Wireless Multi-Client Bridge

User's Manual

Version: 1.0

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Revision History

Version	Date	Notes
1.0	November 05, 2003	Initial Version

1 Introduction

The Wireless Multi-Client Bridge is an Ethernet based Wireless Client Adapter. It provides wireless connectivity when connected to an Ethernet port of a PC. It is a driverless hardware, and does not require any driver/software to establish wireless connectivity. With the factory default settings, right out of the box, when powered on, it can associate with nearby Access Points automatically. It supports both Ad-hoc and Infrastructure modes and is interoperable with all IEEE 802.11b Wireless Clients and Access Points.

This chapter describes the features & benefits, package contents, applications, and network configuration.

1.1 Features & Benefits

Features	Benefits
Up to 23dBm (200mW) RF output power	Up to nine times the coverage of a regular client bridge.
11Mbps IEEE 802.11b compliant	Fully Interoperable with IEEE 802.11b
Point-to-point, Point-to-multipoint (with Access Point) Wireless Connectivity	Allows users to transfer data between multiple buildings.
Plug and Play	No driver needed, quickly and easily connects your Ethernet device to Wireless.
Power-over-Ethernet	Flexible Access Point locations and cost savings.
64 /128-bit WEP data encryption	Powerful data security.
Hide SSID (AP Mode)	Avoids unauthorized users from sharing the bandwidth and increases efficiency of the network.
DHCP Client for dynamic IP support	Simplifies network administration.
Web-based configuration	Administrators can remotely configure and manage the Multi-Client Bridge through the web-browser.

1.2 Package Contents

Open the package carefully, and make sure that none of the items listed below are missing. Do not discard the packing materials, in case of return; the unit must be shipped in its original package.

- One Multi-Client Bridge
- One TNC-Reverse Antenna
- One Power Adapter
- One Crossed RJ-45 Ethernet Cable
- One Quick Installation Guide
- One CD-ROM with User's Manual Included

1.3 Applications

The wireless LAN products are easy to install and highly efficient. The following list describes some of the many applications made possible through the power and flexibility of wireless LANs:

a) **Difficult-to-wire environments**
   There are many situations where wires cannot be laid easily. Historic buildings, older buildings, open areas and across busy streets make the installation of LANs either impossible or very expensive.
b) **Temporary workgroups**
   Consider situations in parks, athletic arenas, exhibition centers, disaster-recovery, temporary offices and construction sites where one wants a temporary WLAN established and removed.
c) **The ability to access real-time information**
   Doctors/nurses, point-of-sale employees, and warehouse workers can access real-time information while dealing with patients, serving customers and processing information.
d) **Frequently changed environments**
   Show rooms, meeting rooms, retail stores, and manufacturing sites where frequently rearrange the workplace.
e) **Small Office and Home Office (SOHO) networks**
   SOHO users need a cost-effective, easy and quick installation of a small network.
f) **Wireless extensions to Ethernet networks**
   Network managers in dynamic environments can minimize the overhead caused by moves, extensions to networks, and other changes with wireless LANs.
g) **Wired LAN backup**
   Network managers implement wireless LANs to provide backup for mission-critical applications running on wired networks.
h) **Training/Educational facilities**
   Training sites at corporations and students at universities use wireless connectivity to ease access to information, information exchanges, and learning.

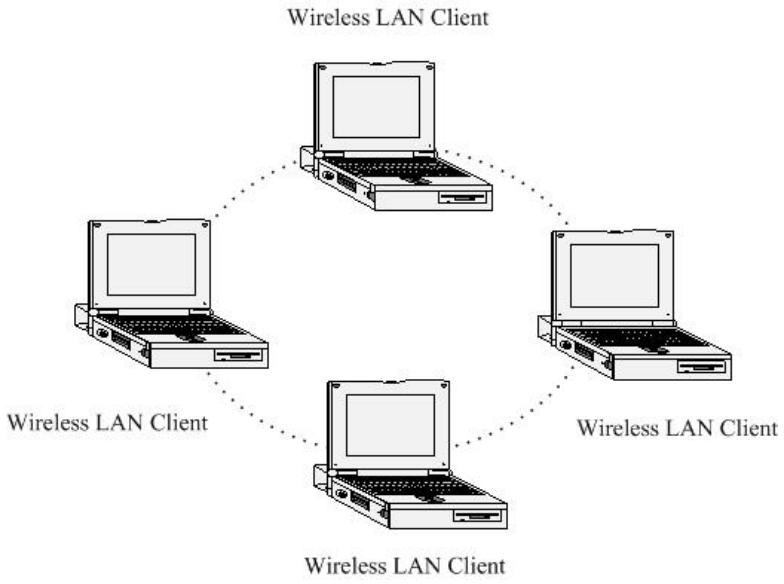
1.4 Network Configuration

To better understand how the wireless LAN products work together to create a wireless network, it might be helpful to depict a few of the possible wireless LAN PC card network configurations. The wireless LAN products can be configured as:

a) Ad-hoc (or peer-to-peer) for departmental or SOHO LANs.
b) Infrastructure for enterprise LANs.

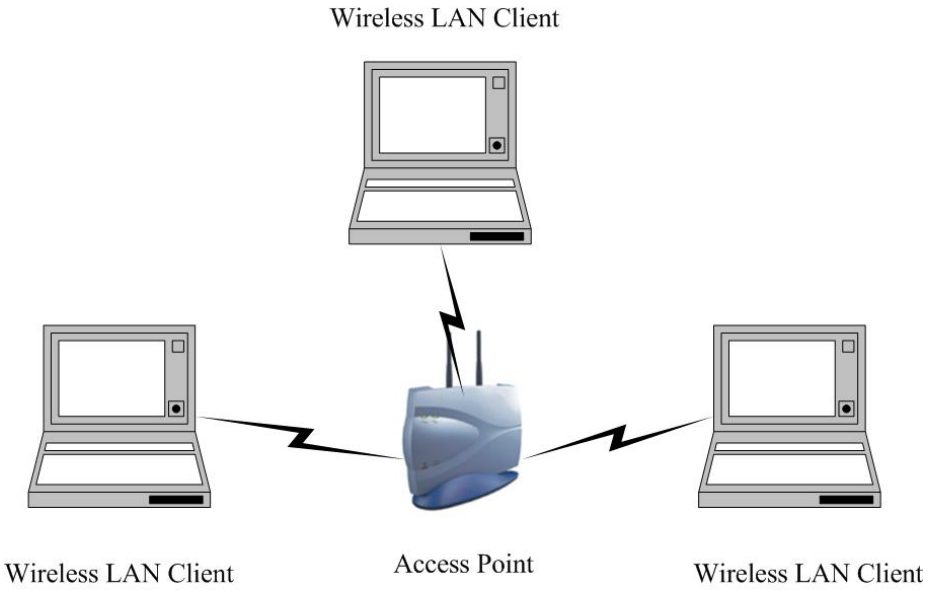
a) Ad-hoc (peer-to-peer) Mode

This is the simplest network configuration with several computers equipped with the PC Cards that form a wireless network whenever they are within range of one another. In ad-hoc mode, each client is peer-to-peer, would only have access to the resources of the other client and does not require an access point. This is the easiest and least expensive way for the SOHO to set up a wireless network. The image below depicts a network in ad-hoc mode.



b) Infrastructure Mode

The infrastructure mode requires the use of an access point (AP). In this mode, all wireless communication between two computers has to be via the AP. It doesn't matter if the AP is stand-alone or wired to an Ethernet network. If used in stand-alone, the AP can extend the range of independent wireless LANs by acting as a repeater, which effectively doubles the distance between wireless stations. The image below depicts a network in infrastructure mode.



2 Understanding the Hardware

2.1 Hardware Configuration

- **RJ-45 Ethernet Connector –** Provides 10 Mbps connectivity to a wired Ethernet LAN.
- **Reset Button –** By holding this down for more than five seconds, the unit will reset to its factory default settings.
- **Power Supply Connector –** Connects to the power adapter.

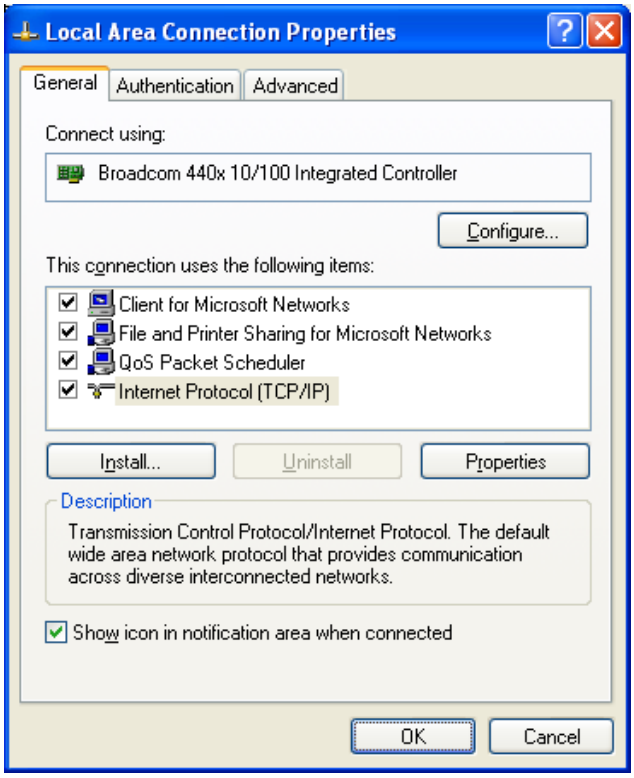
2.2 Hardware Installation

A. Configure your notebook or PC with a wireless LAN card.
B. For a wired LAN, connect your PC's Ethernet port to the unit's LAN port via an Ethernet cable.
C. For WLAN, position the unit in a proper location.
D. Plug in the power cord into the power outlet.

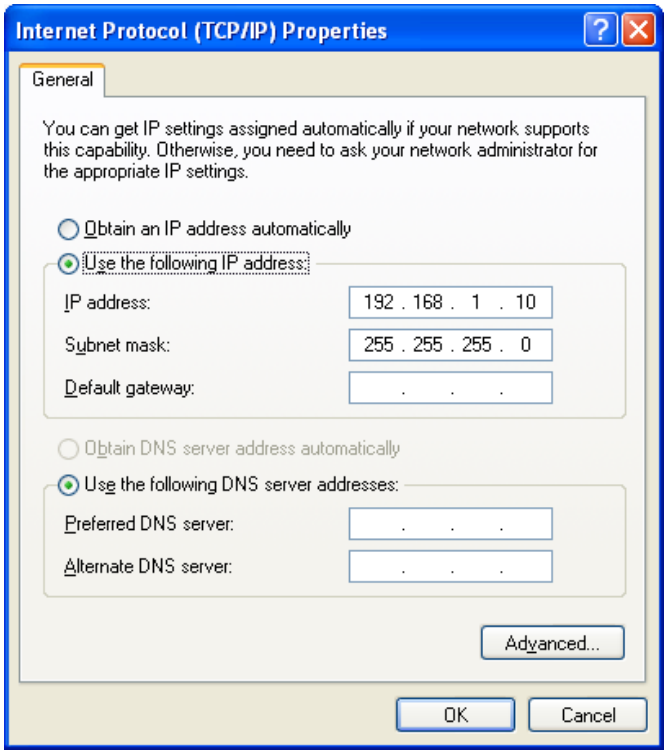
3 PC Configuration

Follow the steps below in order to configure the TCP/IP settings of your PC.

A. In the Control Panel double click **Network Connections**, and then double click on the connection of your Network Interface Card (NIC). You will then see the following screen.



B. Select **Internet Protocol (TCP/IP)** and then click on the **Properties** button. This will allow you to configure the IP address of your PC. You will then see the following screen.



C. Select **Use the following IP address** radio button, and then enter an IP address and subnet mask for your PC. Make sure that the device and your PC are on the same subnet.
D. Click on the **OK** button, your PC's TCP/IP settings have been configured.

4 Web Configuration

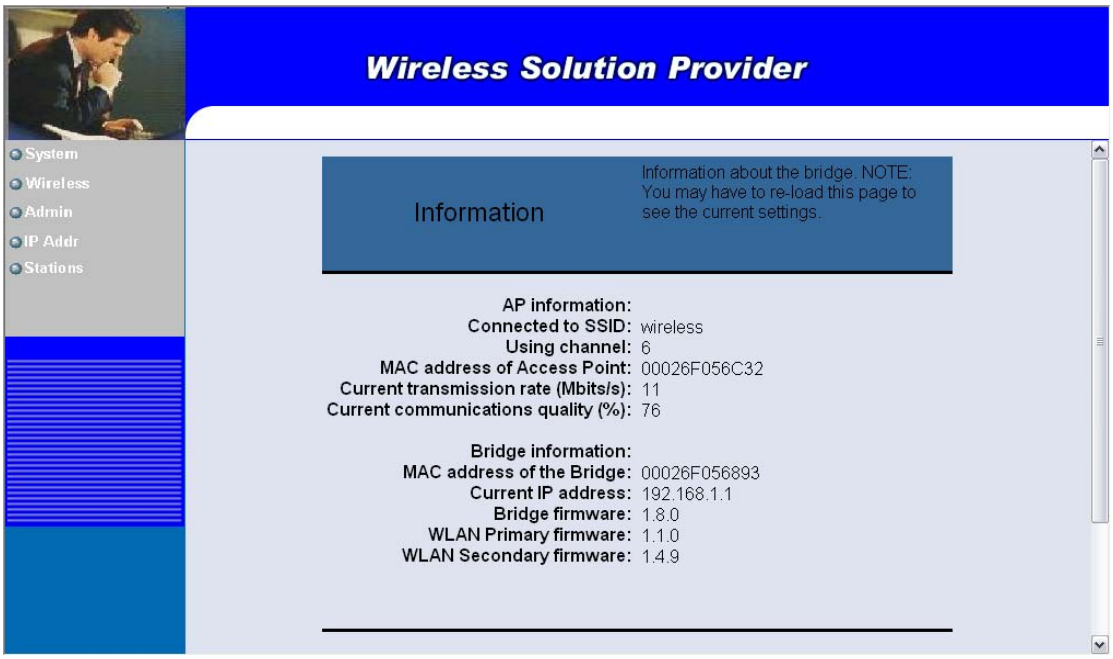
4.1 Logging In

To configure the Bridge through the web-browser, enter the IP address of the Bridge into the address bar of the web-browser (default IP: **192.168.1.1**), and press **Enter**.

You will then see the login window. Enter **admin** as the User name and leave the Password field blank, then click on the **OK** button.

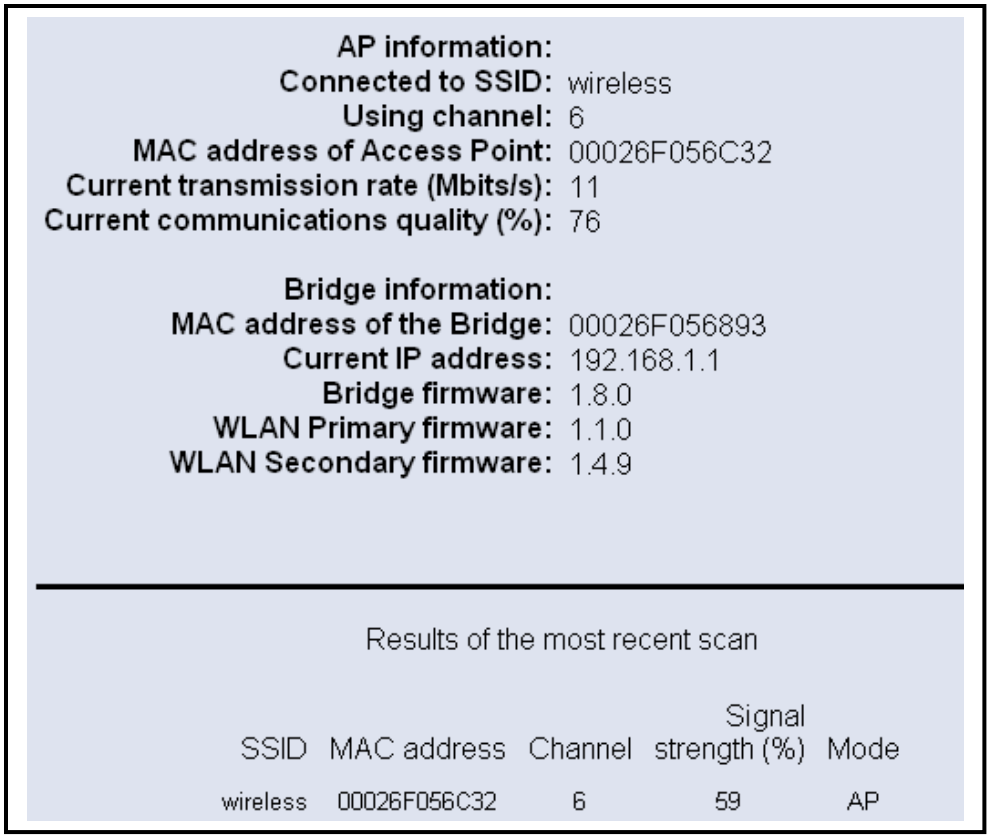
You may also change the password after you login. In order to do so, refer to section **4.4 Admin**.

After you login, you will see the following screen. This screen displays the system information. For more information about these settings refer to section **4.2 System**.



4.2 System

The System page is the first page that is displayed after logging in. This page displays information about the AP and Bridge. You may refresh this page by clicking on the **System** link on the left-hand side of the page (image left). Described below is the information listed along with an image.

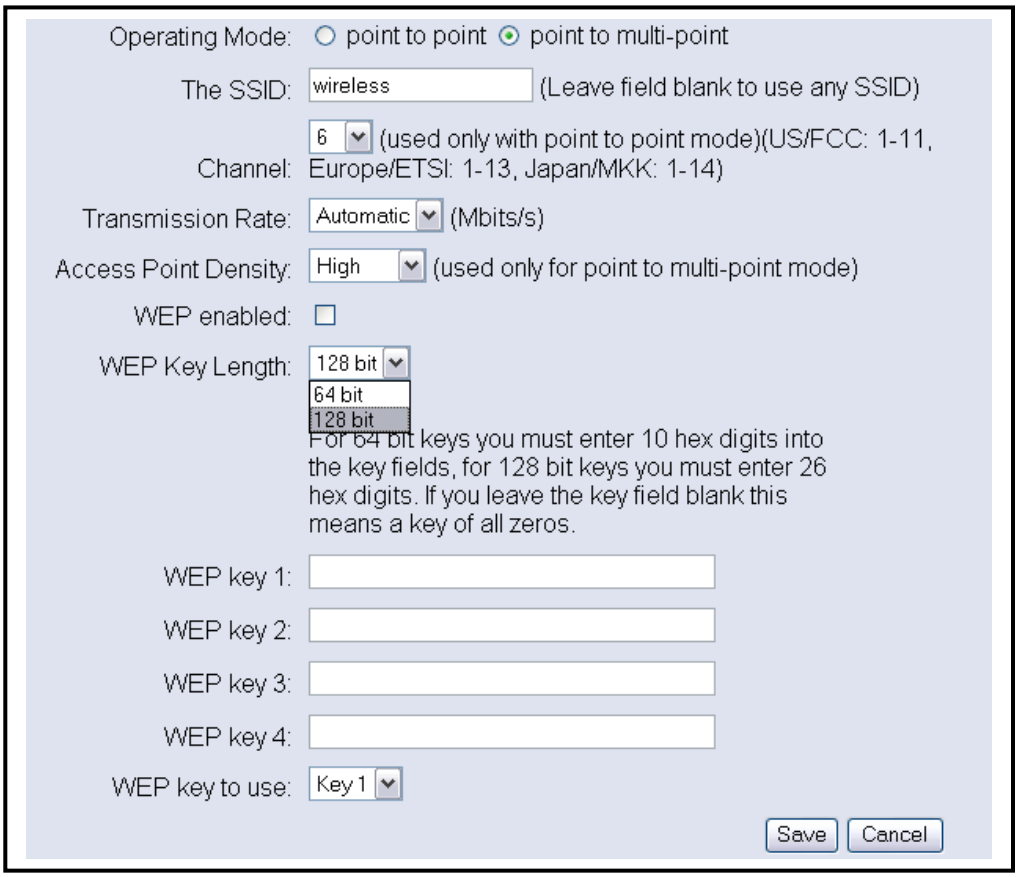


- **Connected to SSID:** displays the SSID of the Access Point. The SSID is a unique name shared among all points in your wireless network. The SSID must be identical for all points in the network, and is case-sensitive.
- **Using Channel:** displays the frequency channel currently being used.
- **MAC address of Access Point:** displays the MAC address of the Access Point that this device is connected to.
- **Current transmission rate:** displays the transmission rate in Mbps.
- **Current Communication Quality:** displays the signal strength.
- **MAC address of the Bridge:** displays the MAC address of this Bridge.
- **Current IP address:** displays the IP address of this Bridge.
- **Bridge firmware:** displays the firmware version of this Bridge.
- **Results of the most recent scan:** these are the results of a site survey

and displays the SSID, MAC address, channel number, signal strength, and mode of Access Points of Stations in the area.

4.3 Wireless

Click on the **Wireless** link on the navigation bar in order to configure the wireless settings of this Bridge. The page displays the current wireless settings and allows you to make changes as you choose. Described below along with an image are details on how to configure the wireless settings of the Bridge.



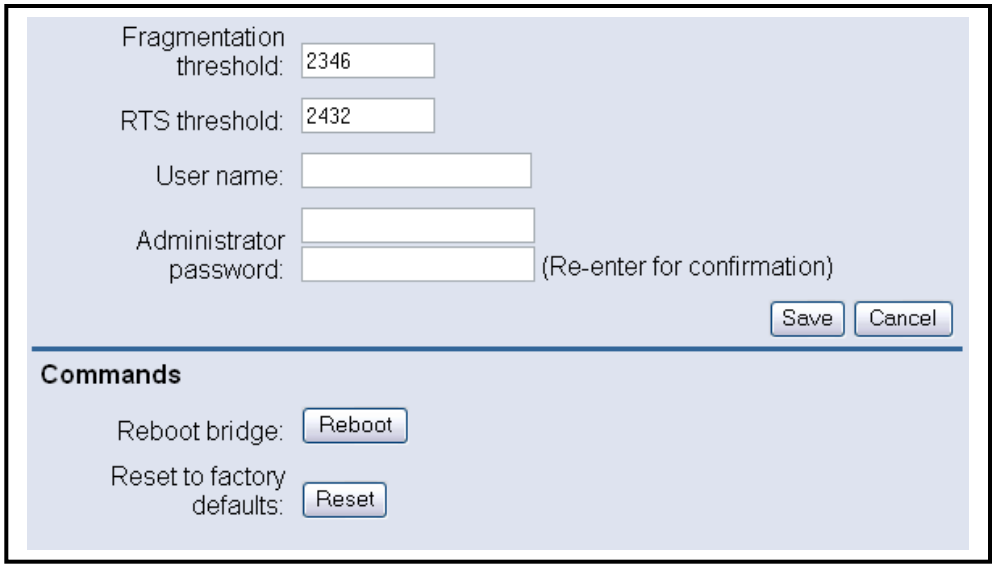
- **Operating Mode:** select a **Point-to-Point** or **Point-to-Multi-point** radio button, depending on the type of network you would like to configure.
- **The SSID:** displays the SSID of the Access Point. The SSID is a unique name shared among all points in your wireless network. The SSID must be identical for all points in the network, and is case-sensitive. Leaving this

field blank means using the SSID “any” and connecting to an Access Point with the strongest available signal.

- **Channel:** select a channel from the drop-down list, which is the shared channel among all points in a point-to-point mode. The permissible channels depend on the regulatory domains.
- **Transmission Rate:** select a supported transmission rate from the drop-down list, or select the default (**automatic**) to let the Bridge decide which data rate to use.
- **Access Point Density:** select from three densities (high, medium, low) to scan the area for Access Points. This can be used in Point-to-Multi-point mode only.
- **WEP enabled:** place a check in this box if you would like to use WEP encryption. WEP is an acronym for Wired Equivalent Privacy, a security protocol for Wireless Local Area Networks (WLANs) defined in the 802.11 standard. WEP is designed to provide the same level of security as a wired LAN.
- **WEP Key Length:** select a WEP key length from the drop-down list. Options available are **64-bit** and **128-bit**.
- **WEP Key 1~4:** enter the WEP key. If you use WEP you must enter the same key into the Access Points and Clients. For **64-bit** keys you must enter 10 hex digits. For **128-bit** keys you must enter 26 hex digits. A hex digit is defined as a number from 0 through 9 or letter from A through F. Leaving this field blank indicates a key of all zeros.
- **WEP key to use:** select a WEP key to use from the drop-down list.
- Click on the **Save** button to confirm the changes.

4.4 Admin

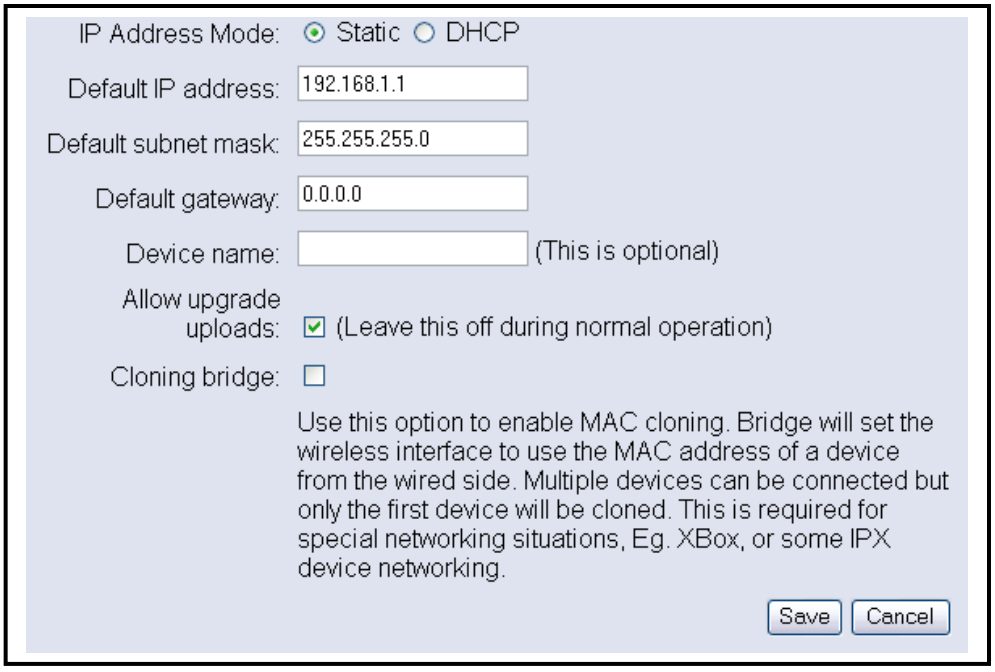
Click on the **Admin** link on the navigation bar in order to configure the threshold values and login details. You may also reboot this device and reset the setting back to the factory defaults. Described below along with an image are details on how to configure the administrative settings.



- **Fragmentation threshold:** transmitted wireless packets larger than this size will be fragmented to maintain performance in noisy wireless networks.
- **RTS threshold:** transmitted wireless packets larger than this size will use the RTS/CTS protocol to (a) maintain performance in noisy wireless networks and (b) prevent hidden nodes from degrading performance.
- **User name:** this user name is used in order to log into the Bridge. If you would like to change the existing user name, enter it into this field.
- **Administrator password:** type in the new password into this field, and re-enter it for confirmation purposes in the field below.
- Click on the **Save** button to confirm the changes. You must reboot the Bridge in order for these new settings to take affect.
- **Reboot Bridge:** click on this button to reboot the Bridge with its current settings.
- **Reset to factory defaults:** click on this button to reset the Bridge to its factory default settings.

4.5 IP Address

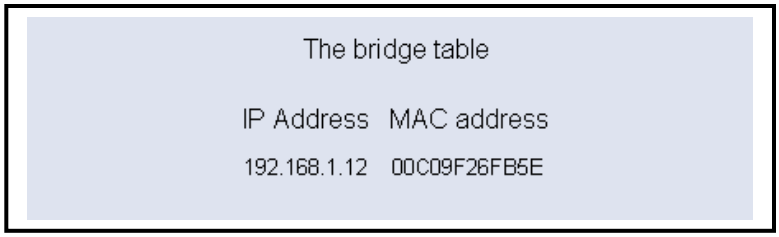
Click on the **IP Addr** link on the navigation bar in order to configure the local IP and DHCP settings. Described below along with an image are details on how to configure the IP settings/DHCP settings.



- **IP Address Mode:** select **Static** or **DHCP**. If you select **Static**, you are required to enter a default IP address, subnet mask, and gateway. However, if you select **DHCP** the IP address, subnet mask, and gateway will be assigned to this bridge via a DHCP server.
- **Default IP address:** enter the IP address of this Bridge.
- **Default subnet mask:** enter the subnet mask for this Bridge.
- **Default Gateway:** enter the IP address of the default gateway.
- **Device Name:** enter a name for this Bridge. This field is optional.
- **Allow upgrade uploads:** this Bridge can be upgraded via TFTP, therefore place a check in this box if you would like to upgrade this device. It is recommended that this box is unchecked during normal operation, when it does not need to be upgraded.
- **Cloning bridge:** place a check in this box to use MAC cloning. The Bridge will set the wireless interface to use the MAC address of a device from the wired side. Multiple devices can be connected but only the first device will be cloned.
- Click on the **Save** button to confirm the changes.

4.6 Stations

Click on the **Stations** link on the navigation bar in order to view a list of stations connected to this Bridge. The image below depicts an example of a Bridge table.



Appendix A – Specifications

General	
Data Transfer Rate	11, 5.5, 2 and 1 Mbps, Auto Fall-Back
Frequency Band	2.400～2.484 GHz
Range (open environment)	11 Mbps –300m/450m (23 dBm output power) 5.5 Mbps –400m/600m (23 dBm output power) 2 Mbps – 500m/750m (23 dBm output power) 1 Mbps –800m/1200m (23 dBm output power)
Compatibility	IEEE 802.11b compliant
Regulation Certifications	FCC Part 15/UL, ETSI 300/328/CE
Power Supply	Power Supply: 90 to 240 VDC ± 10%(depends on country) Device: 12 V/ 1A
RF Information	
Radio type	Direct Sequence Spread Spectrum (DSSS)
Operation Channels	11 for North America, 14 for Japan,13 for Europe, 2 for Spain, 4 for France
Modulation	11 Mbps / 5.5 Mbps CCK；2 Mbps: DQPSK； 1 Mbps: DBPSK
RF Connector	TNC Female-Reverse
RF Output Power	23dBm(200mW)—FCC; 20dBm(100mW)--CE
Network	
Topology	Point-to-Point or Point-to-Multipoint mode
Interface	One 10Base-T RJ-45 LAN Port
Firmware Upgrade	Upgrade firmware via TFTP
Security	WEP encryption (64/128 bit)
IP Auto-configuration	DHCP client
Management	Web-based configuration
Environment	
Temperature Range	0 to 55° C (32 to 131 °F) - Operating -20 to 80 ° C(-4 to 176 °F) - Storage
Humidity (non-condensing)	5%～95% typical

Physical Specifications	
Dimensions	125(L)mm * 108(W)mm * 31(H)mm 4.9 (L)in* 4.3(W)in * 1.2(H)in
Weight	350 g (0.8 lb.)