# IEEE 802.11n Wireless Series

# Wireless Access Point

# User Manual

Version 2.0

Date: Jan. 21, 2010

# FCC Certifications

**Federal Communication Commission Interference Statement**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.  These limits are designed to provide reasonable protection against 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 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 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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

**IMPORTANT NOTE:**

**FCC 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.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

# CE Mark Warning

This equipment complies with the requirements relating to electromagnetic compatibility, EN 55022 class A for ITE, the essential protection requirement of Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Company has an on-going policy of upgrading its products and it may be possible that information in this document is not up-to-date. Please check with your local distributors for the latest information. No part of this document can be copied or reproduced in any form without written consent from the company.

**Trademarks:**

All trade names and trademarks are the properties of their respective companies.

Copyright © 2010, All Rights Reserved.

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

# Contents

# Unpacking Information

Thank you for purchasing the product. Before you start, please check all the contents of this package.

The product package should include the following:

1. One Wireless Access Point
2. One Power Adapter
3. One antenna
4. One resource CD, including:
   - ✧ User's Manual
   - ✧ QIG

**Note:**

Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact with your distributor.

# Conventions

The AP mentioned in this guide stands for IEEE 802.11n Wireless Access Point without any explanation.

# Chapter 1    Introduction to Wireless Access Point

## 1.1 General Description

Easily constructing your LAN, this wireless access point offers a wireless interface and eliminates your effort busying cabling form one computer to another.

With being compliant to IEEE 802.11n specification, this wireless access point supports data rate up to 150 Mbps and hence help to construct your high-speed home or office wireless network. The IEEE 802.11n Wireless Access Point provides a better wireless signal for network than existing wireless 802.11g technology. It complies with IEEE 802.11n draft 2.0 and IEEE 802.11b/g wireless standards.

This access point equips two LAN ports, and one embedding antennas. As for security, it also supports the latest wireless security features to help prevent unauthorized access, be it from over a wireless network or from the Internet. Moreover, supporting for WPA and WPA2 standards ensure that you will be able to use the best possible encryption, regardless of your client devices.

Additionally, this device supports WEB-based graphics user interface that helps users to configure this device easily.

## 1.2 Key Feature

➢ Complies with IEEE 802.11n wireless standards
➢ Provides one 802.11b/g/n wireless Reverse SMA detachable antenna
➢ Maximum receive and transmit data rate up to 72.2Mbps using 20MHz bandwidth
➢ Maximum receive and transmit data rate up to 150Mbps using 40MHz bandwidth
➢ Supports 2.4 GHz frequency band
➢ Supports wireless data encryption with WPA, WPA2, Open/ shared key, and pair-wise key authentication services
➢ Supports authentication for wireless connectivity based on ESSID
➢ Support MDI/MDIX auto crossover function
➢ Supports firmware upgrade function via Web

## 1.3 The Front Panel

The front panel of the Wireless 11n Access Point:



| Name | Status | Indication |
|---|---|---|
| **Status** | Green | Power On |
| | Dark | Power Off |
| | System Resetting default | Blink Green a few times |
| **WPS** | Blink Green One time | System reboot |
| | Blink Green | WPS Connecting |
| | Dark | System Stability |
| **WLAN** | Off | The wireless function is disabled |
| | Flashing | The wireless function is enabled |
| | Flashing fast | Sending or receiving data over wireless |
| **LAN(1~2)** | Off | There is no device linked to the corresponding port or the connection is dropping off. |
| | On | There are devices linked to the corresponding ports but no data transmitted or received. |
| | Flashing | Sending or receiving data over corresponding port |

## 1.4 The Rear Panel

The rear panel of the Wireless 11n Access Point is shown below.

- **LAN(1~2):** Through these ports, you can connect the AP to your PCs and the other Ethernet network devices.
- **DC IN:** Plug the circle end of the power adapter firmly into the rear panel of the Wireless AP, and the other end put into an electric service outlet then the system is ready.

- **Reset Button**

  Push the button for more than 5 seconds and then release it, the system will return to factory default setting. In the meantime, system rewrites flash to default value and SYS LED flash for a while. Approximately 60 seconds later, the SYS LED turn dark, now the whole system parameters have returned to factory default value. If the process has been interrupted by any reason (power off), the system will fail. Before performing the process, ensure a safe operating environment please!

- **Antenna:** Used for enhancing the wireless signal, and expanding the range of signal.

- **WPS:** Help users to connect this AP quickly and security. It uses PIN configuration method or PBC configuration method, in which users can easy setup WPS connection. Please refer to WPS settings for more information.

---

**Warning :** Incomplete factory setting recovery procedure will cause the Wireless AP malfunction ! If you are unfortunately in this situation, do not try to repair it by yourself. Consult your local distributor for help!

---

## 1.5 Placement (Optional)

There are two ways to place the AP. The first way is to place the AP vertically on a surface. The second way is to attach it to the wall. If you select a wall-mount option, please follow the steps below:

1.  Select a location with access for cables and a power outlet.
2.  Unplug the unit. Place it upside down on a flat surface and mark the two holes for anchors.
3.  Installing the wall mount anchor (not supplied) into the wall with tools such as drill or hammer.
4.  Insert the screws (not supplied) in each hole of the stand parts.
5.  Attaches the unit to the anchors on the wall.

# Chapter 2    Installing and Using Wireless Access Point

This chapter provides a step-by-step guide to the installation and configuration of the Wireless AP. We suggest you go over the whole chapter and then do more advanced operation.

## 2.1    Connecting this AP to your network

This Chapter provides a step-by-step guide to the installation and configuration of this wireless access point.

➢ Connect the power adapter with the connector end to the power connector in the rear panel of the device and the plug end to an appropriate outlet.

➢ Connect the LAN port with RJ-45 cable to:

   1.    A broad band router to allow wireless clients to connect to WAN.
   2.    A switch to allow wireless clients to communicate with wired LAN.
   3.    A computer directly to use the computer configuring this AP.

**Note:** You have to configure the network settings of this AP to be communicable with your router, switch or computer first. To change the default network settings of the AP, please refer to "**LAN Interface setup**".
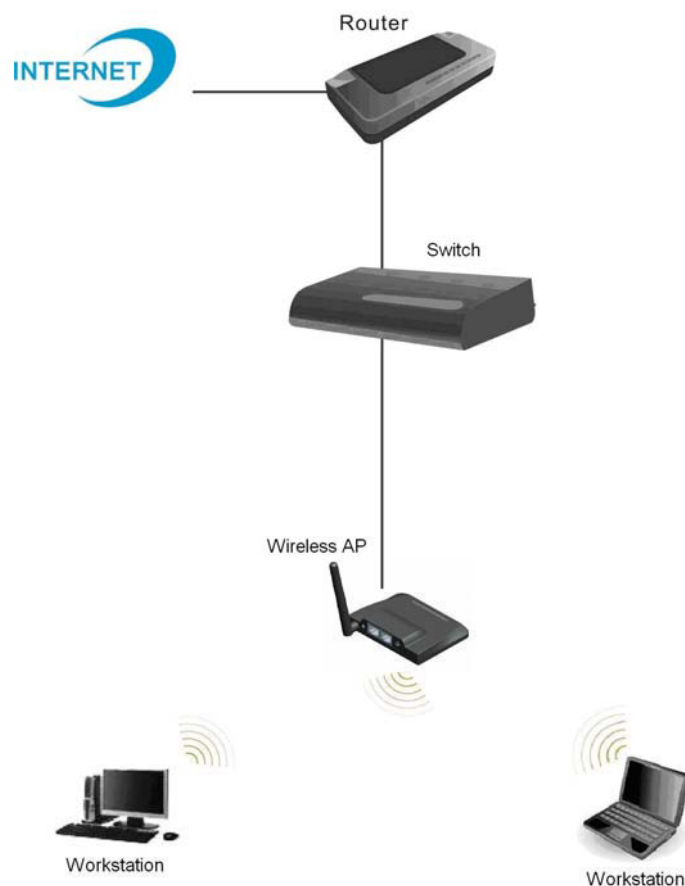
## 2.2    Configuring the IP address of your computer

In order to communicate with this Wireless AP, you have to configure the IP addresses of your computer to make it compatible with the device.

1.  The default network setting of the device:
    **IP address**: 192.168.1.1
    **Subnet Mask**: 255.255.255.0

2.  In the following TCP/IP configuration guide, the IP address "192.168.1.15" is assumed to be your IP address if you want to specify IP addresses manually. Please **DO NOT** choose "192.168.1.1" as the IP address. For the IP address "192.168.1.1 " has been set as the default IP for this device.

3.  The following TCP/IP configuration guide uses windows XP as the presumed operation system.

**Procedures to configure IP addresses for your computer**

1.  If you are in Classic Start menu view, click **Start > Settings > Network Connections**.
    If you are in Start menu view, click **Start > Control Panel > Network Connections.**
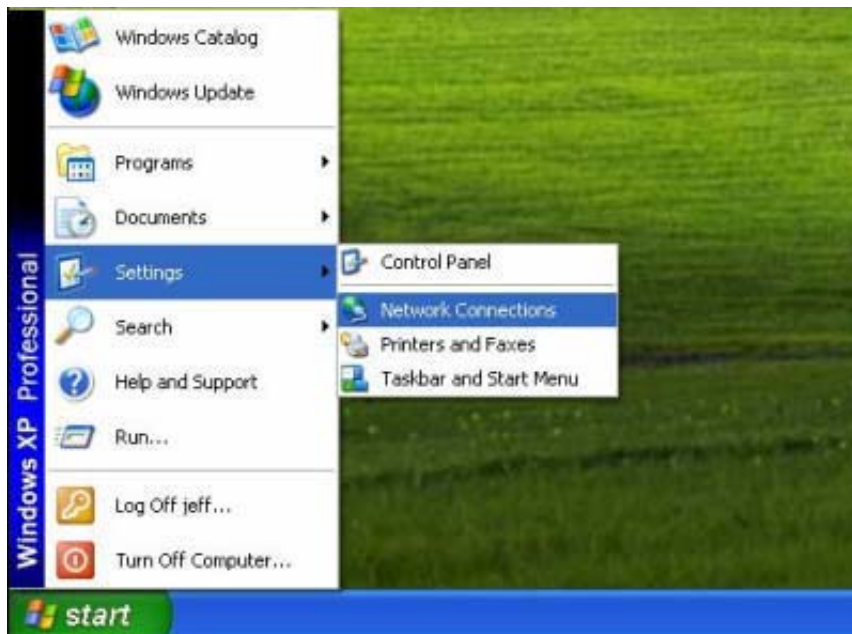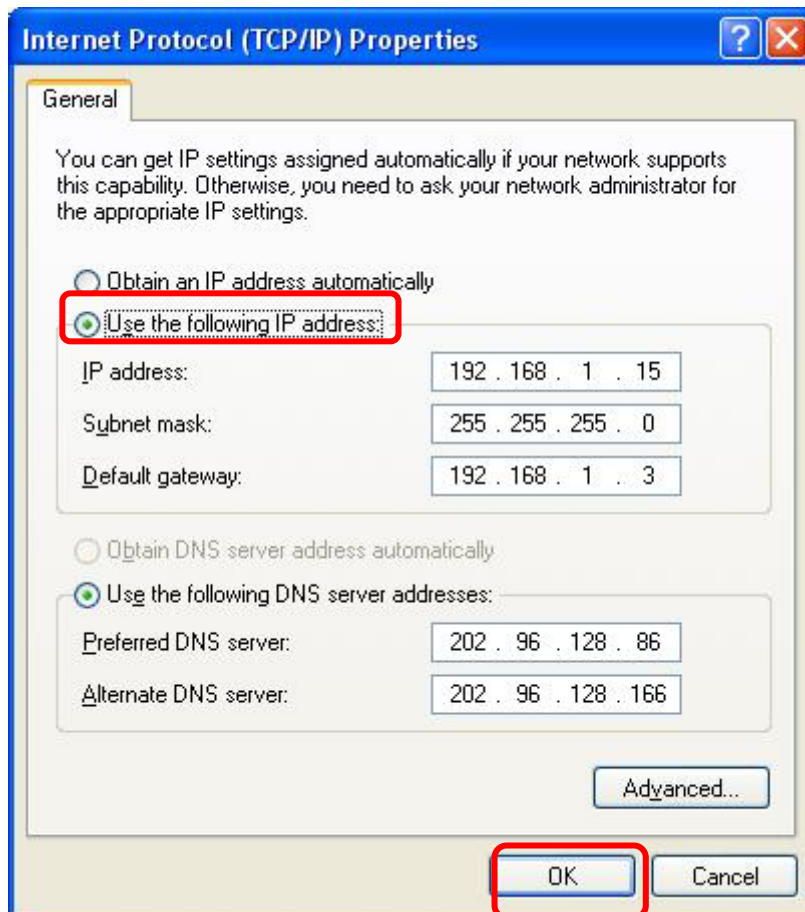
2. Right-click on **Local Area Connection** item and click on **Properties**.
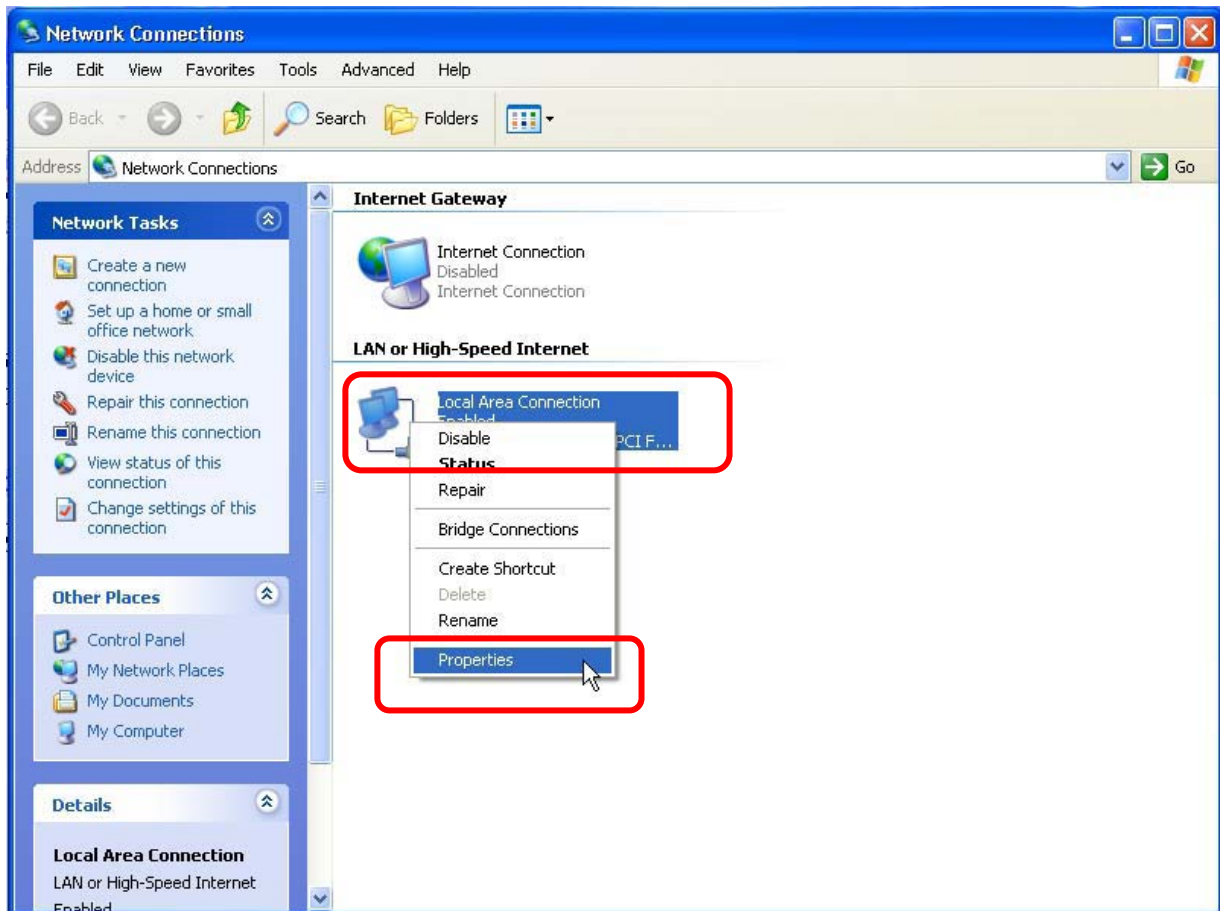


3. Choose **Internet Protocol (TCP/IP)** and click **Properties**.
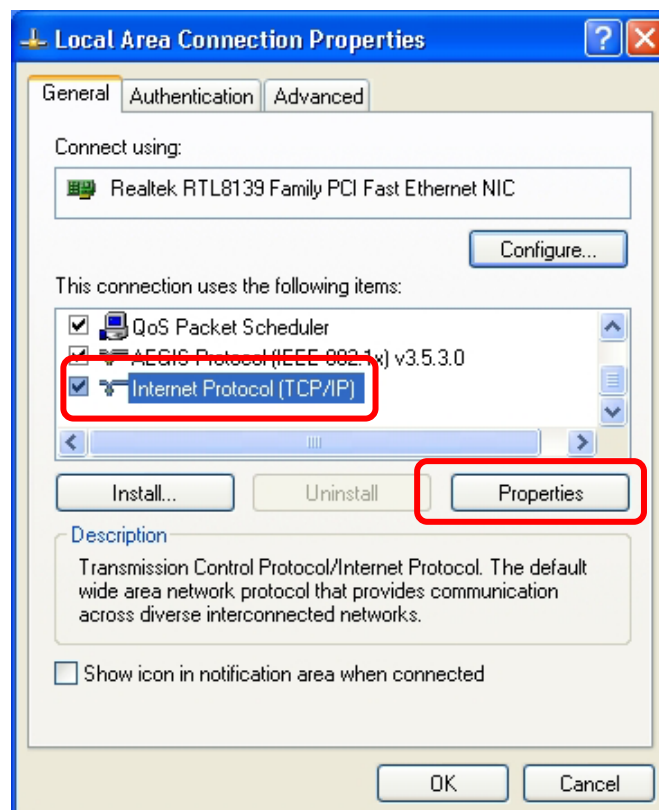
4.  You can't choose "Obtain an IP address automatically" to get IP address automatically in this configuration. Choose "Use the following IP address" to specify IP addresses manually. Please click the **OK** button after your configuration.

# Chapter 3    Management

## 3.1    Starting the WEB-Based Management Interface

The device uses WEB as the management interface. You can use a browser to access the management interface easily. Please follow the steps listed below.

1. Open the Internet WEB browser.

2. Type **192.168.1.1** into the URL WEB address location and press Enter.

3. The Login window appears.

**-** Enter **admin** in the User Name location (default value).

**-** Enter **admin** in the Password location (default value).

**-** Click **OK** button.

## 3.2    The Graphic User Interface

After the password authorization, the information page shows up as the home page of the Graphic User interface. You may click on each folder on left column of each page to get access to each configuration page. Please note that you should click the Save Settings button to apply your configuration to this device. You can also restore the default settings by clicking the Reset Settings button. The Graphic User Interface as follows:



13

| Items | Information |
|---|---|
| Uptime | The period that you turn the device on. |
| Firmware version | The current firmware version of the device. |
| Build Time | The build time of the device originally. |
| Mode | Shows if the device is operating in AP or WDS mode. |
| Band | The band that the wireless AP operating. |
| SSID | The name of this wireless network. |
| Encryption | The security encryption type that the wireless network using. |
| BSSID | The Basic Service Set Identity of this AP(This parameter is the same as the MAC address of LAN port) |
| Associated Clients | The number of members who is currently connected with this AP. |
| Attain IP Protocol | The way for this AP to get a IP address. |
| IP Address | The current IP address of this AP. |
| Subnet Mask | The current subnet mask of this AP. |
| Default Gateway | The current default gateway of this AP. |
| MAC Address | The current MAC address of this AP. |

## 3.3 Wireless

### 3.3.1 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. You can set up the configuration of your Wireless basic settings and monitor the Wireless Clients associate with your AP.



| Items | Information |
|---|---|
| **Disable Wireless LAN Interface** | Mark the checkbox to disable interface of Wireless LAN |
| **Band** | To select a band for this device to match 802.11b, 802.11g, 802.11n, 802.11b/g, 802.11g/n or 802.11b/g/n. optional parameters: 2.4GHz(B),2.4GHz(G),2.4GHz(N),2.4GHz(B+G),2.4GHz(G+N), 2.4GHz(B+G+N) |
| **SSID** | Service set identifier (SSID) for the name of the wireless network. |
| **Channel Width** | Select to use 20MHz or 40MHz as the wireless channel frequency. |
| **Broadcast SSID** | If you enable "Broadcast SSID", every wireless station located within the coverage of this wireless AP can discover this wireless AP easily. If you are building a public wireless network, enabling this feature is recommended. Disabling "Broadcast SSID" can provide better security. |
| **Data Rate** | The transmit limitation of data packets of this wireless AP. The wireless AP will use the highest possible selected transmission rate |

| | |
|---|---|
| | to transmit the data packets. |
| **Associated Client** | Click "**Show Active Clients**" button, then an "Active Wireless Client Table" pops up. You can see the status of all active wireless stations that are connecting to the access point. |

\* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

**Active Wireless Client Table**

This is the window that pops up after clicking the [Show Active Clients] button.

## Active Wireless Client Table

This table shows the MAC address, transmission, reception packet counters and encrypted status for each associated wireless client.

| MAC Address | Mode | Tx Packet | Rx Packet | Tx Rate (Mbps) | Power Saving | Expired Time (s) |
|---|---|---|---|---|---|---|
| None | --- | --- | --- | --- | --- | --- |

[Refresh] [Close]

## 3.3.2 Advanced Settings

You can set advanced wireless LAN parameters of this AP. We recommend not changing these parameters unless you know what changes will be on this AP.



| Items | Information |
|---|---|
| **Fragment Threshold** | This value should remain at its default setting of 2346. If you experience a high packet error rate, you may slightly increase your fragmentation threshold within the value range of 256 to 2346. Setting the fragmentation threshold too low may result in poor performance. |
| **RTS Threshold** | Request To Send threshold. This value should remain at its default setting of 2347. If you encounter inconsistent data flow, only minor modifications to the value range between 0 and 2347 are recommended. |
| **Beacon Interval** | Beacons are packets sent by an access point to synchronize a wireless network. Specify a beacon interval value. Default (100ms) is recommended. |
| **Preamble Type** | The length of CRC blocks in the frames during the wireless communication. |
| **RF Output Power** | Select the signal strength for the wireless network. |

\* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

### 3.3.3 Security

The Security function protects your wireless network from invasion. When you connect it to your PC at the first time, the default configuration is Disable. After you log in, you can modify it. We provide WEP and WPA encryption to secure your wireless network. Please select Disable, WEP, WPA, WPA2, and WPA-Mixed in the drop list. If you select none, any data will be transmitted without encryption and any station can access the AP.



| Items | Information |
| --- | --- |
| **Select SSID** | Please choose a SSID you have set for this AP in the **Wireless > Basic Settings** from the drop-down list. The SSID will be shown on the wireless network for recognizing. |
| **Encryption** | There are 5 modes for you to select: Disable, WEP, WPA, WPA2, and WPA-Mixed. Please refer to the following description. |

## 1. Security Mode -- WEP



| Items | Information |
|---|---|
| **Encryption** | Select a security encryption mode for this AP. |
| **Authentication** | There provide three options for selecting: Open System, Shared Key, Auto |
| **Key Length** | Select 64-bit or 128-bit as the key encryption length. |
| **Key Format** | Select ASCII[1] or Hex[2] to setup the key value. |
| **Encryption Key** | Enter the key according to the key format you select. |
| **Show Password** | Select it or not to configure whether to show the password. |

\* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configurations.

---

[1] ASCII (American Standard Code for Information Interchange) is a code for representing English letters as numbers from 0-127.
[2] Hexadecimal digits consist of the numbers 0-9 and the letters A-F.

**2. Security Mode – WPA / WPA 2**



| Items | Information |
|---|---|
| **Encryption** | Select a security encryption mode for this AP. |
| **WPA Cipher Suite** | Select the WPA Cipher Suite to be TKIP or AES. |
| **Pre-Shared Key Format** | To decide the format, select Pass phrase or Hex in the drop list. |
| **Pre-Shared Key** | Enter the Pre-shared Key according to the pre-shared key format you select. This is the shared secret between AP and STA. This field must be filled with character longer than 8 and less than 64 lengths. |
| **Show Password** | Select it or not to configure whether to show the password. |

## 3. Security Mode – WPA-Mixed



| Items | Information |
|-------|-------------|
| **Encryption** | Select a security encryption mode for this AP. |
| **WPA / WPA2 Cipher Suite** | Select the WPA/WPA2 Cipher Suite to be TKIP or AES. |
| **Pre-Shared Key Format** | To decide the format, select Passphrase or Hex in the drop list. |
| **Pre-Shared Key** | Enter the Pre-shared Key according to the pre-shared key format you select. This field must be filled with character longer than 8 and less than 64 lengths. |
| **Show Password** | Select it or not to configure whether to show the password. |

\* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configurations.

### 3.3.4 Access Control

To restrict the clients of Access authentication of Stations, set up the control list in this page.



| Items | Information |
|---|---|
| **Wireless Access Control Mode** | Click on the drop list to choose the access control mode. You may select "Allow listed" to allow those allowed MAC addresses or select "Deny Listed" to ban those MAC addresses from accessing to this device or select "Disable". |
| **MAC Address & Comment** | Fill in the MAC address that you wish to control, and give a definition to it. |
| **Current Access Control list** | Lists the MAC Access Control Settings you have added before. Click on the list to change configuration. To Delete the station on the list, mark the check box in the select item and click the "Delete Selected". If you want to delete all stations on the list, click "Delete All" to remove all of them. |

* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configurations.

### 3.3.5  WPS Settings

The primary goal of Wi-Fi Protected Setup (Wi-Fi Simple Configuration) is to simplify the security setup and management of Wi-Fi networks. This AP supports the configuration setup using PIN configuration method or PBC configuration method through an internal or external Registrar.



| Items | Information |
|---|---|
| **WPS Status** | You cannot manually select the items here. The WPS Status will change from "UnConfigured" to "Configured" after you enable WPS function and setup a wireless security key for this device. |
| **Self-PIN Number** | If you use this device as a client, you can use this code when trying to connect this device to other AP by using the PIN method. |
| **Push Button Configuration** | Push Button Communication (PBC) method use a simple action of pushing a button on both the AP and the new STA to reach the function of easy setup WPS connection. You can simply click the ⬚Start PBC button in this GUI page. After click on the button, please run the client's WPS and push the PBC button within 2 minutes. |
| **Client PIN Number** | Personal Identification Number (PIN) method. Users have to fill in the PIN code of enrollee device and click on the ⬚Start PIN button to make communication with other AP. After click on the button, please run the client's WPS and push the PIN button within 2 minutes. |

Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

## 3.4　TCP/IP Setting

To set up the configuration of LAN interface, private IP of your AP LAN port and subnet mask for your LAN segment.



| Items | Information |
|---|---|
| **IP Address** | The IP of your AP LAN port (default 192.168.0.51). |
| **Subnet Mask** | Subnet Mask of you LAN (default 255.255.255.0). All devices on the network must have the same subnet mask to communicate on the network. |
| **Default Gateway** | Enter the IP Address of the AP in your network. |

Please click on the **Apply Changes** button or the **Reset** button

at the bottom to save/reset the configurations.

## 3.5 Log

This System Log page shows the information of the current activities on the AP. To enable system log function:

1.  Mark the "Enable Log" checkbox.

2.  To see all information of the system, select the "system all" checkbox.
    To see wireless information only, select the "wireless" checkbox.
    To send the log information to a certain note, select the "Enable Remote Log" checkbox and fill in the IP address in the "Log Server IP Address" box.

3.  Click the [Apply Changes] button to activate. You could also click the [Refresh] button to refresh the log information or click the [Clear] button to clean the log table.

## 3.6   Statistics

This page allows users to get information of data transferring condition, and monitor the status and performance of this AP including receiving and sending packets. To see the latest report, click Refresh button.



## 3.7   Upgrade Firmware

Sometimes a new firmware may be issued to upgrade the system of this device. You could upgrade the firmware you got in this page. To upgrade the firmware, please click on the Browse... button, locate the firmware in your computer and then click the Upload button to execute.
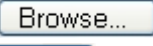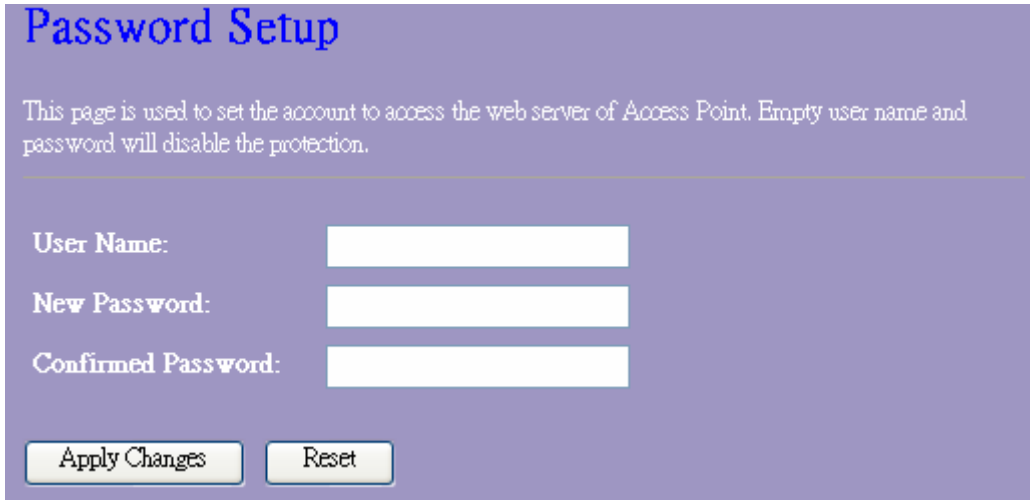
## 3.8  Save/Reload Setting

The Save/Reload Setting page allows users to backup and download the configuration status of the device or restore the factory default configuration.



| Items | Information |
|-------|-------------|
| **Save Settings to File** | Click on the [Save...] button to save the currently configure settings. |
| **Load Settings from File** | Click [Browse...] to select the file that you save, and then click [Upload] to start the process. Please wait for it to complete. |
| **Reset Settings to Default** | Click [Reset] to start the process and it will be completed till the status LED starts blinking. |

## 3.9  Password

To set up the Administrator Account information, enter the Username, New password, and reenter

the password on the text box. Don't forget to click [Apply Changes] to save the configuration.



## 3.10  Logout

This page is used to logout. Click the "Apply Change" button to log out the system and save your changes simultaneously.

# Appendix A: Product Specifications

| | |
|---|---|
| **Standard** | IEEE 802.11n draft 2.0, IEEE 802.11g, IEEE 802.11b, IEEE 802.3, IEEE 802.3u |
| **Interface** | LAN:2 ports 10/100 Mbps Ethernet, RJ-45<br>1* reverse SMA detachable antennas<br>1* reset to factory default button<br>1* WPS button |
| **Antenna** | Antenna type: Dipole<br>Antenna connector type: Reverse SMA |
| **Cable Connections** | RJ-45 (10BASE-T): Category 3,4,5 UTP<br>RJ-45 (100BASE-TX): Category 5 UTP |
| **Transmission Mode** | Auto-Negotiation (Full-duplex, Half-duplex) |
| **Security** | 64/128-bit WEP, WPA, WPA2 |
| **Network Data Rate** | 802.11b: 1,2,5.5, and 11Mbps<br>802.11g: 6,9,12,18,24,36,48 and 54Mbps<br>802.11n: up to 150 Mbps |
| **Receiver Sensitivity** | 802.11n Typical -68 dBm<br>802.11g Typical -73 dBm<br>802.11b Typical -84 dBm |
| **Transmit Power** | 16dBm typically @ 802.11b<br>14dBm typically @ 802.11g<br>13dBm typically @ 802.11n |
| **LED indications** | 1*PWR, 1*SYS, 2*LAN, 1*WLAN |
| **Power Supply** | External Power Adapter, 5V/ 1A |
| **Range Coverage** | Indoor 35~100 meters :<br>Outdoor 100~300 meters. |
| **Temperature** | Operating: 0°C ~ 40°C (32°~104°F)<br>Storage: -10°C ~ 70°C (14°~158°F) |
| **Humidity** | Operating: 10% ~ 90% RH, non-condensing<br>Storage: 5%~90% RH, non-condensing |

61NB-W13100+207