

Wireless Client Bridge/AP

USER MANUAL

Simple connectivity to your network

Chapter 1: Introduction

The Wireless Client Bridge is a 2.4GHz IEEE 802.11b-compliant Wireless Bridge/AP/AP Client. The Wireless Client Bridge can operate as a point-to-point or a point-to-multipoint bridge to link networks in different buildings.

The Wireless Client Bridge includes cost-effective Power-over-Ethernet (PoE) adapter for supplying power to the Bridge when a power outlet is not easily available. With a one-meter RF cable needed between the Wireless Client Bridge and the external antenna, the Wireless Client Bridge is a cost-effective solution for long distance communications. The Wireless Client Bridge is easy to be managed by web-based user interface configuration.

1.1 Package Contents

- One Wireless Client Bridge, complete with one RF TNC type connector (Male Reverse Polarity) for use with external antenna.
- One Dipole Antenna
- One Quick Installation Guide.
- One 5V DC Power Supply Transformer.
- One RJ-45 Ethernet Network Cable.
- One Product Documentation CD-ROM.

Important Note: Open the package carefully and make sure that none of the items listed above are missing. Do not discard packaging materials. In case of return, the unit must be shipped in its original package.

1.2 Feature & Benefit

Long Range Wireless Client Bridge

Feature	Benefit
Up to 23dBm(200mW) RF Output Power	Longer operating range of regular Access Point
11Mbps IEEE 802.11b Compliant	Fully Interoperable with IEEE 802.11b compliant products
Point-to-point, Point-to-multipoint Wireless Connectivity	Let users transfer data between two buildings or multiple buildings
64 /128-bit WEP data encryption	Powerful data security
Power-over-Ethernet	Flexible Access Point locations and cost savings
Web-based configuration	Helps administrators to remotely configure or manage the AP with web browser
DHCP Client for Dynamic IP Support	Simplifies network administration
MAC address filtering	Ensures secure network connection

Chapter 2 Designing Your Wireless Network

There are three different modes which you can set up the Wireless Client Bridge in the building-to-building wireless network: AP mode, Point to Point mode, and Point to Multipoint mode. The following describes how the three different modes work:

2.1 AP mode (Regular Access Point Mode)

You can configure the Wireless Client Bridge as Access Point through the web-based user Interface configuration. Users with a wireless Client device with in range can connect to the Wireless Client Bridge/Access Point to access the Local Area Network.

2.2 Point to Point Connectivity (Ad-hoc Mode)

This is the simplest network configuration that several computers equipped with the PC cards or client bridges that form a wireless network whenever they are within range of one another. In ad-hoc mode, each client is linked peer-to-peer and would only have access to the resources of the other client, this requires no access point. This is the easiest and least expensive way for the SOHO to set up a wireless network.

2.3 Point to Multi-point Connectivity (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 whether the AP is wired to an Ethernet network or stands alone. If used as a stand-alone, the AP can extend the range of independent wireless LANs by acting a repeater, which effectively doubles the distance between wireless stations.

If wired to an Ethernet network, the AP serves as a bridge and provides the link between the server and the wireless clients. The wireless clients can move freely throughout the coverage area of the AP while remaining connected to the Local Area Network. Since the AP is connected to the wired network, each client would have access to the network resources as well as to other clients.

In a very large facility such as an enterprise, a warehouse, or on a college campus, it will probably be necessary to install more than one access point to cover an entire building or campus. In this scenario, access points hand the client off from one to another in a way that is invisible to the client, ensuring unbroken connectivity.

Wireless clients can roam seamlessly between different coverage areas and remain connected to the network.

Chapter 3: Web-based Configuration

3.1 Connecting to the Web-Based Utility

These instructions will help you configure each of your computers to communicate with the Client Bridge. To do this, you will have to configure your PC's network settings manually.

Please make sure the Wireless Client Bridge is connected to your computer with a Cross-Over Cable before this operation.

Step1. Since the default IP address of Client Bridge is 192.168.1.1, please change the IP address of your computer to the same network address (ex.: 192.168.1.100)

Step2. Open your browser, and *disable the proxy or add the IP address of this AP into the exceptions*. Then, enter this product's IP address (the factory setting is 192.168.1.1) into the *Location* (for Netscape) or *Address* (for IE) field and press ENTER.



Step3. An Enter Network Password window will appear. Enter admin (the default user name) in lowercase letters in the User Name field and leave the Password field empty. Then, click the OK button. You will see the first page of the Web-Based Utility.

3.2 Configuring the Web-Based Utility

You will find brief descriptions of each of the utility's items and its more important functions. To clear any values you've entered on any page, click the **Cancel** button. To apply any settings you've altered on any page, click the **Save** button.

3.2.1 System

- **Connected to SSID:** Shows the SSID setting in the wireless network. If it displays "non-spec", then the Bridge is not connected to any wireless network.
- **Using Channel:** Shows the channel which the Bridge is using.
- **MAC address of Access Point:** shows the MAC address of the WLAN card inside the Access Point.
- **Current transmission rate (M bits/s):** Shows the current transmission between the connecting AP and the client bridge.
- **Current communications quality (%):** Shows the Link Quality received from the Access Point. (This is not available when using an ad-hoc or point-to-point connection.)
- **MAC address of the wireless card:** Shows the MAC address of the WLAN card inside the client bridge.
- **Current IP address:** Shows the IP address of the Bridge
- **Firmware Revision:** Shows the installed version of the firmware.
- **Results of the most recent scan:** Shows the following information of the client bridge.
 - SSID** - Shows the current SSID of a network device.
 - MAC Address** - Shows the wireless MAC address of a network device.
 - Channel** - Shows the current channel number of a network device.
 - Signal Strength (%)** - Shows the total available amount of signal measured above the noise. (This is not available when using an ad-hoc or peer-to-peer connection.)
 - Mode** - Displays the operating mode of a network device.

SSID	MAC address	Channel	Signal strength (%)	Mode
------	-------------	---------	---------------------	------

3.2.2 Wireless

- **Operation mode:** Select point to point mode (Ad-hoc) or point to multi-point

mode you need to implement.

- **The SSID (Service Set Identifier):** A unique name setting in the Access Point which the client bridge wants to connect to in the point to point mode or shares among all points in the ad-hoc mode. The SSID must be identical for each point in the wireless network and is case-sensitive. Leaving the field blank means that using "any" to connect to the Access Point having the strongest signal received by the client bridge in point to point mode.
 - **Channel:** the shared channel among all points in point to point mode. The permissible channels depend on the Regulatory Domain.
 - **Transmission rate (M bits/s):** Select and define all the supported rates (1 · 2 · 5.5 · 11 M-bit/s) at which the client bridge will communicate with the Access Point in point to multi-point or other client bridges in point to point mode. You can also leave it to the default (automatic) to let the client bridge decide which data rate to use.
 - **Access Point Density:** select the three different rates (high, medium, low) to scan the Access Points in your wireless network.
 - **WEP configuration:** An acronym for Wired Equivalent Privacy. WEP is an encryption method used to protect your wireless data communications. WEP uses a combination of 64-bit or 128-bit keys to provide access control to your network and encryption security for every data transmission. To decode a data transmission, each point in a network must use an identical **64-bit** or **128-bit** key. Higher encryption levels mean higher levels of security, but due to the complexity of the encryption, they may mean decreased network performance. For 64-bit keys, you must enter **10 hex digits (0-9; A-F)** (ex: 12345ABCDE) into the four key boxes. For 128-bit keys, you must enter **26 hex digits** (ex: 1234567890ABCDEF1234567890) into the key box. If you leave a key box blank, that means setting this key to all zero.
 - **WEP Enabled:** In order to utilize WEP encryption, please click the checkbox. If you do not wish to utilize WEP encryption, leave the checkbox blank.
 - **WEP key lengths:** Select 64-bit or 128-bit key you want to use.
 - **WEP key to use:** Select which set of key you want to use for transmitted data.
- To clear any values you've entered on any page, click the **Cancel** button. To apply any settings you've altered on any page, click the **Save** button. After you change any settings, it is necessary to reboot the client bridge for the new settings to take effect.

3.2.3 Admin

IP Information Settings

You can change **the IP address, Subnet Mask and Default Gateway** of the Client Bridge manually by selecting **Static** in the **IP Address Mode**. If you select **DHCP** in the IP Address Mode, the Client Bridge can get TCP/IP parameters from the DHCP server on your network.

Allow upgrade uploads means you are allowed to upgrade the firmware of the Access Point using TFTP utility. Check the box to enable this function.

- **IP Address Mode** - Enables you to select the IP address mode: Static or DHCP (Dynamic Host Configuration Protocol). DHCP mode enables the DHCP server on your network to override the current IP address settings.
- **IP Address** - Sets the Bridge's IP address.
- **IP Subnet** - Sets the Bridge's Subnet Mask address.
- **IP Gateway** - Sets the IP address of your network's Gateway.
- **Device Name** - Sets the Bridge's name. The default name is **blank**.
- **Allow Firmware Upgrade** - When the box is checked, the Bridge accepts firmware upgrades.
- **Cloning bridge** - Use this option to enable MAC cloning. 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. This is required for special networking situations, eg. Xbox, or some IPX device networking.

Administration

On this page, you can also change the **login user name** and **administrator password, reboot the client bridge, reset all settings to the factory default,** and **switch the client bridge to AP mode.**

- **Change user name** - Set or change the user name required to access the utility. The default user name is **blank**.
- **Change password** - Set or change the network password required to access the utility. The default password is **blank**.

- **Reboot bridge** - After you have made changes through any of the screens, click this button to enable the new settings.
- **Reset to factory defaults** - Resets all configuration settings to their default values.
- **Switch to AP** - Change the Client Bridge mode to the AP mode.

To clear any values you've entered on any page, click the **Cancel** button. To apply any settings you've altered on any page, click the **Save** button. After you change any settings, it is necessary to reboot the client bridge for the new settings to take effect.

Wireless Solution Provider

Administration

On this page you can change the password, reboot the access point, or reset all settings to their factory defaults. If you have changed any settings it is necessary to reboot the access point for the new settings to take effect.

IP Address Mode: Static DHCP

Default IP address:

Default subnet mask:

Default gateway:

Device name: (This is optional)

Allow upgrade uploads: (Leave this off during normal operation)

Cloning bridge:

Use this option to enable MAC cloning. 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. This is required for special networking situations, Eg. XBox, or some IPX device networking.

User name:

Administrator password: (Re-enter for confirmation)

Commands

Reboot bridge:

Reset to factory defaults:

Switch to AP:

3.2.5 Stations

This page shows the list of the information including the IP address and the MAC address of the stations which are being connected to the client bridge.

Wireless Solution Provider

Stations

Information about the stations that are being bridged.
NOTE: You may have to re-load this page to see the current settings.

The bridge table

IP Address	MAC address
192.168.1.100	00D059596A37

Chapter 4: Web-based Configuration of AP

System

Information

- **AP Firmware :** Shows the installed version of the firmware of the AP
- **WLAN Primary firmware:** Shows the Primary firmware of the wireless LAN card inside the AP.
- **WLAN Secondary firmware:** Shows the Secondary firmware of the wireless LAN card inside the AP.
- **MAC address of AP:** Shows the MAC address of the WLAN card inside the Access Point
- **Current IP address:** Shows the IP address of the Access Point

Association

- **MAC address:** A list of the MAC address of the computers connecting to this Access Point
- **Idle time (minutes):** Shows the amount of time since packets were transferred to or from the computer. If the computer is idle for too long, it will be removed from the list

The screenshot displays the 'Wireless Solution Provider' web interface. At the top, there is a blue header with the text 'Wireless Solution Provider'. Below the header, on the left side, there is a navigation menu with links for 'System', 'Wireless', 'Filter', and 'Admin'. The main content area is divided into two sections: 'INFORMATION' and 'ASSOCIATIONS'. The 'INFORMATION' section contains a table of system details, and the 'ASSOCIATIONS' section contains a table of connected stations.

INFORMATION	
AP firmware:	1.7.0
WLAN Primary firmware:	1.1.0
WLAN Secondary firmware:	1.4.9
MAC address of AP:	01030800026F
Current IP address:	4.33.67.192

ASSOCIATIONS	
MAC address	Time idle (minutes)

Wireless

Access Point Name

- **The SSID (Service Set Identifier)** - A unique name shared among all points in a wireless network. The SSID must be identical for each point in the wireless network and is case-sensitive.
- **Channel:** The radio channel number. The permissible channels depend on the

Regulatory Domain.

- **Basic rates (M-bit/s):** The basic transfer rates should be set depending on the speed of your wireless network. You must select **1-2 (Mbps)** if you have older 802.11 compliant equipments on your network, such as wireless adapters that support only 1 or 2 Mbps. Selecting 1-2 (Mbps), however, does **not** limit the basic transfer rates of faster adapters. There are four kinds of basic rates (1、2、5.5、11 M-bit/s). The default enables all the four rates.
- **Supported rates (M-bit/s):** Select and define all the supported rates (1、2、5.5、11 M-bit/s) at which a wireless client will communicate with an Access Point.
- **Transmission rate (M-bit/s):** Select and define all the supported rates (1、2、5.5、11 M-bit/s) at which an access point will communicate with a client. You can also leave it to the default (automatic) to let the AP decide which data rate to use.

AP Visibility

- **Visibility Status:** When Invisibility is selected, the AP is protected against AP discovery by Netstumbler and ApSniff. All wireless clients must explicitly use and know the SSID of the AP.
- **WEP configuration**

An acronym for Wired Equivalent Privacy, WEP is an encryption method used to protect your wireless data communications. WEP uses a combination of 64-bit or 128-bit keys to provide access control to your network and encryption security for every data transmission. To decode a data transmission, each point in a network must use an identical **64-bit** or **128-bit** key. Higher encryption levels mean higher levels of security, but due to the complexity of the encryption, they may mean decreased network performance. For 64-bit keys, you must enter **10** hex digits (**0-9; A-F**) into the four key boxes. For 128-bit keys, you must enter **26** hex digits into the key box. If you leave a key box blank, that means setting this key to all zero.
- **WEP Enabled:** In order to utilize WEP encryption, please click the checkbox. If you do not wish to utilize WEP encryption, leave the checkbox blank.
- **WEP key lengths:** Select 64-bit or 128-bit key you want to use.
- **WEP key to use:** Select which set of key you want to use for transmitted data.
- **Maximum associated stations:** It controls how many clients can associate with the Access Point.
- **Fragmentation threshold:** This value indicates how much of the Access Point's resources are devoted to recovering packet errors. The value should remain at its default setting of 2,346. If you have decreased this value and experience high packet error rates, you can increase it again, but it will likely decrease overall network performance. Only minor modifications of this value are recommended.
- **RTS threshold:** This value should remain at its default setting of 2,432. Should you encounter inconsistent data flow, only minor modifications are recommended.
- **Beacon period:** This value indicates the frequency interval of the beacon. A

beacon is a packet broadcast by the Access Point to keep the network synchronized. A beacon includes the wireless LAN service area, the IP address, the Broadcast destination addresses, a time stamp, Delivery Traffic Indicator Maps, and the Traffic Indicator Message (TIM).

- **DTIM Interval:** This value indicates the interval of the Delivery Traffic Indication Message (DTIM). A DTIM field is a countdown field informing clients of the next window for listening to broadcast and multicast messages. When the Access Point has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. Clients for the Router hear the beacons and awaken to receive the broadcast and multicast messages.
- **Multicast PM buffering:** Enabling this function can avoid network congestion when there are too many clients to transmit data simultaneously.

Wireless Solution Provider



[System](#)
[Wireless](#)
[Filter](#)
[Admin](#)

Wireless Configuration On this page you can configure the basic 802.11b access point settings. Any new settings will not take effect until the access point is rebooted.

Access point name:

The SSID:

Channel: (US/FCC: 1-11, Europe/ETSI: 1-13, Japan/MKK: 1-14)

Basic rates (Mbit/s): 1 2 5.5 11 (Rates for management packets)

Supported rates (Mbit/s): 1 2 5.5 11 (Rate for data packets)

Transmission rate (Mbits/s):

Preamble type:

Long = Universal Compatibility (e.g., ORINOCO cards)
Short = Highest Performance (5.2 to 5.5 Mbps)
Both = Not fully supported by Intersil

AP Visibility When Invisibility is selected, the AP is protected against AP discovery by NetStumbler and ApSniff and all wireless clients must explicitly use and know the SSID.

Visibility Status: Visible Invisible

WEP configuration For 64 bit keys you must enter 10 hex digits into the key box. For 128 bit keys you must enter 26 hex digits into the key box. If you a key box blank then this means a key of all zeros.

WEP enabled:

WEP key lengths: (This length applies to all keys)

WEP key 1:

WEP key 2:

WEP key 3:

WEP key 4:

Maximum associated stations:

Fragmentation threshold:

RTS threshold:

Beacon period: (milliseconds)

DTIM interval: (number of beacons per DTIM)

Multicast PM buffering:

Admin

IP Information Settings

You can change **the IP address, Subnet Mask** and **Default Gateway** of the Access Point manually by selecting **Static** in the **IP Address Mode**. Or you can select **DHCP** in the IP Address Mode. The Access Point can get the TCP/IP parameters from the DHCP server on your network. You don't have to set up them manually.

- **IP Address Mode** - Enables you to select the IP address mode: Static or DHCP (Dynamic Host Configuration Protocol). DHCP mode enables the DHCP server on your network to override the current IP address settings.
- **IP Address** - Sets the AP's IP address.
- **IP Subnet** - Sets the AP's Subnet Mask address.
- **IP Gateway** - Sets the IP address of your network's Gateway.
- **Device Name** - Sets the AP's name. The default name is **blank**.
- **Allow upgrade uploads** means you are allowed to upgrade the firmware of the Access Point using TFTP utility. Check the box to enable this function

On this page you can change the login user name and administrator password, **reboot the Access Point**, or **reset all settings to the factory default**. After you change any settings, it is necessary to reboot the Access Point for the new settings to take effect.

Administration

On this page, you can also change the **login user name** and **administrator password, reboot the AP, reset all settings to the factory default, and switch the AP to the client bridge mode**.

- **Change user name** - Set or change the user name required to access the utility. The default user name is **blank**.
- **Change password** - Set or change the network password required to access the utility. The default password is **blank**.
- **Reboot bridge** - After you have made changes through any of the screens, click this button to enable the new settings.
- **Reset to factory defaults** - Resets all configuration settings to their default values.
- **Switch to bridge** - Change the AP mode to the Client Bridge mode.

To clear any values you've entered on any page, click the **Cancel** button. To apply any settings you've altered on any page, click the **Save** button. After you change any settings, it is necessary to reboot the client bridge for the new settings to take effect.

Wireless Solution Provider



[System](#)
[Wireless](#)
[Filter](#)
[Admin](#)

Administration

On this page you can change the password, reboot the access point, or reset all settings to their factory defaults. If you have changed any settings it is necessary to reboot the access point for the new settings to take effect.

IP Address Mode: Static DHCP

Default IP address:

Default subnet mask:

Default gateway:

User name:

Administrator password:

(Re-enter for confirmation)

Commands

Reboot AP:

Reset to factory defaults:

Switch to Bridge:

Filtering

MAC Address Filtering: If this function is enabled, only the clients whose MAC addresses are listed in these 15 fields can associate with the Access Point. For your convenience, you can cut and paste the addresses from the Associations Web page in to these MAC address fields.

Wireless Solution Provider



[System](#)
[Wireless](#)
[Filter](#)
[Admin](#)

MAC Address Filtering

On this page you can enable MAC address filtering. If enabled, only the MAC addresses entered into the boxes below are allowed to associate to this AP. Note that you can cut and paste the addresses from the Associations Web page into the MAC address boxes. These changes are effective immediately.

Enable filtering:

MAC address 1:

MAC address 2:

MAC address 3:

MAC address 4:

MAC address 5:

MAC address 6:

MAC address 7:

MAC address 8:

MAC address 9:

MAC address 10:

MAC address 11:

Appendix A Technical Specification

Long Range

Wireless Multi-Client Bridge/ Access Point



- Long Operating Range
- Easy and Quick Connect your Ethernet Device to Wireless
- Hide SSID to secure your Network (AP Mode)
- No Driver needed (Plug and Play)
- Flexible Access Point locations and cost savings (Power-over-Ethernet)

Features	Benefits
Up to 23dBm(200mW) RF Output Power	Up to 9 times coverage of Regular Multi-Client Bridge
11Mbps IEEE 802.11b Compliant	Fully Interoperable with IEEE 802.11b Compliant
Point-to-point, Point-to-multipoint Wireless Connectivity	Let users transfer data between two buildings or multiple buildings
Plug and Play	No driver needed, easy and quick to connect 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 unallowable users sharing bandwidth, increases efficiency of the network
DHCP Client/ Server	Simplifies network administration
Web-based configuration	Helps administrators to remotely configure or manage the Multi-Client Bridge with web browser
MAC address filtering (AP Mode)	Ensures secure network connection
Seamless Roaming	Allows users to travel between APs without losing their network connection

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)
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
WEP data encryption	64/128-bit
Compatibility	IEEE 802.11b compliant
Regulation Certifications	FCC Part 15/UL, ETSI 300/328/CE
Power Supply	12V DC/ 1A

Network	
Topology	Point-to-Point/ Point-to-Multipoint/ Infrastructure
Interface	One 10/100Mbps RJ-45 LAN Port
Firmware Upgrade	Upgrade firmware via TFTP
Security	MAC address filtering (AP Mode) WEP encryption (64/128 bit) Hide SSID in beacons, stations can not use “any” SSID (AP Mode)
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.)