

pakedgedevice&software inc.

W7x - Wireless Access Point Family

ENTERPRISE-CLASS, ULTRA HIGH POWER, CONCURRENT DUAL BAND WIRELESS-N ACCESS POINT- High Capacity, Stand-Alone and Controller Based Ready

User Guide – Version 1.2



FCC Declaration of Conformity

Pakedge Device & Software, PO Box 1973, San Mateo, CA 94401, declares under sole responsibility that the W7x complies with 47 CFR Parts 2 and 15 of the FCC Rules as a Class B digital device. This device complies with Part 15 of FCC Rules. Operation of the device is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference that may cause undesired operation.

FCC Compliance Class B Digital Device

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 environment. 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.

Wireless LAN and Your Health

The W7x, like other radio devices, emits radio frequency electromagnetic energy, but operates within the guidelines found in radio frequency safety standards and recommendations.

FCC Certification

The W7x contains a radio transmitter. Accordingly, it has been certified as compliant with 47 CFR Part 15 of the FCC Rules for intentional radiators. Products that contain a radio transmitter are labeled with FCC ID and the FCC logo.

Restrictions on Use of Wireless Devices

In some situations or environments, the use of wireless devices may be restricted by the proprietor of the building or responsible representatives of the organization. For example, these situations may include:

- Using wireless equipment on board an airplane.
- Using wireless equipment in any environment where the risk of interference to other devices or services is perceived or identified as harmful.

If you are uncertain of the applicable policy for the use of wireless equipment in a specific organization or environment (such as airports), you are encouraged to ask for authorization to use the device prior to turning on the equipment. The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of the devices included with this product, or the substitution or attachment of connecting cables and equipment other than specified by the manufacturer. Correction of interference caused by such unauthorized modification, substitution, or attachment is the responsibility of the user. The manufacturer and its authorized resellers or distributors are not liable for any damage or violation of government regulations that may arise from failing to comply with these guidelines.

Caution: Exposure to Radio Frequency Radiation.

To comply with the FCC RF exposure compliance requirements, the separation distance between the antenna and any person's body (including hands, wrists, feet and ankles) must be at least 20 cm (8 inches).

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. THE UNIT MUST NOT BE EXPOSED TO DRIPPING OR SPLASHING WATER. CAUTION: DO NOT OPEN THE UNIT. DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE INSTALLATION AND TROUBLESHOOTING INSTRUCTIONS. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL. CAUTION: THIS DEVICE MUST BE INSTALLED AND USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AS DESCRIBED IN THE USER DOCUMENTATION THAT COMES WITH THE PRODUCT. WARNING: POSTPONE INSTALLATION UNTIL THERE IS NO RISK OF THUNDERSTORM OR LIGHTNING ACTIVITY IN THE AREA.

SAFETY PRECAUTIONS:

When using this device, always follow basic safety precautions, to reduce the risk of fire, electric shock, and injury to persons, including the following:

- Read all of the instructions (listed here and/or in the user manual) before you operate this equipment.
- Comply with all warning and caution statements in the instructions.
- Retain the instructions for future reference.
- Observe all warning and caution symbols that are affixed to this equipment.
- Comply with all instructions that accompany this equipment.
- Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in safe operating condition.
- Installation of this product must be in accordance with national wiring codes and conform to local regulations.
- Avoid using this product during an electrical storm. There may be a risk of electric shock from lightning. For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug the power supply, and disconnect the CAT5e to the W7x at the PoE. This will prevent damage to the product due to lightning and power surges.
- Give particular attention to all safety precautions.
- Operate this product only from the type of power source indicated on the product's marking label. If you are not sure of the type of power supplied to your home, consult your dealer or local power company.
- It is recommended that the customer install an AC surge protector in the AC outlet to which this device is connected. This is to avoid damage to the equipment from lightning strikes and other electrical surges.
- Place POE Injector unit to allow for easy access when disconnecting the power cord/adaptor of the device from the AC wall outlet.

- Wipe the unit with a clean, dry cloth. Never use cleaning fluid or similar chemicals. Do not spray cleaners directly on the unit or use forced air to remove dust.
- Keep the device away from excessive heat and humidity and keep the device free from vibration and dust.
- Do not directly cover the device, or block the airflow to the device with insulation or any other objects.

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INTRODUCTION

Thank you for purchasing the Packedge W7x Concurrent Dual Band Wireless Access Point - the best Concurrent Dual Band Wireless Access Point for your wireless network.

As the central component of your wireless network, the W7x can connect multiple computers, allowing you to share files, audio, video, printers, a high-speed Internet connection, and other resources. You can easily connect devices that have a wireless adapter to the W7x to create a secure, high-speed link between your computers, PDAs, and other electronics; And with the W7x being able to broadcast both 2.4GHz and 5GHz signals simultaneously, 5GHz capable wireless devices are now free to choose the best signal with the least noise and interference, improving the overall stability, reliability and performance of the wireless network.

Each band (either 2.4GHz or 5GHz) of the W7x can operate in any one of three modes:

- **Access Point Mode:** This is the typical configuration for most Wi-Fi networks. In this mode, the W7x broadcasts two Wi-Fi signals (2.4 GHz and 5GHz) that clients can associate with, as shown in the figure below.

Wireless Access Point Mode



- **Client Bridge Mode:** In this mode, you can connect one W7x to a client by its Ethernet port, as shown below. In Client Bridge Mode, the W7x can receive a wireless signal from an Access Point and send the

signal through its Ethernet port to a client. This mode is used when you need to have network connectivity to hard wired device(s) but are unable to run cable to them.

Client Bridge Mode



- **Repeater Mode:** In this mode, the W7x will receive a wireless signal from another AP and then repeat it. This mode is useful in a situation where you need to extend the wireless coverage but are unable to run cable to the W7x from the network.
NOTE: Setting the W7x in repeater mode will sacrifice half of the bandwidth available from the primary access point for devices wirelessly connected to the repeater.

Repeater Mode



Because the functionality of the W7x changes depending on its operating mode, this manual offers both general and mode-specific content.

PACKAGE CONTENTS

- Package contents depend on your W7x model. Please refer to the installation manual of your product.

SYSTEM REQUIREMENTS

The minimum system requirements for the W7x are:

- PC-compatible computer with an Ethernet interface
- Operating system that supports an HTTP Web browser

NETWORK CONFIGURATION

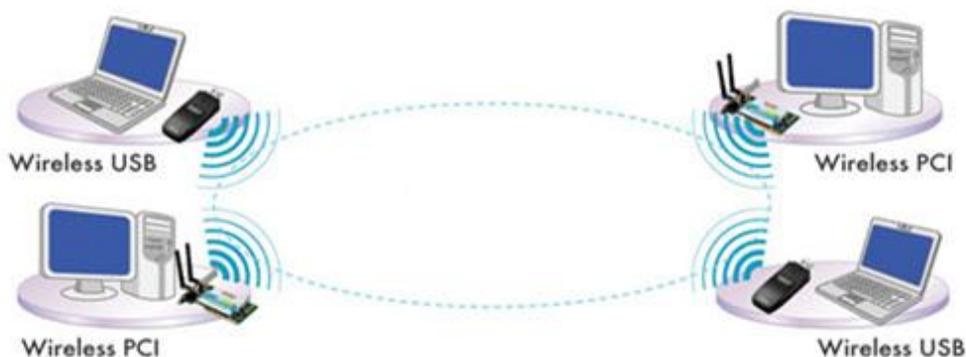
To help you understand how the W7x works with other LAN products to create a wireless network, we will describe several possible wireless network configurations.

The wireless LAN products can be configured as:

- An ad-hoc (peer-to-peer) network for departmental or a small office/home office (SOHO) network
- Infrastructure for enterprise LANs

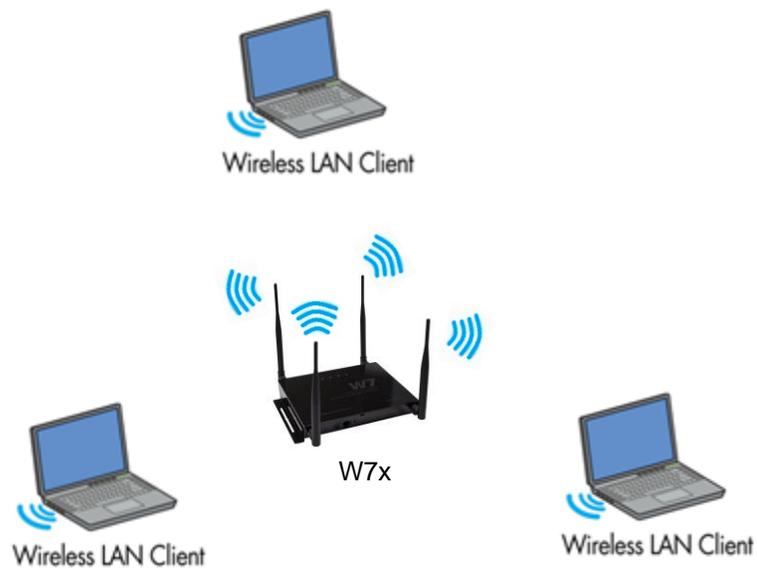
AD-HOC (PEER-TO-PEER MODE)

This is the simplest network configuration with several computers equipped with 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 and only has 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.



INFRASTRUCTURE MODE

In this mode, an Access Point such as the W7x handles all wireless communication between two computers. It doesn't matter if the W7x is stand-alone, or wired to an Ethernet network. In stand-alone mode, the W7x can extend the range of your wireless LANs by acting as a repeater, increasing the connection distance between wireless stations. The figure below shows a network configured in infrastructure mode.



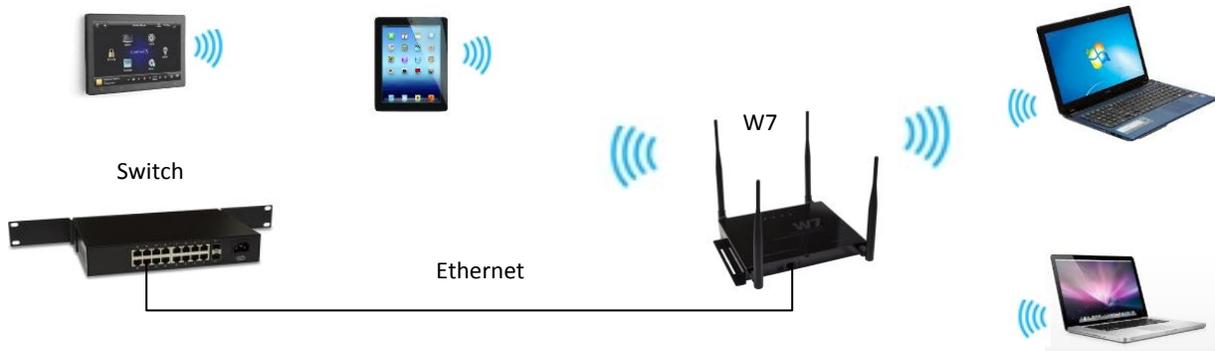
HARDWARE INSTALLATION

The diagrams below depict the configuration using a PoE injector or a PoE Switch to power the W7x.

Power using PoE Injector



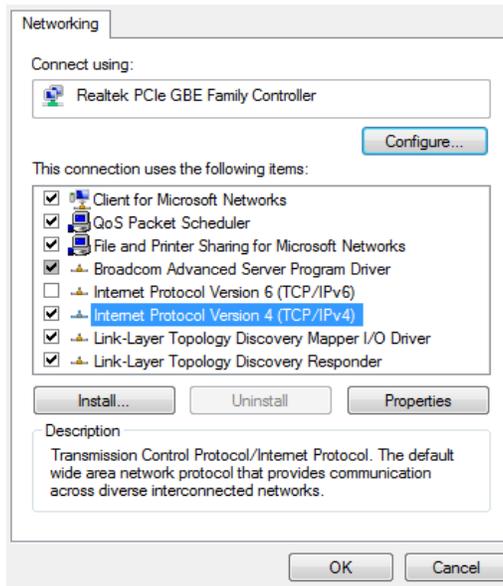
Power using PoE Switch



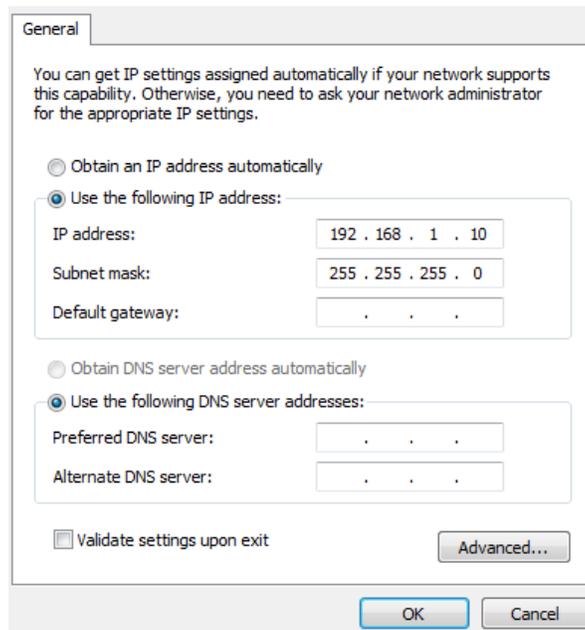
The W7x can be configured in Client Bridge, Repeater, or Access Point mode. When shipped from the factory, the W7x is set to Access Point mode. The default IP address of the W7x is **192.168.1.250** and username/password of **pakedge / pakedgea**

In order to log in to the W7x, you must first configure the TCP/IP settings of your PC/Notebook. Follow these steps:

1. Under **“Control Panel”**, double-click **“Network Connections”** and double-click the connection of your Network Interface Card (NIC). The Local Area Connection Properties dialog appears:



2. Select **“Internet Protocol (TCP/IP)”** and click **“Properties”**. The Internet Protocol (TCP/IP) dialog appears where you can configure the TCP/IP settings of your PC.



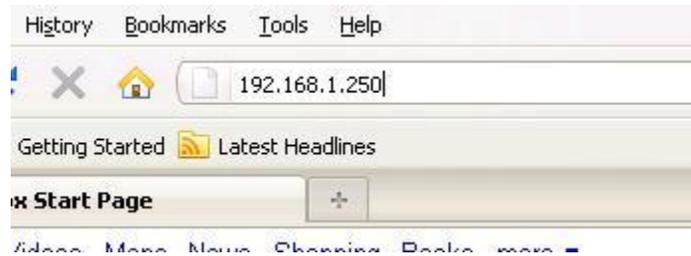
3. Select **“Use the following IP Address”** and type the IP address and subnet mask, as in the example below. (Be sure the IP address and subnet mask are on the same subnet as the W7x.)

W7x IP address:	192.168.1.250
PC IP address:	192.168.1.10
PC subnet mask:	255.255.255.0

4. Click **“OK”** to close the dialog, and click **“OK”** to close the Local Area Connection Properties dialog.

W7X CONFIGURATION

To configure the W7x through a Web Browser, in the address bar of the browser type the IP address of the W7x (default **192.168.1.250**) and press **Enter**.



NOTE: Make sure the Access Point and your computer are configured on the same subnet. To configure the IP address of your computer, follow the steps in the previous section.

The W7x login dialog appears.



In the **User Name** box, type **pakedge**, and in the **Password** box type **pakedgea**, and click **“Login”**.

The W7x main menu appears (see figure below).

System	
Name	W7x Wireless Access Point
Firmware Version	Pakedge_v1.2
Country	United States
Date and Time	Tue Aug 13 11:51:01 PDT 2013
MAC (Network)	90:A7:C1:07:0E:E6
	1 90:A7:C1:07:0E:E6
	2 N/A
	3 N/A
	4 N/A
MAC (2.4GHz Wireless)	5 N/A
	6 N/A
	7 N/A
	8 N/A
	1 90:A7:C1:07:0E:E7
	2 N/A
	3 N/A
	4 N/A
MAC (5GHz Wireless)	5 N/A
	6 N/A
	7 N/A
	8 N/A
Management Vlan	Untagged
Network	
IP Address	192.168.1.111
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.99
DHCP	Enabled
Spanning Tree Protocol	Disabled
2.4GHz Wireless Settings	
Mode	Access Point

The area on the right displays current information about the system. To refresh the data to reflect the current state of the W7x, click **Refresh**.

The navigation bar on the left has five groups:

- **System:** Display and/or modify the W7x's status, system properties, administrative controls, maintenance, firmware options, and internal time settings.
- **Network:** Display and/or modify settings for the system LAN (including IP & gateway), spanning tree, and SNMP.

- **2.4GHz Wireless:** Display and/or modify settings for the wireless network, MAC filter, advanced system options and the client list for the 2.4GHz band.
- **5GHz Wireless:** Display and/or modify settings for the wireless network, MAC filter, advanced system options and the client list for the 5GHz band.
- **Log & Management:** Display and/or modify settings for diagnostics, VLAN management, wireless traffic shaping, system log, log settings and LED options.

NOTE: The main menu options change depending on the operating mode you set for your W7x. The main menu in the figure above shows the options available with the default login, which is Access Point mode. If you set the W7x to a different mode (e.g., Client Bridge mode), the options on the main menu will change. Sections of this manual that discuss settings for the different operating modes include screen shots that show the main menu options available in those modes.

MENU OPTIONS

SYSTEM



On the W7x main menu, the **System** group has six options:

- Status
- Properties
- Administration
- Maintenance
- Firmware
- Time

STATUS

In the System group under the W7x, click **“Status”**. The Main dialog appears and displays the current status of the W7x for the operating mode you’ve selected – see the figure below. The System section shows the W7x’s Name, Firmware Version, Operating Country, Current Date/Time, MAC Network address, MAC Wireless address (for both 2.4GHz and 5GHz band) and the Management VLAN.

The Network section displays the access point’s IP Address, Subnet Mask, Default Gateway, DHCP and Spanning Tree status.

The 2.4GHz/5GHz Wireless section displays the device operating mode, 802.11 mode, channel bandwidth, wireless Channel and Profile Settings.

Because the W7x supports multiple SSIDs, the Wireless section also displays the details of each SSID, and the security settings of each SSID.

Status

System

Name	W7x Wireless Access Point
Firmware Version	Pakedge_v1.2
Country	United States
Date and Time	Tue Aug 13 11:51:01 PDT 2013
MAC (Network)	90:A7:C1:07:0E:E6

1 90:A7:C1:07:0E:E6

2 N/A

3 N/A

4 N/A

MAC (2.4GHz Wireless)

5 N/A

6 N/A

7 N/A

8 N/A

1 90:A7:C1:07:0E:E7

2 N/A

3 N/A

4 N/A

MAC (5GHz Wireless)

5 N/A

6 N/A

7 N/A

8 N/A

Management Vlan Untagged

Network

IP Address	192.168.1.111
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.99
DHCP	Enabled
Spanning Tree Protocol	Disabled

2.4GHz Wireless Settings

Mode	Access Point
802.11	802.11 B/G/N Mixed
Channel Bandwidth	20-40 MHz

PROPERTIES

Under the System section in the W7x main menu, click “**Properties**”. The Properties page is where you can specify a name for the device, choose the country of operation, and switch the W7x’s operating mode.

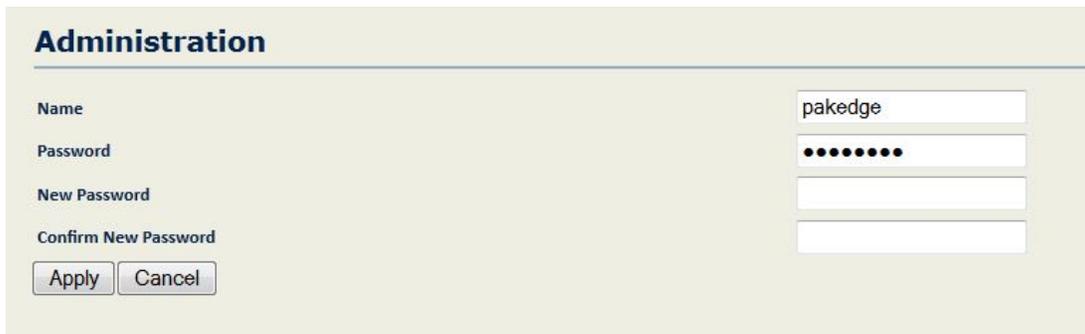
The screenshot shows the 'Properties' configuration page for a W7x device. It features a title 'Properties' at the top left. Below the title, there are three main sections: 'Device Name' with a text input field containing 'W7x Wireless Access Point'; 'Country/Region' with a dropdown menu set to 'United States'; and 'Operation Mode' which is divided into two sub-sections: '2.4GHz Wireless Configuration' and '5GHz Wireless Configuration'. Each sub-section has three radio button options: 'Access Point', 'Client Bridge', and 'Repeater'. In both frequency bands, the 'Access Point' mode is selected. At the bottom of the form, there are two buttons: 'Apply' and 'Cancel'.

- **Name:** Type a name for the device. (**Note: This name is not used as the device SSID.**)
- **Country:** Select a country from the drop-down list.
- **Mode:** Select an operating mode. (For detailed information on configuring operating modes, see the chapter on Mode-Specific Setup.)
- To save your changes, click “**Apply**”.

NOTE: For any changes to take effect, you must click the “Save Changes” button on the lower left below the menu. This will reboot the access point, applying the configuration changes.

ADMINISTRATION

Click “**Administration**” under the System group in the W7x main menu. The Administration page allows you to specify a user name and password for the W7x. By default, the W7x is configured with a default name of **pakedge** and a default password of **pakedgea**. For security reasons, it is imperative to change the default user name and password.



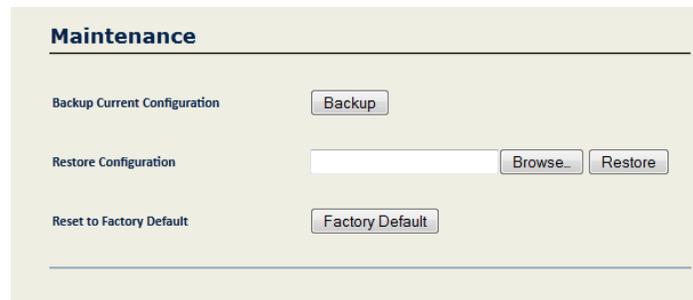
The screenshot shows the 'Administration' section of a web interface. It contains four text input fields: 'Name' (containing 'pakedge'), 'Password' (masked with dots), 'New Password', and 'Confirm New Password'. Below the fields are two buttons: 'Apply' and 'Cancel'.

- **Name:** Type a user name.
- **Password:** Type the current password.
- **New Password:** Type the new password, maximum 12 characters.
- **Confirm New Password:** Type the password again.
- Click **Apply** to save your changes.

NOTE: For any changes to take effect, you must click the “**Save Changes**” button on the lower left below the menu. This will reboot the access point, applying the configuration changes.

MAINTENANCE

Under the System section in the W7x main menu, click “**Maintenance**”. When The Maintenance page appears, you can save the current settings for the W7x. This is useful when, for example, you need to configure several devices with the same settings.



The screenshot shows the 'Maintenance' section of a web interface. It contains three rows of controls: 1) 'Backup Current Configuration' with a 'Backup' button; 2) 'Restore Configuration' with a text input field, a 'Browse...' button, and a 'Restore' button; 3) 'Reset to Factory Default' with a 'Factory Default' button.

- **Backup Current Configuration:** Click “**Backup**” to save the current configuration.
- **Restore Configuration:** If you have already backed up your W7x configuration, you can quickly restore it. Click “**Browse**” and choose the backup file, then click “**Restore**”.
- **Reset to Factory Default:** Click “**Factory Default**” to reset the W7x to the factory default settings. After the device restarts, you can access the W7x at the default IP address: **192.168.1.250** and login: **pakedge / pakedgea**

FIRMWARE

In the W7x main menu, in the **System** group, click **“Firmware”**. In the Firmware page you can upgrade your W7x’s firmware. To perform a firmware upgrade, you must first download the correct firmware from the Pakedge website under the Dealer Portal section.

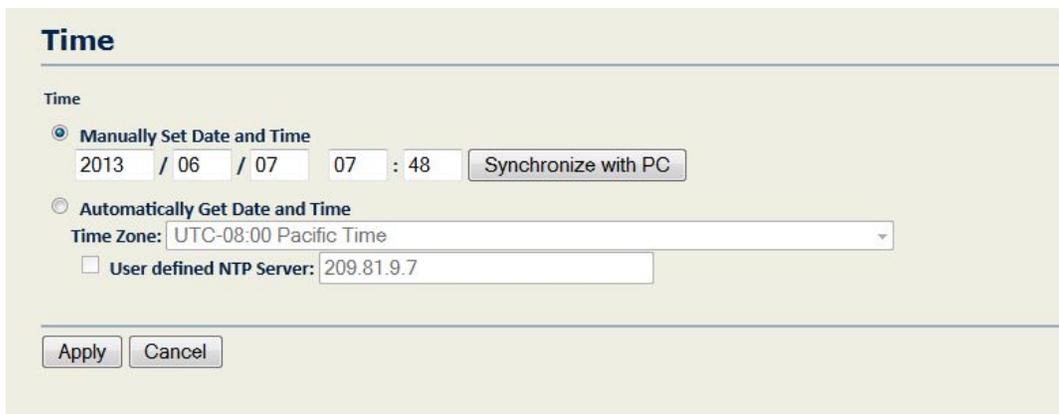


- Click **“Browse”** and choose the firmware file that you downloaded from the Pakedge site.
- Click **“Upgrade”**.

Note: The upgrade usually takes at least 1 minute. **During the firmware upgrade process, do not turn off the device – doing so can damage the W7x.** Once the upgrade completes, the device will restart automatically.

TIME

Click **“Time”**, under the System group in the W7x main menu. The Time page is used for configuring the time on your W7x unit. You can configure the time manually, synchronizing with your PC or by using an NTP time server.

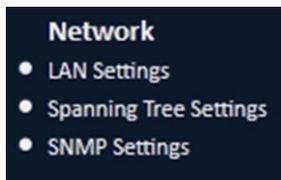


- **Manually Set Date and Time:** Type the date and time or synch it with your PC’s clock.
- **Automatically Get Date and Time:** Choose the time zone of your location from the drop-down list.
- **User Defined NTP Server:** Type the IP address of the NTP server.

- Click “**Apply**” to save your changes.

NOTE: For any changes to take effect, you must click the “**Save Changes**” button on the lower left below the menu. This will reboot the access point, applying the configuration changes.

NETWORK



On the W7x main menu, the **Network** group has three options:

- LAN Settings
- Spanning Tree Settings
- SNMP Settings

LAN SETTINGS

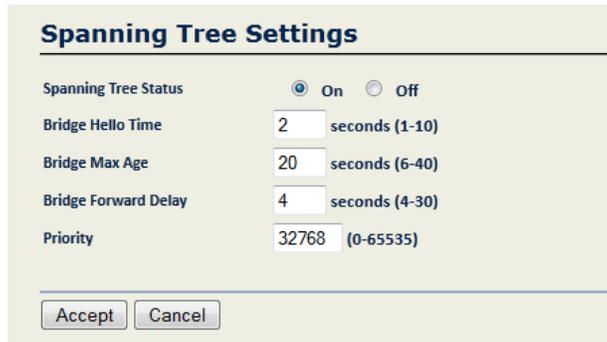
To configure the IP address of your W7x, in the Network section of the W7x main menu, click “**LAN Settings**”. In the LAN Settings page, you can configure the W7x with a static IP address, or obtain an IP address automatically using a DHCP client.

 A screenshot of the "LAN Settings" web interface. At the top, it says "LAN Settings". Below that, there are two radio button options: "Obtain an IP address automatically" (which is unselected) and "Specify an IP address" (which is selected). Underneath, there are five rows of text boxes for configuration: "IP Address" (192 . 168 . 1 . 250), "IP Subnet Mask" (255 . 255 . 255 . 0), "Default Gateway" (192 . 168 . 1 . 99), "Primary DNS" (0 . 0 . 0 . 0), and "Secondary DNS" (0 . 0 . 0 . 0). At the bottom, there are two buttons: "Accept" and "Cancel".

- **Network Setting:** If your W7x is connected to a DHCP server (such as a router), choose “**Obtain an IP address automatically**”. Your W7x will be assigned an IP address from the DHCP pool (**Not recommended**).
- **Specify an IP address (default):** Select this option if you want to use a static IP address. Type the appropriate entries in the text boxes for **IP Address**, **IP Subnet Mask**, **Default Gateway**, **Primary** and **Secondary DNS**.
- Click “**Accept**” to apply the changes.

SPANNING TREE SETTINGS

To configure Spanning Tree protocol for your W7x, in the main menu, in the Network section, click **“Spanning Tree Settings”**.



The image shows a configuration window titled "Spanning Tree Settings". It contains the following fields and controls:

- Spanning Tree Status:** Radio buttons for "On" (selected) and "Off".
- Bridge Hello Time:** A text input field containing "2" with the label "seconds (1-10)".
- Bridge Max Age:** A text input field containing "20" with the label "seconds (6-40)".
- Bridge Forward Delay:** A text input field containing "4" with the label "seconds (4-30)".
- Priority:** A text input field containing "32768" with the label "(0-65535)".

At the bottom of the window are two buttons: "Accept" and "Cancel".

- **Spanning Tree Status:** Disabled by default; to turn it on, select **“On”**.
- **Bridge Hello Time:** The hello time is the interval between sending one bridge protocol data unit (BPDU) and the next unit on a port. Type an entry between 1-10 seconds (recommend using the default **“2”**).
- **Bridge Max Age:** Specify the maximum time the W7x can wait before saving its configuration BPDU information. Type an entry between 6-40 seconds (recommend using the default **“20”**).
- **Bridge Forward Delay:** The forward delay is the amount of time the W7x will spend in listening and learning states. Type an entry between 4-30 seconds (recommend using the default **“4”**).
- **Priority:** Assign a priority for the W7x in the Spanning Tree Protocol hierarchy. Type a number between 0-65535 (recommend using the default **“32768”** unless you have Spanning Tree enabled on any switches in the path between the W7x and the router, then you would want the W7x’s Priority to be larger than any of the switches).

SNMP SETTINGS

In the main menu of the W7x, in the Network section, click **“SNMP Settings”**. The SNMP Settings page appears, where you can enter a community name and password to manage the W7x device remotely, using an SNMP client.

SNMP Settings

SNMP	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Contact	<input type="text"/>
Location	<input type="text"/>
Community Name (Read Only)	public
Community Name (Read/Write)	private
Trap Destination Address	0.0.0.0
Trap Destination Community Name	public
SNMPv3	<input type="radio"/> v3Enable <input checked="" type="radio"/> v3Disable
User Name (1-31 Characters)	pakedge
Authorization Protocol	MD5 ▾
Authorization Key (8-32 Characters)	pakedgea
Privacy Protocol	DES ▾
Privacy Key (8-32 Characters)	pakedgea
Engine ID	<input type="text"/>

Apply Cancel

- **Enable/Disable:** To manage the W7x remotely using an SNMP manager, select “**Enable**”.
- **Contact:** Enter the contact information for the SNMP manager.
- **Location:** Enter the location of the W7x for reference by the SNMP manager.
- **Community Name (Read only):** Type the password for read-only access to the SNMP community.
- **Community Name (Read/Write):** Type the password for read/write access to the SNMP community.
- **Trap Destination Address:** Type the IP address to receive SNMP traps.
- **Trap Destination Community Name:** Type the password of the SNMP trap community.
- **SNMPv3:** Select **v3Enable** for added encryption, if your manager supports SNMPv3.
- **User Name:** Enter the user name for the SNMP manager with permission to access the W7x.
- **Authorization Protocol:** Select the encryption type that the SNMP manager is using for the login information.
- **Authorization Key:** Enter the pass key that the SNMP manager will use to login to the W7x’s SNMP agent.
- Click “**Apply**” to save your settings.

MODE-SPECIFIC SETUP

This section describes the settings for your W7x in the three available modes:

- Access Point
- Client Bridge
- Repeater

ACCESS POINT MODE

The options in the main menu of the W7x change depending on the current operating mode of the W7x. The main menu options discussed in this chapter are those available in Access Point mode.

In this mode, the W7x simultaneously broadcasts a Wi-Fi signal on both a 2.4GHz and 5GHz that clients can associate with. As shown in the figure below.

Wireless Access Point Mode



2.4GHZ AND 5GHZ WIRELESS



On the W7x main menu, the Wireless section includes the following four options, which will be described in detail in the sections that follow:

- Network Settings
- Wireless MAC filter
- Advanced
- Client List

NETWORK SETTINGS

In the W7x main menu, click “**Network Settings**” to begin configuring your W7x network settings, including the following options: wireless mode, channel, channel width, VLAN Tagging, SSID name and Security. The Network Settings screen appears:

2.4GHz / Wireless Network Settings

802.11 Mode: 802.11 B/G/N Mixed

Channel Mode: 20/40MHz

Channel: Ch1 Auto

Detect Best Channel:

Current Profiles					
SSID	Security	VLAN ID	Enable	Edit	
Pakedge1-2.4GHz	None	1	<input checked="" type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge2-2.4GHz	None	2	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge3-2.4GHz	None	3	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge4-2.4GHz	None	4	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge5-2.4GHz	None	5	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge6-2.4GHz	None	6	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge7-2.4GHz	None	7	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge8-2.4GHz	None	8	<input type="checkbox"/>	<input type="button" value="Edit"/>	

5GHz / Wireless Network Settings

802.11 Mode: 802.11 A/N Mixed

Channel Mode: 20/40MHz

Channel: Ch36 Auto

Detect Best Channel:

Current Profiles					
SSID	Security	VLAN ID	Enable	Edit	
Pakedge1-5GHz	None	1	<input checked="" type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge2-5GHz	None	2	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge3-5GHz	None	3	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge4-5GHz	None	4	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge5-5GHz	None	5	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge6-5GHz	None	6	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge7-5GHz	None	7	<input type="checkbox"/>	<input type="button" value="Edit"/>	
Pakedge8-5GHz	None	8	<input type="checkbox"/>	<input type="button" value="Edit"/>	

- **802.11 Mode:** Choose the setting that corresponds to the type of wireless clients connected to your network: **B, G, N, B/G or B/G/N** (on the 2.4GHz) or **A, N or A/N** (on the 5GHz). If you aren't sure which type(s) of clients will access the wireless networks, it's recommended to choose **B/G/N Mixed** (on the 2.4GHz) or **A/N Mixed** (on the 5GHz) for best performance.
NOTE: When set to a mixed mode ALL devices connected to the wireless will use the mode that is compatible for ALL devices. Example – If you have the 2.4GHz Wireless set to B/G/N Mixed and a devices connects using G, all devices will be connected at G speed.
- **Channel Mode:** By default, the “**Channel Mode**” is set to 20/40MHZ (when using N). Selecting the 40MHz channel mode will allow for a greater overall throughput of data but it will also increase the size of the channel.
NOTE: When using 20MHz channel width on the 2.4GHz radio, channel 6 would bleed into channels 4, 5, 7 and 8 giving you three non-overlapping channels (1, 6 and 11). When using 40MHz channel width on the 2.4GHz radio, channel 6 would bleed into channels 2, 3, 4, 5, 7, 8, 9, and 10 giving you only one channel without overlap.
- **Channel:** In the default setting (**Auto**), the W7x automatically associates to the channel with best performance for the wireless network. To select a channel manually, uncheck the “**Auto**” box and select a channel from the drop-down list. The channel options on the list depend on the selected country's regulations.
- **Detect Best Channel:** Click “**Scan**” to perform an automatic site survey. A new window will open and display the site survey utility. The W7x will scan the frequency for devices currently broadcasting their SSID, and then will display them in the table.
- **Current Profiles:** You can configure up to eight wireless profiles, per band, each with its own VLAN ID. To modify and activate a profile check “**Enable**” and then click “**Edit**” to configure the settings.
- **SSID:** The SSID is the name associated with the W7x WIFI network. By default, the SSID is broadcast on the network for easy association by clients. An SSID cannot exceed 32 characters.
- **VLAN ID:** Type the VLAN ID associated with this profile if the SSID will be broadcasting a VLAN other than 1.
- **802.1Q Tagging:** Check if you are using any VLAN other than 1 on this SSID.

2.4GHz / SSID Profile

Wireless Setting

SSID

VLAN ID

802.1q Tagging

Suppressed SSID

Station Separation Enable Disable

Wireless Security

Security Mode

5GHz / SSID Profile

Wireless Setting

SSID

VLAN ID

802.1q Tagging

Suppressed SSID

Station Separation Enable Disable

Wireless Security

Security Mode

- **Suppressed SSID:** If you don't want the SSID to be broadcast, check this box. With the SSID suppressed, wireless clients will not be able to scan for this network in a site survey and will need to manually enter the information to connect.

- **Station Separation:** If you enable this option, clients that connect to this access point will no longer be able to communicate directly with each other. (This is also known as layer 2 isolation.)
- **Wireless Security – Type:** Security is disabled by default. To enable wireless security, select an option from the drop-down menu. For detailed information on configuring the security features of the W7x, such as WPA, WPA-PSK, WPA Mixed, WPA-PSK Mixed, WPA2, and WPA2-PSK, see the next section. When you select a wireless security option from the drop-down menu, the configuration options for that mode appear on the page. (For details on setting the security options, see the next section.)
- Click **“Save”** to update your changes. The **SSID profile** window will close and you need to click on **“Accept”** under the **Network Settings** to update the configuration.

NOTE: For any changes to take effect, you must click the **“Save Changes”** button on the lower left below the menu. This will reboot the access point, applying the configuration changes.

WIRELESS SECURITY

When you select a wireless security **Type**, as described at the end of the previous section, the configuration options for that mode appear (See the figure below). The following sections describe the available options, depending on the type of security you have chosen.

WEP

In the SSID Profile page, under **Wireless Security**, choose a wireless security protocol **Type** from the drop-down list. For example, if your wireless network uses WEP encryption, choose **WEP** from the drop-down list. (WEP is an acronym for Wired Equivalent Privacy, a protocol that offers the same level of security for wireless networks as for wired networks.)

The screenshot displays the 'SSID Profile' configuration window. It is divided into several sections:

- Wireless Setting:** Includes fields for SSID (set to 'Pakedge1', with a note '(1 to 32 characters)'), VLAN ID (set to '1', with a note '(1~4094)'), and a checkbox for 'Suppressed SSID' which is currently unchecked.
- Station Separation:** Features two radio buttons: 'Enable' (unchecked) and 'Disable' (checked).
- Wireless Security:** This section is expanded to show WEP settings:
 - Security Mode:** A dropdown menu set to 'WEP'.
 - Auth Type:** A dropdown menu set to 'Open System'.
 - Input Type:** A dropdown menu set to 'Hex'.
 - Key Length:** A dropdown menu set to '40/64-bit (10 hex digits or 5 ASCII char)'.
 - Default Key:** A dropdown menu set to '1'.
 - Key1, Key2, Key3, Key4:** Four empty text input fields for entering the WEP keys.

At the bottom of the window, there are 'Save' and 'Cancel' buttons.

- **Auth Type:** In the drop-down list, choose an authentication method. The options are **Open System** or **Shared Key**.
 - If you choose **Open System**, any client will be able to authenticate, as long as it conforms to any MAC address filter policies you have set. In an open system, authentication packets are sent without encryption.
 - If you choose **Shared Key**, the W7x sends a challenge text string (unencrypted) to devices that try to communicate with the access point. The device that requests authentication encrypts the challenge text and returns it to the access point. If the challenge text is correctly encrypted, the access point authenticates the requesting device.

If you don't know which authentication type will be used, it's recommended to select **Auto**.

- **Input Type:** Select **Hex** or **ASCII**.
- **Key Length:** Choose a key length. 64-bit hex keys require 10 characters, and 128-bit keys require 26 characters. (A hexadecimal key is in the format of a number between 0 through 9, and a letter between A and F.)
- **Default Key:** You can specify 1-4 keys for up to four networks. Type the number of the key to be used by default.
- **Keys 1-4:** You can enter up to four unique WEP keys.
- Click **Save** to apply the changes. The **SSID profile** window will close and you need to click on **Accept**, under the **Network Settings** window, for the changes to take effect.

WPA-PSK, WPA2-PSK

When you select a wireless security **Type**, the configuration options for that mode appear.

WPA (Wi-Fi Protected Access) improves on the security features of WEP (Wired Equivalent Privacy). WPA technology can work with existing Wi-Fi products that are enabled with WEP. WPA improves data encryption using the Temporal Key Integrity Protocol (TKIP), which scrambles the encryption keys using a hashing algorithm, and adds integrity checking to ensure that keys haven't been tampered with.

If your wireless network uses WPA security **with a pre-shared key (PSK)**, select **WPA-PSK** or **WPA2-PSK** from the **Type** drop-down list. If your network doesn't use a PSK, see the following section.

SSID Profile

Wireless Setting

SSID: Pakedge1 (1 to 32 characters)

VLAN ID: 1 (1~4094)

Suppressed SSID:

Station Separation: Enable Disable

Wireless Security

Security Mode: WPA-PSK

Encryption: Both(TKIP+AES)

Passphrase: (8 to 63 characters) or (64 Hexadecimal characters)

Group Key Update Interval: 3600 seconds(30~3600, 0: disabled)

Save Cancel

- **Encryption:** In the drop-down list, select the type of encryption your wireless network uses: **TKIP**, **AES** or both. For Apple products, **AES** works best.
- **Passphrase:** In the text box, type a passphrase of 8-63 characters to be shared by the Access Points and clients in your network.
- **Group Key Update Interval:** In the text box, type the number of seconds the Access Point will wait to probe the client for a passphrase.
- Click **“Save”** to apply the changes. The **SSID profile** window will close and you need to click on **“Accept”**, under the **Network Settings** window, for the changes to take effect.

WPA, WPA2

When you select a wireless security **Type** in the SSID Profile page, the configuration options for the security mode you chose appear at the bottom of the page.

If your wireless network uses WPA security **without a pre-shared key (PSK) (also known as Enterprise)**, select **WPA** or **WPA2** from the **Type** drop-down list. The options for WPA and WPA2 appear at the bottom of SSID Profile page.

SSID Profile

Wireless Setting

SSID: Pakedge1 (1 to 32 characters)

VLAN ID: 1 (1~4094)

Suppressed SSID:

Station Separation: Enable Disable

Wireless Security

Security Mode: WPA

Encryption: Both(TKIP+AES)

Radius Server: . . .

Radius Port: 1812

Radius Secret:

Group Key Update Interval: 3600 seconds(30~3600, 0: disabled)

Save Cancel

- **Encryption:** In the drop-down list, select the type of encryption your wireless network uses: **TKIP**, **AES** or both. For Apple products, **AES** works best.
- **RADIUS Server:** Type the IP address of the RADIUS server.
- **RADIUS Port:** Type the port number of the RADIUS server. (The most common default is 1812.)
- **RADIUS Secret:** Type the shared password of the RADIUS server.
- **Group Key Update Interval:** Type the number of seconds (between 30-3600) that the Access Point should wait before probing the client for the secret group key.
- Click **Save** to apply the changes. The **SSID profile** window will close and you need to click on **Accept** under the **Network Settings** window for the changes to take effect.

WIRELESS MAC FILTER

Under the W7x main menu, in the Wireless section, click **MAC Filter**. The Wireless MAC Filter page appears for you to allow or block access to the network by clients with specific MAC addresses.

2.4GHz / Wireless MAC Filter

ACL Mode: Disabled

Number	MAC Address
	<input type="text"/> : <input type="text"/> <input type="button" value="Add"/>

- ACL Mode:** To block a client from associating with the W7x, select **Disabled** from the drop-down list. Or to deny or allow access by clients with a MAC that you type in a list, select **Allow MAC in the List** or **Deny MAC in the List** in the drop-down list.
 - If you select **Allow MAC in the List**, only clients whose MAC addresses are on the list in the table will be able to access the network, and other clients will be blocked.
 - If you select **Deny MAC in the List**, clients whose MAC addresses are on the list will be unable to access the network, but all other clients will be granted access.
- MAC Address:** In the text box, type a client’s MAC address and click “**Add**” to add the client to the list.
- The table at the bottom of the page lists MAC addresses you have blocked or allowed. To delete selected MAC addresses, or delete all the addresses in the table, select the address (es) in the list and click **Delete**.
- Click **Accept** to save your changes.

ADVANCED

You can configure the performance of your wireless network by changing the **Data Rate**, **Transmit Power**, and **RTS/CTS Threshold**.

2.4GHz / Advanced

Data Rate: Auto

Transmit Power: 29 dBm

RTS/CTS Threshold (1 - 2346): 2346 bytes

5GHz / Advanced

Data Rate Auto ▾

Transmit Power 26 dBm ▾

RTS/CTS Threshold (1 - 2346) 2346 bytes

- **Data Rate:** From the drop-down list, choose the data transmission rate for the device (It is set to Auto by default.)
- **Transmit Power:** The power needed depends on the distance of the devices in your wireless network. From the drop-down list, select the desired power. You can use this feature to limit the coverage area of the wireless network.
- **RTS/CTS Threshold:** Type the packet size threshold for RTS/CTS (Request to Send/Clear to send) to occur.

CLIENT LIST

The **Client List** menu appears only when the W7x is operating under Access Point mode or repeater mode. This menu will show all the devices connected to the W7x. From the **Client List**, you can click on **“Block”** and this will prevent the device from connecting.

NOTE: If you want to block a device from connecting on both the 2.4GHz and 5GHz band, then you must click on **“Block”** under both the 2.4GHz and 5GHz client list.

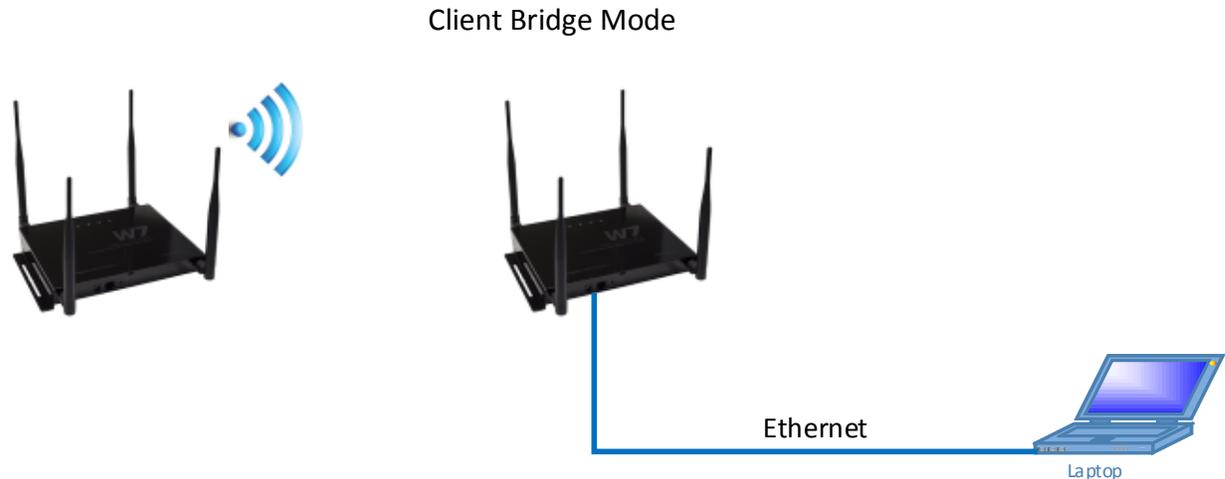
2.4GHz / Client List					
SSID:#	MAC Address	TX(Bytes)	RX(Bytes)	RSSI(dBm)	Deny Access
<div style="border: 1px solid #ccc; padding: 2px; width: fit-content;">Refresh</div>					

5GHz / Client List					
SSID:#	MAC Address	TX(Bytes)	RX(Bytes)	RSSI(dBm)	Deny Access
<div style="border: 1px solid #ccc; padding: 2px; width: fit-content;">Refresh</div>					

CLIENT BRIDGE MODE

NOTE: The options in the main menu of the W7x change depending on the current operating mode of the W7x. The main menu options discussed in this section are those available in Client Bridge mode.

In this mode, you can connect one W7x to a client by its Ethernet port, as shown below. In Client Bridge Mode, the W7x can receive a wireless signal from an Access Point and send the signal through its Ethernet port to a client.



Summary of configuration for Client Bridge Mode

1. First setup the Wireless Access Point that that will be broadcasting to the Client Bridge. This Wireless Access Point is the one broadcasting the Wireless Network you wish to connect the client device to. Setup as usual- i.e. SSID, IP Address, Channel, Security, etc.
2. Connect the W7x to the client and login via your Web Browser.
3. Configure the W7x by selecting **Client Bridge Mode** from the Properties page under the System header.

NOTE: Either the 2.4GHz or the 5GHz band can be in Client Bridge mode. They cannot both be in Client-Bridge mode. That's why when you set one of the Bands to Client Bridge, the only available option for the other is **Access Point** mode only.

4. Under **Wireless (2.4GHz or 5GHz, depending on which band was selected to be in Client Bridge)**, click on **Network Settings**. If you know the SSID you want the client-bridge to associate with, you can type it under "**Specify the static SSID**". For easier setup, click on "**Site Survey**" and a list of available SSID's will show up and you can select the appropriate one.
5. Configure the "**Wireless Security**" to match those on the SSID the client bridge is associated with.
6. Click **Accept** to apply the changes.

2.4GHz / Wireless Network Settings

802.11 Mode

Specify the static SSID :
 SSID (1 to 32 characters)
 Or press the button to search for any available WLAN Service.

Preferred BSSID : : : : :

Wireless Security

Changing the wireless security settings may cause this wireless client to associate with a different one. This may temporarily disrupt your configuration session.

Security Mode

7. Finish the configuration of the W7x in Client Bridge Mode by assigning it a unique IP address if it is not connected to a DHCP server.
8. You should be able to verify performance from the client device by sending a ping request to the IP address of the Wireless Access Point or by accessing the GUI through your Web Browser at the same address.

For more detailed setup information on setting up the W7x in Client-Bridge mode see below.

2.4GHZ AND 5GHZ WIRELESS



With the W7x operating in Client Bridge mode, the main menu shows two options under the Wireless section:

- Network Settings
- Advanced
- Connection Status

NETWORK SETTING

2.4GHz / Wireless Network Settings

802.11 Mode 802.11 B/G/N Mixed ▾

Specify the static SSID :
 SSID (1 to 32 characters)
 Or press the button to search for any available WLAN Service.

Preferred BSSID : : : : :

Wireless Security

Changing the wireless security settings may cause this wireless client to associate with a different one. This may temporarily disrupt your configuration session.

Security Mode Disabled ▾

- 802.11 Mode:** Choose the setting that corresponds to the type of wireless clients connected to your network: **B, G, N, B/G or B/G/N** (on the 2.4GHz) or **A, N or A/N** (on the 5GHz). If you aren't sure which type(s) of clients will access the wireless networks, it's recommended to choose **B/G/N Mixed** (on the 2.4GHz) or **A/N Mixed** (on the 5GHz) for best performance.

NOTE: When set to a mixed mode ALL devices connected to the wireless will use the mode that is compatible for ALL devices. Example – If you have the 2.4GHz Wireless set to B/G/N Mixed and a devices connects using G, all devices will be connected at G speed.
- SSID:** If you know the SSID you want the client bridge to associate with, you can type it under **Specify the static SSID**. For easier setup, click on **"Site Survey"** and a list of available SSID's will show up and you can select the appropriate one.
- Site Survey:** Click **"Site Survey"** to perform an automatic site survey. A new window will display the results of the site survey. (See the figure below.) The W7x will scan the 2.4GHz frequency for devices currently broadcasting their SSIDs, and display them in the 2.4GHz Site Survey table shown below. In the table, click the **BSSID** of the Access Point you wish to connect to.
- Click **"Refresh"** to re-scan the frequency.

2.4GHz / Site Survey							
2GHz Site Survey							
BSSID	SSID	Channel	Signal Level	Type	Security	Mode	
90:A7:C1:07:0E:F8	C3612-1-2.4GHz	1	-50 dBm	11g/n	WPA-PSK		i
12:A7:C1:07:0E:FA	C36-Guest-2.4GHzJaber	6	-49 dBm	11g/n	WPA2-PSK		i
00:1D:7E:E2:E5:76	Meritage	1	-72 dBm	11g/n	WPA/WPA2-PSK		i
00:02:6F:54:B2:35	Pakedge	3	-58 dBm	11b/g	WPA-PSK		i
00:3F:0E:A7:A4:64	Ricoh	1	-87 dBm	11b/g	WPA/WPA2-PSK		i
1C:AF:F7:2F:3D:F8	OMInternal	1	-79 dBm	11g/n	WPA/WPA2-PSK		i
30:85:A9:39:E4:70	socalreps	1	-70 dBm	11g/n	WPA/WPA2-PSK		i
A2:A7:C1:07:0E:F8	C36-Guest-2.4GHzJaber	1	-51 dBm	11g/n	WPA2-PSK		i
92:A7:C1:07:0E:F8	C3612-2-2.4GHz	1	-50 dBm	11g/n	WPA2-PSK		i
A2:A7:C1:07:0E:E2	C36-Guest-2.4GHz	6	-72 dBm	11g/n	WPA2-PSK		i
92:A7:C1:07:0E:DC	15012W72.4-1	6	-60 dBm	11g/n	WPA2-PSK		i

- **Preferred BSSID:** If you want the W7x to associate based on MAC Address instead of SSID, select the “Preferred BSSID” checkbox.
- **Wireless Security:** Configure the security settings to match those on the SSID the client bridge is associated with.
- **Security Mode:** If your wireless network uses WEP encryption, select **WEP** from the drop-down list. The Wireless Security page displays options for WEP encryption.

Wireless Security

Changing the wireless security settings may cause this wireless client to associate with a different one. This may temporarily disrupt your configuration session.

Security Mode:

Auth Type:

Input Type:

Key Length:

Default Key:

Key1:

Key2:

Key3:

Key4:

- **Auth Type:** In the drop-down list, select an authentication method. The options are **Open System**, **Shared Key**, and **Auto**.
 - If you choose **Open System**, any client will be able to authenticate, as long as it conforms to any MAC address filter policies you’ve set. Authentication packets are transmitted unencrypted.
 - Choosing **Shared Key** enables the W7x to send an unencrypted challenge text string to a device that attempts to communicate with the W7x. The device requesting authentication will encrypt the challenge text and return it to the W7x. If the challenge text is correctly encrypted, the W7x allows the requesting device to authenticate.
 - If you are unsure which authentication type to use, it’s recommended to choose **Auto**.
- **Input Type:** From the drop-down list, select **Hex** or **ASCII**.

- **Key Length:** From the drop-down list, select a key format. 64bit-hex keys require 10 characters; 128-bit keys require 26 characters. A hex key is formatted in hexadecimal notation as a number between 0-9 followed by a letter between A-F.
- **Default Key:** From the drop-down list, select the number of the key to be used; you can define four keys (Key1...Key4) in the text boxes.
- **Key 1-4:** Enter up to four unique WEP keys.
- Click **Accept** to apply the changes. The **SSID profile** window will close and you need to click on **Accept** under the **Network Settings** window for the changes to take effect.
- **Security Mode:** If your wireless network uses a WPA pre-shared key, select **WPA-PSK** or **WPA2-PSK** from the drop-down list.

Wireless Security

Changing the wireless security settings may cause this wireless client to associate with a different one. This may temporarily disrupt your configuration session.

Security Mode: WPA-PSK

Encryption: TKIP

Passphrase: (8 to 63 characters) or (64 Hexadecimal characters)

Accept Cancel

- **Encryption:** In the drop-down list, select the type of encryption your wireless network uses: **TKIP** or **AES**.
- **Passphrase:** In the text box, type a passphrase of 8-63 characters that will be shared among the Access Points and clients.
- Click **Apply** to save your changes.

ADVANCED

You can configure the performance of your wireless network by changing the Data Rate, Transmit Power, and RTS/CTS Threshold.

2.4GHz / Advanced

Data Rate	Auto
Transmit Power	29 dBm
RTS/CTS Threshold (1 - 2346)	2346 bytes

CONNECTION STATUS

The **Connection Status** menu appears only when the W7x is operating under Repeater mode or Client-Bridge mode.

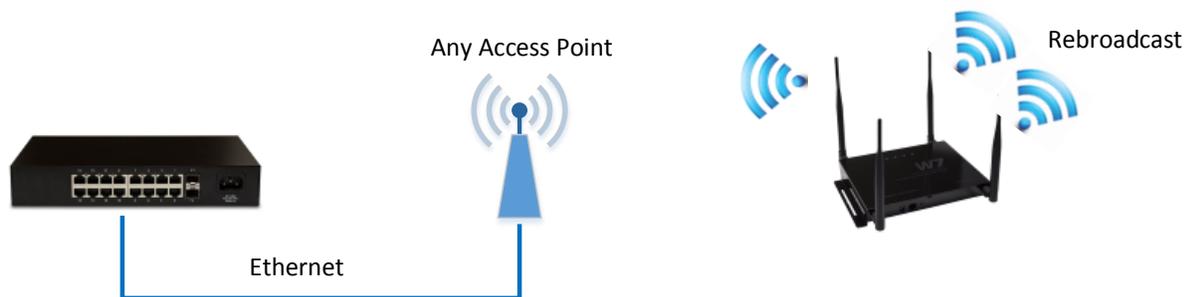
2.4GHz / Connection Status

Network Type	Client Bridge
SSID	AP SSID
BSSID	90:A7:C1:07:0E:E6
Connection Status	Associated
Wireless Mode	IEEE 802.11b/g/n Mixed
Current Channel	2.437 GHz(Channel 6)
Security	None
Tx Data Rates(Mbps)	1 Mbps
Current noise level	-95 dBm
Signal strength	-96 dBm

REPEATER MODE

NOTE: The options in the main menu of the W7x change depending on the current operating mode of the W7x. The main menu options discussed in this chapter are those available in Repeater mode.

In **Repeater** mode, the W7x can associate with any Wireless Access Point, as shown in the figure below.



Summary of configuration for Repeater Mode:

1. First setup the initial Access Point that will be broadcasting the Wireless Network you wish to associate the W7x with. Setup as usual- i.e. SSID, IP Address, Channel, Security, etc. For simplicity, we will refer to this AP as AP-1.
2. Connect the 2nd AP, which we will call AP-2 to the LAN and login via your Web Browser.
3. Configure AP-2 by selecting **Repeater** Mode from the Properties page under the System header.
4. Now configure the SSID, Channel, and Security settings to match those of AP-1.
5. Finish the configuration of the W7x in Repeater Mode by assigning it a unique IP address, if it is not connected to a DHCP server.
6. You should be able to verify performance from the client device by sending a ping request to the IP address of the W7x or accessing the GUI through your Web Browser at the same address.

For more detailed setup information for setting up the W7x in **Repeater** mode see below.

2.4GHZ AND 5GHZ WIRELESS

2.4GHz Wireless

- Network Settings
- Wireless MAC Filter
- Advanced
- Client List
- Connection Status

In Repeater mode, the W7x main menu has the following options, to be described in detail in the sections that follow.

- Network Settings
- Wireless MAC Filter
- Advanced
- Client List
- Connection Status

NETWORK SETTINGS

2.4GHz / Wireless Network Settings

802.11 Mode 802.11 B/G/N Mixed ▼

Specify the static SSID :

SSID (1 to 32 characters)

Or press the button to search for any available WLAN Service.

Repeater SSID (1 to 32 characters)

Preferred BSSID : : : : :

Wireless Security

Changing the wireless security settings may cause this wireless client to associate with a different one. This may temporarily disrupt your configuration session.

Security Mode Disabled ▼

- **802.11 Mode:** Choose the setting that corresponds to the type of wireless clients connected to your network: **B, G, N, B/G or B/G/N** (on the 2.4GHz) or **A, N or A/N** (on the 5GHz). If you aren't sure which type(s) of clients will access the wireless networks, it's recommended to choose **B/G/N Mixed** (on the 2.4GHz) or **A/N Mixed** (on the 5GHz) for best performance.
- **NOTE:** When set to a mixed mode ALL devices connected to the wireless will use the mode that is compatible for ALL devices. Example – If you have the 2.4GHz Wireless set to B/G/N Mixed and a devices connects using G, all devices will be connected at G speed.
- **SSID:** SSID is the name the W7x will broadcast over the wireless network to identify the Access Point. You can set the SSID in either of two ways: type a name in the “Specify the static SSID:” text box (maximum length 32 characters), or click “Site Survey” to perform an automatic Site Survey. A new window will display the site survey utility. The W7x will scan the 2.4GHz frequency for devices currently broadcasting

their SSID and display them in the 2.4GHz Site Survey table (see figure below). In the table, click the **BSSID** of the Access Point you wish to connect to.

- Click “**Refresh**” to re-scan the frequency.

2.4GHz / Site Survey

2GHz Site Survey

BSSID	SSID	Channel	Signal Level	Type	Security	Mode
90:A7:C1:07:12:92	Pakedge1-2.4G	1	-74 dBm	11g/n	none	i
F2:A7:C1:07:12:8A		6	-58 dBm	11g/n	none	i
92:A7:C1:07:12:8A	Pakedge2-2.4GHz	6	-55 dBm	11g/n	none	i
B2:A7:C1:07:12:8A	Pakedge4-2.4GHz	6	-57 dBm	11g/n	none	i
C2:A7:C1:07:12:8A	Pakedge5-2.4GHz	6	-58 dBm	11g/n	none	i
D2:A7:C1:07:12:8A	Pakedge6-2.4GHz	6	-57 dBm	11g/n	none	i
E2:A7:C1:07:12:8A	Pakedge7-2.4GHz	6	-58 dBm	11g/n	none	i
02:A7:C1:07:12:8A		6	-58 dBm	11g/n	none	i

- **Preferred BSSID:** If you want the W7x to associate based on MAC Address instead of SSID, select the checkbox and type a MAC address in the spaces provided.
- **Security Mode:** If your wireless network uses WEP encryption, select **WEP** from the drop-down list. The Wireless Security page will display options for WEP encryption.

Wireless Security

Changing the wireless security settings may cause this wireless client to associate with a different one. This may temporarily disrupt your configuration session.

Security Mode:

Auth Type:

Input Type:

Key Length:

Default Key:

Key1:

Key2:

Key3:

Key4:

- **Auth Type:** In the drop-down list, select an authentication method. The options are **Open System**, **Shared Key**, and **Auto**.
 - If you choose **Open System**, any client will be able to authenticate, as long as it conforms to any MAC address filter policies you’ve set. Authentication packets are transmitted unencrypted.
 - Choosing **Shared Key** enables the W7x to send an unencrypted challenge text string to a device that attempts to communicate with the W7x. The device requesting authentication will encrypt the challenge text and return it to the W7x. If the challenge text is correctly encrypted, the W7x allows the requesting device to authenticate.
 - If you are unsure which authentication type to use, it’s recommended to choose **Auto**.
- **Input Type:** From the drop-down list, select **Hex** or **ASCII**.

- **Key Length:** From the drop-down list, select a key format. 64bit-hex keys require 10 characters; 128-bit keys require 26 characters. A hex key is formatted in hexadecimal notation as a number between 0-9 followed by a letter between A-F.
- **Default Key:** From the drop-down list, select the number of the key to be used; you can define four keys (Key1...Key4) in the text boxes.
- **Key 1-4:** Enter up to four unique WEP keys.
- Click **Accept** to apply the changes. The **SSID profile** window will close and you need to click on **Accept** under the **Network Settings** window for the changes to take effect.
- **Security Mode:** If your wireless network uses a WPA pre-shared key, select **WPA-PSK** or **WPA2-PSK** from the drop-down list.

- **Encryption:** In the drop-down list, select the type of encryption your wireless network uses: **TKIP** or **AES**.
- **Passphrase:** In the text box, type a passphrase of 8-63 characters that will be shared among the Access Points and clients.
- Click **Accept** to apply the changes. The **SSID profile** window will close and you need to click on **Accept** under the **Network Settings** window for the changes to take effect.

WIRELESS MAC FILTER

On the W7x's main menu, in the Wireless section, click **Wireless MAC Filter**. The Wireless MAC Filter page appears where you can allow or block access to the network by clients with specific MAC addresses.

- **ACL Mode:** To block a client from associating with the W7x, or to deny or allow access by a client with a MAC on a list, select the appropriate option from the drop-down list.

- If you select **Allow MAC in the List**, only clients whose MAC addresses are on the list in the table will be able to access the network; other clients will be blocked.
- If you select **Deny MAC in the List**, clients whose MAC addresses are on the list will be unable to access the network; but all other clients will be granted access.
- **MAC Address:** In the text boxes, type a client’s MAC address, then click **Apply** to add the client to the list.
- The table at the bottom of the dialogue lists the MAC address you have blocked or allowed. To delete selected MAC addresses or delete all the addresses in the table, select the address (es) in the list and click **Delete**.
- Click **Apply** to save your changes.

ADVANCED

You can configure the performance of your wireless network by changing the Data Rate, Transmit Power, and RTS/CTS Threshold.

2.4GHz / Advanced

Data Rate Auto ▼

Transmit Power 29 dBm ▼

RTS/CTS Threshold (1 - 2346) 2346 bytes

CLIENT LIST

The **Client List** menu appears only when the W7x is operating under Access Point mode or repeater mode. This menu will show all the devices connected to the W7x. From the **Client List**, you can click on **“Block”** and this will prevent the device from connecting.

NOTE: If you want to block a device from connecting on both the 2.4GHz and 5GHz band, then you must click on **“Block”** under both the 2.4GHz and 5GHz client list.

2.4GHz / Client List

SSID:#	MAC Address	TX(Bytes)	RX(Bytes)	RSSI(dBm)	Deny Access
<input type="button" value="Refresh"/>					

CONNECTION STATUS

The **Connection Status** menu appears only when the W7x is operating under Repeater mode or Client-Bridge mode.

2.4GHz / Connection Status	
Network Type	Repeater
SSID	AP SSID
BSSID	90:A7:C1:07:0E:E6
Connection Status	Associated
Wireless Mode	IEEE 802.11b/g/n Mixed
Current Channel	2.437 GHz(Channel 6)
Security	None
Tx Data Rates(Mbps)	1 Mbps
Current noise level	-95 dBm
Signal strength	-96 dBm

LOG & MANAGEMENT

Log & Management

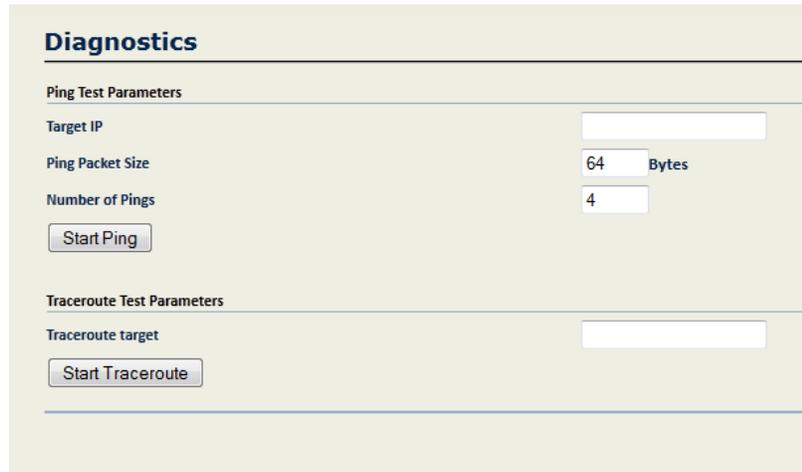
- Diagnostics
- VLAN Management
- Wireless Traffic Shaping
- Band Steering
- System Log
- Log
- LED Options

The Log & Management menu has the following settings:

- Diagnostics
- VLAN Management
- Wireless Traffic Shaping
- Band Steering
- System Log
- Log
- LED Options

DIAGNOSTICS

If you experience network errors or unresponsive devices, the W7x diagnostic functions can help you determine the cause. To access the diagnostic functions, on the W7x main menu, in the Log & Management section, click **Diagnostics**. The Diagnostics page appears.



The screenshot shows the 'Diagnostics' page with two sections: 'Ping Test Parameters' and 'Traceroute Test Parameters'. The 'Ping Test Parameters' section includes fields for 'Target IP', 'Ping Packet Size' (set to 64 Bytes), and 'Number of Pings' (set to 4), along with a 'Start Ping' button. The 'Traceroute Test Parameters' section includes a 'Traceroute target' field and a 'Start Traceroute' button.

PING TEST PARAMETERS

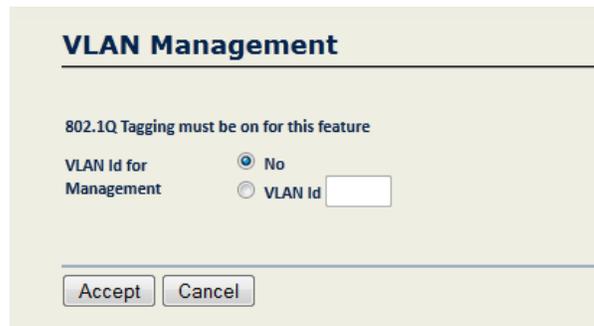
- **Target IP:** Type the IP Address of the device to check.
- **Ping Packet Size:** Type the size of the ping packets (In Bytes).
- **Number of Pings:** Type the number of ping attempts.
- Click **Start Ping** to start the test.

TRACEROUTE TEST PARAMETERS

A Traceroute test can help you identify obstacles you may have in the network. The Traceroute text maps the path that packets take between the W7x and the target device. To run a Traceroute test, type the Traceroute target and click **“Start Traceroute”** to begin the test.

VLAN MANAGEMENT

If you enable VLAN tagging in the W7x Wireless section under any of the SSIDs, you can choose a VLAN Management ID for the W7x to access the administrative functions of your W7x. Let’s say you pick VLAN3 to be the VLAN used for management and the subnet range for VLAN 3 is 192.168.3.X. The IP address for the W7x must be 192.168.3.X, where X is any value in range.



The screenshot shows a dialog box titled "VLAN Management". Below the title, there is a note: "802.1Q Tagging must be on for this feature". Underneath, the text "VLAN Id for Management" is followed by two radio button options: "No" (which is selected) and "VLAN Id" (which is unselected). To the right of the "VLAN Id" option is a small, empty text input box. At the bottom of the dialog box, there are two buttons: "Accept" and "Cancel".

- **VLAN Id for Management:** To turn on VLAN Management, select the **VLAN Id** button.
- In the **VLAN Id** text box, type the ID number of the VLAN you want to allow access to the administrative functions of the W7x. For example, if VLAN3 is used for management, type in 3.
- Click **Accept** to save your changes.

WIRELESS TRAFFIC SHAPING

The **Traffic Shaping** option allows you to limit incoming and outgoing traffic and divide traffic up per percentage across different SSIDs.

NOTE: This feature will not only when the Access Point is in Access Point mode.

Wireless Traffic Shaping

Traffic Shaping Enable Disable

Incoming Traffic Limit kbit/s

2.4GHz Setting

Outgoing Traffic Limit kbit/s

Total Percentage %

SSID #1 : Pakedge1-2.4GHz %

SSID #2 : (Off) %

SSID #3 : (Off) %

SSID #4 : (Off) %

SSID #5 : (Off) %

SSID #6 : (Off) %

SSID #7 : (Off) %

SSID #8 : (Off) %

5GHz Setting

Outgoing Traffic Limit kbit/s

Total Percentage %

SSID #1 : Pakedge1-5GHz %

SSID #2 : (Off) %

SSID #3 : (Off) %

SSID #4 : (Off) %

SSID #5 : (Off) %

SSID #6 : (Off) %

SSID #7 : (Off) %

SSID #8 : (Off) %

BAND STEERING

Band steering allows connected clients to steer from 2.4GHz to 5GHz. It is important to note that the clients must support 5GHz in order for Band Steering to work. Band steering is a very important feature and when enabled, it increases the throughput by reducing the contention for the busy 2.4GHz band resources. Before you enable Band Steering, make sure that you have at least one SSID on the 2.4GHz band that has the same exact settings on the 5GHz band. If you try to enable Band Steering and you do not have matching SSIDs on both bands, you will get an error message and the functionality will not work.

Band Steering

NOTE:

For Band Steering to function properly, at least one SSID on the 2.4GHz Band must have the same exact settings(SSID Name, Security, 802.11 Mode...) on the 5GHz Band.

Enable

SYSTEM LOG

The **System Log** menu option will display logs recorded by the W7x.

Show log type: In the drop-down menu, select a log type. The log types available are: **Debug, Information, Notice, Warning, Error, Critical, Alert, and Emergency.**

System Log

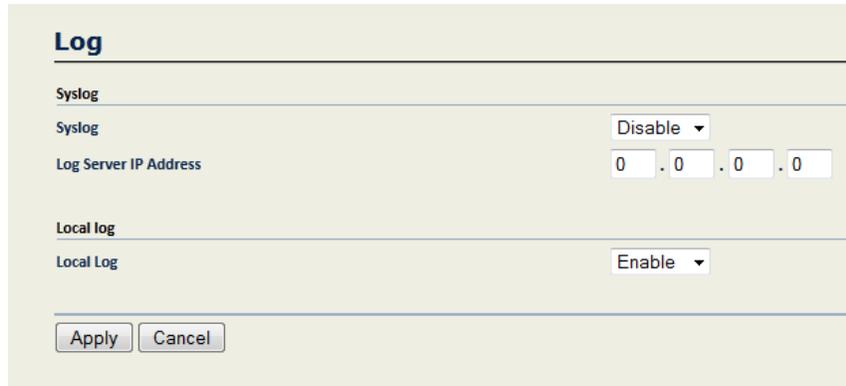
Show log type: All

```
Jun  4 15:11:49 W6x syslog.info syslogd started: BusyBox v1.15.3
```

LOG

While the system log contains a history of events recorded by the W7x device, the management log contains events triggered on the Ethernet and wireless interface. This log is a useful debugging tool when an unknown error occurs on the system, or when you need to send a report to Pakedge technical support.

The **Log** page displays a history of events triggered on the Ethernet and Wireless interface.



Log

Syslog

Syslog

Log Server IP Address . . .

Local log

Local Log

Syslog: Choose to **Enable** or **Disable** the system log.

Log Server IP Address: Type the IP address of the server that will receive the system log.

Local Log: Choose to **Enable** or **Disable** the local log.

Click **Apply** to save your changes.

LED OPTIONS

This menu will allow you to turn **ON/OFF** the LEDs for Power, Ethernet and Wireless.



LED Options

Power ON OFF

LAN ON OFF

2.4GHz ON OFF

5GHz ON OFF

APPENDIX A – SPECS

HARDWARE SPECIFICATIONS

- 1 x 10/100/1000 Gigabit Ethernet RJ-45 port with IEEE 802.3af Power over Ethernet (PoE) support
- Configurable LED Indicators for Power, Ethernet, 2.4GHz Wireless and 5GHz Wireless
- Power over Ethernet (PoE) IEEE802.3af compliant 48 VDC / 0.375A
- Power Supply: 100 to 240 VDC \pm 10%, 50/60 Hz (depends on different countries)
- DC input: 12V/2A

RF INFORMATION

- Frequency Band:
 - 802.11 B/G/N on 2.4 to 2.462GHz, which can be programmed based on country regulations.
 - 802.11 A/N on 5 to 5.805GHz, which can be programmed based on country regulations.
- Operating Channels:
 - 2.4GHz - 11 for North America, 13 for Europe, 14 for Japan
 - 5GHz – 24 Channels depending on country
- Transmit Power (Typical):
 - 802.11a (5.180 ~ 5.805GHz) up to 26dBm
 - 802.11b (2.412 ~ 2.462GHz) up to 29dBm
 - 802.11g (2.412 ~ 2.462GHz) up to 29dBm
 - 802.11n (2.412 ~ 2.462GHz, 5.180 ~ 5.805GHz) up to 26dBm
- Receiver Sensitivity (Typical):
 - 802.11a (5.180 ~ 5.805GHz) up to -93dBm
 - 802.11b (2.412 ~ 2.472 GHz) up to -98 dBm
 - 802.11g (2.412 ~ 2.472 GHz) up to -93 dBm
 - 802.11n (2.412 ~ 2.472 GHz, 5.180 ~ 5.805GHz) up to -93 dBm

OPERATIONS

- Operation Modes:
 - 2.4/5GHz Have independent operation modes.
 - Access Point/Client Bridge/WDS Bridge/WDS AP/Repeater
- Up to 16 SSID
- Supports 802.1q VLANs
- Spanning Tree Supports 802.1d Spanning Tree Protocol
- IP Auto-configuration – DHCP client
- Transmission rate options:

- 2.4GHZ – N ONLY, B/G/N MIX, B ONLY, G ONLY
- 5GHZ – N ONLY, A/N MIX, A ONLY

MANAGEMENT AND SECURITY

- User Power Control Adjustment by dBm
- Web-based configuration (HTTP)/Telnet
- Upgrade firmware via web browser
- Reset Button: to reboot (press 1 second); to reset to Factory Default (press and hold for 10 second)
- System Monitoring Statistic and Event log
- Traffic Measurement Per interface
- Auto-channel Selects least congested channel
- Bandwidth management
- Backup & Restore settings through Web interface
- QoS WMM
- WEP/WPA/WPA2/ WPA MIXED Encryption
- WPA-PSK using TKIP or AES / WPA-EAP using TKIP
- 802.1x Authenticator
- SSID broadcast enable/disable
- MAC Address Filter
- WLAN L2 Isolation (AP mode only)
- Wireless Client connected list

ENVIRONMENT

- Temperature Range: 0 to 50° C (32° to 122° F)
- Storage: -20 to 60° C (-4° to 140° F)
- Humidity (non-condensing):
 - Operating: 90% or less
 - Storage: 90% of less

MECHANICAL

- Dimensions – 9.142” x 6.242” x 1.438” (L x W x D)
- Weight – 17.4 oz.
- Housing – 14 gauge anodized aluminum electronic housing.
-

APPENDIX B – TECHNICAL SUPPORT

Please visit our website for up-to-date support information:

Website: www.pakedge.com

Email: support@pakedge.com

CONTACT INFORMATION:

Pakedge Device & Software Inc.

1163 Triton Drive

Foster City, CA 94404

U.S.A

APPENDIX C – LIMITED WARRANTY

MODEL W7X

Congratulations on your purchase of a Pakedge Device & Software wireless product! Pakedge designs and manufactures the finest home networking products. With proper installation, setup, and care, you should enjoy many years of unparalleled performance. Please read this consumer protection plan carefully and retain it with your other important documents.

This is a LIMITED WARRANTY as defined by the U.S. Consumer Product Warranty and Federal Trade Commission Improvement Act.

What Is Covered Under the Terms of This Warranty

SERVICE LABOR: Pakedge will pay for service labor by an approved Pakedge service center when needed as a result of manufacturing defect for a period of one (1) year from the effective date of delivery to the end user.

PARTS: Pakedge will provide new or rebuilt replacement parts for parts that fail due to defects in materials or workmanship for a period of one (1) year from the effective date of delivery to the end user. Such replacement parts are then subsequently warranted for the remaining portion (if any) of the original warranty period.

What Is Not Covered Under the Terms of This Warranty

This warranty only covers failure due to defects in materials and workmanship that occur during normal use and does not cover normal maintenance. This warranty does not cover any appearance item; any damage to living structure; failure resulting from accident (for example: flood, electrical shorts, insulation); misuse, abuse, neglect, mishandling, misapplication, faulty or improper installation or setup adjustments; improper maintenance, alteration, improper use of any input signal and/or power, damage due to lightning or power line surges, spikes and brownouts; damage that occurs during shipping or transit; or damage that is attributed to acts of God.

The foregoing limited warranty is Pakedge's sole warranty and is applicable only to Products sold as new by Authorized Dealers. The remedies provided herein are in lieu of a) any and all other remedies and warranties,

whether expressed, implied or statutory, including but not limited to, any implied warranty of merchantability, fitness for a particular purpose or non-infringement, and b) any and all obligations and liabilities of Pakedge for damages including but not limited to incidental, consequential or special damages, or any financial loss, lost profits or expense, or loss of network connection arising out of or in connection with the purchase, use or performance of the Product, even if Pakedge has been advised of the possibility of such damages.

CAUTION: DAMAGE RESULTING DIRECTLY OR INDIRECTLY FROM IMPROPER INSTALLATION OR SETUP IS SPECIFICALLY EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. IT IS IMPERATIVE THAT INSTALLTION AND SETUP WORK BE PERFORMED ONLY BY AN AUTHORIZED PAKEDGE DEALER TO PROTECT YOUR RIGHTS UNDER THIS WARRANTY. THIS WILL ALSO ENSURE THAT YOU ENJOY THE FINE PERFORMANCE YOUR PAKEDGE PRODUCT IS CAPABLE OF PROVIDING.

Rights, Limits, and Exclusions

Pakedge limits its obligation under any implied warranties under state laws to a period not to exceed the warranty period. There are no express warranties. Pakedge also excludes any obligation on its part for incidental or consequential damages related to the failure of this product to function properly. Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow the exclusion or limitation of incidental or consequential damages. In this case, the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

Effective Warranty Date

This warranty begins on the effective date of delivery to the end user. For your convenience, keep the original bill of sale as evidence of the purchase date from your authorized dealer.

Important- Warranty Registration

Please register your product at www.pakedge.com. It is imperative that Pakedge knows how to reach you promptly if we should discover a safety problem or product update for which you must be notified. In addition, you may be eligible for discounts on future upgrades as new networking standards come about.

To Obtain Service, Contact Your Pakedge Dealer.

Repairs made under the terms of the Limited Warranty covering your Pakedge product will be performed by an Authorized Pakedge Service Center. These arrangements must be made through the selling Pakedge Dealer. If this is not possible, contact Pakedge directly for further instructions. Prior to returning a defective Product directly to Pakedge, you must obtain a Return Material Authorization number and shipping instructions. Return shipping costs will be the responsibility of the owner.

For additional information about this warranty, visit our website:

Pakedge Device & Software Inc.

1163 Triton Drive

Foster City, CA 94404-1213

U.S.A

877-274-6100

Email- support@pakedge.com

www.pakedge.com

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www.pakedge.com

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