

p a k e d g e device&software_{inc.}

WK-2

802.11ac Dual Band Access Point

User Guide – Version 1.0



WK-2x User Manual

FCC Declaration of Conformity

Pakedge Device & Software, 3847 Breakwater Avenue, Hayward, CA 94545, declares under sole responsibility that the WK-2x 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.

CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

RF exposure warning

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Wireless LAN and Your Health

The WK-2x, 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 WK-2x 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:

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- 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 WK-2x at the PoE. This will prevent damage to the product due to lightning and power surges.

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- 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.

Canada, Industry Canada (IC) Notices

This device complies with Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Canada, avis d'Industry Canada (IC)

Cet appareil est conforme avec Industrie Canada exemptes de licence RSS standard(s).

Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

Radio Frequency (RF) Exposure Information

The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has also been evaluated and shown compliant with the IC RF Exposure limits under mobile exposure conditions. (antennas are greater than 20cm from a person's body).

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par l'appareil de sans fil est inférieure à la limite d'exposition aux fréquences radio d'Industry Canada (IC). Utilisez l'appareil de sans fil de façon à minimiser les contacts humains lors du fonctionnement normal.

Ce périphérique a également été évalué et démontré conforme aux limites d'exposition aux RF d'IC dans des conditions d'exposition à des appareils mobiles (antennes sont supérieures à 20 cm à partir du corps d'une personne).

This device is operation in 5.15 – 5.25GHz frequency range, then restricted in indoor use only, Outdoor operations in the 5150~5250MHz is prohibit.

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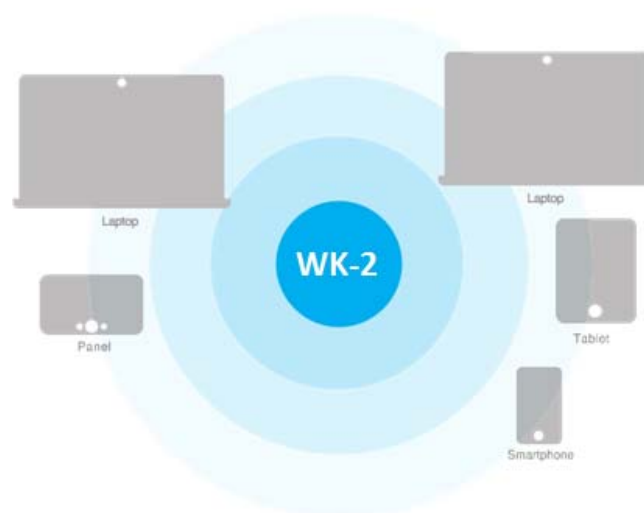
INTRODUCTION

Thank you for purchasing the Packedge WK-2x 802.11ac Dual Band Access Point

As the central component of your wireless network, the WK-2 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 WK-2x to create a secure, high-speed link between your computers, PDAs, and other electronics; And with the WK-2x 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.

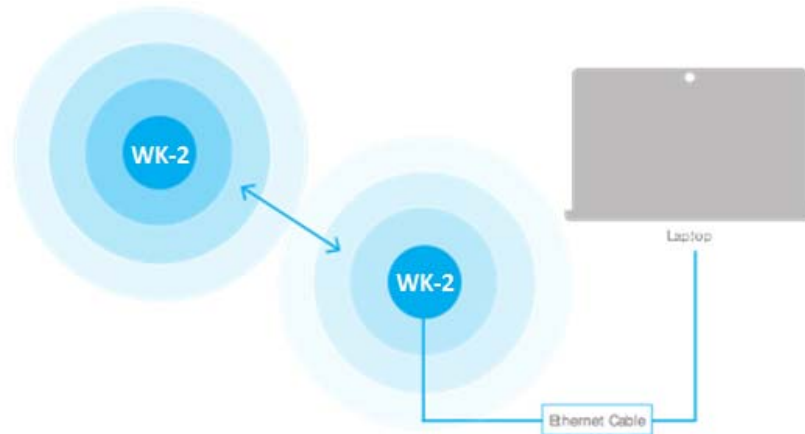
Each band (either 2.4GHz or 5GHz) of the WK-2x can operate in any one of three modes:

- **Access Point Mode:** This is the typical configuration for most Wi-Fi networks. In this mode, the WK-2x broadcasts two Wi-Fi signals (2.4 GHz and 5GHz) that clients can associate with, as shown in the figure below.



- **WDS Bridge Mode:** In this mode, you can connect one WK-2x to a client by its Ethernet port, as shown below. In Client Bridge Mode, the WK-2x 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.



- **WDS Repeater Mode:** This can be used to connect two WK-2 access points wirelessly and extend your wireless network coverage.



Because the functionality of the WK-2x changes depending on its operating mode, this manual offers both general and mode-specific content.

SYSTEM REQUIREMENTS

The minimum system requirements for the WK-2x are:

- PC or Mac book compatible with an Ethernet interface
- Operating system that supports an HTTP Web browser

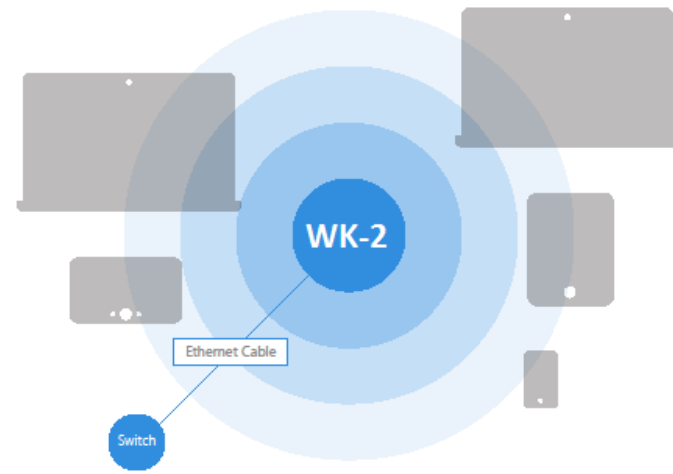
HARDWARE INSTALLATION

The diagrams below depict the configuration using a PoE+ injector or a PoE Switch to power the WK-2x

Power using PoE+ Injector



Power using PoE+ Switch



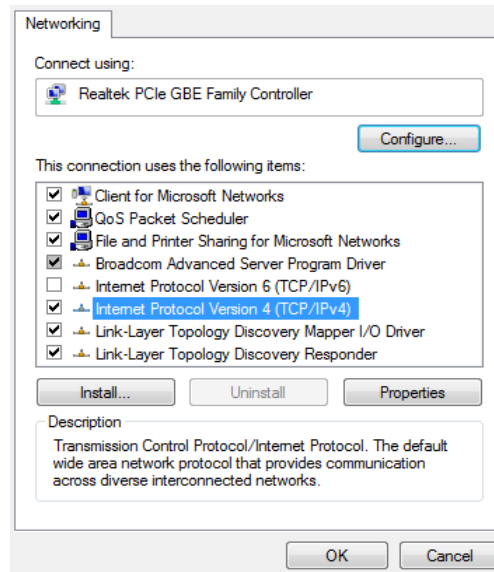
Power using the included power adapter



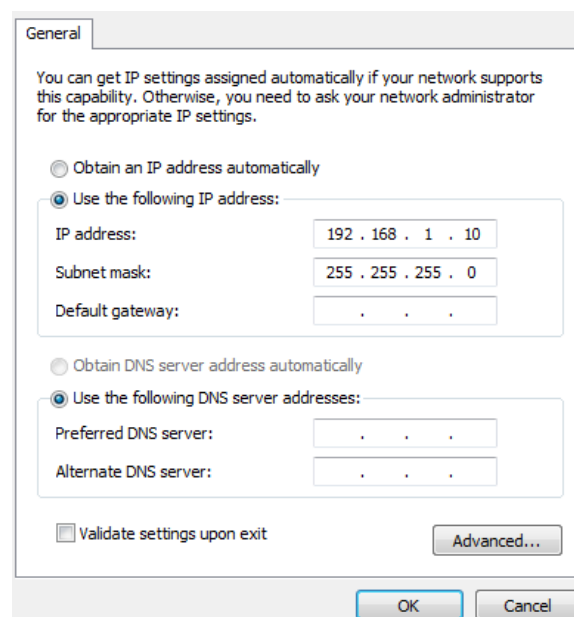
The WK-2x can be configured in Client Bridge, WDS Access Point, or Access Point mode. When shipped from the factory, the WK-2x is set to Access Point mode. The default IP address of the WK-2x is **DHCP or 192.168.1.250** and username/password of **pakedge/pakedgea**

In order to log into the WK-2x, 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.



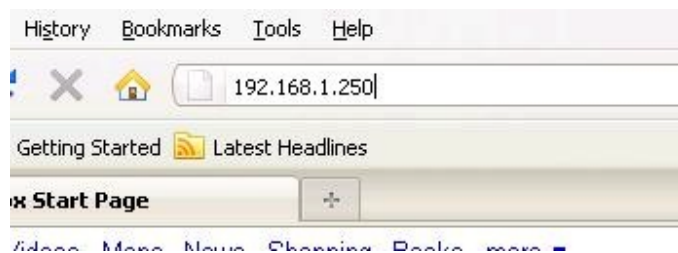
3. Select **“Use the following IP Address”** and type the IP address and subnet mask, as in the example below. (Be sure the IP address and subnet mask are on the same subnet as the WK-2x.)

WK-2x 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.

WK-2X START UP

To configure the WK-2x through a Web Browser, in the address bar of the browser type the IP address of the WK-2x (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.

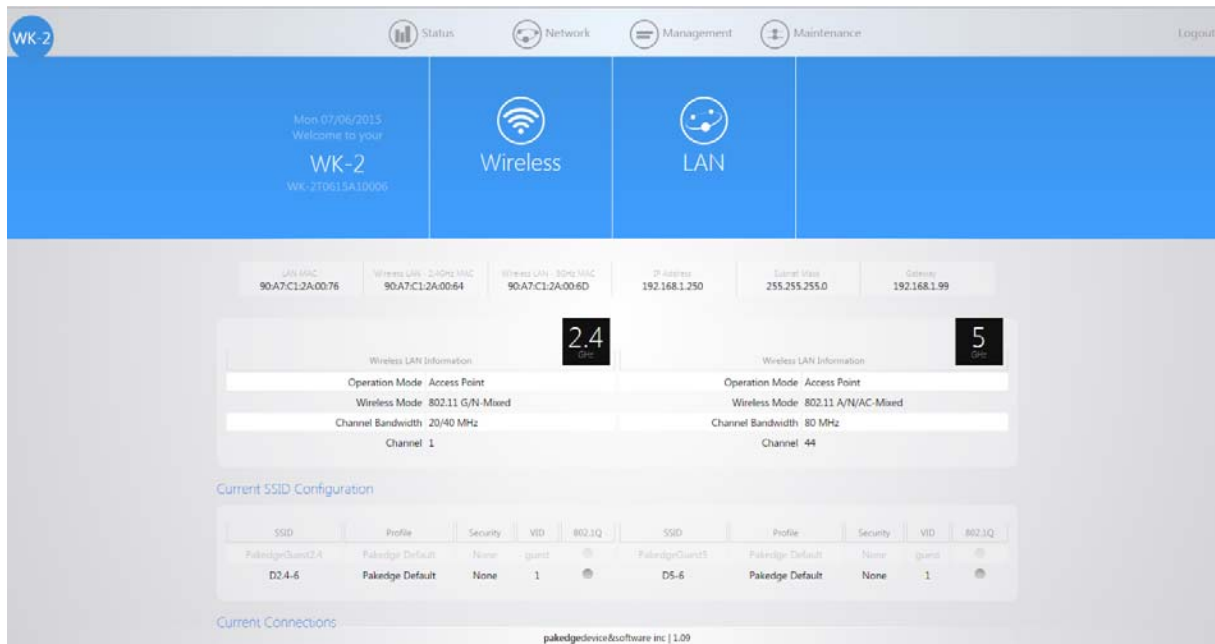
The WK-2x login dialog appears.



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

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The WK-2x main menu appears (see figure below). The main menu displays the current status of WK-2x, general system information such as Device Name, MAC address, Current Time, Firmware Version and Management VLAN ID. The 2.4GHz/5GHz Wireless section displays the device operating mode, 802.11 mode, channel bandwidth, wireless Channel and Profile Settings. Because the WK-2x supports multiple SSIDs, the Wireless section also displays the details of each SSID, and the security settings of each SSID



MENU OPTIONS



The navigation bar on the top has 3 groups:

- **Network:** Allow user access to LAN, Wireless, WiFi Scheduler and Advanced settings
- **Management:** Allows user to access Tools, modify SNMP settings
- **System:** Allows user to modify AP settings as in login to the AP's web interface, firmware updates, and configuration back and restores.

NETWORK



- LAN
- Wireless
 - Advanced

LAN



Hover over **Network** icon, click “**LAN**”. This page displays the LAN settings for WK-2x. To configure the IP address of your WK-2x, you can configure the WK-2x with a static IP address, or obtain an IP address automatically using a DHCP client.

The screenshot shows a configuration interface with two main sections. The top section, titled 'IP Settings', contains the following fields: 'IP Network Setting' with a dropdown menu set to 'Static address'; 'IP Address' with a text box containing '192.168.1.148'; 'Subnet Mask' with a dropdown menu set to '255.255.255.0'; 'Gateway' with a text box containing '192.168.1.99'; and 'Use custom DNS servers' with a text box containing '192.168.1.99' and an orange plus icon to its right. The bottom section, titled 'Management VLAN Settings', contains an 'Enable' checkbox which is unchecked, and a 'VLAN ID' text box containing the number '1'.

IP Settings

- **IP Network Setting:** If your WK-2x is connected to a DHCP server (such as a router), choose “**DHCP Client**”. Your WK-2x 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**, **Gateway**, and **Use Custom DNS Servers**.

VLAN Management

If you enable VLAN tagging in the WK-2x Wireless section under any of the SSIDs, you can choose a VLAN Management ID for the WK-2x to access the administrative functions of your WK-2x. Let’s say you pick VLAN 3 to be the VLAN used for management and the subnet range for VLAN 3 is 192.168.3.X. The IP address for the WX-1x must be 192.168.3.X, where X is any value in range.

- **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 WX-1x. For example, if VLAN3 is used for management, type in 3.
- Click **Accept** to save your changes.

WIRELESS



RADIO

Hover over **Network** and click on **Wireless**, you will be directed to the Radio configuration page under the **Radio** tab.

A screenshot of the 'Wireless' configuration page. The page has a header 'Wireless' and four tabs: 'Radio', 'Security Profiles', 'Configuration', and 'Guest Network'. The 'Radio' tab is selected and highlighted with a blue arrow. The main content area is divided into two columns for '2.4GHz' and '5GHz' settings. The '2.4GHz' column has settings for Operation Mode (Access Point), Wireless Mode (G/N-Mixed), Channel Mode (HT 20 MHz), and Channel (Auto). The '5GHz' column has settings for WDS Root Access Point, A/N/AC-Mixed, VHT 80 MHz, and Channel (36). There are 'Scan' buttons for AP Detection in both columns. An 'Apply' button is at the bottom center. The 'Country Code' is set to 'US (locked)' and 'Band Steering' is disabled.

- **Country Code:** Selecting your country is required for proper functionality of this device and may be required by law. After selecting your country and clicking Apply, the Country Code feature will become locked. To regain access to Country Code, the access point must be reset to factory default.
- **Band Steering:** Band steering steers 5Ghz capable clients to that frequency. By enabling this function, the 2.4GHz SSID and settings will be copied to the 5GHz band.

- **Operation Mode:** Both the 2.4 and the 5 GHz band have the following operating modes: Access Point, WDS Root Access Point, WDS Repeater and WDS Bridge.
 - **Access Point:** Standard mode of operation. Allows a wireless connection to the LAN.
 - **WDS Root Access Point:** The access point with this mode set will be the “root” device that access points configured with WDS Repeater and WDS Bridge will connect to.
 - **WDS Repeater:** This mode allows the access point to connect to a WDS Root Access Point. This setting will take the SSID broadcasted by the WDS Root Access Point and rebroadcast it to end user devices.
 - **WDS Bridge:** This mode allows the access point to connect to a WDS Root Access Point. This mode takes in the SSID broadcasted by the WDS Root Access Point and turns it into Ethernet connectivity for client devices.
- **Wireless Mode:** Choose the setting that corresponds to the type of wireless clients connected to your network: B-Only, G-Only, B/G-Mixed, N/G-Mixed or B/G/N-Mixed (on the 2.4GHz) or A-Only, N-Only, N/A-Mixed, AC-Only, AC/N-Mixed or A/AC/N-Mixed (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 and A/AC/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 all connected devices use G, the speeds will slow accordingly.

- **Channel Mode:** By default, the **Channel Mode** is set to HT 20MHz (when using 2.4GHz) and HT 80 MHz (when using 5GHz). Selecting the HT 40 MHz channel mode on 2.4 GHz will allow for greater speeds, but at the risk of also increasing interference.
 - **Example:** When using the 20 MHz channel width on the 2.4GHz band, 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.
- **Channel** – Using the default setting (**Auto**), the WK-2x automatically selects the channel with best performance for the wireless network. To select a channel manually, click the drop-down list and select a channel. The channel options available depend on the Country Code selected.
- **AP Detection** – Click “**Scan**” to perform an automatic site survey. A new window will open and display the site survey utility. The WK-2x will scan the frequency for devices currently broadcasting their SSID, and then will display them in the table.

AP Detection

	FiOS-9T6IP Channel:153	BSSID: C8:A7:0A:9E:90:1C	Encryption:WPA2 - PSK
100%			
	Pakedge5-1 Channel:44	BSSID: 90:A7:C1:08:02:91	Encryption:open
100%			
	PakedgeGuest2.4 Channel:40	BSSID: B2:A7:C1:08:02:95	Encryption:WPA2 - PSK
100%			
	PakedgeManagment2.4 Channel:40	BSSID: 90:A7:C1:08:02:95	Encryption:WPA2 - PSK
100%			
	PakedgeNetwork2.4 Channel:40	BSSID: A2:A7:C1:08:02:95	Encryption:WPA2 - PSK
100%			
	PakedgeVOIP2.4 Channel:40	BSSID: 92:A7:C1:08:02:95	Encryption:mixed WPA/WPA2 - PSK
100%			
	Support Lab 5GHz Channel:36	BSSID: 90:A7:C1:08:02:A1	Encryption:WPA2 - PSK
100%			
	TAS Channel:149	BSSID: 02:18:5A:59:22:30	Encryption:mixed WPA/WPA2 - PSK
100%			
	TAS_ALFs Channel:149	BSSID: 02:18:5A:59:22:32	Encryption:WPA2 - PSK
100%			
	TAS_Guest Channel:149	BSSID: 02:18:5A:59:22:31	Encryption:WPA2 - PSK
100%			
	Training WK Channel:36	BSSID: 90:A7:C1:08:05:F1	Encryption:WPA2 - PSK
100%			
	WK-Rack1 Channel:44	BSSID: 90:A7:C1:08:0D:4D	Encryption:WPA2 - PSK
100%			

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SECURITY PROFILES

Under the **Security Profiles** tab, you will be able to configure security profiles that can be used when creating SSIDs under the configuration tab.

Wireless

Radio Security Profiles Configuration Guest Network

Profile Name	Encryption	Password	Manage
Pakedge Default	No Encryption		In Use
Test 1	WPA2 PSK		Delete
Test 2	WPA2 PSK		Delete
Test 3	WPA2 PSK		Delete

Add Wireless Security Profile

Apply

- **Profile Name:** Create a name for the security profile.
- **Encryption:** Select an encryption type for your security profile. The four available options are, No Encryption, WPA PSK, WPA2 PSK, and WPA/WPA2 PSK.
 - o **No Encryption:** This will leave your profile without security (not recommended).
 - o **WPA PSK:** Password must be at least 8 characters long. This is a legacy encryption protocol (not recommended).
 - o **WPA2 PSK:** Password must be at least 8 characters long. AES-only encryption. (Recommended)
 - o **WPA/WPA2 PSK:** Password must be at least 8 characters long. This feature is also known as Mixed Mode and uses TKIP encryption.

NOTE: Passwords may only contain numbers and letters. Special characters are not allowed. Examples of special characters: (!@#\$%&^*).

CONFIGURATION

To configure SSIDs for both the 2.4 GHz and 5 GHz bands, go to the **Configuration** tab. The WK-2x can set up to 8 SSIDs per band for a total of 16 SSIDs.

Wireless

Radio Security Profiles **Configuration** Guest Network

2.4 GHz

On Off	Wireless Name (SSID)	Security Profile	Hide SSID	Client Isolation	Pakedge Zone (VLAN)	Manage
☒	Pakedge2.4-1	Pakedge Default	☐	☐	1	

Add 2.4GHz Wireless Profile

1 / 8 Used

5 GHz

On Off	Wireless Name (SSID)	Security Profile	Hide SSID	Client Isolation	Pakedge Zone (VLAN)	Manage
☒	Pakedge5-1	Pakedge Default	☐	☐	1	

Add 5GHz Wireless Profile

1 / 8 Used

Apply

- **On Off:** The SSID may be turned on or turned off using this checkbox.
- **Wireless Name (SSID):** The SSID is the name associated with the Wi-Fi network. An SSID cannot exceed 32 characters.
- **Security Profile:** The profiles created under the Security Profiles tab may be applied to the SSID here.
- **Hide SSID:** Enabling this feature will keep the SSID name from being broadcast. The SSID will still be available for client access, provided the SSID is turned on. This is not a security feature.
- **Client Isolation:** This feature is also referred to as “station separation”. This feature prevents clients on the same SSID from being able to access other clients on the network.
- **Pakedge Zone (VLAN):** This option defines the VLAN that on which the SSID will reside. To change the VLAN, select the grey circle with the number 1 inside it. A selection ring will appear with the available VLAN options.
- **Manage:** This column displays the management settings that were configured under Management VLAN. Management VLAN is located on the LAN page under Network.

GUEST NETWORK SETTINGS

The Guest Network feature is designed for networks that do not have a guest VLAN. The Guest Network acts as its own network and only has access to the internet. Each access point's guest network is independent from the guest networks of other access points.

To enable the Guest Network, select On/Off. By default, the guest network name is Pakedge-Guest and the IP scheme is set to 192.168.200.X. You have the option to change the default settings, if desired. You can change the SSID, IP address, subnet, starting IP address and ending IP address. Once changes are complete, click **Apply** to save them.

Wireless

Radio Security Profiles Configuration **Guest Network**

SSID

Radio	On/Off	Wireless Name (SSID)	Security Profile
2.4GHz	☐	PakedgeGuest2.4	Pakedge Default No Encryption
5GHz	☐	PakedgeGuest5	Pakedge Default No Encryption

Manual IP Settings

IP Address: 192.168.200.1
Subnet Mask: 255.255.255.0

Automatic DHCP Server Settings

Starting IP Address: 192.168.200.100
Ending IP Address: 192.168.200.250
DNS Server IP: 8.8.8.8

Apply

SSID

- **Radio:** There is a guest network available on both the 2.4 GHz and 5 GHz band.
- **On/Off:** This option turns the Guest Network on and off.
- **Wireless Name (SSID):** The SSID of the Guest Network can be entered in this textbox.
- **Security Profile:** Select a security profile that has already been defined under the Security Profiles tab.

Manual IP Settings



Manual IP Settings

IP Address: 192.168.200.1

Subnet Mask: 255.255.255.0

- **IP Address:** Enter in the IP address the access point will be used on.
- **Subnet Mask:** Select the class of the guest network. 255.255.255.0 is the standard setting and is selected by default.

Manual IP Settings



Automatic DHCP Server Settings

Starting IP Address: 192.168.200.100

Ending IP Address: 192.168.200.250

DNS Server IP: 8.8.8.8

- **Starting IP Address:** This is the beginning of the DHCP range used on the guest network. If you have multiple access points, you can give them the same DHCP range because the guest network of each access point will be independent of one another.
- **Ending IP Address:** This is the last IP address available on the DHCP range.
- **DNS Server IP:** The DNS Server IP can be set to an external DNS or to the router's IP address if the router provides a DNS server.

ADVANCED



On the **Advanced** page, you can configure:

- **Transmit Power:** The power 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.
 - **Maximum:** This setting will broadcast at the maximum allowed mW for the channel selected if Obey Regulatory Power is checked. If Obey Regulatory Power is not checked, then the maximum 30 dBm (1000 mW) will be broadcast.
 - **Automatic:** This setting will adjust the power of the access point based on the distance to the furthest client device. The access point will lower its power if the furthest client is 10 feet away and will raise the power if the furthest client is 100 feet away.
 - **1 dBm (1 mW) – 30 dBm (1000 mW):** These are static power settings. The access point will broadcast at the selected power level.
- **Obey Regulatory Power:** This feature will enable government mandated power levels per channel based on the access point's Country Code.
- **RTS/CTS Threshold:** Enter the packet size threshold for RTS/CTS (Request to Send/Clear to Send) to occur. The primary reason for implementing this function is to minimize the collision between hidden stations, which occurs when access points and wireless users are spread out in a location and there is a high occurrence of retransmissions on the wireless LAN. Default setting is 2347.
- **Beacon Interval:** Adjusting Beacon Interval will allow clients to sleep longer. Clients have to wake up for every beacon, so this setting tells your client how many milliseconds it can sleep for (e.g., if BP = 100 your stations are allowed to sleep for up to 100 ms).

Advanced

2.4
GHz

Transmit Power

Maximum

Obey Regulatory Power

RTS/CTS Threshold (0-2347)

2347

Beacon interval

100

5
GHz

Transmit Power

Maximum

Obey Regulatory Power

RTS/CTS Threshold (0-2347)

2347

Beacon interval

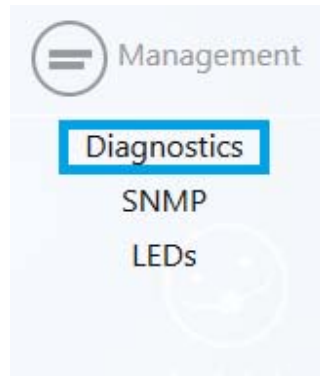
100

Apply

MANAGEMENT

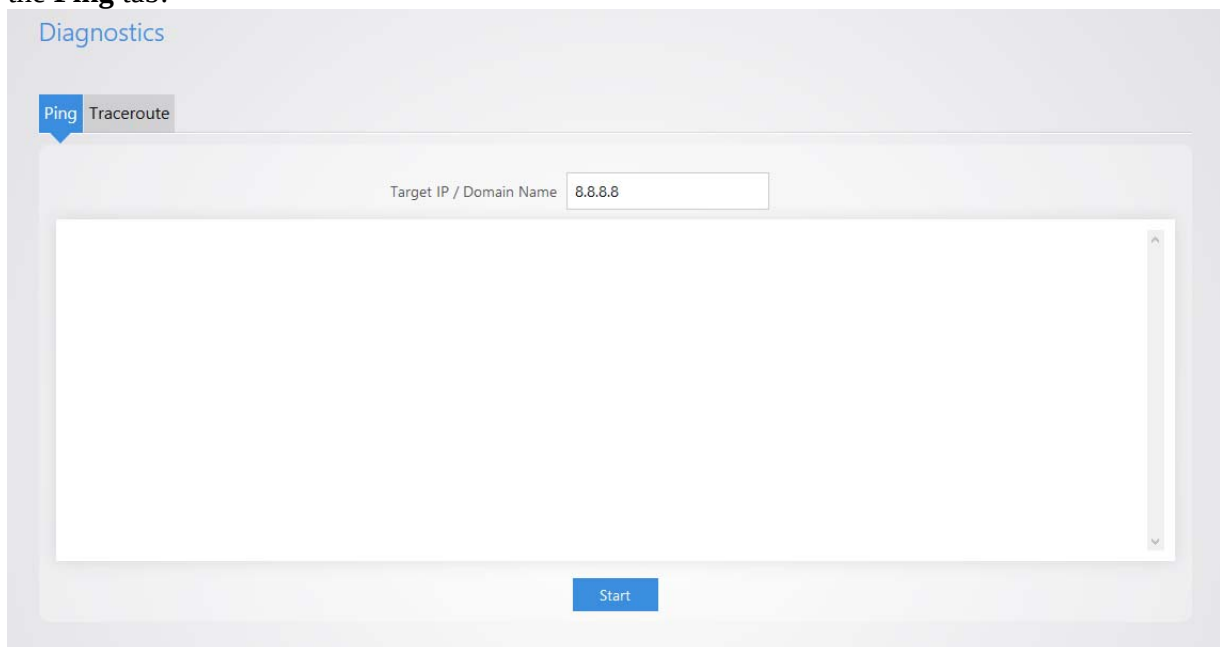


DIAGNOSTICS



PING

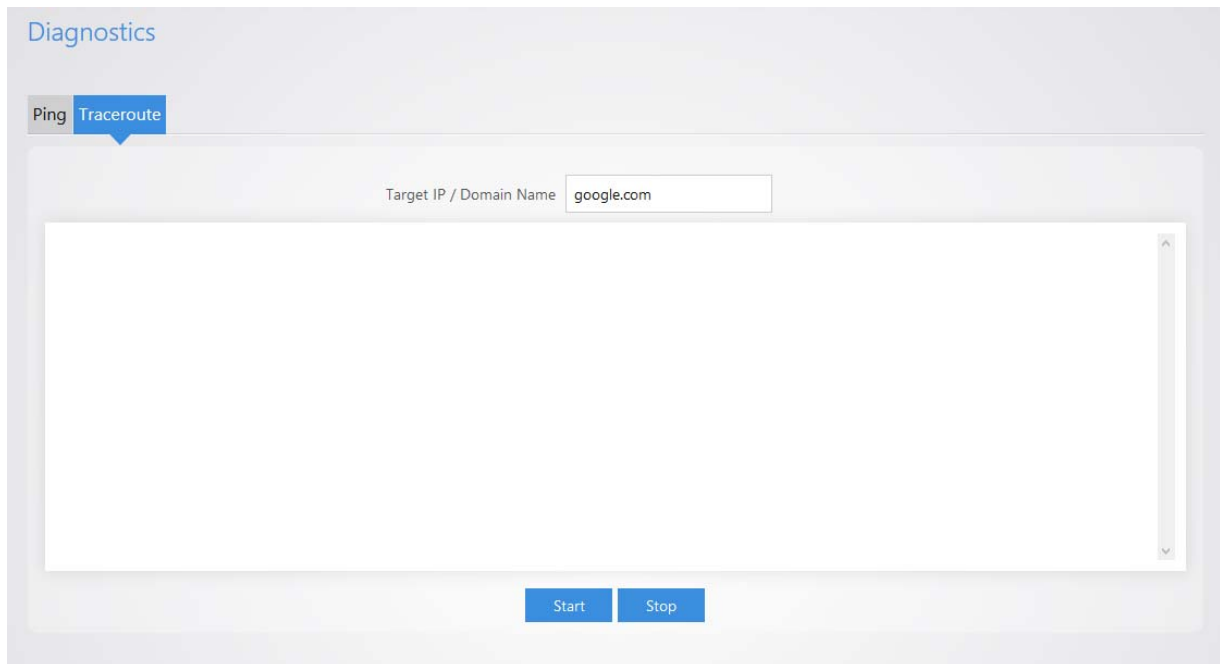
Hover over **Management** and click on **Diagnostics**. You will be directed to the ping test under the **Ping** tab:



- Ping –
 - o **Target IP / Domain Name:** Enter the IP Address of a location to ping. 8.8.8.8 is a Google DNS server.
 - o Click **Start** to start the test.

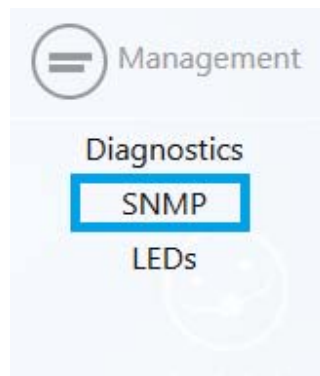
TRACEROUTE

Click on the **Traceroute** tab.



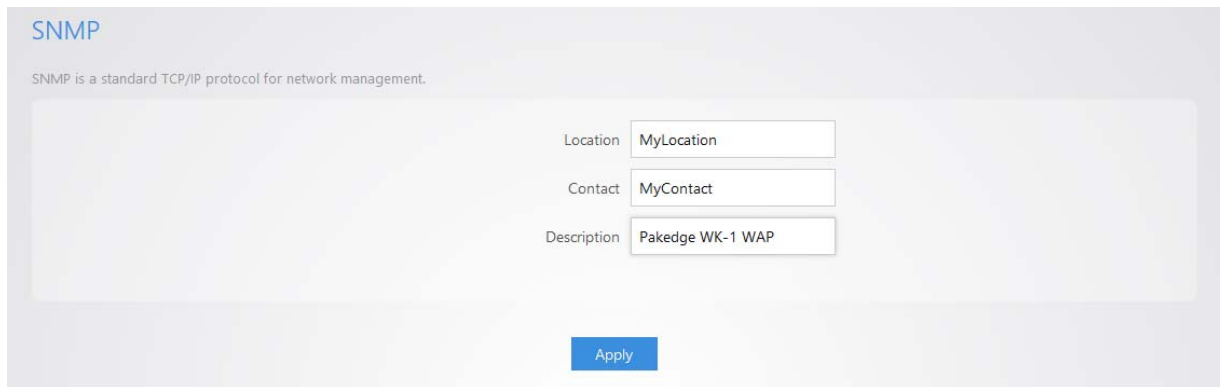
A Traceroute test can help you identify obstacles you may have in the network. The Traceroute text maps the path for packets moving between the WK-2x and the target location. To run a Traceroute test, enter an IP Address or Domain Name into the **Target IP / Domain Name** textbox and click **Start** to begin the test. If the test fails to complete or takes too long, click **Stop**.

SNMP



Hover over **Management** and click on SNMP.

WK-2x User Manual



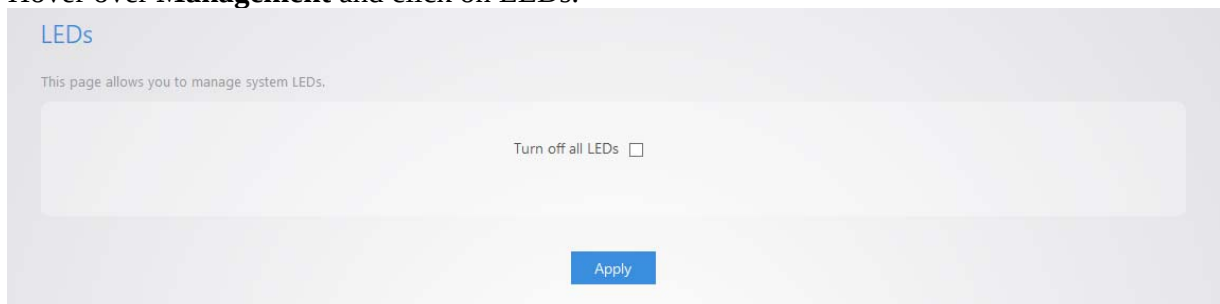
The image shows the 'SNMP' configuration page. At the top, the title 'SNMP' is in blue. Below it, a subtitle reads 'SNMP is a standard TCP/IP protocol for network management.' The main area contains three input fields: 'Location' with the value 'MyLocation', 'Contact' with the value 'MyContact', and 'Description' with the value 'Pakedge WK-1 WAP'. Below these fields is a blue 'Apply' button.

- **Location:** Enter the physical location of the WK-2x as a reference.
- **Contact:** Enter the contact information of the installer or network administrator for the SNMP manager.
- **Description:** Enter in a description of the device. The default description is Pakedge WK-2 WAP.

LEDs



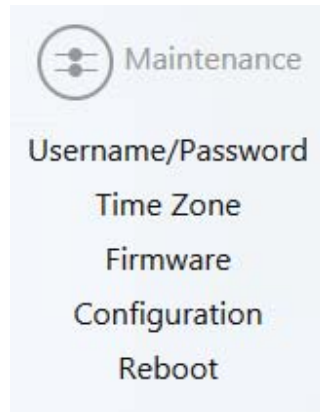
Hover over **Management** and click on LEDs.



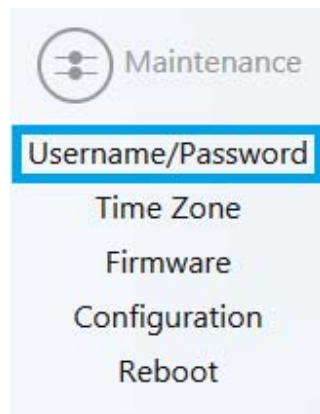
The image shows the 'LEDs' configuration page. At the top, the title 'LEDs' is in blue. Below it, a subtitle reads 'This page allows you to manage system LEDs.' The main area contains a single checkbox labeled 'Turn off all LEDs'. Below this is a blue 'Apply' button.

- **Turn off all LEDs:** Check to turn LEDs off.

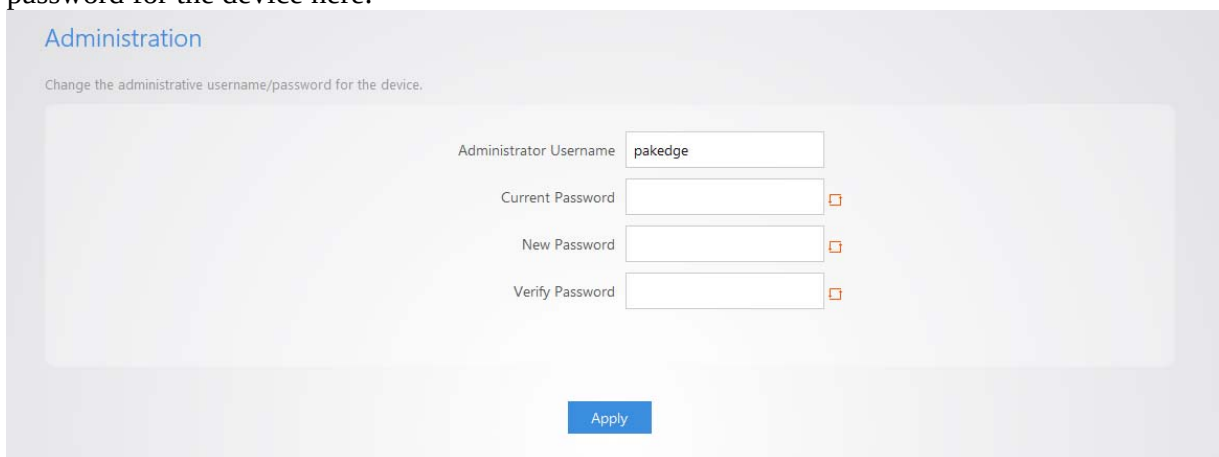
MAINTENANCE



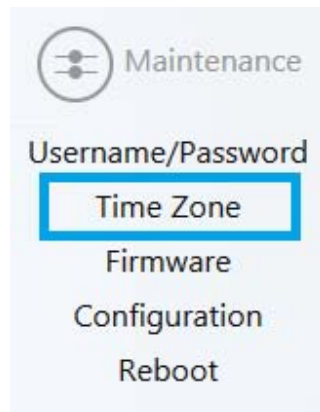
USERNAME/PASSWORD



Hover over **Maintenance** and click on **Username/Password**. You can change the username and password for the device here.

A screenshot of the 'Administration' page. The page title is 'Administration' in blue. Below it, a subtitle reads 'Change the administrative username/password for the device.' The form contains four input fields: 'Administrator Username' with the value 'pakedge', 'Current Password', 'New Password', and 'Verify Password'. Each password field has a small orange square icon to its right. At the bottom of the form is a blue 'Apply' button.

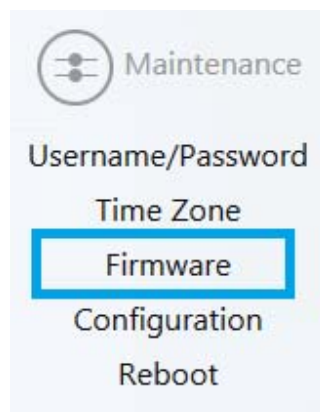
TIME ZONE



Hover over **Maintenance** and click on **Time Zone**. This page allows you to setup the timezone.

A screenshot of the 'Time Zone' configuration page. The page has a light blue header with the title 'Time Zone' in a darker blue font. Below the header, a light gray box contains the text 'This page allows you to setup time zone.' In the center of the page, there is a white box with a light gray border. Inside this box, the 'Local Time' is displayed as 'Thu Apr 16 16:00:48 2015'. Below that, the 'Timezone' is shown as a dropdown menu with 'America/Los Angeles' selected. At the bottom of the white box, there is a blue button with the word 'Apply' in white text.

FIRMWARE

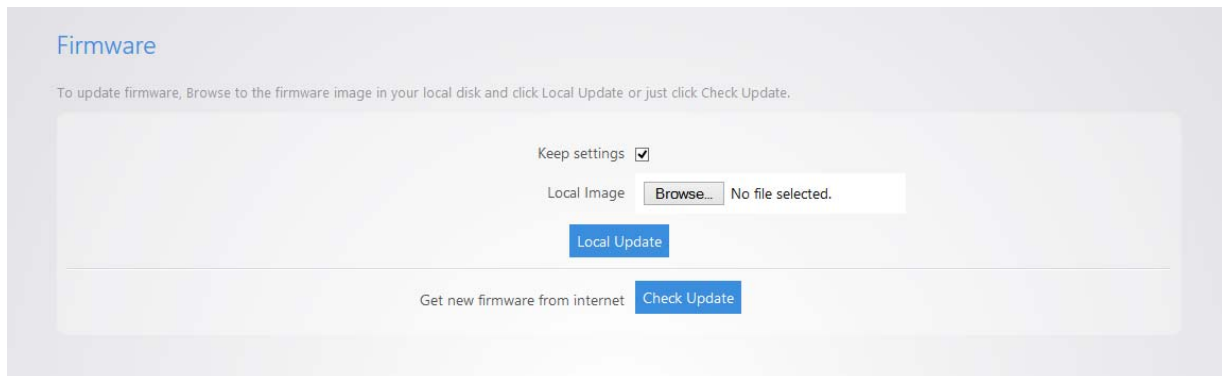


Allows you to update the firmware for the unit.

- **Keep Settings:** Selecting this will preserve your current configurations after the firmware update.
- **Local Image:** Click Choose File to select the firmware file.
- **Local Update:** Updates the firmware with the file you selected.

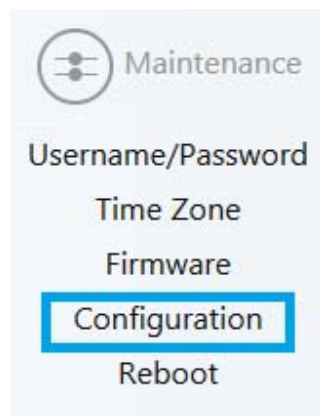
WK-2x User Manual

- **Check Update:** This feature will only work if the WK-2x is connected to the internet.

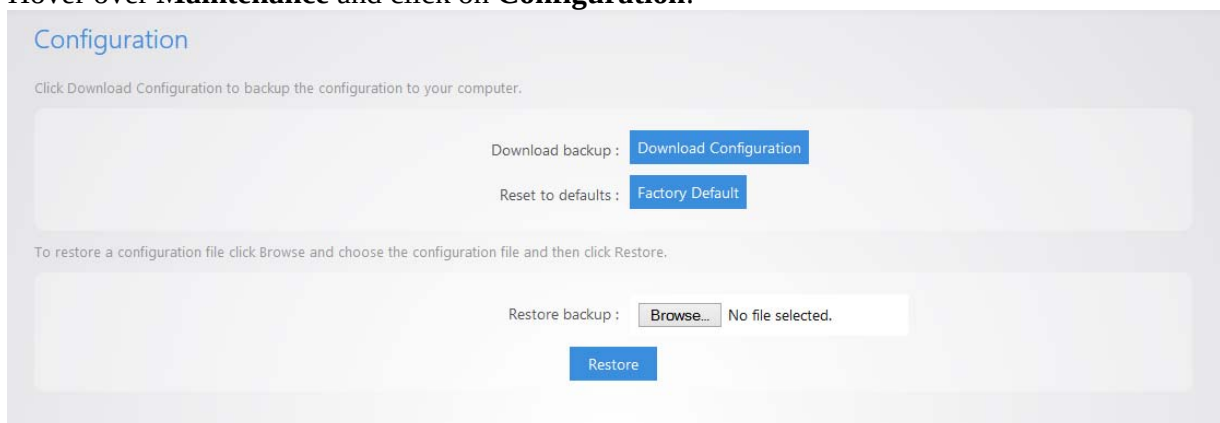


The screenshot shows the 'Firmware' section of a web interface. At the top, it says 'Firmware' in blue. Below that, a instruction reads: 'To update firmware, Browse to the firmware image in your local disk and click Local Update or just click Check Update.' There are two main sections. The first section has a 'Keep settings' checkbox which is checked, a 'Local Image' label, a 'Browse...' button, and the text 'No file selected.' Below this is a 'Local Update' button. The second section has the text 'Get new firmware from internet' and a 'Check Update' button.

CONFIGURATION



Hover over **Maintenance** and click on **Configuration**:



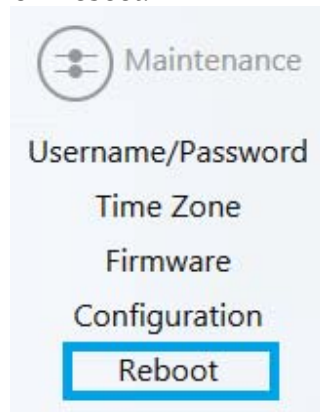
The screenshot shows the 'Configuration' section of a web interface. At the top, it says 'Configuration' in blue. Below that, a instruction reads: 'Click Download Configuration to backup the configuration to your computer.' There are two main sections. The first section has a 'Download backup :' label and a 'Download Configuration' button. The second section has a 'Reset to defaults :' label and a 'Factory Default' button. Below this, another instruction reads: 'To restore a configuration file click Browse and choose the configuration file and then click Restore.' There are two main sections. The first section has a 'Restore backup :' label, a 'Browse...' button, and the text 'No file selected.' Below this is a 'Restore' button.

- **Download backup:** Click Download Configuration to save and export the current settings of the WK-2x.
- **Reset to defaults:** Click Factory Default to reset the the WK-2x back to its factory default settings.

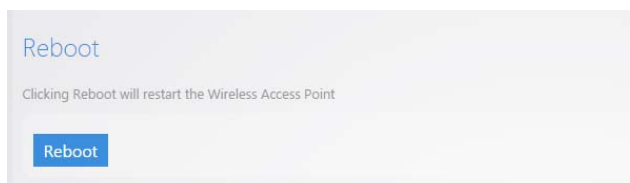
- **Restore backup** – Load a configuration file using the Browse button to restore the WK-2x to a previous configuration.

REBOOT

Hover over **Maintenance** and click on Reboot.



Clicking the Reboot Button allows you to reboot the device.



APPENDIX A – SPECS

HARDWARE SPECIFICATIONS

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

RF INFORMATION

- Frequency Band:
 - o 802.11 B/G/N on 2.4 to 2.462GHz, which can be programmed based on country regulations.
 - o 802.11 A/N/AC on 5 to 5.805GHz, which can be programmed based on country regulations.
- Operating Channels:
 - o 2.4GHz - 11 for North America, 13 for Europe, 14 for Japan
 - o 5GHz - 24 Channels depending on country

Maximum Transmit Power (per chain) +/- 2 dBm		
	2.4GHz	5GHz
11 b (1Mbps)	24	-
11 b (11Mbps)	24	-
11 g (6Mbps)	24	-
11 g (54Mbps)	22	-
11 a (6Mbps)	-	24
11 a (54Mbps)	-	22
HT20(MSC 0/8)	24/23	24/23
HT20(MSC 7/15)	22	20
HT40(MSC 0/8)	23	23/20
HT40(MSC 7/15)	22	20/19
VHT40 256QAM @ 3/4 Code Rate	-	18
VHT40 256QAM @ 5/6 Code Rate	-	18
VHT80 256QAM @ 3/4 Code Rate	-	18
VHT80 256QAM @ 5/6 Code Rate	-	17

- Transmit Power (Typical):

Receive sensitivity (per chain) +/- 2 dBm		
	2.4GHz	5GHz
11 g (6Mbps)	-91	-
11 g (54Mbps)	-74	-
11 a (6Mbps)	-	-90
11 a (54Mbps)	-	-72
HT20(MSC 0/8)	-91	-90
HT20(MSC 7/15)	-70	-70
HT40(MSC 0/8)	-87	-86
HT40(MSC 7/15)	-67	-67
VHT40 256QAM @ 3/4 Code Rate	-	-65
VHT40 256QAM @ 5/6 Code Rate	-	-63
VHT40 256QAM @ 3/4 Code Rate	-	-62
VHT40 256QAM @ 5/6 Code Rate	-	-60
VHT80 256QAM @ 3/4 Code Rate	-	-59
VHT80 256QAM @ 5/6 Code Rate	-	-57

- Receiver Sensitivity (Typical):

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, AC ONLY

MANAGEMENT AND SECURITY

- User Power Control Adjustment by dBm
- Web-based configuration (HTTP)/Telnet
- Upgrade firmware via web browser
- Auto-channel Selects least congested channel
- Backup & Restore settings through Web interface
- QoSWM
- WEP/WPA/WPA2/ WPA MIXED Encryption
- WPA-PSK using TKIP or AES / WPA-EAP using TKIP
- 802.1x Authenticator
- SSID broadcast enable/disable
- WLAN L2 Isolation (AP mode only)
- Wireless Client connected list

ENVIRONMENT

- Temperature Range: 0 to 45°C (32°to 113°F)
- Storage: -20 to 60°C (-4°to 140°F)
- Humidity (non-condensing):
 - o Operating: 90% or less
 - o Storage: 90% of less

MECHANICAL

Enclosure: 9.81inches X 7.05 inches

- o Depth: 1.44 inches
- o Base 7.76 inches X 5.55 inches

APPENDIX B – TECHNICAL SUPPORT

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

Website: www.pakedge.com

Email: support@pakedge.com

CONTACT INFORMATION:

Northern California Office

Pakedge Device & Software
3847 Breakwater Avenue
Hayward, CA 94545-3606

Southern California Office:

Pakedge Device & Software
17011 Beach Blvd.
Suite 600
Huntington Beach, CA 92647-5946

APPENDIX C – LIMITED WARRANTY

MODEL WK-2X

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 (3) 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:

Northern California Office
Pakedge Device & Software
3847 Breakwater Avenue
Hayward, CA 94545-3606

Southern California Office:
Pakedge Device & Software
17011 Beach Blvd.
Suite 600
Huntington Beach, CA 92647-5946

p a k e d g e device & software inc.

Northern California Office

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Visit Us At:

www.pakedge.com