Wireless LAN Device Series

N_Max Wireless Access Point

WAP-6010 User's Manual

Version. 1 (Draft. 2008.12.12)

Notice

FCC 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.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against 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 connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC RF Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible. 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.

CE Statement

ZINWELL, hereby declares that this device is in compliance with the essential requirement and other relevant provisions of the R&TTE Directive 1999/5/EC.

This device will be sold in the following EEA countries：Austria, Italy, Belgium, Liechtenstein, Denmark, Luxembourg, Finland, Netherlands, France, Norway, Germany, Portugal, Greece, Spain, Iceland, Sweden, Ireland, United Kingdom, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Slovakia, Poland, Slovenia, Bulgaria, Romania.

Preface

This guide is for the experienced user who installs and manages the N_Max WAP-6010 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.

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Ch 1. WAP-6010 Installation

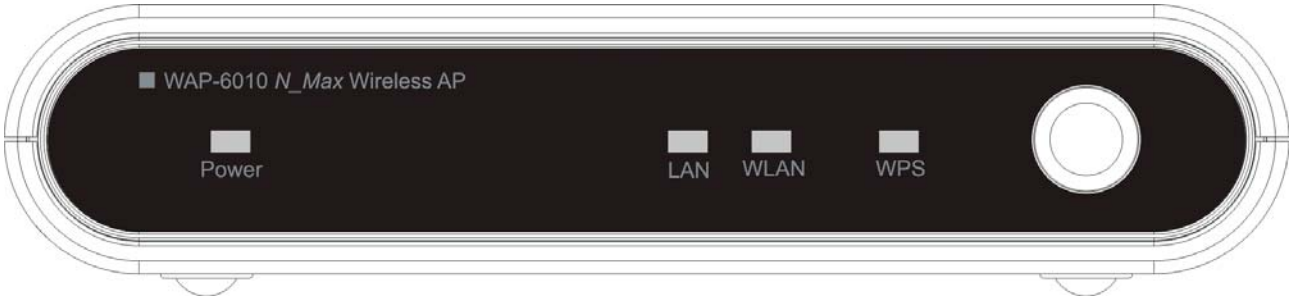
Packing List

Before starting the installation of the device, please make sure the package contains the following items:

- WAP-6010 AP unit x 1
- Power Adapter x 1
- RJ-45 Cable x 1

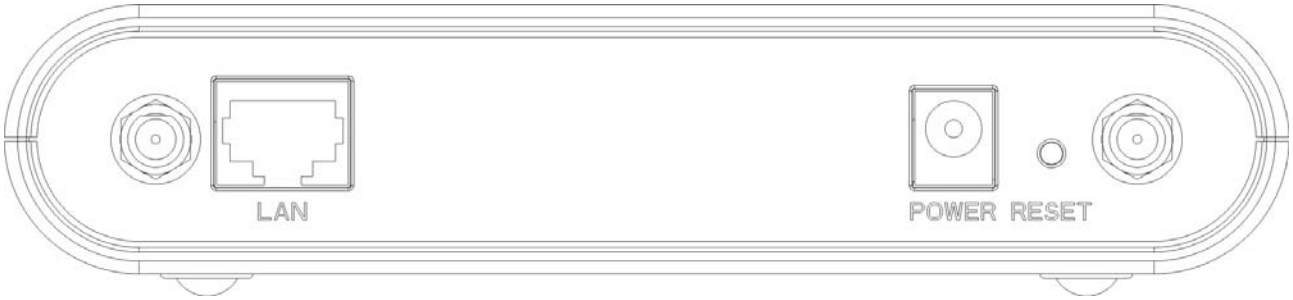
Connectors, Buttons and LEDs

Front Panel



From Left to right:
Power LED: The LED lights when power on.
LAN: The LED lights when the Ethernet port is plugged and flashes when it is transmitting.
WLAN: The LED flashes when WLAN is working.
WPS LED: The LED lights when the WPS button is pushed.
WPS Button: Press it to enable PBC (Press Button Communication) for WPS authentication.

Back Panel



From left to right:

LAN: You can connect the Ethernet port to PC or the other switch.

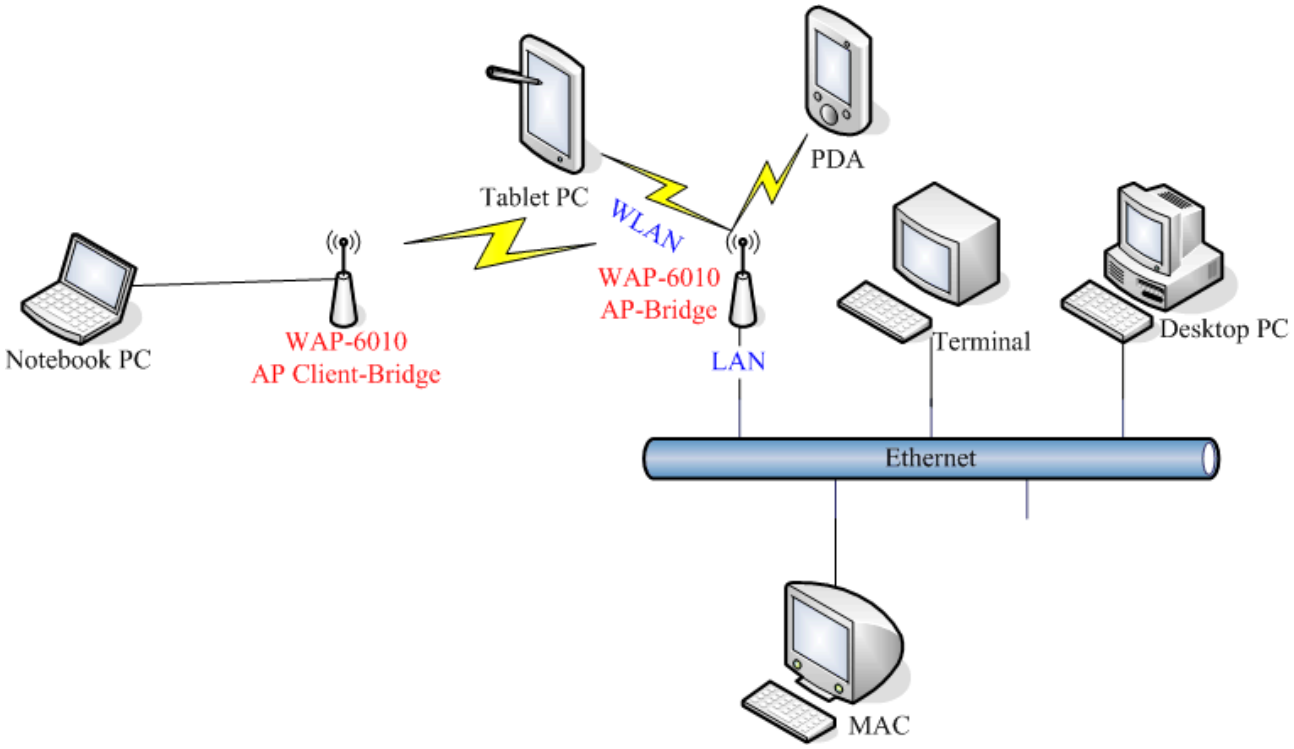
POWER: Please supply the power in 12V and 1A.

Reset Button: Press Reset button to revert it to factory default.

Antenna port: There are two antenna ports in the both ends of this side. Connect the antenna into the port.

Hardware Installation

Once you check everything from the package, you can start to install the device. You can use the wall mount hole on the bottom of the device to mount the device on the wall, or just put the device on the desktop. The administrator can refer to the figure below while in the process of constructing your WLAN environment.

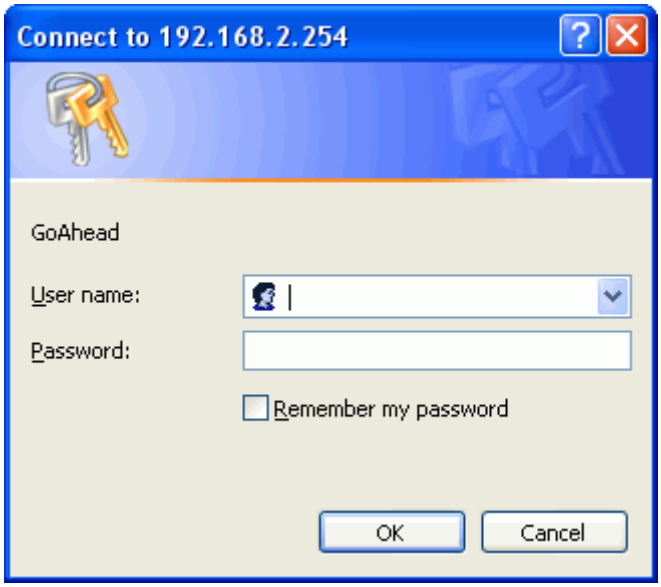


Ch 2. First Time Configuration

Before Start to Configure

The configuration of this device is through web-browser. 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 192.168.0.254, and the subnet-mask is 255.255.255.0. For the first time configuration, please login with username: **admin** and password: **admin**.



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.

Knowing the Network Application

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

- Access Point
- WDS mode
- Bridge
- Repeater

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. Following are the types of operation mode.

Bridge

The Ethernet-LAN port will bridge to the radio including AP, WDS, AP+WDS, Repeater and AP Client.

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

AP (Access Point) / Bridge

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

AP Client mode

This mode enables the establishment of connection with the other AP using infrastructure/Ad-hoc networking types. With bridge operation mode, you can directly connect one of the wired Ethernet port to your PC and the device becomes a wireless adapter. And with WISP operation mode, you can connect one of 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 combines up to 5 WDS or AP+WDS devices to a single wireless network; 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.

AP + WDS

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

For WDS and AP+WDS connection, please use the same model of devices to establish the WDS network.

The following table shows the supporting association of wireless radio modes.

WLAN mode	*AP*	*WDS Only*	*AP + WDS*	*Repeater*	*Client-Infra*	*Client - Ad Hoc*
AP	X	X	X	V	V	X
WDS Only	X	V	V	X	X	X
AP + WDS	X	V	V	V	V	X
Repeater	V	X	V	V	V	X
Client-Infrastructure	V	X	V	V	X	X
Client-Ad Hoc	X	X	X	X	X	V

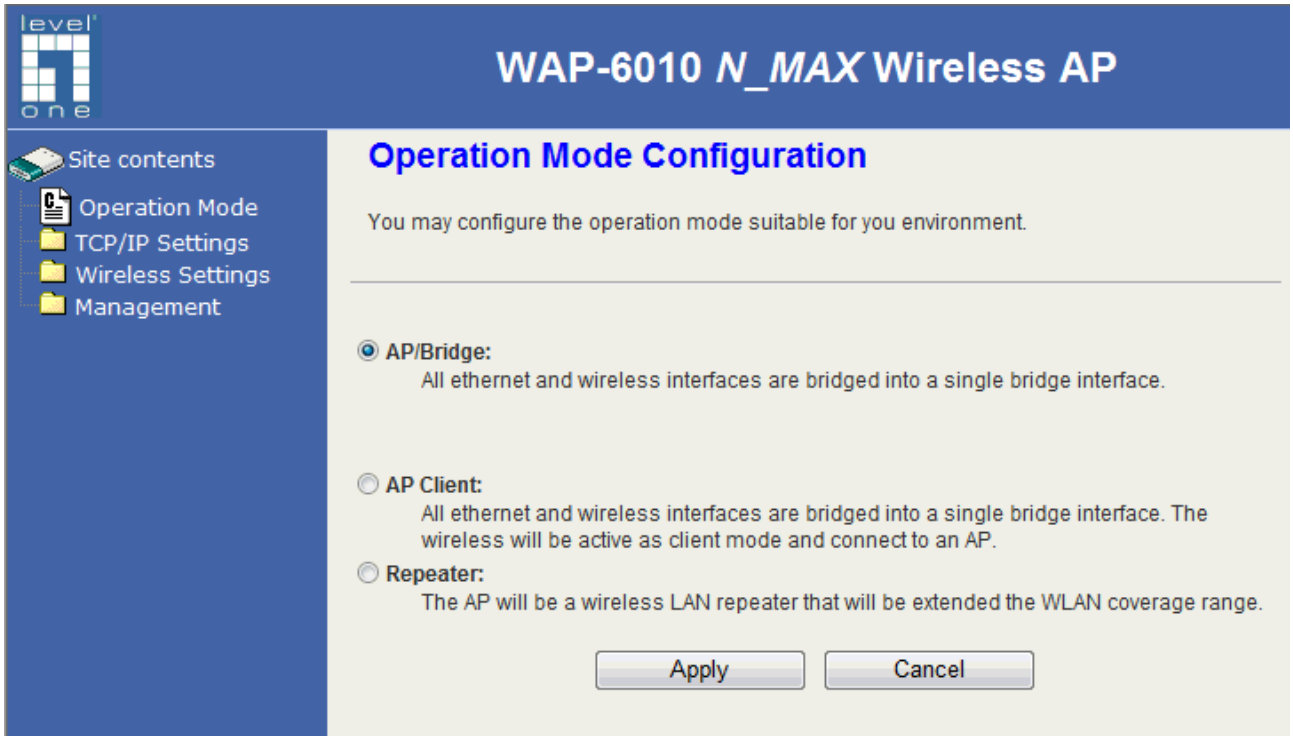
V: Supported.

X: Not supported.

WDS function supports the same model only.

Ch 3. Detail Configuration

Operation Mode



This device supports 3 modes of radio. Click the radio button to select one among the modes.

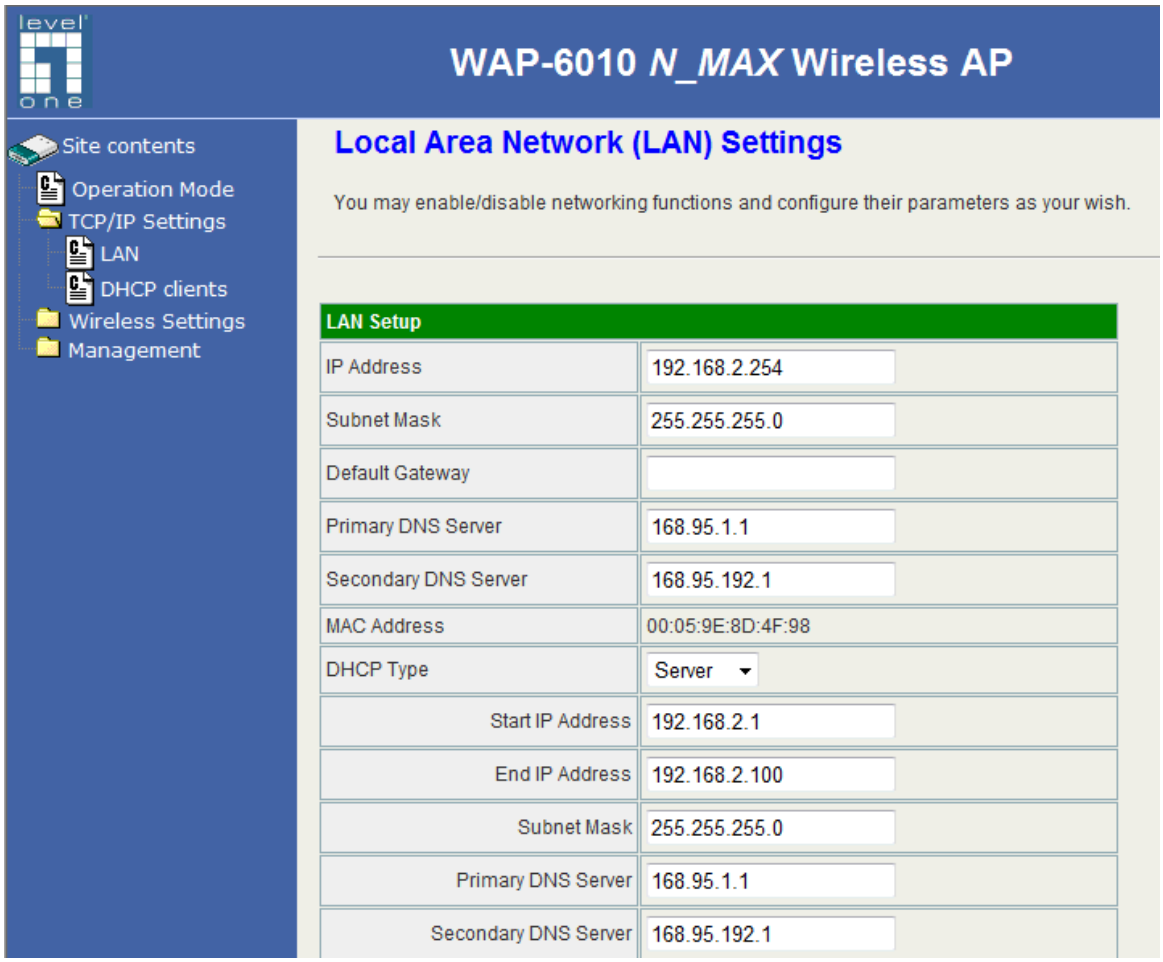
AP/Bridge: This mode is to setup as an AP-bridge. The other WLAN clients (WLAN Station) associate to this device to get the LAN connection.

AP Client: This mode is to associate to AP or other clients. For the infrastructure mode, the bridge-client associates to the AP; for the Ad Hoc mode, the bridge-client associates to the other bridge-clients in the Ad Hoc network.

Repeater: This mode acts as the AP and also bridges the remote AP to extend the WLAN coverage.

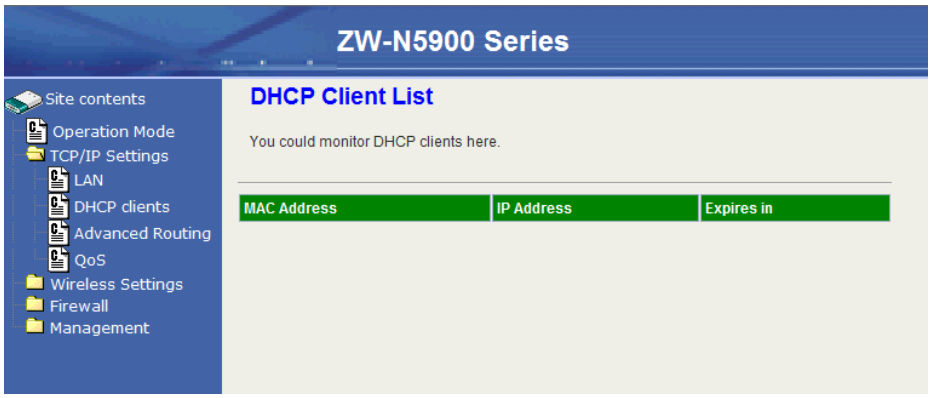
TCP/IP Settings

Configuring LAN Interface



Item	Description
IP Address	This is the IP Address for this device. You can login this IP Address via LAN/WLAN, and you can change it if you want to.
Subnet Mask	This is the subnet mask for the LAN. The default value is “255.255.255.0”.
MAC Address	The MAC Address of LAN is showed in this field.
DHCP Type	You can select to enable DHCP server. When enabling the DHCP server, you must setup the information below.
Start IP Address	This is the first IP Address of the IP pool which the server assigns the IP Address from.
End IP Address	This is the last IP Address of the IP pool.

Subnet mask	This is the subnet mask of this domain. The default value is “255.255.255.0”.
Primary DNS Server	This is the primary DNS server for the LAN PCs.
Secondary DNS Server	This is the second DNS server for the LAN PCs.
Default Gateway	This is the default gateway for the LAN PCs.
Lease Time	This is the DHCP lease time. When it is short, the IP release/renew of the LAN will be faster but the network congestion will be more.
Statically Assigned	You can manually assign the IP Address to the certain PCs. Enter the MAC Address and IP Address in the table.
LLTD	Enable this function to support LLTD (Link Layer Topology Discovery) for Windows Vista. It shows the status of connection in the Windows Vista.



User can set the routing information let the Router knows what routing is correct also it can not learn automatically through other means.

Wireless Settings

AP mode

Basic

Basic Settings	
Item	Description
Radio On/Off	Click the “RADIO OFF” button to turn off the radio. Click it again to turn on the radio.

Network Mode	The available options are “11b/g mixed mode”, “11b only”, “11g only”, “11n only” and “11b/g/n mixed mode”. We recommend selecting the default value “11b/g/n mixed mode”.
Network Name (SSID)	The SSID, which is also called ESSID is a unique identifier that wireless networking devices use in order 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.
Multiple SSID 1-3	This device supports multiple SSID. Input the multiple SSID 1, 2, 3 in the field to enable the function. With the field of Network Name (SSID), the device supports maximum 4 SSIDs.
Broadcast Network Name (SSID)	Disable this function to hide SSID. With hidden SSID, the AP can’t be scanned and the wireless client must input SSID manually to associate this AP.
AP Isolation	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.
MBSSID AP Isolation	The device supports multi-SSID. You can decide whether the clients associated to different SSID on the device can see each other. Enable the option to block it. The Default value is “Disable”.
BSSID	The BSSID is displayed in this field.
Frequency (Channel)	Click the drop down box to select the radio channel. Select the unused channel to prevent the radio overlapping. If you are not sure which channel is used, select “AutoSelect” to let the device to detect and select the available channel.

Wireless Distribution System (WDS)	
Item	Description
WDS Mode	This device supports “WDS Mode only” and “AP+WDS Mode”. When selecting WDS mode only, this device provides WDS connection only and doesn’t provide radio to the WLAN stations (clients). To provide both AP and WDS connections, select “AP + WDS Mode”.
Phy Mode	There are four modes including “CCK, OFDM, HTMIX, and Greenfield”. Select one according the WDS devices. The CCK is for pure 802.11b WDS network. OFDM is for pure

	802.11g WDS network. HTMIX is for 802.11 g/n WDS network. Greenfield is for pure 802.11n WDS network.
AP MAC Address	This device connects 4 WDS devices. Enter the MAC Address in the field to connect.

HT Physical Mode—only configurable in 11 b/g/n mixed or 11n only mode.	
Item	Description
Operating Mode	Default: Mixed (Mixed, Green Field). **Mixed mode**: In this mode the device transmits the packets with preamble compatible legacy (802.11g), so they can be decoded by legacy devices. The device receives and decodes both Mixed Mode packets and legacy packets. **Green Field mode**: the device transmits HT packets without legacy compatible part. But the device receives and decodes both Green Field and legacy packets.
Channel Bandwidth	Click the radio button to choose between 20 MHz or 20/40MHz. This option affects the Phy data rate of radio. Please refer to the table below
Guard Interval	The 11n device inserts the Guard Interval into the signal. You can choose the interval between “Long” and “Auto”. This option affects the Phy data rate of radio. Please refer to the table below.
MCS	It is Modulation Coding Scheme. The available options are “Auto, 0, 1, …, 32”. It changes the modulation of this device and effect the maximum Phy data rate. We recommend “Auto” setting. For the details, please refer to the table below.
Reverse Direction Grant (RDG)	Enable this function to provide more robust data packet transmission.
Extension Channel	The “20/40” bandwidth mode uses 5 channels. For example, selecting channel 7 and you can select 3 or 11 for extension channel. Choose the unused channel for the extension channel.
Aggregation MSDU (A-MSDU)	The multiple HT packets can be transmitted with single ACK reply packet. Enable it to apply this function and reduce the network congestion.
Auto Block ACK	It is another aggregation technique which prevents sending ACK in the communication to reduce the network congestion. If this option is enabled, the device will try to activate this function when transmitting massive data.
Decline BA Request	Enable this option to decline the Block ACK request addressed by the other devices.

The table below shows the relationship among Phy data rate, Bandwidth and Guard Interval.

Data Rate Mbps / MCS	Bandwidth = 20MHz		Bandwidth = 40MHz	
	Short Guard Interval	Long Guard Interval	Short Guard Interval	Long Guard Interval
0 (1S)	7.2	6.5	15	13.5
1	14.4	13	30	27
2	21.7	19.5	45	40.5
3	28.9	26	60	54
4	43.3	39	90	81
5	57.8	52	120	108
6	65	58.5	135	121.5
7	72.2	65	150	135
8 (2S)	14.4	13	30	27
9	28.9	26	60	54
10	43.3	39	90	81
11	57.8	52	120	108
12	86.7	78	180	162
13	115.6	104	240	216
14	130	117	270	243
15	144.4	130	300	270
32	Not Supported	Not Supported	6.7	6

MCS: Modulation Coding Scheme

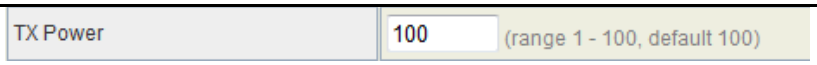
MCS=0~7 (1S, One Tx Stream)

MCS=8~15 (2S, Two Tx Stream)

MCS 32: BPSK

Advanced

Advanced Wireless	
Item	Description
BG Protection Mode	Default: Auto. You can select the other options including On and Off. The B/G protection technology is CTS-To-Self. It will try to reserve the throughput for 11g clients from 11b clients connecting to the device as AP mode.
Basic Data Rates	Choose the ACK rate for this device in B/G mode.
Beacon Interval	Beacons are the packets sending by Access point to

	synchronize the wireless network. The beacon interval is the time interval between beacons sending by this unit in AP or AP+WDS mode. The default and recommended beacon interval is 100 milliseconds.
Data Beacon Rate (DTIM)	This is the Delivery Traffic Indication Map. It is used to alert the clients that multicast and broadcast packets buffered at the AP will be transmitted immediately after the transmission of this beacon frame. You can change the value from 1 to 255. The AP will check the buffered data according to this value. For example, selecting “1” means to check the buffered data at every beacon.
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.
TX Power	 The default TX power is 100%. In case of shortening the distance and the coverage of the wireless network, input a smaller value to reduce the radio transmission power. For example, input 80 to apply 80% Tx power.
Short Preamble	Default: Disable. It is a performance parameter for 802.11 b/g mode and not supported by some of very early stage of 802.11b station cards. If there is no such kind of stations associated to this AP, you can enable this function.
Short Slot	For a WLAN network with 802.11g/n devices, the time slot can be set short to increase the throughput. Disable this option for the backward compatibility with 802.11b device.
Tx Burst	The device will try to send a serial of packages with single ACK reply from the clients. Enable this function to apply it.

Wi-Fi Multimedia	
Item	Description
WMM Capable	Choose “Enable” to enable WMM function.
WMM Parameter	Click the button to edit the WMM parameter.

Multicast-to-Unicast Converter	
Item	Description
Multicast-to-Unicast	Enable/Disable to enable this function.

Security

Wireless Security/Encryption Settings

Select SSID	
Item	Description
SSID choice	Choose the ESSID to configure the security setting.

Wireless Security/Encryption Settings	
Item	Description
Security Mode	Disable, OPEN, SHARED, WEPAUTO, WPA, WPA-PSK, WPA2, WPA2-PSK, WPA/WPA2 PSK, WPA/WPA2, 802.1X.

The available options are showed according to the numbers of the BSSID in the Basic Setting. Each SSID can setup different encryption type. For example, set up 4 BSSID and 4 sets of security shows on this page:

- Security Mode: Choose one as the wireless authentication among the following types: Open, Shared, WEP Auto, WPA, WPA-PSK, WPA2, WPA2-PSK, WPA/WPA2-PSK, WPA/WPA2, and 802.1 X.
- Encryption Type: Select one for the encryption type. The options vary depending on the Authentication mode. The corresponding options shows below.

Authentication	**Encryption type**	**Key option**
Open/Shared/WEP Auto	WEP	Default Key ID, Key content of Key 1/2/3/4
WPA/WPA2-PSK (Pre-Shared Key)	TKIP, AES, TKIP/AES	Pass Phrase (8-32 bytes), Key Renewal Interval
WPA/WPA2 Enterprise	TKIP, AES, TKIP/AES	Radius Server Network/Address/Port/Key/Session timeout

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.

- Authentication Type: Open, Shared and Auto. When choose “Open” or “Shared”, all of the clients must select the same authentication to associate this AP. If select “WEP Auto”, the clients don’t have to use the same “Open” or “Shared” authentication. They can choose any one to authenticate.
- Default Key ID: Select whether the Key ID as the default Key.
- Key 1/2/3/4: Select “ASCII” or “Hex” and then type the key in the text field.
  - 64-bit WEP Encryption：64-bit WEP keys are as same as the encryption method of 40-bit WEP. When input 10 hexadecimal digits (0-9, a-f or A-F) or 5 ACSII chars as the key, it is using 64-bit WEP encryption.
  - 128-bit WEP Encryption：128-bit WEP keys are as same as the encryption method of 104-bit WEP. When input 26 hexadecimal digits (0-9, a-f or A-F) or 10 ACSII chars, it is using 128-bit WEP encryption.

WPA Authentication Mode

This device supports six WPA modes including WPA-PSK (Pre-Shared Key), WPA, WPA2-PSK, WPA2 and additional WPA/WPA2 PSK and WPA/WPA2 mixed mode. For individual and residential user, it is recommended to select WPA-PSK or WPA2-PSK to encrypt the link without additional RADIUS server. This mode requires only an access point and client station that supports WPA-PSK. For WPA/WPA2, authentication is achieved via WPA RADIUS Server. You need a RADIUS or other authentication server on the network.

- **WPA/WPA2-PSK:**
  - Pass Phrase:

  Option: Pass Phrase (8-32bytes). 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.
  - Key Renewal Interval:

  The WPA Algorithm will regroup the key for a period. The default value is 3600 seconds and you can adjust the time interval.

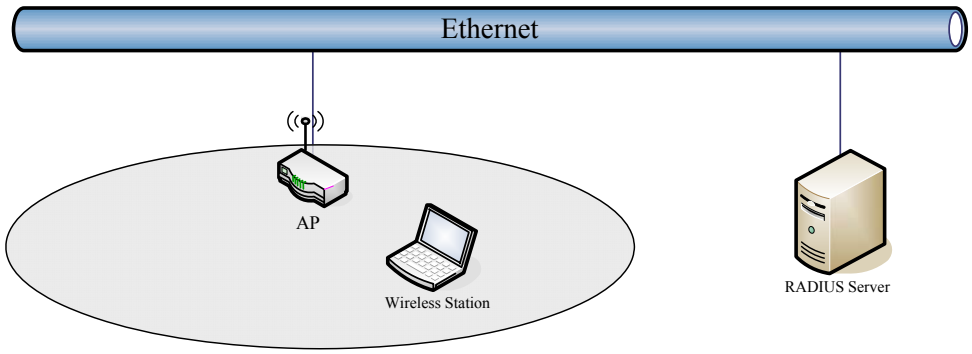
- **WPA/WPA2:**

When selecting WPA/WPA2, you have to add user accounts and the target device to the RADIUS Server. In the device, you need to specify the Server Network,

Server address, Server Port and Server Key of the target RADIUS server.

- WPA Algorithms: TKIP, AES, TKIP/AES. Select the encryption type. When selecting TKIP/AES, the client can use whether TKIP or AES for the authentication.
- Pre-Authentication Support option: This option only appears when selecting WPA2 or WPA/WPA2 as the authentication mode. Enable it to use this function.

- **Radius Server setting:**
  - IP Address: Input the IP Address of the Radius server.
  - Port: Input the port of the Radius server. The default port is 1812.
  - Shared Secret: Input the Authentication Key.
  - Session Timeout: Input the maximum idle time for this connection.



Hereby, this is the available security setting for each mode.

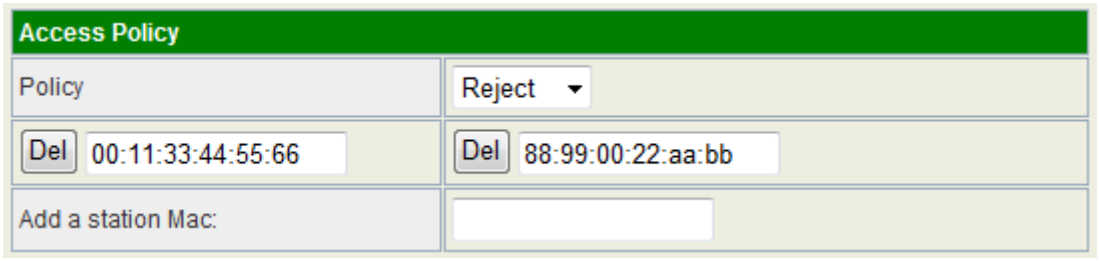
WLAN security	*AP*	*WDS Only*	*AP + WDS*	*Repeater*	*Client-Infra*	*Client – Ad Hoc*
No encryption	V	V	V	V	V	V
WEP (open/ Shared/Auto)	V	V	V	V	V	V
WPA	V	X	X	V	X	X
WPA2	V	X	X	V	X	X
WPA-PSK	V	V	V	V	V	WPA-NONE
WPA2-PSK	V	V	V	V	V	X
802.1X	V	X	X	V	X	X
WPS	V	X	X	V	V	X

V: Supported.
X: Not supported.
WDS function supports the same model only.
WPS function supports only WPA-PSK or WPS2-PSK encryption.

Access Policy

For each SSID, the Access Policy can be selected and setup. The policy includes “Reject” and “Allow”. The Reject policy rejects the station according to the MAC table in the policy configuration, and let the other stations to connect. The allow policy performs reversely.

Add a station MAC: Key in station MAC Address in the text field. The valid format of the MAC Address is “00:11:22:33:44:55”. The station MAC Address can be found on the label or configure utility of the WLAN card. For deleting one record in the table, click the “Del” button of the record. The maximum number of record on the table is ?.



WPS

This function helps to establish the Wi-Fi security. For AP mode, it can be setup one WPS method including PIN (Personal Identification Number) and PBC (Push Button Communication).
To begin the WPS progress, the WLAN security must be setup first. Please setup one among WPAPSK, WPA2PSK, WPA/WPA2PSK and then apply WPS setting.

PIN: query the PIN code in the utility of WLAN client, and then enter it in the PIN field. The Wi-Fi link between the WLAN client and the device should be encrypted.

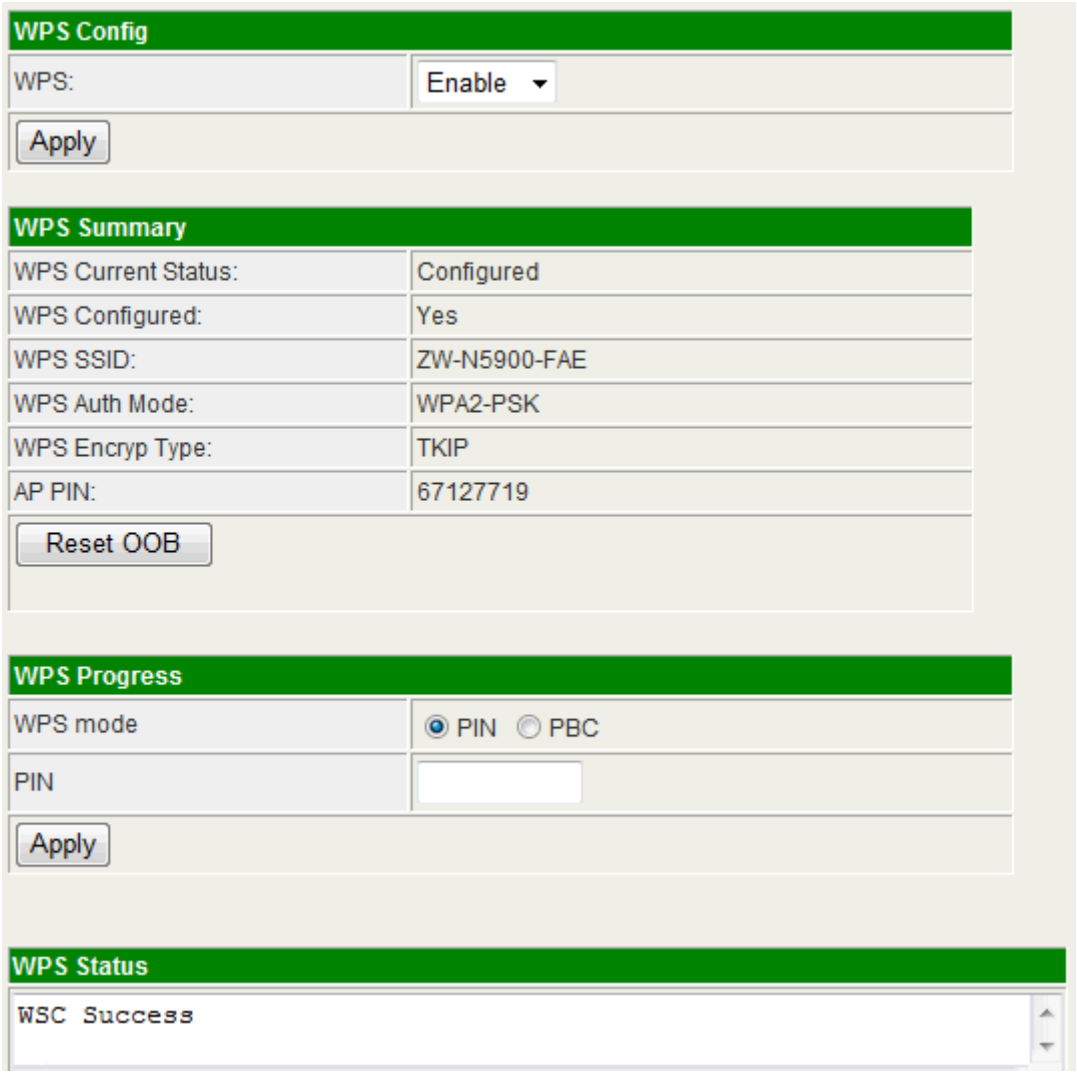
PBC: Select PBC, and then you can begin the PBC process. Press the PBC button in the front panel can also trigger this process. Press or click the PBC button on the WLAN client to finish the communication. You can press the PBC button on the WLAN client first and then click the PBC button on this device to establish the encryption.

The options and the information fields are showed below.

WPS Config	
Item	Description
WPS Enable/Disable	Select to enable this function.

WPS Summary—information of WPS	
Item	Description
WPS Current Status	It shows the current status of the WPS process.
WPS Configured	It indicated whether the WPS is configured.
WPS SSID	It is the first SSID of the device.
WPS Auth Mode	It indicates the authenticate mode of this device. It can be configured in the wireless security page.
WPS Encryp Type	It indicates the encryption method of this device. Like WPS authentication mode, it can be configured in the wireless security page.
AP PIN	It shows the current PIN number of this device.
Reset OOB button	Press this button to reset the WPS of this device. The AP PIN number will be changed.

WPS Progress	
Item	Description
WPS mode	Choose to use PIN (Personal Identification Number) or PBC (Push Button Communication).
PIN	Input the 8-digit PIN of client.



Station List

In the Station list, the information of associated clients is displayed.

Client mode

Profile

In the first page, you can see the profile list to show the information including Profile name, SSID, Channel, Authentication, Encryption and Network Type. Use four buttons to manage the profile list. The “Add” button is to add a new profile. The “Delete” button is to delete the selected profile. The “Edit” button is to edit the selected profile. The “Activate” button is to enable the selected button, so this device will associate to the AP according to the profile.

System Configuration	
Item	Description
Profile Name	Enter your profile name.
SSID	Enter the SSID of the AP or Ad Hoc network.
Network Type	Choose one between “802.11Ad Hoc” and Infrastructure.
Channel	This option shows only for the Ad Hoc network. Select one for it.
11B Preamble Type	In the Ad Hoc network, choose “Long” for the compatibility of the some old 802.11b station cards, or “Auto” for setup this option automatically.
Power Saving Mode	For the Infrastructure network, this device can be setup to CAM (Constantly Awake Mode) or Power Saving Mode.
RTS Threshold	Check the box to setup the RTS Threshold. The default value is 2347 and the available range is from 0 to 2432.
Fragment Threshold	Check the box to setup the Fragment Threshold. The default value is 2346 and the available range is from 256 to 2432.

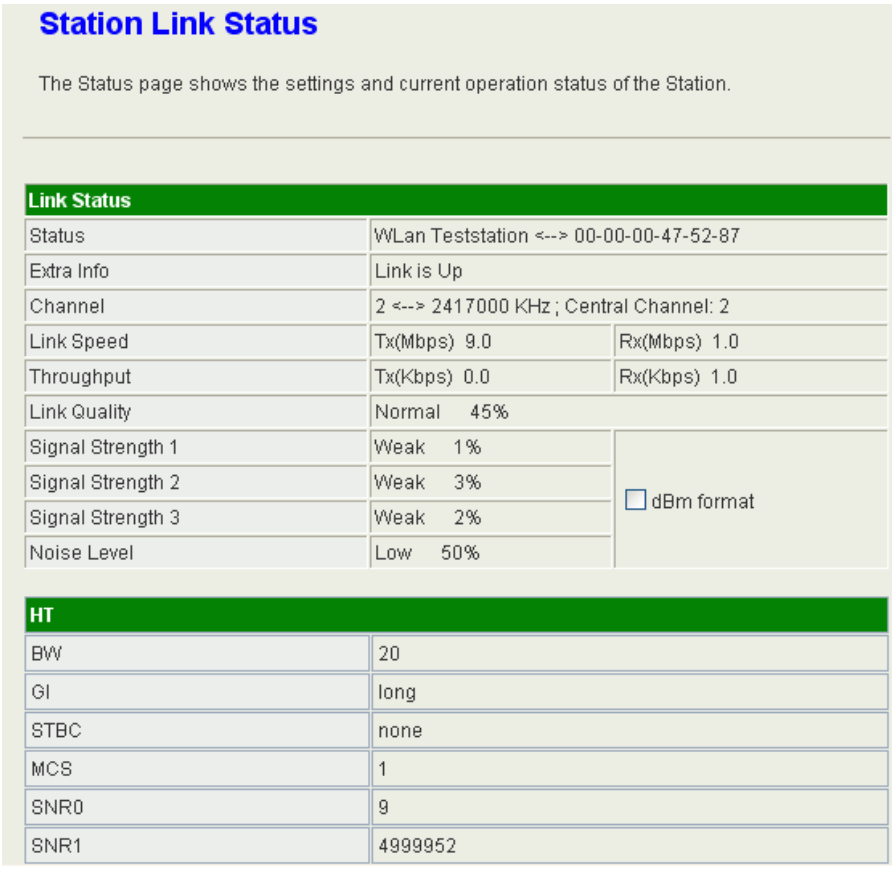
Security Policy	
Item	Description
Security Mode	Please choose the encryption method. The available options are OPEN, SHARED, WPA-Personal and WPA2-Personal.

WEP/WPA PSK	
Item	Description
WEP Key Length	Choose to use 64bit or 128bit length of key.
WEP Key Entry	Select the key type. The available options are ASCII Text or

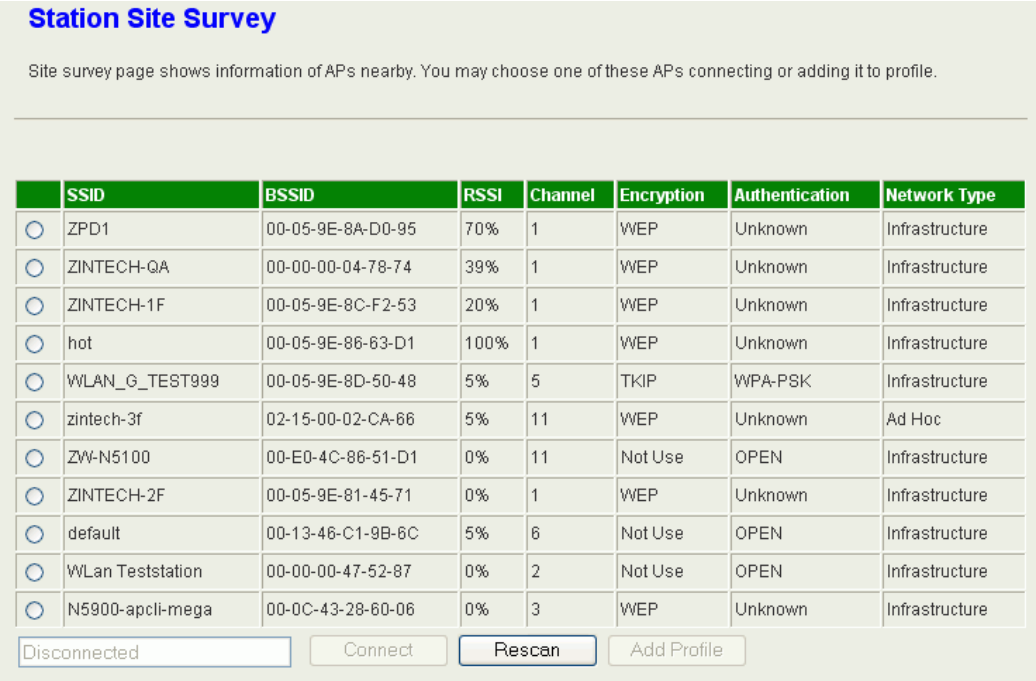
Method	Hexadecimal.
WEP Keys	For WEP key, please input the key1-4. The key text and the length must match the above settings.
Default Key	Select the default Tx WEP key.
WPA Algorithms	Choose the algorithm between TKIP and AES.
Pass Phrase	Input the key for WPA-PSK/WPA2-PSK. The length is from 8 to 63 characters.

Link Status

The status of the radio shows in this field.

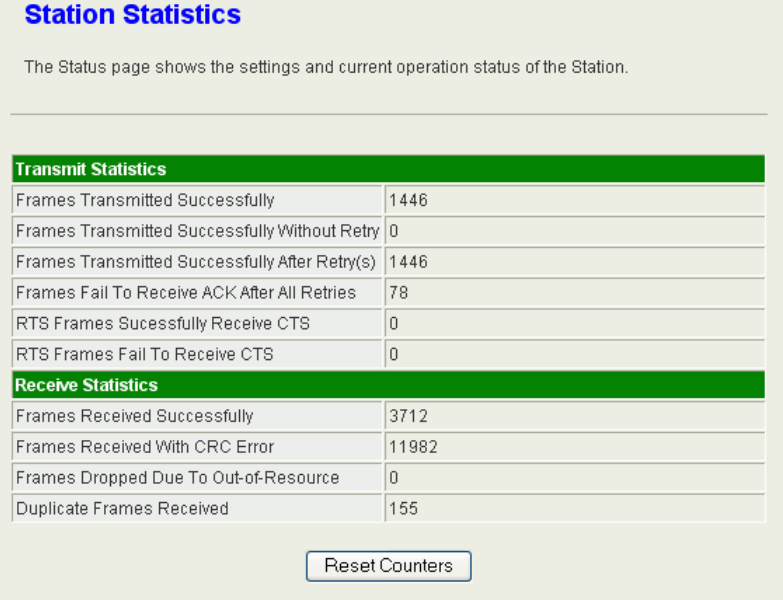


Site Survey



Advance Configuration	
Item	Description
Connect button	Check the radio button in front of the ESSID and click “Connect” button to connect.
Rescan	Click this button to refresh the list.
Add Profile	Check the radio button and click this button to add the ESSID to the profile.

Statistics



Advanced

Advance Configuration	
Item	Description
Wireless Mode (Infrastructure)	Choose the WLAN type. The available options are “802.11B/G/N mixed mode”, “802.11B Only”, “802.11G Only”, “802.11N Only”, “802.11GN mixed mode”, and “802.11 B/G/N mixed mode”.
Tx Burst	This is the range of the source IP Address.

HT Physical Mode	
Item	Description
HT (High throughput)	MM (Mixed Mode) or GF (Green Field). **Mixed mode**: In this mode the device transmits the packets with preamble compatible legacy (802.11g), so they can be decoded by legacy devices. The device receives and decodes both Mixed Mode packets and legacy packets. **Green Field mode**: the device transmits HT packets without legacy compatible part. But the device receives and decodes both Green Field and legacy packets.
BW (Bandwidth)	Choose “20” for the standard bandwidth or “Auto” to use the 40MHz bandwidth automatically.
GI (Guard Interval)	Choose “Long” to use long guard interval or “Auto” to setup the GI automatically.
MCS (Modulation	Choose MCS. Please refer to the section of Access Point.

Coding Scheme**)**	

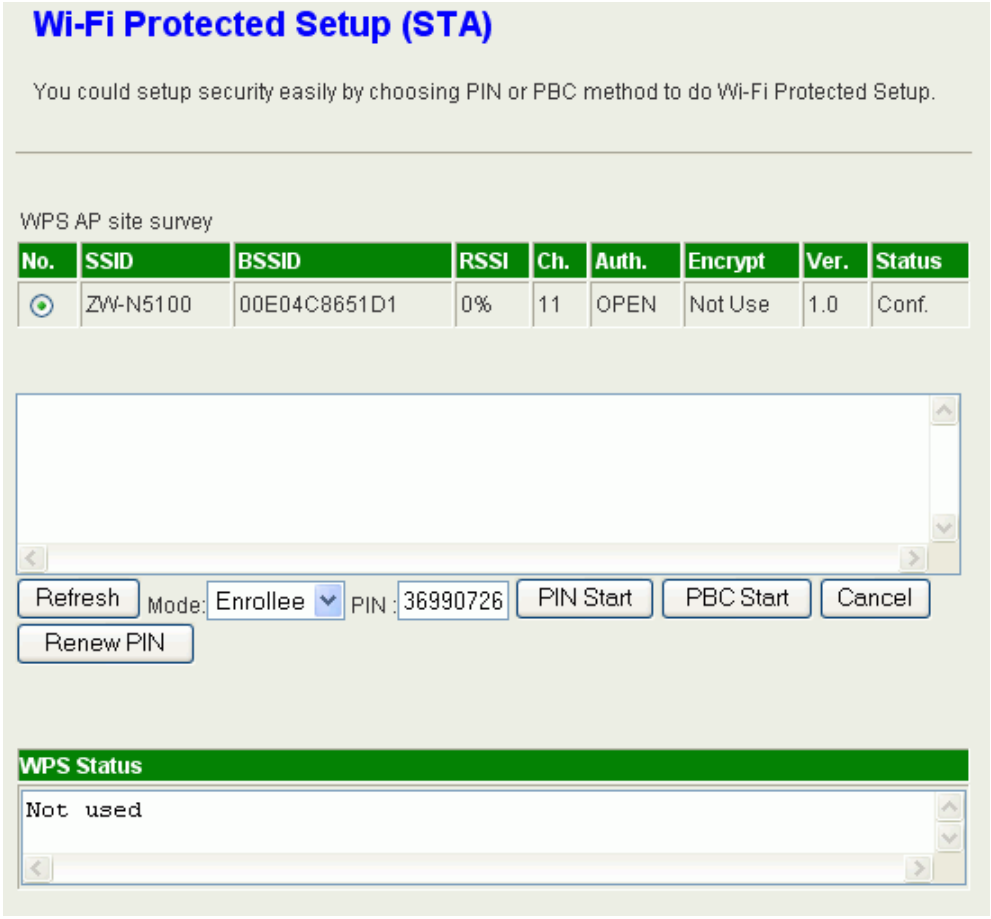
QoS

QoS Configuration	
Item	Description
WMM	Check the box to enable WMM function. It depends on the associated AP, if it supports WMM and you can enable this function on this device.
WMM Power Saving	Check the box to enable WMM function. It depends on the associated AP, if it supports WMM and you can enable this function on this device. When enabled, the options below can be configured.
PS Mode	The options are “AC_BE”, “AC_BK”, “AC_VI” and “AC_VO”. Please select the respective options according to the AP.

11n Configurations

11n Configuration	
Item	Description
MPDU Aggregation	Check the box to enable this function. Click on “Manual” radio button to setup the MPDU or “Auto” to setup automatically.
MPDU density	Select the MPDU density.
Aggregation MSDU (A-MSDU)	The multiple HT packets can be transmitted with single ACK reply packet. Enable it to apply this function and reduce the network congestion.

WPS



The WPS AP lists in the top of the page. The bottom panel shows the status of WPS. Please refer to the section of Access Point mode for the operation.

11n Configuration	
Item	Description
Refresh button	Click this button to refresh the WPS AP list.
Mode	This device only supports Enrollee in WLAN client mode.
PIN	This is the PIN code for PIN communication. Click “Renew PIN” to generate a new PIN code.
PIN Start	Click this button to start PIN process.
PBC Start	Click this button to start PBC communication.
Cancel	Click this button to cancel the establishing WPS link.
Renew PIN	Click this button to discard current PIN and generate a new PIN code.

Management

Status

System Info

Item	Description
Model	It shows the model name of the device.
Firmware Version	It shows the version of firmware on this device.
System Time	It indicates the time on this device. If the NTP client is enabled, the time will sync with the NTP server.
Operation Mode	It shows the operation mode of this device.

Internet Configurations

Item	Description
Connected Type	It shows the WAN type such as DHCP, Static IP, PPPoE, etc.
WAN IP Address	It shows the IP Address of the WAN interface.
Subnet Mask	This is subnet mask of the WAN interface.
Default Gateway	It is the default gateway of WAN interface.
Primary Domain Name Server	It shows the primary DNS server.
Secondary Domain Name Server	It shows the current secondary DNS server.
MAC Address	This is the MAC Address of the WAN interface.

Local Network

Item	Description
Local IP Address	This is the IP Address of the LAN interface.
Local Netmask	This is the Netmask for the LAN.
MAC Address	This is the MAC Address of the LAN interface.

Wireless Information

AP mode

Item	Description
Mode	This is the wireless mode for the device such as AP, client mode.
Band	It shows the current radio mode such as “B+G+N”, “B+G”, “B only” and “G only”.
SSID	It shows the SSID of this device.
Channel	It shows the current channel of the radio.
Encryption	It indicates the encryption type for the radio.
Bssid	It is the current BSSID of the radio. In this device, it is also the MAC Address of the WLAN interface.

Associated Clients	The number of associated WLAN clients show in this field.
Driver Vision	This is the driver version.

Client mode

Item	Description
Mode	This is the wireless mode for the device such as AP, client mode.
Status	This is the WLAN status.
Extra Info	Reserved for the future expansion.
Channel	It indicates the current Wi-Fi channel.
Link speed	It shows the Phy data rate of transmit and receive.
Link Quality	It indicates the link quality of current link.
MAC Address	This is the MAC Address of the radio.
Driver Vision	This is the driver version.

Statistic

Memory

Item	Description
Memory total	This is the total memory size for this device.
Memory left	The available memory size shows in this field.

WAN/LAN

The information below shows the transmit status.

WAN Rx packets, WAN Rx bytes, WAN Tx packets, WAN Tx bytes, LAN Rx packets, LAN Rx bytes, LAN Tx packets, LAN Tx bytes.

All interfaces

The information likes “Rx Packet”, “Rx Byte”, “Tx Packet” and “Tx Byte” shows the status of all interface including “eth2, lo, ra0, ra1, ra2, ra3, wds0, wds1, wds2, wds3, eth2.1, eth2.2, br0”

System Management

Administrator Settings

Enter the account for login the web interface.

Account: enter the name for login. The default name is “root”.

Password: enter the password for login. The default password is “root”.

NTP Settings

Current Time: The current time on the device shows in this field. Click “Sync” button to sync the time with NTP server.

Time Zone: Select local time zone.

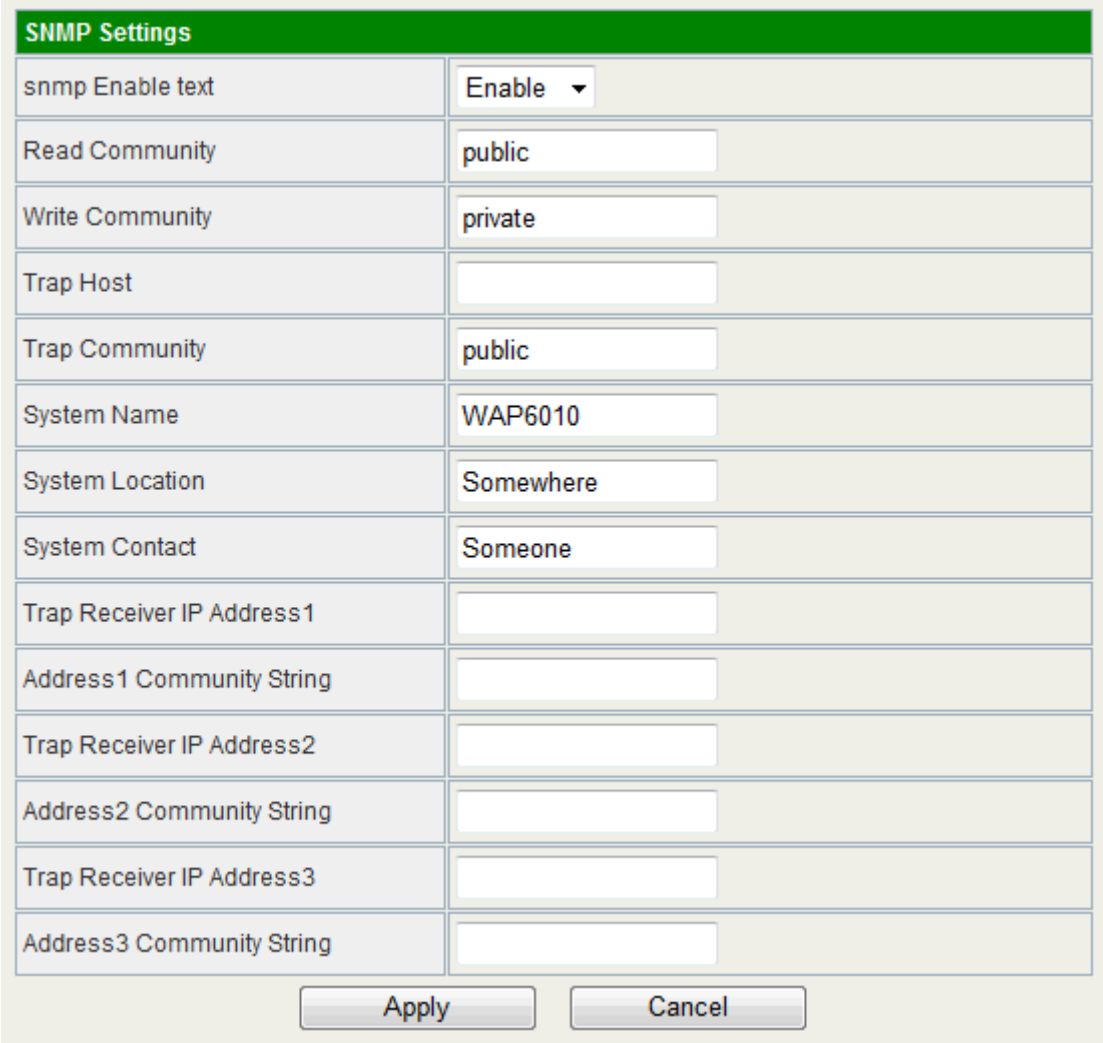
NTP Server: Input the NTP server address. If you are not sure about the local NTP server address, you can input pool.ntp.org.

NTP synchronization (hours): This is the time interval of NTP synchronization. The range is 1-300 hours. It is the necessary field for NTP setting and please input it to apply.

Reboot System

Click the button to reboot the device.

SNMP



This device is compatible with SNMP v1/v2c and provides standard MIB II. Currently only the “public” community string is available and the modified settings by SNMP SET

request will be lost after rebooting the device

SNMP Settings	
Item	Description
snmp Enable text	Options: Enable/Disable. Select “Enable” to enable this function. The details setting shows only when enables this function.
Read Community	This is password sent with each trap to the SNMP Manager.
Write Community	Input the password for the write community. This function is still under development.
Trap Host	Reserved for the write community.
Trap Community	Reserved for the write community.
System Name	Type in the Name of this device.
System Location	Type in the Location which is location of device
System Contact	Type in the Name which is person or group when the device has problem can find they.
Trap Receiver IP Address 1	This device supports up to 3 traps. Type in the IP Address of the first SNMP Manager.
Address 1 Community String	This is password receive with the first trap from the device (SNMP Agent).
Trap Receiver IP Address 2	Type in the IP Address of the second SNMP Manager.
Address 2 Community String	This is password receive with the second trap from the device (SNMP Agent).
Trap Receiver IP Address 3	Type in the IP Address of the third SNMP Manager.
Address 3 Community String	This is password receive with the third trap from the device (SNMP Agent).

SNMP Traps	
Item	Description
coldStart(0)	This is the trap from device after reboot the device.
linkDown(2)	The trap is sent when any of the links are down. See the following table.
linkup(3)	The trap is sent when any of the links are UP. See the following table.
authenticationFailure(4)	The trap is sent when the device receiving gets or sets requirement with wrong community.

Private MIBs	
OID	Description
1.3.6.1.4.1.99.1	Mode, Operation Mode in device
1.3.6.1.4.1.99.2	SSID, SSID of the device
1.3.6.1.4.1.99.3	Channel, Channel of the device in WLAN

1.3.6.1.4.1.99.4	Band, 802.11g / 802.11b only
1.3.6.1.4.1.99.5	RSSI, Receive Signal Strength Index (Support AP and Client RSSI)
1.3.6.1.4.1.99.6	Active_Clients, The number of associate clients
1.3.6.1.4.1.99.7	Active_Clients_List, Client's Information (MAC Address, Data Rate, RSSI…etc)
1.3.6.1.4.1.99.8	Encryption, Encryption type of device in Wireless Network

Upgrade Firmware

This page provides the firmware upgrade function. Click the browse button to browse the file and click "open" button to select the file. The upgrade process takes about 1 minute and do not power off the device during this period.

Save/Reload Settings

In this page, you can export the setting, import the setting or load the factory default.

Export Settings:
To export the settings, click "Export" button to open or save the configuration. In the pop up window, click "Open" to open the configuration. You can read the configuration in the next page. Click "Save" to save the configuration file. The file extension is ".dat".

Import Settings:
To import the settings, click "Browse" to browse the file, and then click "Import" to import the setting file.

Load Factory Defaults:
Click "Load Default" button to reset the device to factory default. All users' settings will be cleared.

System Log

The system log shows in this window. For technical support, you may need to copy and save the log to text file and send it to the technical service. Click "Refresh" button to refresh the page or "Clear" button to clear the log.

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
13	2472	EMEA and Japan
14	2484	Japan only

*: EMEA (Europe, the Middle East and Africa).

The available channel is set by the factory according to the region of distribution and can’t be changed by user. For example, the available channel of the American model is from ch1 to ch11.

Specification

Frequency Range	2.4~2.4835GHz
802.11b TX power **802.11g TX power** **802.11n TX power** **802.11b RX sensitivity** **802.11g RX sensitivity** **802.11n RX sensitivity**	17dBm ± 1dB@11Mbps 14dBm ± 1dB@54Mbps 14dBm ± 1dB@150Mbps -89dBm ± 2dB@11Mbps -74dBm ± 2dB@54Mbps -66dBm ± 2dB@150Mbps
Data Rate	802.11b: 11, 5.5, 2, 1Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6Mbps 802.11n (20MHz): MCS0~15, Up to 144.4Mbps 802.11n (40MHz): MCS0~15, Up to 300Mbps
Standards	WLAN: IEEE 802.11 b/g, IEEE 802.11n Draft 4.0 LAN: IEEE 802.3, IEEE 802.3u, IEEE 802.3x, IEEE 802.1d
Operation Mode	Wireless Access Point mode, Multi-SSID AP mode, AP Client mode, Bridge mode, WDS mode, Repeater mode.
Security	Password Protection, MAC filtering, Hidden SSID Broadcasting, 64/128-bit WEP Encryption, SPI (Stateful Packet Inspection) firewall, WPS Push button and PIN code, WPA for 802.1x and WPA-PSK, WPA2 / IEEE 802.11i
Antenna type	2T2R 2dBi RP-SMA external antenna x2
Operating Environment	Temperature 0~60□C Humidity 10~90%(non-condensing)
Power Consumption	12Vdc +/- 5%, 1A
Dimension	146 x 101.5 x 33.5 mm
Software Feature	WLAN: b/g protection, Block WLAN Relay, Tx Burst, Tx Short Preamble, Packet Aggregation, HT Operation mode, HT Guard Interval, MAC ACL, Site survey. LAN: 802.1d Spanning Tree, DHCP server, DNS relay. Management: NTP Client, System log, Upload config file,

	Firmware upgrade, password management.
Certification	CE, FCC, NCC, TELEC, BSMI, VCCI, Anatel, Wi-Fi compliant