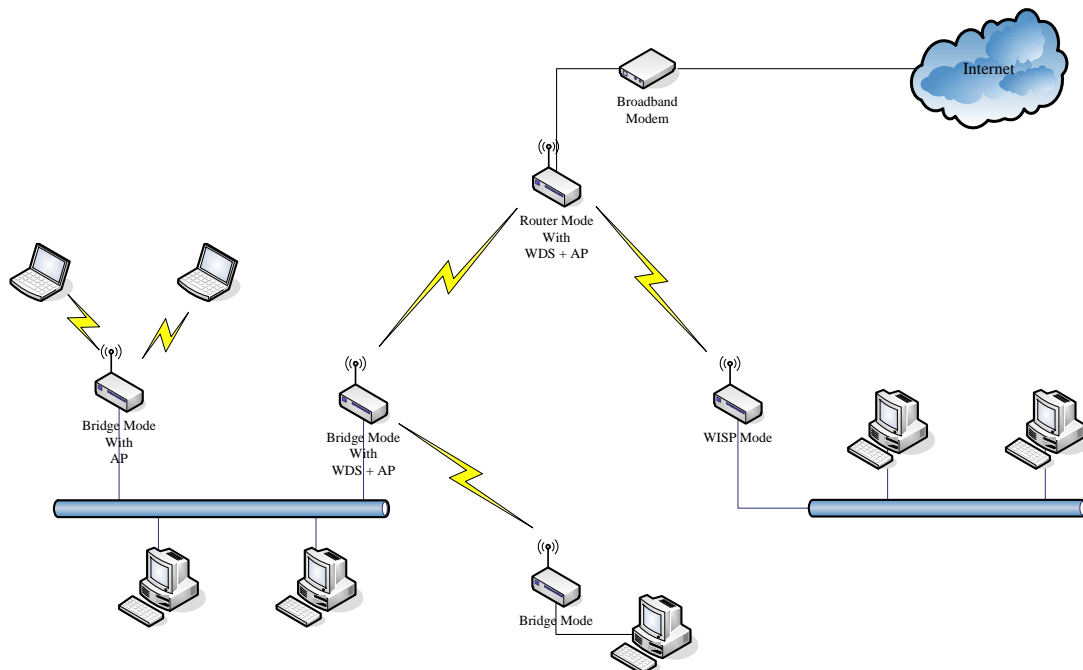
### WDS+AP

This mode combines WDS plus AP modes, it not only allows WDS connections but also the wireless clients can survey and connect to the device.

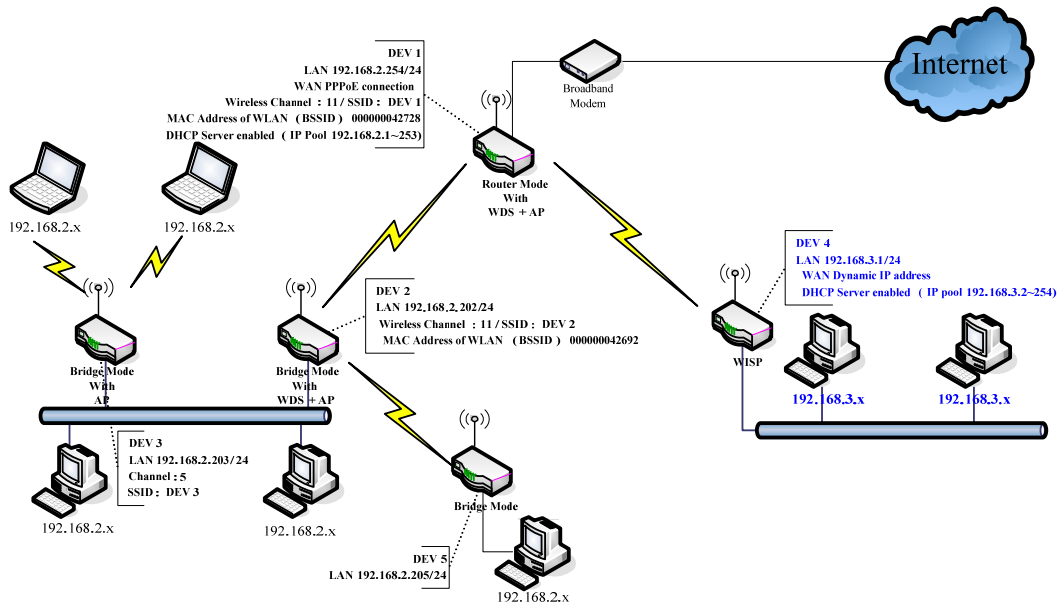
The following table shows the supporting combination of operation and wireless radio modes.

	<i>Bridge</i>	<i>Router</i>	<i>WISP</i>
<b>AP</b>	V	V	X
<b>WDS</b>	V	V	X
<b>Client</b>	V	X	V
<b>AP+WDS</b>	V	V	X

Hereafter are some topologies of network application for your reference.



## Examples of Configuration



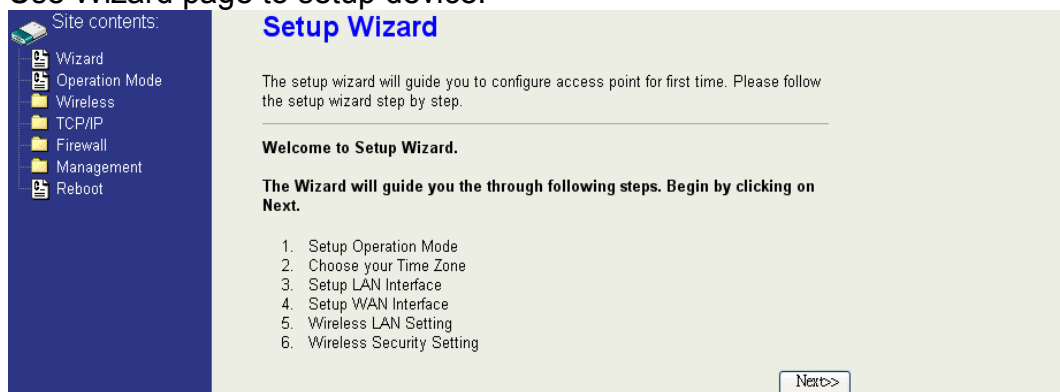
This example demonstrates how to set up a network with different device configurations. There are 2 DHCP servers (DEV1/DEV4) in the network to control the IP configuration of 2 domains (192.168.2.x/192.168.3.x). Once the setting is done, all the PCs can visit Internet through DEV1.

We assume all the devices keep the factory default setting. To make sure that user can continuing press the reset button for more than 5 seconds to restore the factory default setting.

The following descriptions show the steps to configure DEV1 to DEV5.

Configure DEV1:

1. Connect the ADSL modem to Ethernet port of device using Ethernet cable.
2. Access the web server (<http://192.168.2.254>) of device from the wireless station.
3. Use Wizard page to setup device.





4. Press “Next>>” button then set the “Operation Mode” to “Router” mode.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 1. Operation Mode

You can setup different modes to LAN and WLAN interface for NAT and bridging function.

☒ **Router:** In this mode, the device is supposed to connect to internet via ADSL/Cable Modem. The NAT is enabled and PCs connected with WLAN share the same IP to ISP through WAN port. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or Static IP. 172.1.1.1 is the default Static IP address for WAN port

☐ **Bridge:** In this mode, the ethernet port and wireless interface are bridged together and NAT function is disabled. All the WAN related function and firewall are not supported.

☐ **Wireless ISP:** In this mode, the wireless client will connect to ISP access point. The NAT is enabled and PCs connecting with the ethernet port share the same IP to ISP through wireless LAN. **You must set the wireless to client mode** and connect to the ISP AP. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or Static IP.

Cancel <<Back Next>>

5. Press “Next>>” button then disable “Time Zone” function.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 2. Time Zone Setting

You can maintain the system time by synchronizing with a public time server over the Internet.

☐ **Enable NTP client update**

**Time Zone Select :** (GMT-08:00)Pacific Time (US & Canada); Tijuana

**NTP server :** 192.5.41.41 - North America

Cancel <<Back Next>>

6. Press “Next>>” button then set the IP address of LAN interface.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 3. LAN Interface Setup

This page is used to configure the parameters for local area network which connects to the device. Here you may change the setting for IP Address, Subnet Mask. The DHCP Server will be up and running, please make sure there is no another DHCP Server in your network when the device is in Bridge/Client Modes.

**IP Address:** 192.168.2.254

**Subnet Mask:** 255.255.255.0

Cancel <<Back Next>>

7. Press “Next>>” button then select the “PPPoE” for “WAN Access Type” and fill in the “User Name” and “Password” fields.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 4. WAN Interface Setup

This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to Static IP, DHCP, PPPoE or PPTP by click the item value of WAN Access type.

**WAN Access Type:** PPPoE

**User Name:** 87043609@hinet.net

**Password:** ●●●●●●

Cancel <<Back Next>>

8. Press “Next>>” button then select the “AP+WDS” for “mode” and change the SSID to “DEV1”.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 5. Wireless Basic Settings

This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. If you want to use Wireless ISP mode, please choose the Client Mode.

Band: 2.4 GHz (B+G)

Mode: AP+WDS

Network Type: Infrastructure

SSID: DEV1

Channel Number: 11

☐ Enable Mac Clone (Single Ethernet Client)

Cancel <<Back Next>>

9. Press “Next>>” button then select “None” for “Encryption” then press “Finished” button.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 6. Wireless Security Setup

This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.

Encryption: None

Cancel <<Back Finished

10. Wait for refreshing web page.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### Change setting successfully!

Please wait a while for refreshing webpage.

If IP address was modified, you have to re-connect the WebServer with the new address.

11. Use “WDS Settings” page to configure WDS.

Site contents:

- Wizard
- Operation Mode
- Wireless
  - Basic Settings
  - Advanced Settings
  - Security
  - Access Control
  - WDS settings
  - Site Survey
  - Connecting Profile
- TCP/IP
- Firewall
- Management
- Reboot

### WDS Settings

Wireless Distribution System uses wireless media to communicate with other APs, like the Ethernet does. To do this, you must set these APs in the same channel and set MAC address of other APs which you want to communicate with in the table and then enable the WDS.

☐ Enable WDS

Add WDS AP: MAC Address Comment

Apply Changes Reset Set Security Show Statistics

Current WDS AP List:

MAC Address	Comment	Select
-------------	---------	--------

Delete Selected Delete All Reset

12. Enable WDS function and add the BSSID of DEV2 to “Current WDS AP List”.

**WDS Settings**

Wireless Distribution System uses wireless media to communicate with other APs, like the Ethernet does. To do this, you must set these APs in the same channel and set MAC address of other APs which you want to communicate with in the table and then enable the WDS.

☒ **Enable WDS**

Add WDS AP:    MAC Address     Comment

**Current WDS AP List:**

MAC Address	Comment	Select
00:00:00:04:26:92	DEV2	<input type="checkbox"/>

13. Since we access the device by wireless connection, it may temporarily disconnect when applying the WDS setting. After re-connecting to the device, use the “Status” page to check the settings.

**System**

Uptime	0day:0h:20m:6s
Free Memory	10776 kB
Firmware Version	1.3.0.9a 20060712
Webpage Version	1.3.0.9a 20060712

**Wireless Configuration**

Mode	AP+WDS - Router
Band	2.4 GHz (B+G)
SSID	DEV1
Channel Number	11
Encryption	Disabled(AP), Disabled(WDS)
BSSID	00:00:00:04:27:28
Associated Clients	0
Power(OFDM/G)	24 dbm
Power(CCK/B)	27 dbm

**TCP/IP Configuration**

Attain IP Protocol	Fixed IP
IP Address	192.168.2.254
Subnet Mask	255.255.255.0
Default Gateway	192.168.2.254
DHCP Server	Enabled
MAC Address	00:00:00:04:27:28

**WAN Configuration**

Attain IP Protocol	PPPoE Connected
IP Address	218.168.146.93
Subnet Mask	255.255.255.0
Default Gateway	218.168.146.254
MAC Address	00:00:00:04:27:29

Configure DEV2:

1. Access the web server (<http://192.168.2.254>) of device from the Ethernet port.

### **Caution**

If you configure multiple devices in the same PC, since the devices have the same default IP address but different MAC addresses, it may cause you not able to access the web server of device. If the situation happens, please try to clean the ARP table of your PC by DOS command “arp -d” then you can access the web server of device using the default IP address.

2. Use Wizard page to setup device.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### Setup Wizard

The setup wizard will guide you to configure access point for first time. Please follow the setup wizard step by step.

**Welcome to Setup Wizard.**

The Wizard will guide you the through following steps. Begin by clicking on **Next**.

1. Setup Operation Mode
2. Choose your Time Zone
3. Setup LAN Interface
4. Setup WAN Interface
5. Wireless LAN Setting
6. Wireless Security Setting

Next>>

3. Press “Next>>” button then set the “Operation Mode” to “Bridge” mode.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 1. Operation Mode

You can setup different modes to LAN and WLAN interface for NAT and bridging function.

☐ **Router:** In this mode, the device is supposed to connect to internet via ADSL/Cable Modem. The NAT is enabled and PCs connected with WLAN share the same IP to ISP through WAN port. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or Static IP. 172.1.1.1 is the default Static IP address for WAN port

☒ **Bridge:** In this mode, the ethernet port and wireless interface are bridged together and NAT function is disabled. All the WAN related function and firewall are not supported.

☐ **Wireless ISP:** In this mode, the wireless client will connect to ISP access point. The NAT is enabled and PCs connecting with the ethernet port share the same IP to ISP through wireless LAN. **You must set the wireless to client mode** and connect to the ISP AP. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or Static IP.

Cancel <<Back Next>>

4. Press “Next>>” button then disable “Time Zone” function.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 2. Time Zone Setting

You can maintain the system time by synchronizing with a public time server over the Internet.

☐ **Enable NTP client update**

**Time Zone Select :** (GMT-08:00)Pacific Time (US & Canada);Tijuana

**NTP server :** 192.541.41 - North America

Cancel <<Back Next>>

5. Press “Next>>” button then set the IP address of LAN interface.

The screenshot shows the '3. LAN Interface Setup' page. On the left is a 'Site contents' sidebar with a tree view containing: Wizard, Operation Mode, Wireless, TCP/IP, Firewall, Management, and Reboot. The main area has a title '3. LAN Interface Setup' and a description: 'This page is used to configure the parameters for local area network which connects to the device. Here you may change the setting for IP Address, Subnet Mask. The DHCP Server will be up and running, please make sure there is no another DHCP Server in your network when the device is in Bridge/Client Modes.' Below this are two input fields: 'IP Address' with the value '192.168.2.202' and 'Subnet Mask' with the value '255.255.255.0'. At the bottom right are three buttons: 'Cancel', '<<Back', and 'Next>>'.

6. Press “Next>>” button then select the “AP+WDS” for “mode” and change the SSID to “DEV2”.

The screenshot shows the '5. Wireless Basic Settings' page. The 'Site contents' sidebar is identical to the previous page. The main area has a title '5. Wireless Basic Settings' and a description: 'This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. If you want to use Wireless ISP mode, please choose the Client Mode.' The configuration fields are: 'Band' (dropdown menu set to '2.4 GHz (B+G)'), 'Mode' (dropdown menu set to 'AP+WDS'), 'Network Type' (dropdown menu set to 'Infrastructure'), 'SSID' (text input field containing 'DEV2'), and 'Channel Number' (dropdown menu set to '11'). There is an unchecked checkbox labeled 'Enable Mac Clone (Single Ethernet Client)'. At the bottom right are three buttons: 'Cancel', '<<Back', and 'Next>>'.

7. Press “Next>>” button then select “None” for “Encryption” then press “Finished” button.

The screenshot shows the '6. Wireless Security Setup' page. The 'Site contents' sidebar is identical. The main area has a title '6. Wireless Security Setup' and a description: 'This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.' There is an 'Encryption' dropdown menu set to 'None'. At the bottom right are three buttons: 'Cancel', '<<Back', and 'Finished'.

8. Wait for refreshing web page.

The screenshot shows a confirmation page. The 'Site contents' sidebar is identical. The main area contains the following text: 'Change setting successfully!', 'Please wait a while for refreshing webpage.', and 'If IP address was modified, you have to re-connect the WebServer with the new address.'

9. Access the web server by new IP address “192.168.2.202” then use “LAN Interface” page to disable DHCP Server.

The screenshot shows the 'LAN Interface Setup' page. On the left is a 'Site contents' sidebar with a tree view including Wizard, Operation Mode, Wireless, TCP/IP (selected), LAN Interface, WAN Interface, Route, Firewall, Management, and Reboot. The main content area has a title 'LAN Interface Setup' and a description: 'This page is used to configure the parameters for local area network which connects to the device. Here you may change the setting for IP Address, Subnet Mask, DHCP, etc..'. Below this are several configuration fields: IP Address (192.168.2.202), Subnet Mask (255.255.255.0), Default Gateway (0.0.0.0), DHCP (Disabled), DHCP Client Range (192.168.2.1 - 192.168.2.201 with a 'Show Client' button), 802.1d Spanning Tree (Enabled), Clone MAC Address (000000000000), and MTU Size (1500). At the bottom are 'Apply Changes' and 'Reset' buttons.

10. Wait for refreshing web page.

The screenshot shows a confirmation message. The 'Site contents' sidebar is identical to the previous screenshot. The main content area displays the message: 'Change setting successfully! Please wait a while for refreshing webpage. If IP address was modified, you have to re-connect the WebServer with the new address.'

11. Use “WDS Settings” page to configure WDS.

The screenshot shows the 'WDS Settings' page. The 'Site contents' sidebar has a tree view where 'Wireless' is selected, and 'WDS settings' is highlighted. The main content area has a title 'WDS Settings' and a description: 'Wireless Distribution System uses wireless media to communicate with other APs, like the Ethernet does. To do this, you must set these APs in the same channel and set MAC address of other APs which you want to communicate with in the table and then enable the WDS.' Below this is an 'Enable WDS' checkbox. There is an 'Add WDS AP' section with a table with columns 'MAC Address' and 'Comment'. Below this table are 'Apply Changes', 'Reset', 'Set Security', and 'Show Statistics' buttons. At the bottom, there is a 'Current WDS AP List' section with a table with columns 'MAC Address', 'Comment', and 'Select'. Below this table are 'Delete Selected', 'Delete All', and 'Reset' buttons.

12. Enable WDS function and add the BSSID of DEV1 to “Current WDS AP List”.

Site contents:

- Wizard
- Operation Mode
- Wireless
  - Basic Settings
  - Advanced Settings
  - Security
  - Access Control
  - WDS settings
  - Site Survey
  - Connecting Profile
- TCP/IP
- Firewall
- Management
- Reboot

### WDS Settings

Wireless Distribution System uses wireless media to communicate with other APs, like the Ethernet does. To do this, you must set these APs in the same channel and set MAC address of other APs which you want to communicate with in the table and then enable the WDS.

☒ **Enable WDS**

Add WDS AP:    **MAC Address**     **Comment**

**Current WDS AP List:**

MAC Address	Comment	Select
00:00:00:04:27:28	DEV1	<input type="checkbox"/>

13. Use the “Status” page to check the settings.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
  - Status**
  - QoS
  - Bandwidth Control
  - SNMP
  - Statistics
  - DDNS
  - Time Zone
  - Log
  - Miscellaneous
  - Upgrade Firmware
  - Save/Reload Setting
  - Password
  - Reboot

### System

**Uptime** 0day:0h:39m:6s

**Free Memory** 10992 kB

**Firmware Version** 1.3.0.9a 20060712

**Webpage Version** 1.3.0.9a 20060712

### Wireless Configuration

**Mode** AP+WDS - Bridge

**Band** 2.4 GHz (B+G)

**SSID** DEV2

**Channel Number** 11

**Encryption** Disabled(AP), Disabled(WDS)

**BSSID** 00:00:00:04:26:92

**Associated Clients** 0

**Power(OFDM/G)** 24 dbm

**Power(CCK/B)** 27 dbm

### TCP/IP Configuration

**Attain IP Protocol** Fixed IP

**IP Address** 192.168.2.202

**Subnet Mask** 255.255.255.0

**Default Gateway** 0.0.0.0

**DHCP Server** Disabled

**MAC Address** 00:00:00:04:26:92

### Configure DEV3:

1. Access the web server (<http://192.168.2.254>) of device from the Ethernet port.

#### **Caution**

If you configure multiple devices in the same PC, since the devices have the same default IP address but different MAC addresses, it may cause you not able to access the web server of device. If the situation happens, please try to clean the ARP table of your PC by DOS command “arp -d” then you can access the web server of device using the default IP address.

2. Use “LAN Interface” page to set the IP address of LAN interface and disable DHCP server.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
  - LAN Interface
  - WAN Interface
  - Route
- Firewall
- Management
- Reboot

### LAN Interface Setup

This page is used to configure the parameters for local area network which connects to the device. Here you may change the setting for IP Address, Subnet Mask, DHCP, etc..

IP Address:

Subnet Mask:

Default Gateway:

DHCP:

DHCP Client Range:  -

802.1d Spanning Tree:

Clone MAC Address:

MTU Size:

3. Wait for refreshing web page.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
  - LAN Interface
  - WAN Interface
  - Route
- Firewall
- Management
- Reboot

Change setting successfully!

Please wait a while for refreshing webpage.

If IP address was modified, you have to re-connect the WebServer with the new address.



- Access the web server by new IP address “192.168.2.203” then use “Basic Settings” page to change SSID and CHANNEL.

Site contents:

- Wizard
- Operation Mode
- Wireless
  - Basic Settings
  - Advanced Settings
  - Security
  - Access Control
  - WDS settings
  - Site Survey
  - Connecting Profile
- TCP/IP
- Firewall
- Management
- Reboot

### Wireless Basic Settings

This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless encryption settings as well as wireless network parameters. Enable universal repeater mode can let radio act as AP and client simultaneously but remember the channel must be as same as the connected AP.

☐ Disable Wireless LAN Interface

Band: 2.4 GHz (B+G)

Mode: AP

Network Type: Infrastructure

SSID: DEV3

Channel Number: 5 [Show Active Clients](#)

☐ Enable Mac Clone (Single Ethernet Client)

☐ Enable Universal Repeater Mode

Extended SSID:

(once selected and applied, extended SSID and channel number will be updated)

SSID	BSSID	Channel	Type	Encrypt	RSSI	Quality
<a href="#">Refresh</a>						

[Apply Changes](#) [Reset](#)

- Use the “Status” page to check the settings.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
  - Status
  - QoS
  - Bandwidth Control
  - SNMP
  - Statistics
  - DDNS
  - Time Zone
  - Log
  - Miscellaneous
  - Upgrade Firmware
  - Save/Reload Setting
  - Password
- Reboot

### System

Uptime: 0day:2h:33m:18s

Free Memory: 11352 kB

Firmware Version: 1.3.0.9a 20060712

Webpage Version: 1.3.0.9a 20060712

### Wireless Configuration

Mode: AP - Bridge

Band: 2.4 GHz (B+G)

SSID: ZPlus-G192

Channel Number: 11

Encryption: Disabled

BSSID: 00:00:00:04:28:29

Associated Clients: 0

Power(OFDM/G): 24 dbm

Power(CCK/B): 27 dbm

### TCP/IP Configuration

Attain IP Protocol: Fixed IP

IP Address: 192.168.2.203

Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0

DHCP Server: Disabled

MAC Address: 00:00:00:04:28:29

Configure DEV4:

1. Access the web server (http://192.168.2.254) of device from the Ethernet port.

### **Caution**

If you configure multiple devices in the same PC, since the devices have the same default IP address but different MAC addresses, it may cause you unable to access the web server of device. If the situation happens, please try to clean the ARP table of your PC by DOS command “arp -d” then you can access the web server of device using the default IP address.

2. Use Wizard page to setup device.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### Setup Wizard

The setup wizard will guide you to configure access point for first time. Please follow the setup wizard step by step.

**Welcome to Setup Wizard.**

The Wizard will guide you the through following steps. Begin by clicking on **Next**.

1. Setup Operation Mode
2. Choose your Time Zone
3. Setup LAN Interface
4. Setup WAN Interface
5. Wireless LAN Setting
6. Wireless Security Setting

Next>>

3. Press “Next>>” button then set the “Operation Mode” to “Wireless ISP” mode.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 1. Operation Mode

You can setup different modes to LAN and WLAN interface for NAT and bridging function.

☐ **Router:** In this mode, the device is supposed to connect to internet via ADSL/Cable Modem. The NAT is enabled and PCs connected with WLAN share the same IP to ISP through WAN port. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or Static IP. 172.1.1.1 is the default Static IP address for WAN port

☐ **Bridge:** In this mode, the ethernet port and wireless interface are bridged together and NAT function is disabled. All the WAN related function and firewall are not supported.

☒ **Wireless ISP:** In this mode, the wireless client will connect to ISP access point. The NAT is enabled and PCs connecting with the ethernet port share the same IP to ISP through wireless LAN. You must set the wireless to client mode and connect to the ISP AP. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or Static IP.

Cancel <<Back Next>>

4. Press “Next>>” button then disable “Time Zone” function.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 2. Time Zone Setting

You can maintain the system time by synchronizing with a public time server over the Internet.

☐ **Enable NTP client update**

Time Zone Select : (GMT-08:00)Pacific Time (US & Canada); Tijuana

NTP server : 192.541.41 - North America

Cancel <<Back Next>>

5. Press “Next>>” button then set the IP address of LAN interface.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 3. LAN Interface Setup

This page is used to configure the parameters for local area network which connects to the device. Here you may change the setting for IP Address, Subnet Mask. The DHCP Server will be up and running, please make sure there is no another DHCP Server in your network when the device is in Bridge/Client Modes.

IP Address:

Subnet Mask:

Cancel <<Back Next>>

6. Press “Next>>” button then select the “DHCP Client” for “WAN Access Type”.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 4. WAN Interface Setup

This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to Static IP, DHCP, PPPoE or PPTP by click the item value of WAN Access type.

WAN Access Type:

Cancel <<Back Next>>

7. Press “Next>>” button then select the “Client” for “mode” and change the SSID to “DEV4”.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 5. Wireless Basic Settings

This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. If you want to use Wireless ISP mode, please choose the Client Mode.

Band:

Mode:

Network Type:

SSID:

Channel Number:

☐ Enable Mac Clone (Single Ethernet Client)

Cancel <<Back Next>>

8. Press “Next>>” button then select “None” for “Encryption” then press “Finished” button.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 6. Wireless Security Setup

This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.

Encryption:

Cancel <<Back Finished

9. Wait for refreshing web page.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

**Change setting successfully!**

Please wait a while for refreshing webpage.

If IP address was modified, you have to re-connect the WebServer with the new address.

10. Change the IP address of your PC to 192.168.3.x then access the web server by the new IP address “192.168.3.1” and use “Status” page check the setting.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management**
- Status
- QoS
- Bandwidth Control
- SNMP
- Statistics
- DDNS
- Time Zone
- Log
- Miscellaneous
- Upgrade Firmware
- Save/Reload Setting
- Password
- Reboot

System	
Uptime	0day:2h:56m:36s
Free Memory	10896 kB
Firmware Version	1.3.0.9a 20060712
Webpage Version	1.3.0.9a 20060712
Wireless Configuration	
Mode	Infrastructure Client - Router
Band	2.4 GHz (B+G)
SSID	DEV4
Channel Number	5
Encryption	Disabled
BSSID	00:00:00:00:00:00
State	Scanning
RSSI	0
AP Info	---
TCP/IP Configuration	
Attain IP Protocol	Fixed IP
IP Address	192.168.3.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.3.1
DHCP Server	Enabled
MAC Address	00:00:00:05:12:13
WAN Configuration	
Attain IP Protocol	Getting IP from DHCP server...
IP Address	0.0.0.0
Subnet Mask	0.0.0.0
Default Gateway	0.0.0.0
MAC Address	00:00:00:05:12:14

11. If the “State” of “Wireless Configuration” is not “Connected” or you want to refresh the “RSSI”, please use “Site Survey” page to re-connect a AP.

Site contents:

- Wizard
- Operation Mode
- Wireless**
- Basic Settings
- Advanced Settings
- Security
- Access Control
- WDS settings
- Site Survey
- Connecting Profile
- TCP/IP
- Firewall
- Management
- Reboot

### Wireless Site Survey

This page provides tool to scan the wireless network. If any Access Point or IBSS is found, you could choose to connect it manually when client mode is enabled.

SSID	BSSID	Channel	Type	Encrypt	RSSI	Quality	Select	Aim
DEV1	00:00:00:04:27:28	11 (B+G)	AP	no	67 (-49 dbm)	96	<input checked="" type="radio"/>	<input type="radio"/>
	00:0d:14:00:80:18	1 (B+G)	AP	no	61 (-53 dbm)	85	<input type="radio"/>	<input type="radio"/>
RAD500	00:05:9e:80:46:69	11 (B)	AP	no	40 (-70 dbm)	92	<input type="radio"/>	<input type="radio"/>
ZINTECH-2F	00:05:9e:80:b1:e3	1 (B+G)	AP	yes	36 (-68 dbm)	92	<input type="radio"/>	<input type="radio"/>
ZINTECH-3F	00:05:9e:80:b1:bd	11 (B+G)	AP	yes	29 (-72 dbm)	85	<input type="radio"/>	<input type="radio"/>
RTL8186-default	00:00:00:aa:bb:01	7 (B+G)	AP	no	24 (-75 dbm)	68	<input type="radio"/>	<input type="radio"/>
throu.	00:05:9e:81:b9:67	6 (B+G)	AP	no	12 (-82 dbm)	34	<input type="radio"/>	<input type="radio"/>

Configure DEV5:

1. Access the web server (http://192.168.2.254) of device from the Ethernet port.

### **Caution**

If you configure multiple devices in the same PC, since the devices have the same default IP address but different MAC addresses, it may cause you unable to access the web server of device. If the situation happens, please try to clean the ARP table of your PC by DOS command “arp -d” then you can access the web server of device using the default IP address.

2. Use Wizard page to setup device.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### Setup Wizard

The setup wizard will guide you to configure access point for first time. Please follow the setup wizard step by step.

**Welcome to Setup Wizard.**

The Wizard will guide you the through following steps. Begin by clicking on **Next**.

1. Setup Operation Mode
2. Choose your Time Zone
3. Setup LAN Interface
4. Setup WAN Interface
5. Wireless LAN Setting
6. Wireless Security Setting

Next>>

3. Press “Next>>” button then set the “Operation Mode” to “Wireless ISP” mode.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 1. Operation Mode

You can setup different modes to LAN and WLAN interface for NAT and bridging function.

☐ **Router:** In this mode, the device is supposed to connect to internet via ADSL/Cable Modem. The NAT is enabled and PCs connected with WLAN share the same IP to ISP through WAN port. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or Static IP. 172.1.1.1 is the default Static IP address for WAN port

☒ **Bridge:** In this mode, the ethernet port and wireless interface are bridged together and NAT function is disabled. All the WAN related function and firewall are not supported.

☐ **Wireless ISP:** In this mode, the wireless client will connect to ISP access point. The NAT is enabled and PCs connecting with the ethernet port share the same IP to ISP through wireless LAN. **You must set the wireless to client mode** and connect to the ISP AP. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or Static IP.

Cancel <<Back Next>>

4. Press “Next>>” button then disable “Time Zone” function.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
- Reboot

### 2. Time Zone Setting

You can maintain the system time by synchronizing with a public time server over the Internet.

☐ **Enable NTP client update**

Time Zone Select : (GMT-08:00)Pacific Time (US & Canada); Tijuana

NTP server : 192.541.41 - North America

Cancel <<Back Next>>

5. Press “Next>>” button then set the IP address of LAN interface.

The screenshot shows the '3. LAN Interface Setup' page. On the left is a 'Site contents' sidebar with a tree view containing: Wizard, Operation Mode, Wireless, TCP/IP, Firewall, Management, and Reboot. The main content area has a title '3. LAN Interface Setup' and a descriptive paragraph: 'This page is used to configure the parameters for local area network which connects to the device. Here you may change the setting for IP Address, Subnet Mask. The DHCP Server will be up and running, please make sure there is no another DHCP Server in your network when the device is in Bridge/Client Modes.' Below this, there are two input fields: 'IP Address:' with the value '192.168.2.205' and 'Subnet Mask:' with the value '255.255.255.0'. At the bottom right are three buttons: 'Cancel', '<<Back', and 'Next>>'.

6. Press “Next>>” button then select the “Client” for “mode” and change the SSID to “DEV5”.

The screenshot shows the '5. Wireless Basic Settings' page. The 'Site contents' sidebar is identical to the previous page. The main content area has a title '5. Wireless Basic Settings' and a descriptive paragraph: 'This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. If you want to use Wireless ISP mode, please choose the Client Mode.' Below this, there are several configuration options: 'Band:' set to '2.4 GHz (B+G)', 'Mode:' set to 'Client', 'Network Type:' set to 'Infrastructure', and 'SSID:' set to 'DEV5'. There is also a 'Channel Number:' dropdown set to '11'. At the bottom, there is a checkbox labeled 'Enable Mac Clone (Single Ethernet Client)' which is unchecked. At the bottom right are three buttons: 'Cancel', '<<Back', and 'Next>>'.

7. Press “Next>>” button then select “None” for “Encryption” then press “Finished” button.

The screenshot shows the '6. Wireless Security Setup' page. The 'Site contents' sidebar is identical to the previous pages. The main content area has a title '6. Wireless Security Setup' and a descriptive paragraph: 'This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.' Below this, there is an 'Encryption:' dropdown menu set to 'None'. At the bottom right are three buttons: 'Cancel', '<<Back', and 'Finished'.

8. Wait for refreshing web page.

The screenshot shows a confirmation page after the configuration. The 'Site contents' sidebar is identical to the previous pages. The main content area has the text: 'Change setting successfully!', 'Please wait a while for refreshing webpage.', and 'If IP address was modified, you have to re-connect the WebServer with the new address.'

9. Access the web server by the new IP address “192.168.2.205” and use “LAN Interface” page to disable DHCP Server.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
  - LAN Interface
  - WAN Interface
  - Route
- Firewall
- Management
- Reboot

### LAN Interface Setup

This page is used to configure the parameters for local area network which connects to the device. Here you may change the setting for IP Address, Subnet Mask, DHCP, etc..

IP Address:	<input type="text" value="192.168.2.205"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Default Gateway:	<input type="text" value="0.0.0.0"/>
DHCP:	<input type="button" value="Disabled"/>
DHCP Client Range:	<input type="text" value="192.168.2.1"/> - <input type="text" value="192.168.2.204"/> <input type="button" value="Show Client"/>
802.1d Spanning Tree:	<input type="button" value="Disabled"/>
Clone MAC Address:	<input type="text" value="000000000000"/>
MTU Size:	<input type="text" value="1500"/>

10. Wait for refreshing webpage.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
  - LAN Interface
  - WAN Interface
  - Route
- Firewall
- Management
- Reboot

**Change setting successfully!**

Please wait a while for refreshing webpage.

If IP address was modified, you have to re-connect the WebServer with the new address.

11. Use “State” page to check setting.

Site contents:

- Wizard
- Operation Mode
- Wireless
- TCP/IP
- Firewall
- Management
  - Status
  - QoS
  - Bandwidth Control
  - SNMP
  - Statistics
  - DDNS
  - Time Zone
  - Log
  - Miscellaneous
  - Upgrade Firmware
  - Save/Reload Setting
  - Password
- Reboot

<b>System</b>	
Uptime	0day:3h:15m:1s
Free Memory	11184 kB
Firmware Version	1.3.0.9a 20060712
Webpage Version	1.3.0.9a 20060712
<b>Wireless Configuration</b>	
Mode	Infrastructure Client - Bridge
Band	2.4 GHz (B+G)
SSID	DEV5
Channel Number	2
Encryption	Disabled
BSSID	00:00:00:00:00:00
State	Scanning
RSSI	0
AP Info	---
<b>TCP/IP Configuration</b>	
Attain IP Protocol	Fixed IP
IP Address	192.168.2.205
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0
DHCP Server	Disabled
MAC Address	00:00:00:04:22:21

12. If the “State” of “Wireless Configuration” is not “Connected” or you want to refresh the “RSSI”, please use “Site Survey” page to re-connect a AP.

Site contents:

Wizard

Operation Mode

Wireless

Basic Settings

Advanced Settings

Security

Access Control

WDS settings

Site Survey

Connecting Profile

TCP/IP

Firewall

Management

Reboot

Wireless Site Survey

This page provides tool to scan the wireless network. If any Access Point or IBSS is found, you could choose to connect it manually when client mode is enabled.

SSID	BSSID	Channel	Type	Encrypt	RSSI	Quality	Select	Aim
DEV2	00:00:00:04:26:92	11 (B+G)	AP	no	61 (-53 dbm)	85	<input checked="" type="radio"/>	<input type="radio"/>
	00:0d:14:00:80:18	1 (B+G)	AP	no	60 (-54 dbm)	85	<input type="radio"/>	<input type="radio"/>
ZINTECH-2F	00:05:9e:80:b1:e3	1 (B+G)	AP	yes	41 (-65 dbm)	90	<input type="radio"/>	<input type="radio"/>
RAD500	00:05:9e:80:46:69	11 (B)	AP	no	40 (-70 dbm)	93	<input type="radio"/>	<input type="radio"/>
ZINTECH-3F	00:05:9e:80:b1:bd	11 (B+G)	AP	yes	29 (-72 dbm)	78	<input type="radio"/>	<input type="radio"/>
RTL8186-default	00:00:00:aa:bb:01	7 (B+G)	AP	no	26 (-74 dbm)	89	<input type="radio"/>	<input type="radio"/>
throu.	00:05:9e:81:b9:67	6 (B+G)	AP	no	13 (-82 dbm)	67	<input type="radio"/>	<input type="radio"/>

Refresh

Auto Refresh

Connect

Aiming



# Basic Settings

Site contents:

- Wizard
- Operation Mode
- Basic Settings
- Advanced Settings
- Security
- Access Control
- WDS settings
- Site Survey
- Connecting Profile
- TCP/IP
- Firewall
- Management
- Reboot

## Wireless Basic Settings

This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless encryption settings as well as wireless network parameters. Enable universal repeater mode can let radio act as AP and client simultaneously but remember the channel must be as same as the connected AP.

☐ Disable Wireless LAN Interface

Band: 2.4 GHz (B+G)

Mode: AP

Network Type: Infrastructure

SSID: hank

Channel Number: 11

☐ Enable Mac Clone (Single Ethernet Client)

☐ Enable Universal Repeater Mode

Extended SSID:

(once selected and applied, extended SSID and channel number will be updated)

SSID	BSSID	Channel	Type	Encrypt	RSSI	Quality
------	-------	---------	------	---------	------	---------

Refresh

Apply Changes Reset

## Disable Wireless LAN Interface

Disable the wireless interface of device

## Band:

The device supports 2.4GHz(B), 2.4GHz(G) and 2.4GHz(B+G) mixed modes.

## Mode:

The radio of device supports different modes as following:

### 1. AP

The radio of device acts as an Access Point to serves all wireless clients to join a wireless local network.

### 2. Client

Support Infrastructure and Ad-hoc network types to act as a wireless adapter.

### 3. WDS

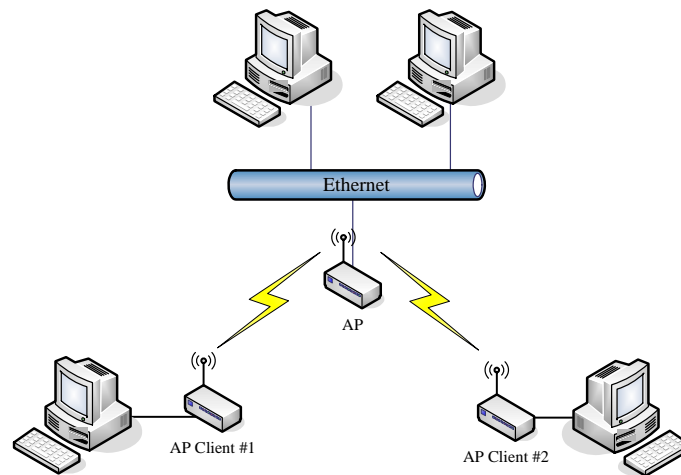
Wireless Distribution System, this mode serves as a wireless repeater, only devices with WDS function supported can connect to it, all the wireless clients can't survey and connect the device when the mode is selected.

### 4. AP+WDS

Support both AP and WDS functions, the wireless clients and devices with WDS function supported can survey and connect to it.

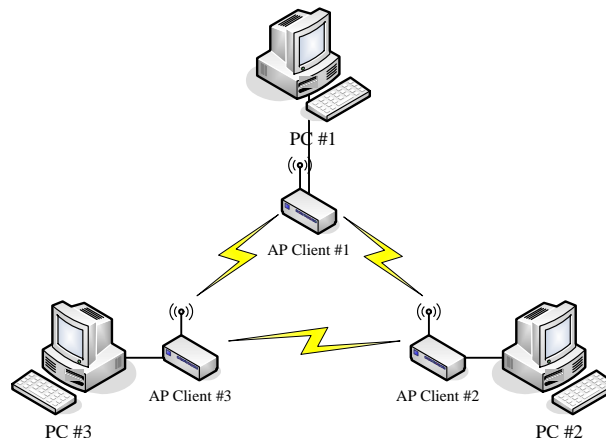
- **Infrastructure:**

This type requires the presence of 802.11b/g Access Point. All communication is done via the Access Point.



- **Ad Hoc:**

This type provides a peer-to-peer communication between wireless stations. All the communication is done from Client to Client without any Access Point involved. Ad Hoc networking must use the same SSID and channel for establishing the wireless connection.



In client mode, the device can't support the Router mode function including Firewall and WAN settings.

**SSID:**

The SSID is a unique identifier that wireless networking devices use to establish and maintain wireless connectivity. Multiple access point/bridges on a network or sub-network can use the same SSID. SSIDs are case sensitive and can contain up to 32 alphanumeric characters. Do not include spaces in your SSID.

### Channel Number

The following table is the available frequencies (in MHz) for the 2.4-GHz radio:

Channel No.	Frequency	Country Domain
1	2412	Americas, EMEA, Japan, and China
2	2417	Americas, EMEA, Japan, and China
3	2422	Americas, EMEA, Japan, Israel, and China
4	2427	Americas, EMEA, Japan, Israel, and China
5	2432	Americas, EMEA, Japan, Israel, and China
6	2437	Americas, EMEA, Japan, Israel, and China
7	2442	Americas, EMEA, Japan, Israel, and China
8	2447	Americas, EMEA, Japan, Israel, and China
9	2452	Americas, EMEA, Japan, Israel, and China
10	2457	Americas, EMEA, Japan, and China
11	2462	Americas, EMEA, Japan, and China
12	2467	EMEA and Japan only
13	2472	EMEA and Japan only
14	2484	Japan only

When set to “Auto”, the device will find the least-congested channel for use.

### Associated Client

Show the information of active wireless client stations that connected to the device.

REMARK ☐

☐

This device operation of this product in the U.S.A. is firmware-limited to channels 1-11.

# Advanced Settings

These settings are only for more technically advanced users who have sufficient knowledge about wireless LAN. These settings should not be changed unless you know what effect the changes will have on your device. The default setting is optimized for the normal operation. For specific application, setting configuration will required highly attention to reach optimistic condition.

---

**Note :**

Any unreasonable value change to default setting will reduce the throughput of the device.

---

**Site contents:**

- Wizard
- Operation Mode
- Wireless
- Basic Settings
- Advanced Settings
- Security
- Access Control
- WDS settings
- Site Survey
- Connecting Profile
- TCP/IP
- Firewall
- Management
- Reboot

### Wireless Advanced Settings

These settings are only for more technically advanced users who have a sufficient knowledge about wireless LAN. These settings should not be changed unless you know what effect the changes will have on your Access Point.

**Authentication Type:** ☐ Open System ☐ Shared Key ☒ Auto

**Fragment Threshold:**  (256-2346)

**RTS Threshold:**  (0-2347)

**Beacon Interval:**  (20-1024 ms)

**ACK Timing:**  (0-255 \* 4 us)

**Client Expired Time:**  (101-40000000 sec)

**MTU Size:**  (100-1500)

**Data Rate:**

**Preamble Type:** ☒ Long Preamble ☐ Short Preamble

**Broadcast SSID:** ☒ Enabled ☐ Disabled

**IAPP:** ☒ Enabled ☐ Disabled

**802.11g Protection:** ☒ Enabled ☐ Disabled

**Block WLAN Relay:** ☐ Enabled ☒ Disabled

**Turbo Mode:** ☐ Enabled ☒ Disabled (auto)

**Aggregation Mode:** ☐ Enabled ☒ Disabled

**Tx Burst Mode:** ☐ Enabled ☒ Disabled

**Transmit Power(OFDM):**

**Transmit Power(CCK):**

## Authentication Type

The device supports two Authentication Types “Open system” and “Shared Key”. When you select “Share Key”, you need to setup “WEP” key in “Security” page (See the next section). The default setting is “Auto”. The wireless client can associate with the device by using one of the two types.

## Fragment Threshold

The fragmentation threshold determines the size at which packets are fragmented (sent as several pieces instead of as one block). Use a low setting in areas where communication is poor or where there is a great deal of radio interference. This function will help you to improve the network performance.

**RTS Threshold**

The RTS threshold determines the packet size at which the radio issues a request to send (RTS) before sending the packet. A low RTS Threshold setting can be useful in areas where many client devices are associating with the device, or in areas where the clients are far apart and can detect only the device and not each other. You can enter a setting ranging from 0 to 2347 bytes.

**Beacon Interval**

The beacon interval is the amount of time between access point beacons in mini-seconds. The default beacon interval is 100.

**ACK Timing**

Acknowledgement Timing, is the amount of time that device wait client's response. This concept is related to EIFS (Extended Inter-Frame Space). The EIFS interval shall begin while the device is idle after detection of the erroneous frame. The EIFS is defined to provide enough time for another device to acknowledge what was, to this device, an incorrectly received frame before this device commences transmission. The default ACK timing is 91\*4us. You may need to change this value due to the environment or distance.

**Client Expired Time**

The client expired time determines time interval the client need to re-associate with the device while client is idle. The default client expired time is 300 sec.

**MTU Size**

Maximum Transmission Unit, the default MTU size is 1500. The MTU setting controls the maximum Ethernet packet size your PC will send. Why a limit? Because although larger packets can be constructed and sent, your ISP and Internet backbone routers and equipment will fragment any larger than their limit, then these parts are re-assembled by the target equipment before reading. This fragmentation and re-assembly is not optimal. You may need to change the MTU for optimal performance of your wireless LAN traffic.

**Data Rate**

The standard IEEE 802.11b/11g supports 1, 2, 5.5, 11 / 6, 9, 12, 18, 24, 36, 48 and 54 Mbps data rates. You can choose the rate that the device uses for data transmission. The default value is "auto". The device will use the highest possible selected transmission rate.

**Broadcast SSID**

Broadcasting the SSID will let your wireless clients find the device automatically. If you are building a public Wireless Network, disable this function can provide better security. Every wireless stations located within the coverage of the device must connect this device by manually configure the

SSID in your client settings.

### **IAPP (Inter-Access Point Protocol)**

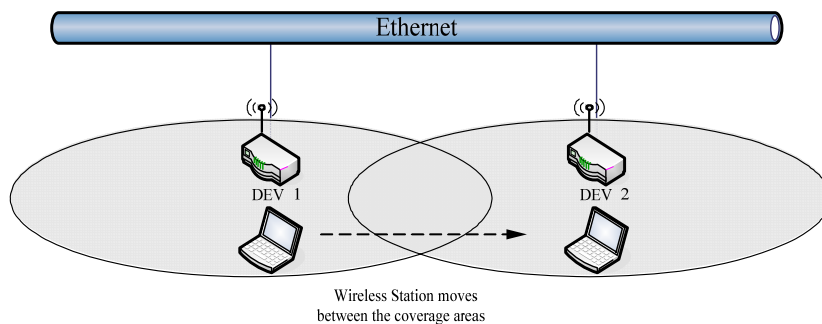
This function will let Wireless Stations roam among a network environment with multiple devices. Wireless Stations are able to switch from one device to another as they move between the coverage areas. Users can have more wireless working range. An example is as the following figure.

You should comply with the following instructions to roam among the wireless coverage areas.

---

**Note :** For implementing the roaming function, the setting **MUST** comply the following two items.

- All the devices must be in the same subnet network and the SSID must be the same.
  - If you use the 802.1x authentication, you need to have the user profile in these devices for the roaming station.
- 



### **Block WLAN Relay (Isolate Client)**

The device supports isolation function. If you are building a public Wireless Network, enable this function can provide better security. The device will block packets between wireless clients (relay). All the wireless clients connected to the device can't see each other.

### **Transmit Power**

The device supports eleven transmission output power levels from 17 to 27dBm for CCK (802.11b) mode and eight transmission output power levels from 17 to 24dBm for OFDM (802.11g) mode. User can adjust the power level to change the coverage of the device. Every wireless stations located within the coverage of the device also needs to have the high power radio. Otherwise the wireless stations only can survey the device, but can't establish connection with device.

# Configuring Wireless Security

This device provides complete wireless security function include WEP, 802.1x, WPA-TKIP, WPA2-AES and WPA2-Mixed in different mode (see the Security Support Table).

The default security setting of the encryption function is disabled. Choose your preferred security setting depending on what security function you need.

**Site contents:**

- Wizard
- Operation Mode
- Wireless**
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### Wireless Security Setup

This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.

**Authentication Type:** ☐ Open System ☐ Shared Key ☒ Auto

**Encryption:** None Set WEP Key

☐ Use 802.1x Authentication ☒ WEP 64bits ☐ WEP 128bits

☐ Enable MAC Authentication

**WPA Authentication Mode:** ☐ Enterprise (RADIUS) ☒ Personal (Pre-Shared Key)

**Pre-Shared Key Format:** Passphrase

**Pre-Shared Key:**

☐ Enable Pre-Authentication

**Authentication RADIUS Server:** Port 1812 IP address  Password

*Note: When encryption WEP is selected, you must set WEP key value.*

Apply Changes Reset

## WEP Encryption Setting

Wired Equivalent Privacy (WEP) is implemented in this device to prevent unauthorized access to your wireless network. The WEP setting must be as same as each client in your wireless network. For more secure data transmission, you can change encryption type to “WEP” and click the “Set WEP Key” button to open the “Wireless WEP Key setup” page.

**Encryption:** WEP Set WEP Key

☐ Use 802.1x Authentication ☒ WEP 64bits ☐ WEP 128bits

☐ Enable MAC Authentication

**WPA Authentication Mode:** ☐ Enterprise (RADIUS) ☒ Personal (Pre-Shared Key)

**Pre-Shared Key Format:** Passphrase

**Pre-Shared Key:**

☐ Enable Pre-Authentication

**Authentication RADIUS Server:** Port 1812 IP address  Password

When you decide to use the WEP encryption to secure your WLAN, please refer to the following setting of the WEP encryption:

- 64-bit WEP Encryption : 64-bit WEP keys are as same as the encryption method of 40-bit WEP. You can input 10 hexadecimal digits (0~9, a~f or A~F) or 5 ACSII chars.
- 128-bit WEP Encryption : 128-bit WEP keys are as same as the encryption method of 104-bit WEP. You can input 26 hexadecimal digits (0~9, a~f or A~F) or 10 ACSII chars.
- The Default Tx Key field decides which of the four keys you want to use in your WLAN environment.

**Wireless WEP Key Setup**

This page allows you setup the WEP key value. You could choose use 64-bit or 128-bit as the encryption key, and select ASCII or Hex as the format of input value.

Key Length:

Key Format:

Default Tx Key:

Encryption Key 1:

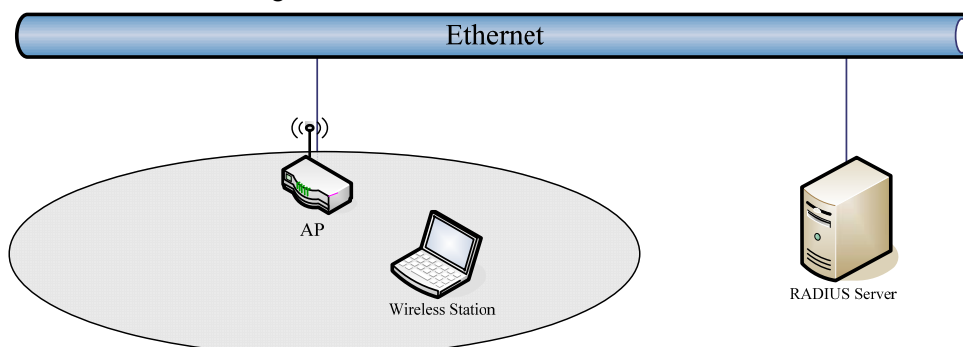
Encryption Key 2:

Encryption Key 3:

Encryption Key 4:

### WEP Encryption with 802.1x Setting

The device supports external RADIUS Server that can secure networks against unauthorized access. If you use the WEP encryption, you can also use the RADIUS server to check the admission of the users. By this way every user must use a valid account before accessing the Wireless LAN and requires a RADIUS or other authentication server on the network. An example is shown as following.



You should choose WEP 64 or 128 bit encryption to fit with your network environment first. Then add user accounts and the target device to the RADIUS server. In the device , you need to specify the IP address 、 Password (Shared Secret) and Port number of the target RADIUS server.



Encryption: WEP Set WEP Key

☒ Use 802.1x Authentication ☒ WEP 64bits ☐ WEP 128bits

☐ Enable MAC Authentication

WPA Authentication Mode: ☐ Enterprise (RADIUS) ☒ Personal (Pre-Shared Key)

Pre-Shared Key Format: Passphrase

Pre-Shared Key:

☐ Enable Pre-Authentication

Authentication RADIUS Server: Port  IP address  Password

### WPA Encryption Setting

WPA feature provides a high level of assurance for end-users and administrators that their data will remain private and access to their network restricted to authorized users. You can choose the WPA encryption and select the Authentication Mode.

### WPA Authentication Mode

This device supports two WPA modes. For personal user, you can use the Pre-shared Key to enhance your security setting. This mode requires only an access point and client station that supports WPA-PSK. For Enterprise, authentication is achieved via WPA RADIUS Server. You need a RADIUS or other authentication server on the network.

- **Enterprise (RADIUS):**

When WPA Authentication mode is Enterprise (RADIUS), you have to add user accounts and the target device to the RADIUS Server. In the device , you need to specify the IP address 、 Password (Shared Secret) and Port number of the target RADIUS server.

- **Pre-Share Key:**

This mode requires only an access point and client station that supports WPA-PSK. The WPA-PSK settings include Key Format, Length and Value. They must be as same as each wireless client in your wireless network. When Key format is Passphrase, the key value should have 8~63 ACSII chars. When Key format is Hex, the key value should have 64 hexadecimal digits (0~9, a~f or A~F).

# Configuring as WLAN Client Adapter

This device can be configured as a wireless Ethernet adapter. In this mode, the device can connect to the other wireless stations (Ad-Hoc network type) or Access Point (Infrastructure network type) and you don't need to install any driver.

## Quick start to configure

**Step 1.** In "Basic Settings" page, change the Mode to "Client" mode. And key in the SSID of the AP you want to connect then press "Apply Changes" button to apply the change.

**Wireless Basic Settings**

This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless encryption settings as well as wireless network parameters. Enable universal repeater mode can let radio act as AP and client simultaneously but remember the channel must be as same as the connected AP.

☐ Disable Wireless LAN Interface

Band: 2.4 GHz (B+G)

3 Mode: Client

Network Type: Infrastructure

4 SSID: Target-AP-SSID

Channel Number: 11

Show Active Clients

☐ Enable Mac Clone (Single Ethernet Client)

☐ Enable Universal Repeater Mode

Extended SSID:

(once selected and applied, extended SSID and channel number will be updated)

SSID	BSSID	Channel	Type	Encrypt	RSSI	Quality
------	-------	---------	------	---------	------	---------

Refresh

5 Apply Changes Reset

**Step 2.** Check the status of connection in "Status" web page

**System**

Uptime: 0day:0h:14m:2s

Free Memory: 11912 kB

Firmware Version: 1.3.0.9a 20060712

Webpage Version: 1.3.0.9a 20060712

**Wireless Configuration**

Mode: Infrastructure Client - Bridge

Band: 2.4 GHz (B+G)

SSID: Target-AP-SSID

Channel Number: 11

Encryption: Disabled

BSSID: 00:00:00:00:00:00

State: Scanning

RSSI: 0

AP Info: ---

**TCP/IP Configuration**

Attain IP Protocol: Fixed IP

IP Address: 192.168.2.205

Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0

DHCP Server: Disabled

MAC Address: 00:00:00:04:22:21

The alternative way to configure as following:

**Step 1.** In “Wireless Site Survey” page, select one of the SSIDs you want to connect and then press “Connect” button to establish the link.

**Wireless Site Survey**

This page provides tool to scan the wireless network. If any Access Point or IBSS is found, you could choose to connect it manually when client mode is enabled.

SSID	BSSID	Channel	Type	Encrypt	RSSI	Quality	Select	Act
WLAN_G_TEST	00:00:01:02:03:04	11 (B+G)	AP	no	61 (-53 dbm)	85	<input checked="" type="radio"/>	<input type="radio"/>
	00:0d:14:00:80:18	1 (B+G)	AP	no	60 (-54 dbm)	85	<input type="radio"/>	<input type="radio"/>
ZINTECH-2F	00:05:9e:80:b1:e3	1 (B+G)	AP	yes	41 (-65 dbm)	90	<input type="radio"/>	<input type="radio"/>
RAD500	00:05:9e:80:46:69	11 (B)	AP	no	40 (-70 dbm)	93	<input type="radio"/>	<input type="radio"/>
ZINTECH-3F	00:05:9e:80:b1:bd	11 (B+G)	AP	yes	29 (-72 dbm)	78	<input type="radio"/>	<input type="radio"/>
RTL8186-default	00:00:00:aa:bb:01	7 (B+G)	AP	no	26 (-74 dbm)	89	<input type="radio"/>	<input type="radio"/>
throu.	00:05:9e:81:b9:67	6 (B+G)	AP	no	13 (-82 dbm)	67	<input type="radio"/>	<input type="radio"/>

Refresh Auto Refresh **Connect** Aiming

**Step 2.** If the linking is established successfully. It will show the message “Connect successfully”. Then press “OK”.

**Connect successfully!**

OK

**Step 3.** Then you can check the linking information in “Status” page.

**System**

Uptime	0day:0h:16m:32s
Free Memory	11912 kB
Firmware Version	1.3.0.9a 20060712
Webpage Version	1.3.0.9a 20060712

**Wireless Configuration**

Mode	Infrastructure Client - Bridge
Band	2.4 GHz (B+G)
SSID	WLAN_G_TEST
Channel Number	11
Encryption	Disabled
BSSID	00:00:01:02:03:04
<b>State</b>	<b>Connected</b>
RSSI	36 (-72 dbm, Quality 79)
AP Info	---

**TCP/IP Configuration**

Attain IP Protocol	Fixed IP
IP Address	192.168.2.205
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0
DHCP Server	Disabled
MAC Address	00:00:00:04:22:21

---

**Note :**

If the available network requires authentication and data encryption, you need to setup the authentication and encryption before step1 and all the settings must be as same as the Access Point or Station. About the detail authentication and data encryption settings, please refer the security section.

---

**Authentication Type**

In client mode, the device also supports two Authentication Types “Open system” and “Shared Key”. Although the default setting is “Auto”, not every Access Points can support “Auto” mode. If the authentication type on the Access Point is knew by user, we suggest to set the authentication type as same as the Access Point.

**Data Encryption**

In client mode, the device supports WEP and WPA Personal/Enterprise except WPA2 mixed mode data encryption. About the detail data encryption settings, please refer the security section.

## **MAC Clone for Single Ethernet Client**

Enable/Disable Mac Clone (Single Ethernet Client) in Wireless-Basic Settings page determines whether the Ethernet Client use it's own MAC address or AP-Client's MAC address to transmit data. Enable MAC Clone, the single Ethernet client can use its own MAC address. Disable MAC Clone, the single Ethernet client must to use AP-Client's MAC address.

While you use this device act as AP-Client and only one host connect to this device via Ethernet, you need to check this option in this page, otherwise the other device can't recognize your host behind AP-Client. If you use hub/switch connect multi-device to this AP-Client, you should uncheck this option.

Site contents:

- Wizard
- Operation Mode
- Wireless **1**
- Basic Settings **2**
- Advanced Settings
- Security
- Access Control
- WDS settings
- Site Survey
- Connecting Profile
- TCP/IP
- Firewall
- Management
- Reboot

## Wireless Basic Settings

This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless encryption settings as well as wireless network parameters. Enable universal repeater mode can let radio act as AP and client simultaneously but remember the channel must be as same as the connected AP.

☐ Disable Wireless LAN Interface

Band: 2.4 GHz (B+G)

Mode: Client

Network Type: Infrastructure

SSID: hank

Channel Number: 11 [Show Active Clients](#)

**3** ☒ Enable Mac Clone (Single Ethernet Client)

☐ Enable Universal Repeater Mode

Extended SSID:

(once selected and applied, extended SSID and channel number will be updated)

SSID	BSSID	Channel	Type	Encrypt	RSSI	Quality
<a href="#">Refresh</a>						

**4** [Apply Changes](#) [Reset](#)

## Configuring Universal Repeater

This device can be configured as a Repeater. In this mode, the device can extend available wireless range of other AP let user can link the network that they want, Also the device working as AP and Repeater same time.

Following two ways describe how to make Universal Repeater effective.

1. Enable Universal Repeater Mode and then select a SSID in the Table that you want. Final click Apply Changes button to take effective. **(Click Refresh button to make table renew)**