- **Encryption**: The type of security used on this network. It may be disabled, WEP, WPA, etc.
- **BSSID**: The MAC address of the SSID.
- **Associated Clients**: Displays the number of clients currently associated to the Access Point.

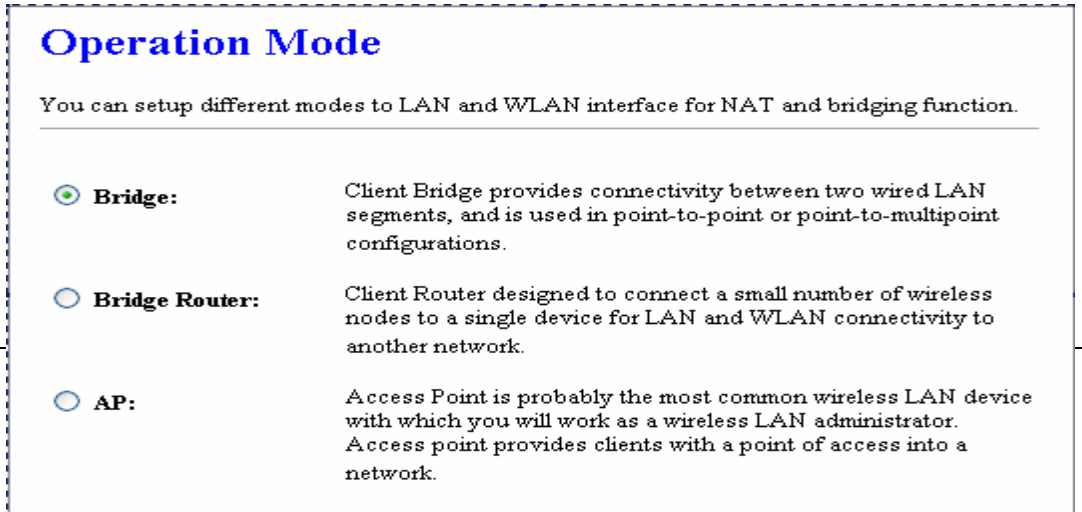
- **TCP/IP Configuration:**
  - **Attain IP Protocol**: The IP address setting may be fixed or static.
  - **IP Address**: Displays the current IP address of the LAN port.
  - **Subnet Mask**: Displays the current subnet mask for the IP address.
  - **Default Gateway**: Displays the default gateway for the device.
  - **DHCP**: Displays the DHCP setting.
  - **MAC Address**: Displays the MAC address of the device.

5.2 Management

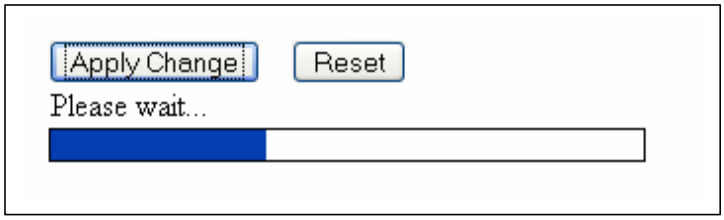
- Click on the **Management** link on the navigation drop-down menu. You will then see five options: operation mode, status, statistics, log, upgrade firmware, save/reload settings, and password. Each option is described below.

5.2.1 Operation Mode

- Click on the **Operation Mode** link under the **Management** menu. The **Operation Mode** allows you to switch from Access Point to Client Bridge mode.



- Select the **AP**, **Bridge** or **Bridge Router** and then click on the **Apply Change** button.



- Wait for about a minute until you see the Pop-Up message.

- Click on the **OK** button and then enter the specified IP address into the web-browser.

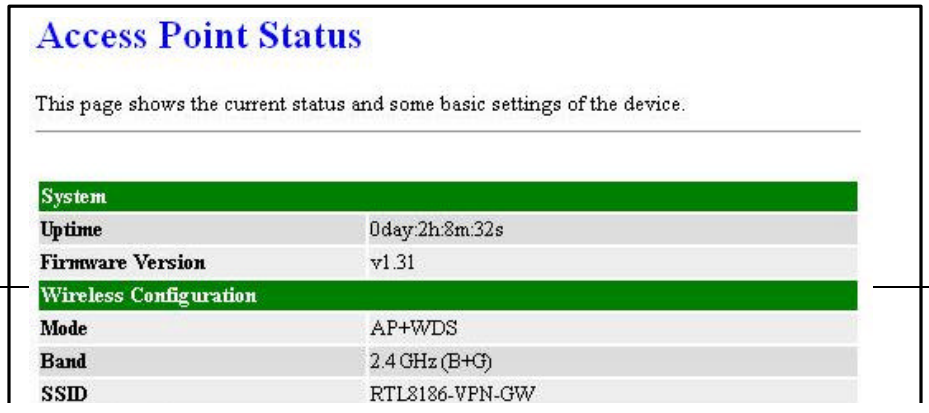
Switch to other mode, the configuration settings will continue using.

- Switch to other mode, the setting

Refer to Chapter 4 **to learn how to configure this device in Bridge/Router mode.**

5.2.2 Status

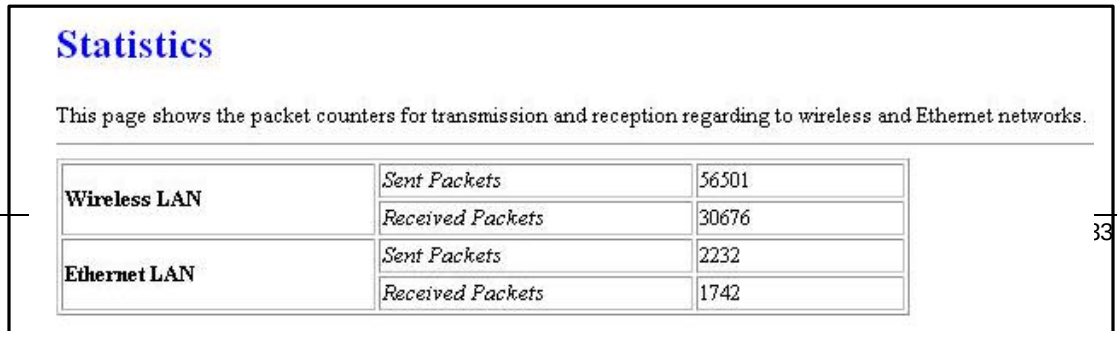
- Click on the **Status** link under the **Management** menu. The **Status** page is the first page that is displayed once you have logged in. This includes details about the system, wireless, and TCP/IP configuration.



- **System**
  - **Uptime:** Duration of time since the device was last reset.
  - **Firmware version**: Version of the firmware that is currently loaded on the device.
- **Wireless Configuration**:
  - **Mode**: Wireless configuration mode such as client bridge, AP, or WDS.
  - **Band**: Frequency and IEEE 802.11 operation mode (b-only, g-only, or b+g).
  - **SSID**: The name used to identify the wireless network.
  - **Channel Number**: The channel used to communicate on the wireless network.
  - **Encryption**: The type of security used on this network. It may be disabled, WEP, WPA, etc.
  - **BSSID**: The MAC address of the SSID.
  - **Associated Clients**: Displays the number of clients currently associated to the Access Point.
- **TCP/IP Configuration:**
  - **Attain IP Protocol**: The IP address setting may be fixed or static.
  - **IP Address**: Displays the current IP address of the LAN port.
  - **Subnet Mask**: Displays the current subnet mask for the IP address.
  - **Default Gateway**: Displays the default gateway for the device.
  - **DHCP**: Displays the DHCP setting.
  - **MAC Address**: Displays the MAC address of the device.

5.2.3 Statistics

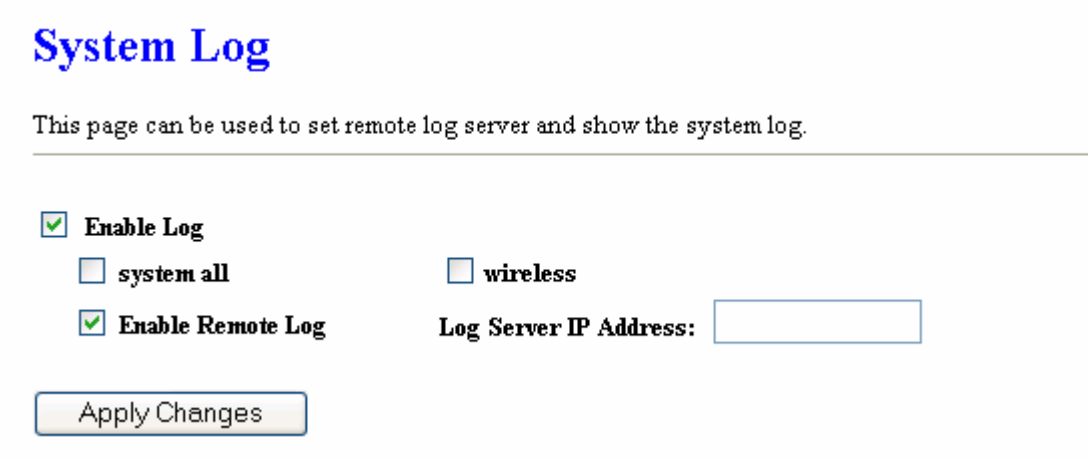
- Click on the **Statistics** link under the **Management** menu. This page displays the number of sent and received packets on the Ethernet and Wireless interface.



- Since the packet counter is not dynamic, you must click on the **Refresh** button for the most recent statistics.

5.2.4 Log

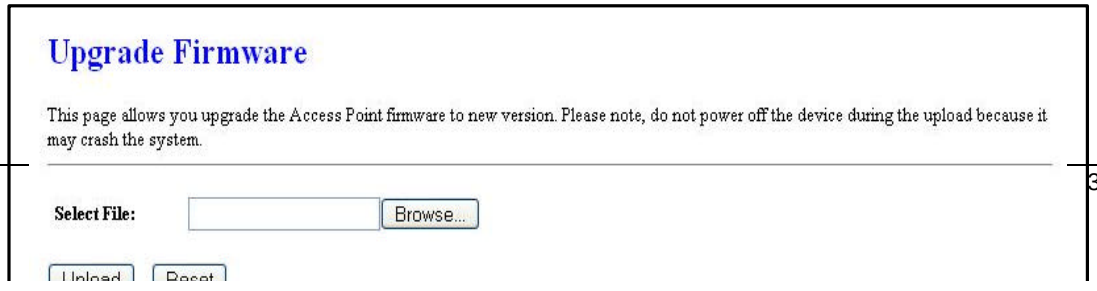
- Click on the **Log** link under the **Management** menu. The **Log** page displays a list of events that are triggered on the Ethernet and Wireless interface. This log can be referred when an unknown error occurs on the system or when a report needs to be sent to the technical support department for debugging purposes.



- In order for the log to record all the events, you must first place a check in the **Enable Log** or **Enable Remote Log (Log Server required)** check box.
- Select **system all** or **wireless** depending on the type of events you want recorded.
- Since the log is not dynamic, you must click on the **Refresh** button for the most recent events, or click on the **Clear** button to clear the log.

5.2.5 Upgrade Firmware

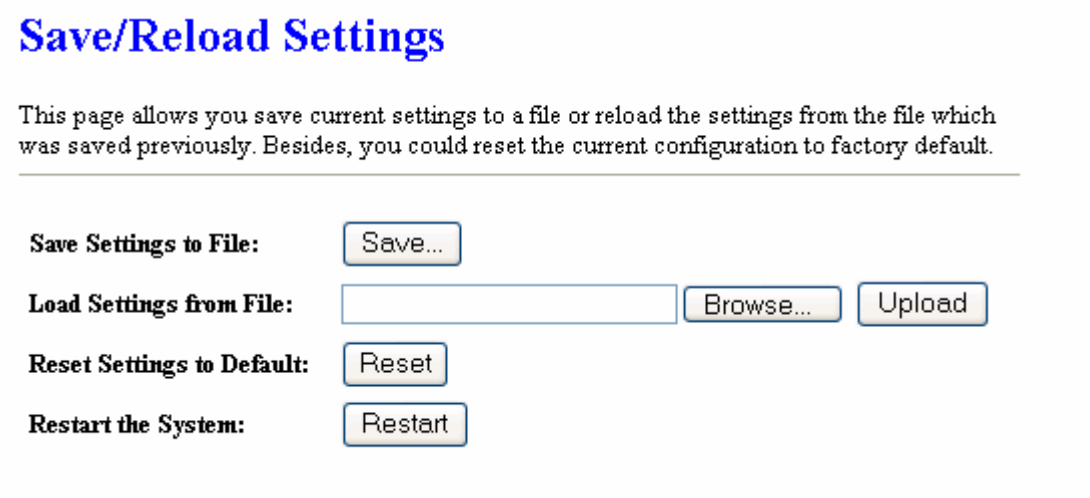
- Click on the **Upgrade Firmware** link under the **Management** menu. This page is used to upgrade the firmware on the device. Make sure that downloaded the appropriate firmware from your vendor.



- Click on the Browse button and then select the appropriate firmware and then click on the **Upload** button.
  Note: The upgrade process may take about 1 minute to complete. Do not power off the device during this process as it may crash the device and make it unusable. The device will restart automatically once the upgrade is complete.

5.2.6 Save / Reload Settings, Reset to Default

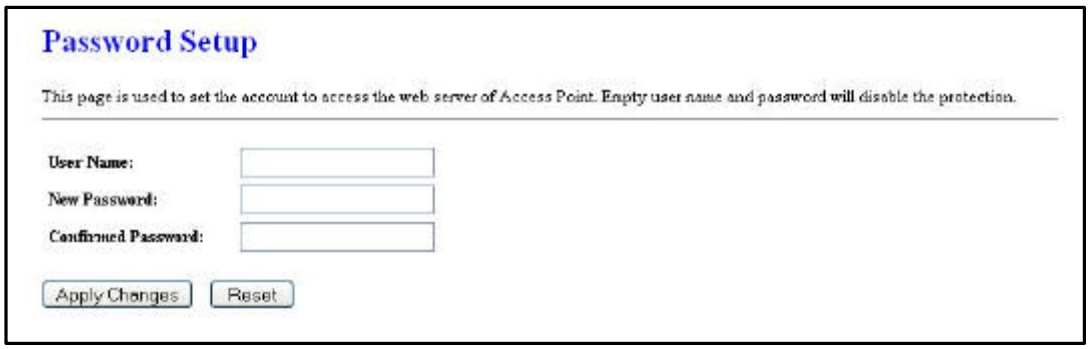
- Click on the **Save / Reload Setting** link under the **Management** menu. This option is used to save the current settings of the device in a file on your local disk or load settings on to the device from a local disk. This feature is very handy for administrators who have several devices that need to be configured with the same settings.
- This page also allows you to reset the device to its factory default settings.



- Click on the **Save** button to save the current settings to a file on the local disk.
- Click on the **Browse** button to select the settings file and then click on the Upload button to load the previously saved settings.
- Click on the **Reset** button to reset the device to its factory default settings. Click **Restart** to reboot the device.

5.2.7 Password

- Click on the **Password** link under the **Management** menu. This option allows you to create a user name and password for the device. By default, this device is configured without a user name and password. For security reasons it is highly recommended that you create a user name and password.



- Enter a **user name** into the first field.
- Enter a password into the **New Password** field and then re-type the password into the **Confirmed Password** field. Then click on the **Apply Changes** button.
- By clicking on the **Reset** button, the user name and password fields will become blank indicating that the username and password has been disabled.

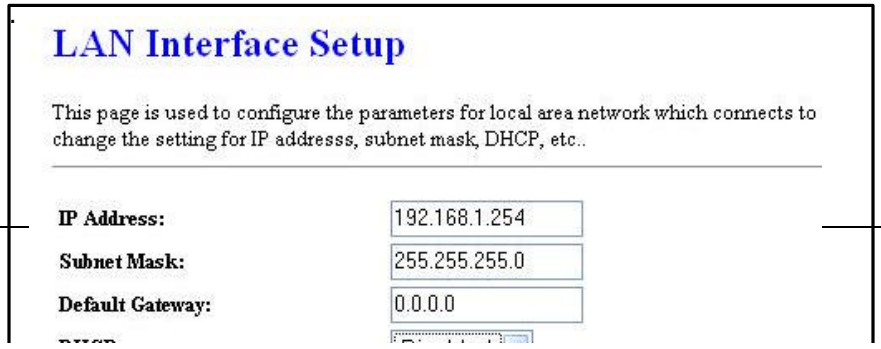
5.3 TCP/IP Settings

- Click on the **TCP/IP Settings** link on the navigation drop-down menu. You will then see the LAN Interface option. This option is described in detail below.

5.3.1 LAN Interface

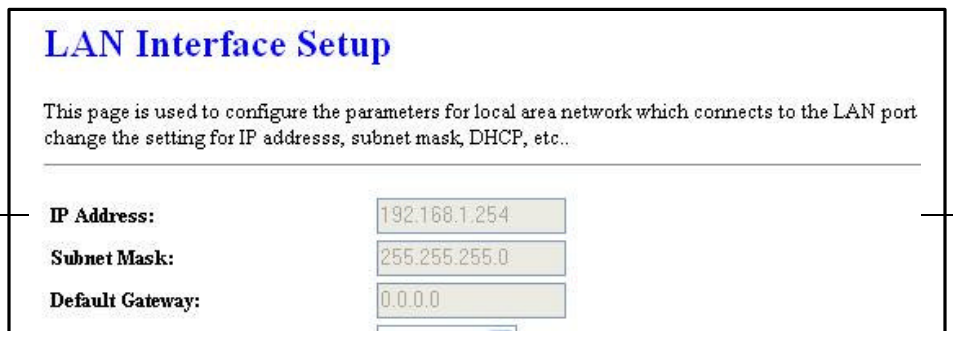
- Click on the **LAN Interface** link under the **TCP/IP Settings** menu. Using this option you may change the IP address of the device as well as toggle the DHCP and 802.1d spanning tree feature.

5.3.1.1 Static IP Address



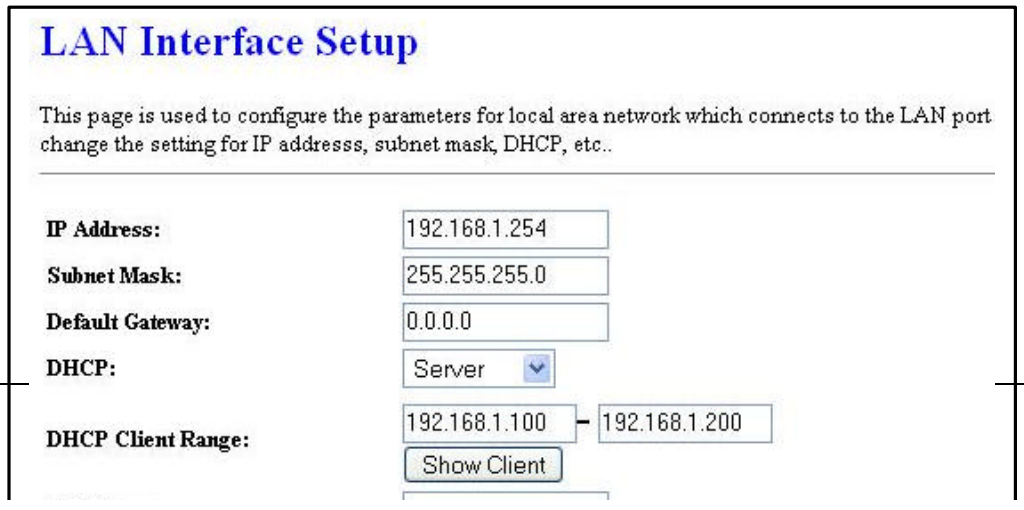
- **IP Address**: Enter the IP address.
- **Subnet Mask**: Enter the subnet mask for the IP address.
- **Default Gateway**: Enter the IP address for the default gateway.
- **DHCP**: Since a static IP address is used, this option must be set to **Disabled**. If this device is a DHCP client and will receive its IP settings from a DHCP server, then select **Enabled** from the drop-down list. Enabling the DHCP client will disable the IP address, subnet mask, and default gateway fields. If the DHCP option is **Disabled**, then the IP address, subnet mask, and default gateway fields must be filled in.
- **802.1d Spanning Tree**: Select **Enabled** from the drop-down list if you if you would like to use the spanning tree feature.
- Click on the **Apply Changes** button to confirm the changes. This device will automatically restart once these changes have been applied.

5.3.1.2 DHCP Client



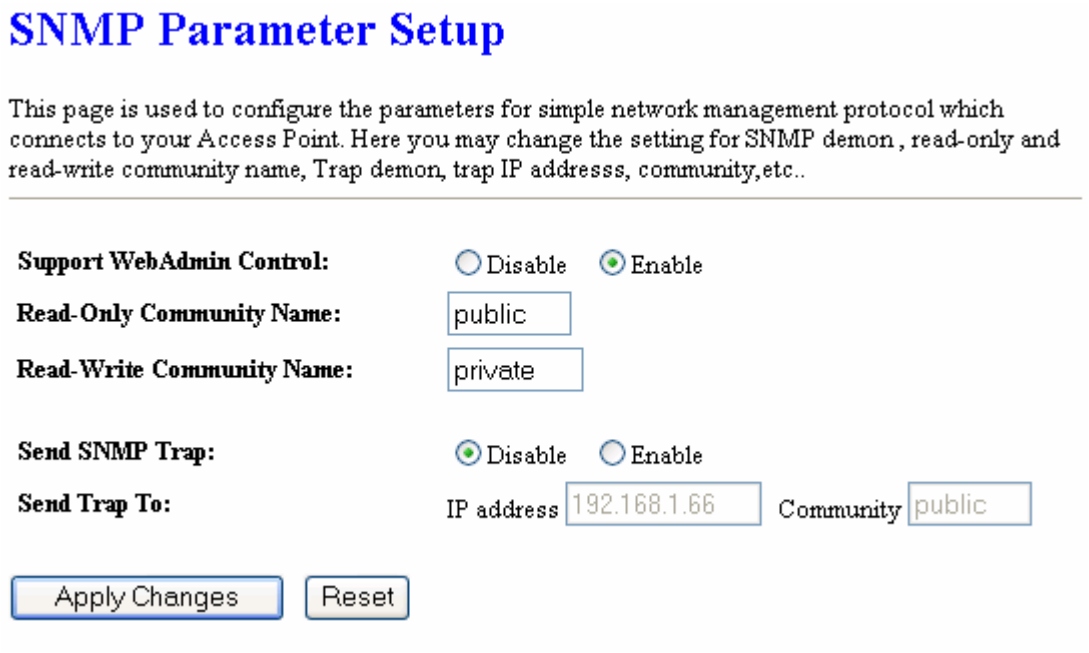
- **DHCP**: If this device is a DHCP client and will receive its IP settings from a DHCP server, then select **Client** from the drop-down list. Enabling the DHCP client will disable the IP address, subnet mask, and default gateway fields. If the DHCP option is **Disabled**, then the IP address, subnet mask, and default gateway fields must be filled in.
- **802.1d Spanning Tree**: Select **Enabled** from the drop-down list if you if you would like to use the spanning tree feature.
- Click on the **Apply Changes** button to confirm the changes. This device will automatically restart once these changes have been applied.

5.3.1.3 DHCP Server



- **IP Address**: Enter the IP address.
- **Subnet Mask**: Enter the subnet mask for the IP address.
- **Default Gateway**: Enter the IP address for the default gateway.
- **DHCP**: Select Server from the drop-down list since this device is the DHCP server. This device will distribute the IP addresses to the clients associated.
- **DHCP Client Range**: Enter the first and last IP address of the range. Make sure that the range is on the same subnet as the device. You may click on the Show Client button to view a list of IP addresses that were distributed.
- **DNS Server**: Enter the IP address of the DNS server.
- **802.1d Spanning Tree**: Select **Enabled** from the drop-down list if you if you would like to use the spanning tree feature.
- Click on the **Apply Changes** button to confirm the changes. This device will automatically restart once these changes have been applied.

4.3.2 SNMP Settings



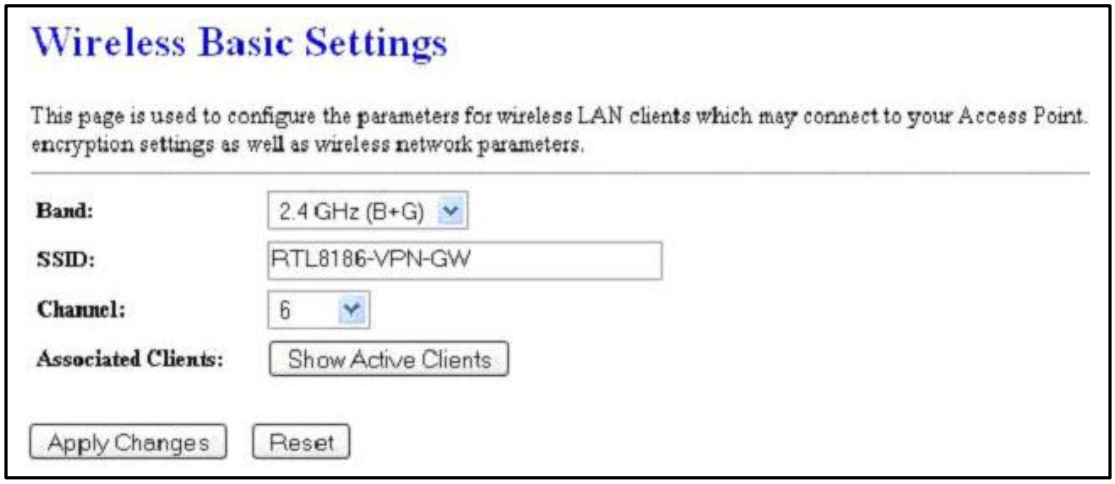
- Check **Enable** to activate the SNMP and then configure the **Read/Write Community** Strings.
- Enable **Send SNMP Trap** to activate the SNMP Trap Agent and input the IP address of SNMP Trap Host.

5.4 Wireless

- Click on the **Wireless** link on the navigation drop-down menu. You will then see five options: basic settings, advanced settings security, access control and WDS. Each option is described below.

5.4.1 Basic Settings

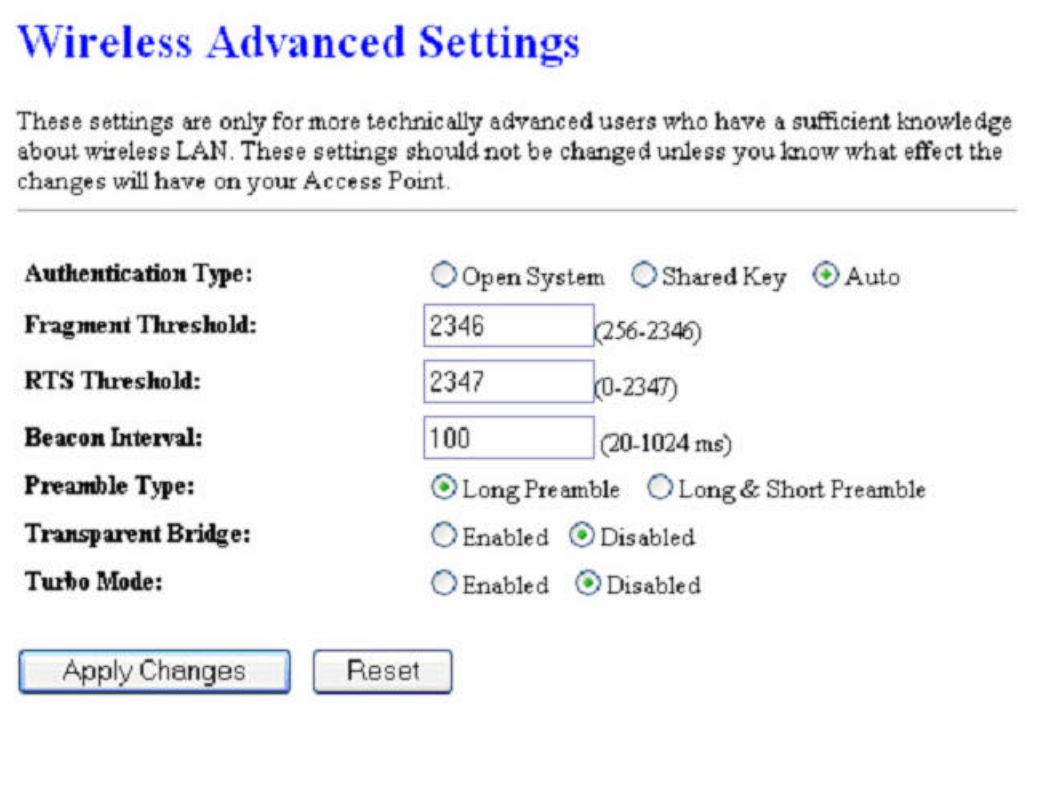
- Click on the **Basic Settings** link under the **Wireless** menu. Using this option you may configure the 802.11b/g settings as well as the frequency, channel, and SSID.



- **Band**: Select the IEEE 802.11 mode from the drop-down list. Options available are **2.4GHz (B), 2.4GHz (G), or 2.4GHz (B+G)**. Select the appropriate mode based on the type of wireless network. For example, if you are sure that the wireless network will be using only IEEE 802.11g clients, then it is recommended to select 2.4GHz (G) instead of 2.4GHz (B+G) which will reduce the performance of the wireless network.
- **SSID**: The SSID is a unique named shared amongst all the points of the wireless network. The SSID must be identical on all points of the wireless network and cannot exceed 32 characters.
- **Channel**: Select a channel from the drop-down list. The channels available are based on the country's regulation. When selecting Infrastructure mode, a channel is not required, however, when selecting Adhoc mode, you must select the same channel on all points.
- **Show Active Clients**: Click on this button to view a list of associated clients.
- Click on the **Apply Changes** button to confirm the changes. This device will automatically restart once these changes have been applied.

5.4.2 Advanced Settings

- Click on the **Advanced Settings** link under the **Wireless** menu. On this page you can configure the advanced settings to tweak the performance of your wireless network. Options available are: fragmentation threshold, RTS threshold, beacon interval, output power, preamble type, broadcast SSID, IAPP, and 802.11g protection.



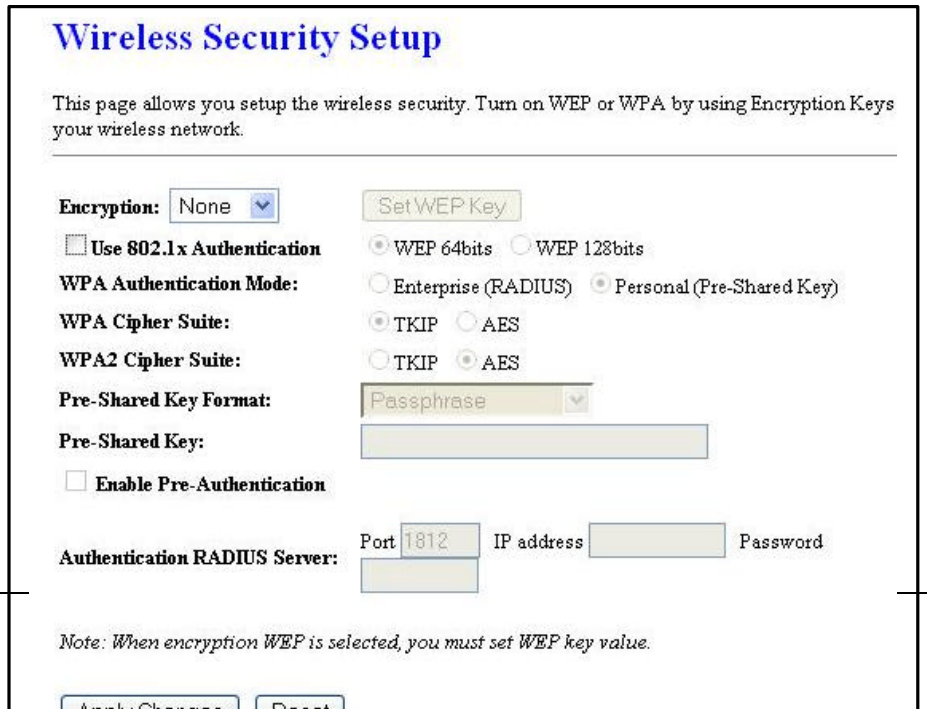
- **Authentication Type:** select an authentication method. Options available are **Open System**, **Shared Key** or **Auto**. An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. Shared Key sends an unencrypted challenge text string to any device attempting to communicate with the AP. The device requesting authentication encrypts the challenge text and sends it back to the access point. If the challenge text is encrypted correctly, the access point allows the requesting device to authenticate. It is recommended to select Auto if you are not sure which authentication type is used.
- **Fragment Threshold**: Packets over the specified size will be fragmented in order to improve performance on noisy networks.
- **RTS Threshold**: Packets over the specified size will use the RTS/CTS mechanism to maintain performance in noisy networks and preventing hidden nodes from degrading the performance.
- **Beacon Interval**: Beacons will be sent out to devices at the specified intervals. This value is measured in milliseconds (ms).
- **Data Rate**: If you would like to force a data rate, you may select one from the drop-down list. However, for best performance it is recommended to use the **Auto** setting.
- **Preamble Type**: For best performance, all devices on the wireless network should use the same preamble type. However, the wireless network will still function even though the wrong preamble type is used.
- **Broadcast SSID**: This is a security feature that is enabled by default. This allows clients on the wireless network to run a site survey and detect this Access Point. Select **Disabled** if you do not want this Access Point detected in a site survey.
- **IAPP**: It is recommended to **Enable** the Inter-Access Point Protocol (IAPP) if you would like the clients on the wireless network to seamlessly roam between Access Points of the same SSID.

- **802.11g Protection**: If your wireless network is using both 802.11b and 802.g devices then it is recommended to enable this feature so that the 802.11b devices will not degrade the performance of 802.11g devices.
- **User Isolation**: Click "**Enabled**" to stop packet transmission between Wireless Clients.
- **Turbo Mode**: Select "**Enable**" to activate the Turbo mode for better performance. The Default is disabled.
- Click on the **Apply Changes** button to confirm the changes. This device will automatically restart once these changes have been applied.

5.4.3 Security

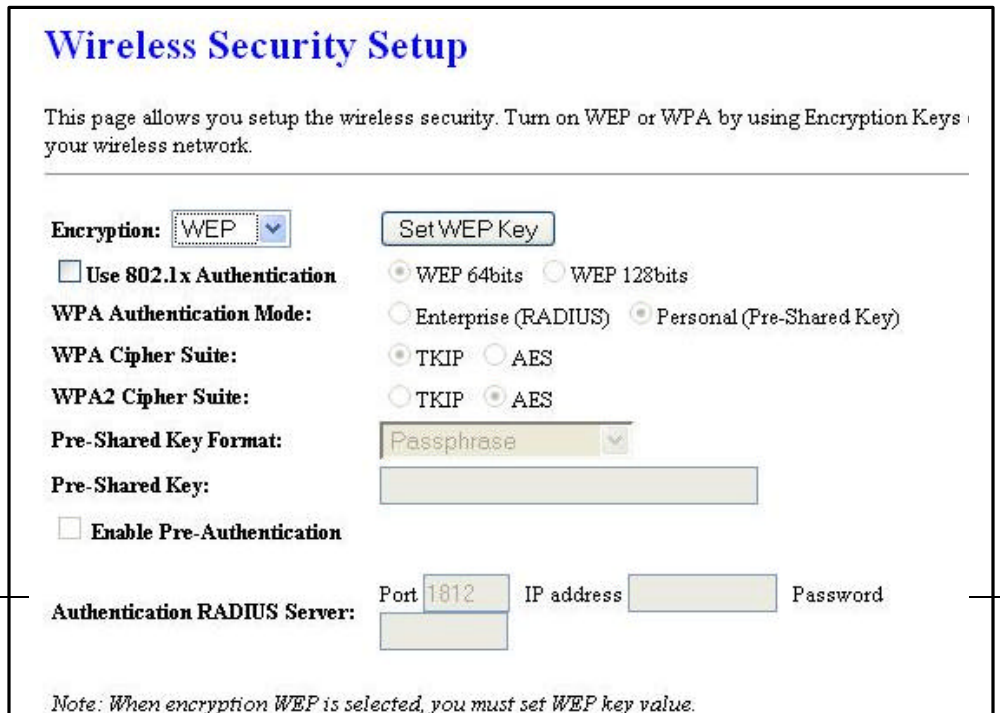
- Click on the **Security** link under the **Wireless** menu. On this page you can configure the authentication and encryption settings such as WEP, WPA, and 802.1x.

5.4.3.1 Encryption Disabled



- **Encryption**: Select **None** from the drop-down list if your wireless network does not use any type of encryption.
- Click on the **Apply Changes** button to confirm the changes. This device will automatically restart once these changes have been applied.

5.4.3.2 WEP 64-bit / 128-bit



- **Encryption**: Select **WEP** from the drop-down list if your wireless network uses WEP encryption. WEP is an acronym for Wired Equivalent Privacy, and is a security protocol that provides the same level of security for wireless networks as for a wired network.
- **Set WEP Key**: Click on this button to configure the WEP Key.

- **Key Length**: Select a **64-bit** or **128-bit** from the drop-down list.
- **Key Format:** Select a key format from the drop-down list. 64bit-hex keys require 10 characters, where as 128-bit keys require 26 characters. A hex key is defined as a number between 0 through 9 and letter between A through F.
- **Default Tx Key:** You may use up to four different keys for four different networks. Select the current key that will be used.
- **Encryption Key 1-4:** You may enter four different WEP keys.
- Click on the **Apply Changes** button to confirm the changes and then click on the **Close** button to return to the pervious window.

5.4.3.3 WPA / WPA2 / WPA2 Mixed Passphrase

- **Encryption**: Select **WPA**, **WPA2 or WPA2_Mixed** from the drop-down list if your wireless network uses this encryption. WPA (Wi-Fi Protected Access) was designed to improve upon the security features of WEP (Wired Equivalent Privacy). The technology is designed to work with existing Wi-Fi products that have been enabled with WEP. WPA provides improved data encryption through the Temporal Integrity Protocol (TKIP), which scrambles the keys using a hashing algorithm and by adding an integrity checking feature which makes sure that keys haven't been tampered with.
- **WPA Authentication Mode**: Select the **Personal (Pre-Shared Key)** radio button.
- **WPA/WPA2**: Select **TKIP**, **AES** or both as the cipher suite.
- **Pre-Shared Key Format**: Select **Passphrase** from the drop-down list.
- **Pre-Shared Key**: Enter the pass phrase; this should be between 8 and 63 characters.
- Click on the **Apply Changes** button to confirm the changes. This device will automatically restart once these changes have been applied.

5.4.3.4 WPA / WPA2 / WPA2 Mixed RADIUS Authentication

- **Encryption**: Select **WPA**, **WPA2** or **WPA2_Mixed** from the drop-down list if your wireless network uses this encryption. WPA (Wi-Fi Protected Access) was designed to improve upon the security features of WEP (Wired Equivalent Privacy). The technology is designed to work with existing Wi-Fi products that have been enabled with WEP. WPA provides improved data encryption through the Temporal Integrity Protocol (TKIP), which scrambles the keys using a hashing algorithm and by adding an integrity checking feature which makes sure that keys haven't been tampered with.
- **WPA Authentication Mode**: Select the **Enterprise (RADIUS)** radio button.
- **WPA/WPA2**: Select **TKIP**, **AES** or both as the cipher suite.
- **RADIUS Port:** Enter the port number of the RADIUS server. The default is usually 1812.
- **RADIUS IP Address:** Enter the IP address of the RADIUS server.
- **RADIUS Password:** Enter the shared password of the RADIUS server.
- Click on the **Apply Changes** button to confirm the changes. This device will automatically restart once these changes have been applied.

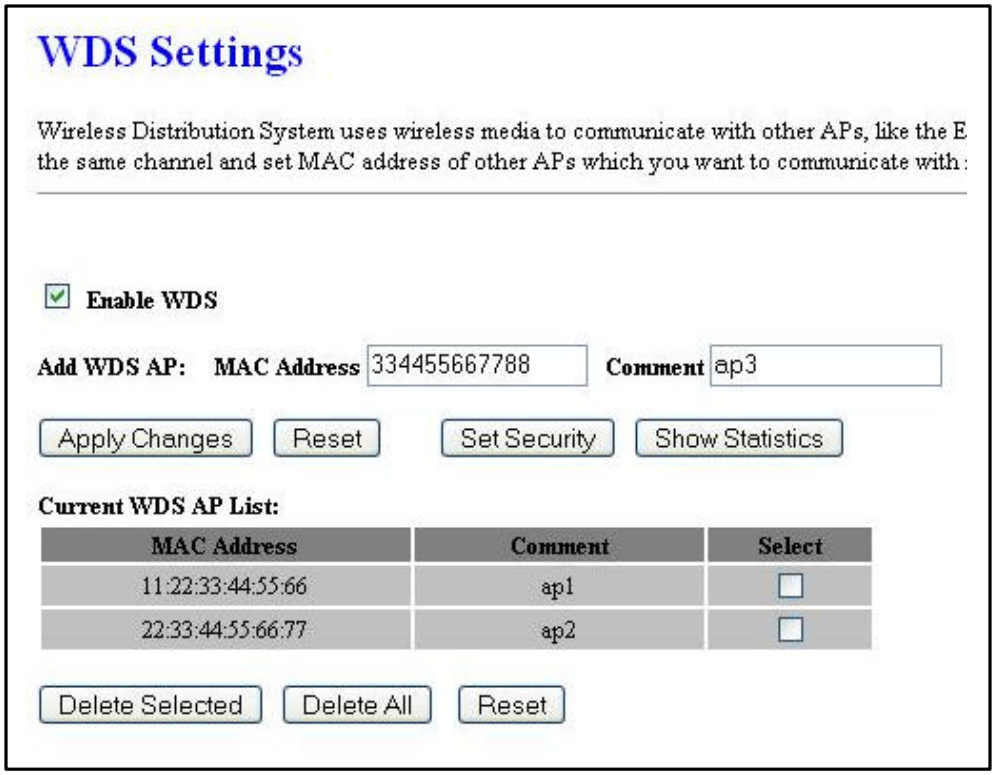
5.4.4 Access Control

- Click on the **Access Conrol** link under the **Wireless** menu. On this page you can filter the MAC address by allowing or blocking access the network.

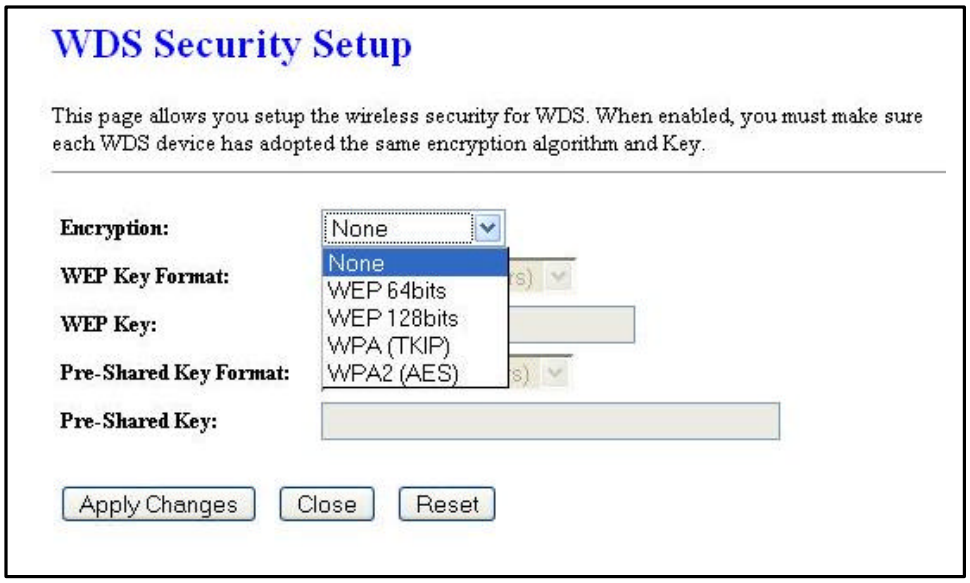
- **Wireless Access Control Mode:** You may choose to **Disable**, **Allow Listed**, or **Deny Listed** MAC address from associating with the network. By selecting Allow Listed, only the address listed in the table will have access to the network; all other clients will be blocked. On the other hand, selected Deny Listed, only the listed MAC address will be blocked from access the network; all other clients will have access to the network.
- **MAC Address:** Enter the MAC address.
- **Current Access Control list:** This table lists the blocked or allowed MAC addresses; you may delete selected MAC address or delete all the addresses from the table by clicking on the associated buttons.
- Click on the **Apply Changes** button to confirm the changes. This device will automatically restart once these changes have been applied.

5.4.5 WDS

- Click on the **WDS** link under the **Wireless** menu. On this page you can configure the WDS (Wireless Distribution System) which allows the Access Point to function as a repeater.



- **Enable WDS:** Place a check in this box to enable this feature.
- **Add WDS AP:** Enter the MAC address of the Access Point that will join the WDS network along with a comment about the AP.
- **Current WDS AP list:** This table lists MAC addresses; you may delete selected MAC address or delete all the addresses from the table by clicking on the associated buttons.
- Click on the **Apply Changes** button to confirm the changes. This device will automatically restart once these changes have been applied.
- Click on the **Set Security** button to configure the security settings.



- **Encryption**: Select **WEP** 64bits, WEP 128bits, WPA (TKIP) or WPA2 (AES) from the drop-down list if your wireless network uses a specific encryption.
- **Key Format:** Select a key format from the drop-down list. 64bit-hex keys require 10 characters, where as 128-bit keys require 26 characters. A hex key is defined as a number between 0 through 9 and letter between A through F.
- **Key Length**: Select a **64-bit** or **128-bit** from the drop-down list.
- **Pre-Shared Key Format**: Select **Passphrase** from the drop-down list.
- **Pre-Shared Key**: Enter the pass phrase; this should be between 8 and 63 characters.
- Click on the **Apply Changes** button to confirm the changes. This device will automatically restart once these changes have been applied.

Appendix A – Specifications

Data Rates

1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54 Mbps

Standards

IEEE802.11b/g, IEEE802.1x, IEEE802.3, IEEE802.3u

Compatibility

IEEE 802.11g/ IEEE 802.11b

Power Requirements

Active Ethernet (802.3af) – 48 VDC/0.35A

Regulation Certifications

FCC Part 15/UL, ETSI 300/328/CE

RF Information

Frequency Band

2.400 2.4835 GHz (US, EU)
2.400 2.484 GHz (JP)

Media Access Protocol

Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)

Modulation Technology

Orthogonal Frequency Division Multiplexing (OFDM)
DBPSK @ 1Mbps
DQPSK @2Mbps
CCK @ 5.5 & 11Mbps
BPSK @ 6 and 9 Mbps
QPSK @ 12 and 18 Mbps
16-QAM @ 24 and 36 Mbps
64-QAM @ 48 and 54 Mbps

Operating Channels

11 for North America, 14 for Japan, 13 for Europe,

Receive Sensitivity (Typical)

-88dBm @ 6Mbps
-70dBm @ 54Mbps

Available transmit power (Max.)

16dBm

Antenna

9dBi Internal(Patch), or 5dBi External (Dipole)

RF Connector

SMA (Fr) Type (Optional for External Antenna use)

Networking

Topology

Ad-Hoc, Infrastructure

Operation Mode

Point-to-Point/ Point-to-Multipoint Bridge/ AP/ Client Bridge/ WDS

Interface

One 10/100Mbps RJ-45 LAN Port

Security

IEEE802.1x authenticator / RADIUS client (EAP-MD5/TLS/TTLS) support in AP mode
WPA2/WPA / Pre Share KEY (PSK)/ AES/TKIP
MAC address filtering
Hide SSID in beacons

IP Auto-configuration

DHCP client/server

Management

Configuration

Web-based configuration (HTTP)

Firmware Upgrade

Upgrade firmware via web-browser
Serial Interface (RS-232)

Physical

Dimensions

163.8(L)mm * 135.2(W)mm * 47.0(H)mm

Weight

1.2 Kg (2.6 lbs)

Environmental

Temperature Range

Operating: -20°C to 60°C (-4°F to 140°F) -
Storage: -40°Cto 80°C (-40°F to 176°F)

Humidity (non-condensing)

5%~95% Typical

Package Contents

- Outdoor Wireless Client Bridge unit
- 48V, 0.375A AC/DC adapter with wall-plug power code
- Inline Power Injector (PoE)
- 1.8m Grounding Cable
- User's manual CD-ROM
- Wall mounting kit
- Mast mounting kit
- Waterproof kit

Appendix B – FCC Interference Statement

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.

We declare that the product is limited in CH1~CH11 by specified firmware controlled in the USA.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IC statement

Operation is subject to the following two conditions:
This device may not cause interference and
This device must accept any interference, including interference that may cause undesired operation of the device.
This device has been designed to operate with an antenna having a maximum gain of 9 dBi. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

IMPORTANT NOTE:
IC Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. 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.

Règlement d' Industry Canada

Les conditions de fonctionnement sont sujettes à deux conditions:
Ce périphérique ne doit pas causer d'interférence et.
Ce périphérique doit accepter toute interférence, y compris les interférences pouvant perturber le bon fonctionnement de ce périphérique.