

PEP WAVE

Broadband Possibilities

User Manual

Pepwave AP One Series:

AP One/ AP One 300M / AP One mini / AP One Flex / AP One In-Wall

Pepwave AP Pro Series:

AP Pro

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1. Introduction and Scope

Pepwave's AP Series of enterprise-grade 802.11b/g/n Wi-Fi access points is engineered to provide fast, dependable, and flexible operation in a variety of environments, all controlled by an easy-to-use centralized management system. From the small but powerful AP One mini to the top-of-the-line AP Pro, the Pepwave AP Series offers wireless networking solutions to suit any business need, and every Pepwave access point is loaded with essential features such as multiple SSIDs, VLAN, WDS, and Guest Protect.

A single Pepwave access point can masquerade as up to four virtual access points, each with its own security policy (WPA, WPA2, etc.) and authentication mechanism (802.1x, open, captive portal, etc.), allowing faster, easier, and more cost-effective network builds. Each member of the Pepwave AP Series family also features a high-powered Wi-Fi transmitter that greatly enhances coverage and performance while reducing equipment costs and maintenance.

2. Product Features and Benefits

Key features and benefits of the Pepwave AP series:

- High-powered Wi-Fi transmitter enhances coverage and lowers cost of ownership.
- Independent security policies and encryption mechanisms for each virtual access point allow fast, flexible, cost-effective network builds.
- Centralized management via InControl reduces maintenance expense and time.
- WDS support allows secure and fast network expansion.
- Guest Protect support guards sensitive business data and sub-networks.

WMM (Wi-Fi Multimedia) and QoS (Quality of Service) support keeps video and other bandwidth-intensive data flowing fast and lag-free.

3. Package Contents

3.1 AP One

Each Pepwave AP One package contains:

- 1 x Pepwave AP One
- 1 x omni-directional antenna
- 1 x power supply
- 1 x instruction sheet

3.2 AP One 300M

Each Pepwave AP One 300M package contains:

- 1 x Pepwave AP One 300M
- 2 x omni-directional antennas
- 1 x power supply
- 1 x instruction sheet

3.3 AP One mini

Each Pepwave AP One mini package contains:

- 1 x Pepwave AP One mini
- 1 x omni-directional antenna
- 1 x power supply
- 1 x instruction sheet

3.4 AP One Flex

Each Pepwave AP One Flex package contains:

- 1 x Pepwave AP One Flex
- 1 x instruction sheet
- 1 x installation guide

3.5 Ap One In-Wall

Each Pepwave AP One In-Wall package contains:

- 1 x Pepwave AP One In-Wall
- 1 x mounting kit

3.6 AP Pro

Each Pepwave AP Pro package contains:

- 1 x Pepwave AP Pro
- 1 x instruction sheet
- 1 x installation guide

4. Hardware Overview

4.1 AP One

Front View



Rear Panel View



Connectors

**Antenna
(Left Connector)**

RP-SMA connector for attaching the antenna.

WAN 

10/100BaseT Ethernet connector, normally connected to a back haul network.

Reset

Inset reset button. Depress with a pin and hold for at least five seconds to restore factory defaults. For further details, please refer to [Restoring Factory Defaults](#).

Power Connector

DC 12V power input for use with the supplied power adapter.

LED Indicators

 **Power**

OFF– Power is off.

ON – Power is on.

 **Status**

OFF – Unit is initializing.

ON – Unit is ready.

 **Ethernet**

OFF – Ethernet port is not connected.

ON – Ethernet port is connected.

 **Wireless**

OFF – Wireless is not ready.

On – Wireless is ready.

4.2 AP One 300M

Front View



Rear Panel View



Connectors

USB

Reserved for future functionality.



10/100BaseT Ethernet connector, normally connected to a back haul network.



10/100BaseT Power over Ethernet 802.3af connector, normally connected to a back haul network.

Reset

Inset reset button. Depress with a pin and hold for at least five seconds to restore factory defaults. For further details, please refer to [Restoring Factory Defaults](#).

Power Connector DC 12V power input for use with the supplied power adapter.

LED Indicators



OFF – Power is off.

ON – Power is on.



OFF – Unit is initializing.

ON – Unit is ready.



OFF – Wireless is not ready.

On – Wireless is ready.

4.3 AP One mini

Front View




Rear Panel View



Connectors

USB	Reserved for future functionality.
Power Connector	DC 12V power input for use with the supplied power adapter.
WAN	10/100BaseT Ethernet connector, normally connected to a back haul network.
Antenna (Right Connector)	RP-SMA connector for attaching the antenna.

LED Indicators

PWR	OFF – Power is off.
	ON – Power is on.
RDY	RED – Device is not booted.
	AMBER – Device is not booted.
ENET	OFF – Ethernet port is not connected.
	ON – Ethernet port is connected.
	OFF – No client is associated.
	ON – Clients are associated. Each bar indicates an increase of up to 10 connected clients. The shortest bar indicates from one to 10 clients while the longest indicates 31 or more clients.

4.4 AP One Flex

Front View



Rear LED Indicators



Connectors Panel inside the lid



Connectors

LAN1*PoE	10/100BaseT Power over Ethernet Passive PoE connector
LAN2 / 3	Ethernet LAN Port
Reset	Inset reset button. Depress with a pin and hold for at least five seconds to restore factory defaults. For further details, please refer to Restoring Factory Defaults .

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LED Indicators



OFF – Unit is initializing.

ON – Unit is ready.

LAN

OFF – Ethernet port is not connected.

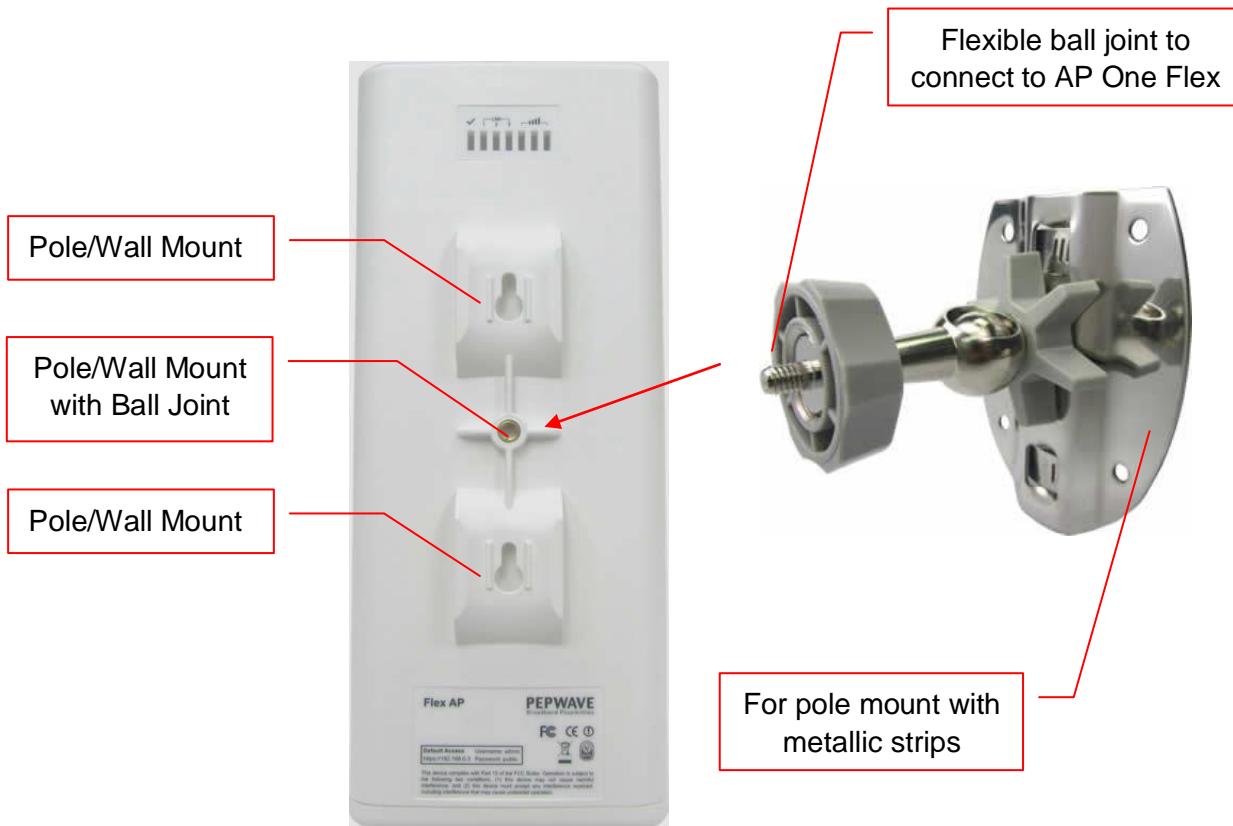
ON – Ethernet port is connected.



Indicate the signal strength.

Mounting the Unit

Pepwave AP One Flex can be mounted on a flat surface or a pole using the wall/pole mount (available separately).



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4.5 AP One In-Wall

Front View



Top View



Connectors Panel at the bottom



Connectors Panel at the side



Connectors

LAN	Ethernet LAN ports
POE IN LAN/UPLINK	10/100BaseT Power over Ethernet Passive PoE connector
Reset	Inset reset button. Depress with a pin and hold for at least five seconds to restore factory defaults. For further details, please refer to Restoring Factory Defaults .
Pass Through	Digital pass through for PBX
Power Connector	DC 48V power input.

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4.6 AP Pro

Front View



Top View



AP Pro Rear Panel View



AP Pro 300M Rear Panel View



AP Pro Duo Rear Panel View

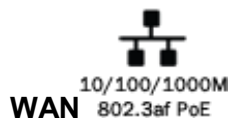


Connectors

Antenna Female N-type connectors for attaching antennas.

Ground Ground connection.

Console RJ-45 Console connector for Pepwave Console Adapter with remote factory reset functionality.



10/100BaseT Power over Ethernet 802.3af connector, normally connected to a back haul network.

Power Connector A connector for DC 10V-30V power input, to be used with the supplied waterproof power connector.

LED Indicators

OFF – Power is off.

Status RED – Unit is initializing.

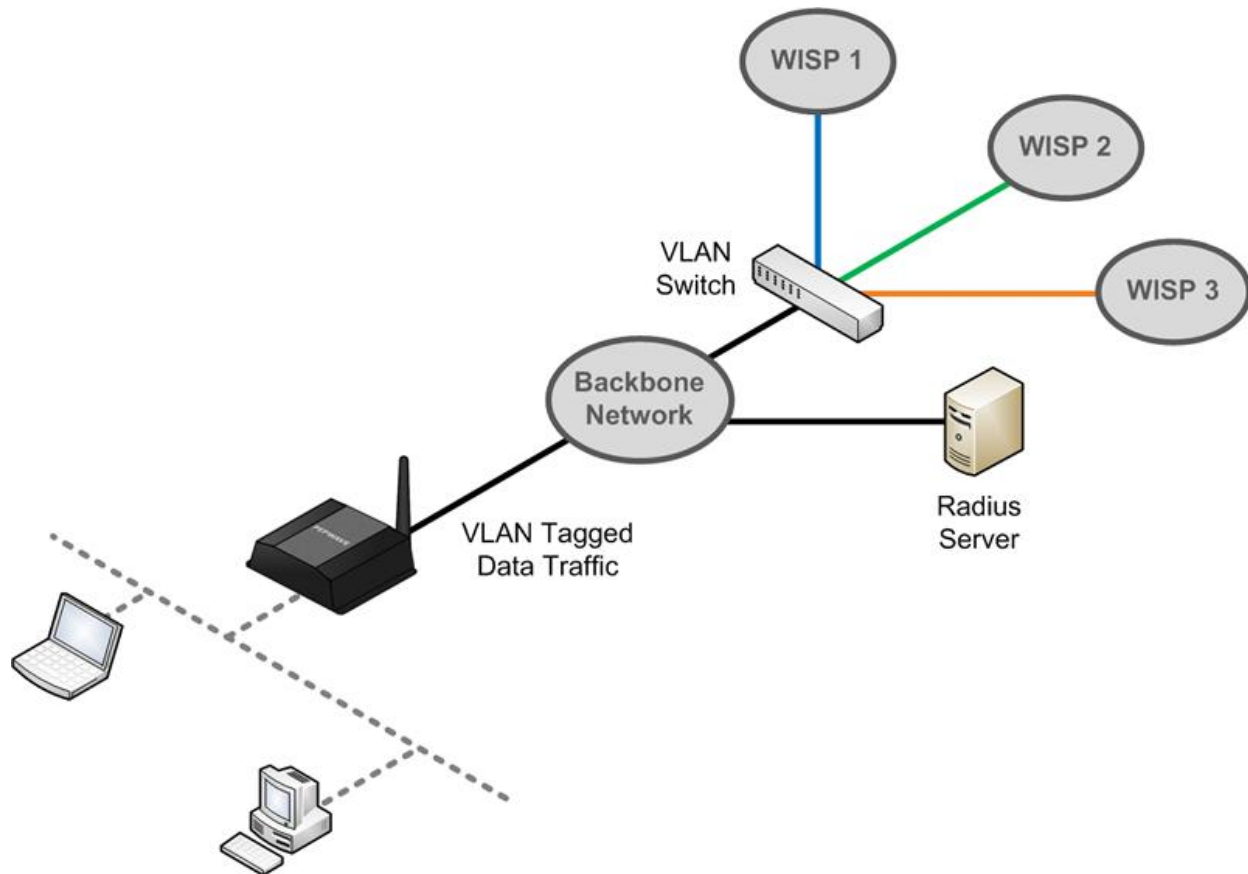
GREEN – Unit is ready.

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PEPWAVE AP Series

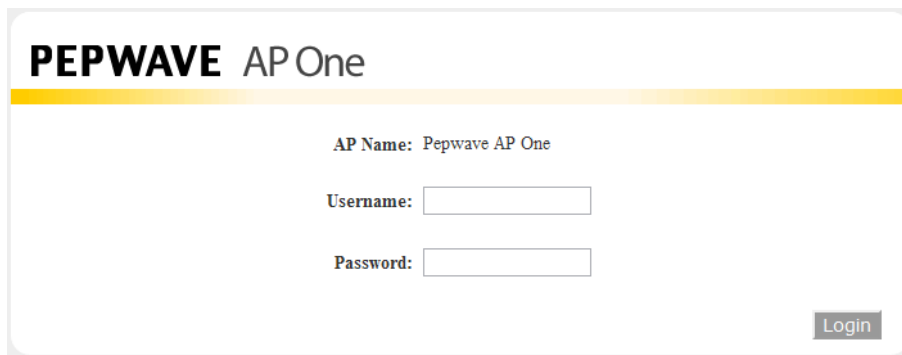
5. Installation

Your Pepwave access point acts as a bridge between wireless and wired Ethernet interfaces. A typical setup follows:



5.1 Installation Procedures

1. Attach the antenna to your Pepwave access point.
2. Connect the Ethernet port on the unit with the backbone network using an Ethernet cable. The port should auto sense whether the cable is straight-through or crossover.
3. Connect the power adapter to the power connector of the unit. Plug the power adapter into a power source.
4. Wait for the status LED to turn green.
5. Connect a PC to the backbone network. Configure the IP address of the PC to be any IP address between 192.168.0.4 and 192.168.0.254, with a subnet mask of 255.255.255.0.
6. Using Microsoft Internet Explorer 6 or above, Mozilla Firefox 2.0 or above, or Google Chrome 2.0 or above, connect to <https://192.168.0.3>.
7. Enter the default admin login ID and password, **admin** and **public** respectively.



PEPWAVE AP One

AP Name: Pepwave AP One

Username:

Password:

Login

After logging in, the following Information main page appears. Click **System**, located under **Configure** on the left, to begin setting up your access point.

6. Information

The **Information** section contains a number of tabs to keep you up-to-date on your access point's status and operation.

PEPWAVE

The screenshot displays the PEPWAVE web interface. On the left is a navigation menu with categories: Information (System, Wireless), Configure (System, LAN, Wireless Networks, Advanced Wireless, WDS, SpeedFusion™, SNMP, Web Administration), Tools (Diagnostic Tools), Commands (Activate Changes, Firmware, Configuration, Misc), and Logout. The main content area is titled 'System Information' and contains a 'System' tab. Below the tab is a table of system details. At the bottom left of the main area is a 'Real Time Status' box showing controller connection and running status.

System	
Model	AP One
Firmware Version	3.3.1 build 1124
AP Name	AP One (Hostname: AP-One)
Location	site1
Serial Number	2830-1234-1234
MAC Address	00:1A:DD:00:00:00
Network IP Information	10.10.10.167 / 16 (Detail)
System Time	Fri Dec 7 02:16:16 UTC 2012
Up Time	4day, 21:03:28

Real Time Status
Controller:
Connecting to Balance
(10.9.1.1)
Status:
Running

6.1 System

Click **System**, located under **Information** on the left, to display tabs for basic and advanced AP configuration options.

System Information

System	
Model	AP One
Firmware Version	3.3.1 build 1124
AP Name	AP One (Hostname: AP-One)
Location	site1
Serial Number	2830-1234-1234
MAC Address	00:1A:DD:00:00:00
Network IP Information	10.10.10.167 / 16 (Detail)
System Time	Fri Dec 7 02:16:16 UTC 2012
Up Time	4day, 21:03:28

System Information

Model	Model name of your access point.
Firmware Version	Firmware version number running on your access point.
AP Name	Name of your access point as defined in the configuration.
Location	Location of your access point as defined in the configuration.
Serial Number	Serial number of your access point.
MAC Address	MAC address of your access point.
Network IP Information	Current gateway IP address of your access point.
System Time	Current system time with respect to the configured time.
Up Time	Up time of your access point since the most recent boot.

Click the **Detail** link next to **Network IP Information** to check **IP Address Mode**, **IP Address**, **Subnet Mask**, **Default Gateway**, and **DNS Server**.

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IP INFO		Close
IP Address Mode	Automatic	
IP Address	192.168.1.78	
Subnet Mask	255.255.255.0	
Default Gateway	192.168.1.1	
DNS Server	192.168.1.1	

Click Close to dismiss the IP

Wireless

Click **Wireless**, located under **Information** on the left, to display tabs containing information about your Pepwave access point, connected clients, WDS, and nearby networks.

PEPWAVE

Wireless Information

AP Info **Connected Clients** WDS Info Nearby Networks

Wireless Network SSID	Radio	Security Policy	Channel	Default VLAN ID	MAC Address(BSSID)	
PEPWAVE_6DE0	2.4GHz	Open	1	0	00:1A:DD:00:00:00	Info Stat

Usage Data Type: Hourly

Wireless Network Usage

Number of Wireless Clients

Wireless Network Usage

02:39	Total	923.55 kbps
02:39	PEPWAVE_6DE0	923.55 kbps

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6.1.1 AP Info Wireless Information



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Wireless Information – AP Info

Wireless Network SSID	SSID of your access point.
Radio	Frequency used by your access point's radio.
Security Policy	Wireless authentication and encryption methods used by your access point.
Channel	802.11 channel used by your access point.
Default VLAN ID	VLAN ID tagged onto all outgoing packets generated using the current wireless network profile.
MAC Address (BSSID)	Detailed BSSIDs for the current wireless network profile.
Usage Data Type	Data display used in the Wired Network Usage graph. Check Hourly to display usage in 60-minute increments.
Wireless Network Usage	Wireless network usage displayed using the options selected from the Usage Data Type drop-down menu and the Hourly checkbox.
Number of Wireless Clients	Number of wireless clients displayed using the options selected from the Usage Data Type drop-down menu and the Hourly checkbox.

Click **Info** to see **Web Portal Login**, **Wireless Network Firewall**, **MAC Filter**, **Bandwidth Control**, and **Layer 2 Isolation**.

INFO		Close
Web Portal Login	InControl	
MAC Filter	None	
Bandwidth Control	Disable	
Layer 2 Isolation	Disable	

Click **Close** to dismiss the **Info** dialog.

Click **Stat** to check **Packets Sent**, **Bytes Sent**, **Packets Received**, and **Bytes Received**.

STAT		Close
Packets Sent	142	
Bytes Sent	19025	
Packets Received	0	
Bytes Received	0	

Click **Close** to dismiss the **Stat** dialog.

6.1.2 Connected Clients

Wireless Information

AP Info Connected Clients WDS Info Nearby Networks										
Refresh Interval: <input type="text" value="Never"/>		Refresh		Total: 1						
MAC Address	Manufacturer	IP Address	Type	Signal	Duration	TX/RX Rate	TX/RX Bytes(Packets)	TX Errs	RX Errs	
<i>PEPWAVE_6DE0 [Open]</i>										
cc:fe:3c:00:00:00	Client A	0.0.0.0	ng	18	00:00:05	26M / 19.5M	580 / 25.5K (1 / 0)	0	23	

Wireless Information – Connected Clients

Refresh Interval	Interval used when refreshing connected client data.
Refresh	Click to manually refresh connected client data.
Total	Number of connected clients since the last refresh.
MAC address	Client MAC address.
Manufacturer	AP manufacturer name, based on MAC prefix.
IP Address	IP address of the connected client.
Type	Radio mode of the connected client.
Signal	Signal strength of the connected client.
Duration	Time the listed client has been connected to the network, as reported at the last refresh.
TX/RX Rate	Transmit and receive data rates for the connected client, as reported at the last refresh.
TX/RX Bytes (Packets)	Transmit and receive data volume for the connected client, as reported at the last refresh. Packet data shown in parenthesis.
TX Errs	Number of transmit errors for the connected client, as reported at the last refresh.
RX Errs	Number of receive errors for the connected client, as reported at the last refresh.

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6.1.3 WDS Info

WDS

WDS

Local MAC Address	00:1A:DD:00:00:00			
Current Channel	1			
Manufacturer	MAC Address	Status	Encryption	
Pepwave	00:1D:00:00:00:00	Disable	Open	Edit Delete Info

[Add](#)

Wireless Information – WDS Info

Local MAC Address	MAC address identifying the local system.
Current Channel	Current 802.11 broadcast channel used by the system.
Manufacturer	Access point manufacturer name, based on MAC prefix.
MAC Address	MAC address for connected peers.
Status	Current WDS status: enabled or disabled .
Encryption	Encryption method used by the WDS.

Click **Edit** to **enable** or **disable** WDS, edit the WDS MAC address, and select an encryption method.

WDS Details

Settings

Enable	<input type="radio"/> Yes <input checked="" type="radio"/> No
MAC Address	<input type="text" value="00:1D:00:00:00:00"/>
Encryption	None ▾

[Save](#)

[Save to flash and activate](#)

6.1.4 Nearby Networks

Wireless Information

Network Discovery	Disable
Scanning Interval	10 s
Scanning Time	50 ms

Group by:

Manufacturer	SSID	Security	MAC Address	Channel	Signal	Last Seen	Status
Pepwave Ltd	SSID_Home	wpa	00:01:00:00:00:00	1	Excellent (37)	14:14 07-30	down

1 | 0 - 0 of 0 Refresh

Wireless Information – Nearby Networks

Network Discovery	Displays whether your access point is set to scan and discover nearby access points.
Scanning Interval	How often your access point scans for nearby access points, providing Network Discovery is Enabled .
Scanning Time	Channel scan interval used by your access point when searching for nearby access points.
Group by	Grouping method used for display of nearby access points.
Manufacturer	Access point manufacturer name, based on MAC prefix.
SSID	SSID used to refer to the nearby access point.
Security	Client authentication method(s) used by the nearby access point.
MAC address	MAC address of the nearby access point.
Channel	Channel used by the nearby access point.
Signal (RSSI)	Radio signal strength of the nearby access point.
Last Seen	Time stamp indicating when the nearby access point was last seen, if at all.
Status	Current status of the nearby access point.
Quantity drop-down menu	Number of nearby access points to display on one page.
Refresh	Click this link to manually refresh nearby access point data.

7. Configuration

The **Configure** section allows you to set up all aspects of your Pepwave access point, from basic system settings to advanced wireless options and more.

PEPWAVE

The screenshot shows the configuration interface for a Pepwave access point. On the left is a navigation sidebar with categories: Information (System, Wireless), Configure (System, LAN, Wireless Networks, Advanced Wireless, WDS, SpeedFusion™, SNMP, Web Administration), Tools (Diagnostic Tools), Commands (Activate Changes, Firmware, Configuration, Misc), and Logout. A 'Real Time Status' box shows the controller as 'Connecting to Balance (10.9.1.1)' and the status as 'Running'. The main content area is titled 'System' and has two tabs: 'Basic' and 'Advanced'. The 'Advanced' tab is active, showing a form with the following fields: 'AP Name' (text input with 'AP One'), 'Location' (text input with 'site1'), 'Timezone' (dropdown menu with 'UTC (Coordinated Universal Time)'), 'Keep Default IP' (checkbox checked with 'Enable'), and 'IP Address Mode' (dropdown menu with 'Automatic'). At the bottom of the form are two buttons: 'Save' and 'Save to flash and activate'.

7.1 System

Click **System**, located under **Configure** on the left, to display tabs for basic and advanced AP

System

Basic	Advanced
AP Name	<input type="text" value="AP One"/>
Location	<input type="text" value="site1"/>
Timezone	UTC (Coordinated Universal Time) ▾
Keep Default IP	<input checked="" type="checkbox"/> Enable
IP Address Mode	Manual ▾
Static IP Address	<input type="text"/>
Subnet Mask	255.255.255.0 (/24) ▾
Default Gateway	<input type="text"/>
DNS Server	<input type="text"/>

[Save](#) [Save to flash and activate](#)

configuration options.

7.1.1 Basic

System Settings - Basic

AP Name	User-specified name assigned to your Pepwave access point. This name can be retrieved via SNMP.
Location	User-specified name for the location of your access point. This name can be retrieved via SNMP.
Timezone	Time region used by the system. All choices are based on UTC.
Keep Default IP	When enabled, this option maintains 192.168.0.3 as your access point's default IP address.
IP Address Mode	IP Address Mode options are Automatic and Manual . Automatic : The IP address of your access point is acquired from a DHCP server on the Ethernet segment. Manual : A user-specified IP address is used for your access point. See next page for an example.

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System

Basic		Advanced	
AP Name	<input type="text" value="AP One"/>		
Location	<input type="text" value="site1"/>		
Timezone	UTC (Coordinated Universal Time) ▼		
Keep Default IP	<input checked="" type="checkbox"/> Enable		
IP Address Mode	Manual ▼		
Static IP Address	<input type="text"/>		
Subnet Mask	255.255.255.0 (/24) ▼		
Default Gateway	<input type="text"/>		
DNS Server	<input type="text"/>		

IP Address Mode – Manual

Static IP Address	Unique IP address used by your Pepwave access point to communicate on the Ethernet segment. This IP address is distinct from the admin IP address (192.168.0.3) on the Ethernet segment.
Subnet Mask	Subnet mask used by your access point.
Default Gateway	Default gateway used by your access point.
DNS Server	DNS server address used by your Pepwave access point to resolve host names.

IP Address Mode –Advanced

PPPoE Username	This specifies the username required in order to connect via PPPoE to acquire Internet connectivity. The information is typically determined by and can be obtained from the ISP.
PPPoE Password	This specifies the password required in order to connect via PPPoE to acquire Internet connectivity. The information is typically determined by and can be obtained from the ISP.
PPPoE Service Name	This is a PPPoE parameter which is provided by the ISP. Note: Leave this field empty if you are not sure.

7.1.2 Advanced

System

Basic Advanced

Management VLAN ID	<input type="text" value="0"/>						
NTP Server	<input type="text" value="0.pepwave.pool.ntp.org"/>						
Scheduled Reboot	<input type="checkbox"/> Enable <table><thead><tr><th>Schedule</th><th>Day</th><th>Time</th></tr></thead><tbody><tr><td>Weekly</td><td>Sunday</td><td>00:00</td></tr></tbody></table>	Schedule	Day	Time	Weekly	Sunday	00:00
Schedule	Day	Time					
Weekly	Sunday	00:00					
Ethernet Speed/Duplex	<input type="text" value="Auto"/>						
Controller IP Address / Domain Name	<input type="text"/> (optional)						
AP Mode	<input type="text" value="Bridge"/> <input type="text" value="Bridge"/> <input type="text" value="Router"/>						

Save Save to flash and activate

System Settings - Advanced

Management VLAN ID	VLAN ID from which management sessions are allowed. Establishment of management sessions is restricted to the specified VLAN ID. If Management VLAN ID is set to 0 , management sessions can be established without VLAN ID restrictions. Default value is 0 , which means that tagging is disabled , not that management sessions will be tagged with 0 .
NTP Server	Network Time Protocol (NTP) Server hostname used when synchronizing your access point's system clock. Default value is pool.ntp.org .
Scheduled Reboot	Automatic reboot schedule. Check Enable , then set the reboot schedule using the Schedule , Day , and Time drop-down menus.
Ethernet Speed/Duplex	Ethernet send and receive speed.
Controller IP Address / Domain Name	IP address or domain name of an optional Peplink Balance AP Controller. Leave this field blank if not using a Balance AP Controller.
AP Mode	Access point operation mode. Choose Bridge or Router . When Router is selected, the following Manual Router Settings will be available:

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7.1.2.1 Manual Router Settings

Manual Router Settings are available only when **AP Mode** in **Advanced System Settings** is set to **Router**. When using **Router** mode, your Pepwave access point can be used as a DHCP server for devices located behind it in the network.

Manual Router Settings

LAN IP	192.168.1.1
LAN Subnet Mask	255.255.255.0
DHCP Server	<input checked="" type="checkbox"/> Enabled
IP Start Range	192.168.1.100
IP Stop Range	192.168.1.200
Subnet Mask	255.255.255.0
Broadcast Address	192.168.1.255
Gateway	192.168.1.1
DNS 1	192.168.1.1
DNS 2	
DNS 3	
Lease Time	3600 seconds

Manual Router/DHCP Server Parameters

LAN IP	DHCP server IP address.
LAN Subnet Mask	Subnet mask of the DHCP server.
DHCP Server	Check to enable the DHCP server feature of your Pepwave access point. The following options will be enabled once you have checked and enabled DHCP Server .
IP Start Range	First address in the range of IP addresses assigned to DHCP clients.
IP Stop Range	Last address in the range of IP addresses assigned to DHCP clients.
Subnet Mask	Subnet mask used by DHCP clients.
Broadcast Address	Broadcast address used by DHCP clients.
Gateway	Default routing gateway used by DHCP clients.
DNS 1	IP address of the primary DNS server offered to DHCP clients.
DNS 2	IP address of the secondary DNS server offered to DHCP clients.
DNS 3	IP address of the tertiary DNS server offered to DHCP clients.

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Lease Time

Length of time that an IP address of a DHCP client remains valid. When lease time has expired, the assigned IP address is no longer valid, and renewal of the IP address assignment is required.

7.2 LAN

Select **LAN**, located under **Configure** on the left, to begin configuring a local area network for your Pepwave access point.

7.2.1 LAN

LAN

LAN	DMZ	Port Forward
LAN IP	<input type="text" value="192.168.1.1"/>	
LAN Subnet Mask	<input type="text" value="255.255.255.0 (/24)"/> ▾	
DHCP Server	<input checked="" type="checkbox"/> Enabled	
IP Start Range	<input type="text" value="192.168.1.100"/>	
IP Stop Range	<input type="text" value="192.168.1.200"/>	
Subnet Mask	<input type="text" value="255.255.255.0 (/24)"/> ▾	
Broadcast Address	<input type="text" value="192.168.1.255"/>	
Gateway	<input type="text" value="192.168.1.1"/>	
DNS 1	<input type="text" value="192.168.1.1"/>	
DNS 2	<input type="text"/> (optional)	
DNS 3	<input type="text"/> (optional)	
Lease Time	<input type="text" value="86400"/> seconds	
Reservation	<input type="text"/>	<input type="button" value="Delete"/>
	MAC Address: <input type="text"/>	<input type="button" value="Add"/>
	IP Address: <input type="text"/>	

LAN

LAN IP	IP address of your Pepwave access point.
LAN Subnet Mask	Specifies the number of clients that can connect to your access point.
DHCP Server	Check to enable the DHCP server feature of your access point. Enabling DHCP is the best option for most users. The following options will be enabled once you have checked and enabled DHCP Server .
IP Start Range	First address in the range of IP addresses assigned to DHCP clients. Default is 192.168.1.100
IP Stop Range	Last address in the range of IP addresses assigned to DHCP clients. Default is 192.168.1.200 .
Subnet Mask	Number of clients that can connect to your access point. This value should match the value in LAN Subnet Mask . Default is 255.255.255.0 .
Broadcast Address	Broadcast address used by DHCP clients.
Gateway	Default routing gateway used by DHCP clients.
DNS 1	IP address of the primary DNS server offered to DHCP clients.
DNS 2	IP address of the secondary DNS server offered to DHCP clients.
DNS 3	IP address of the tertiary DNS server offered to DHCP clients.
Lease Time	Length of time that an IP address of a DHCP client remains valid. When lease time has expired, the assigned IP address is no longer valid, and renewal of the IP address assignment is required.
Reservation	Assigns an IP address to a specific MAC address. To add a new reservation, enter MAC address and IP Address , then click Add . To remove a reservation from the displayed list, click Delete .

7.2.2 DMZ

LAN

LAN DMZ Port Forward

DMZ Enable

DMZ IP

Save Save to flash and activate

DMZ

- DMZ** Enable your AP One unit to become a DMZ device.
- DMZ IP** Address used by external users to connect to your IP's ports.

7.2.3 Port Forward

LAN

LAN DMZ Port Forward

Name	IP	Port
<input type="text"/>	<input type="text"/>	TCP <input type="text"/> -- Selection Tool -- Single Port <input type="text"/> Port <input type="text"/>

Apply

Save Save to flash and activate

Port Forward

- Name** Name for your port forwarding rule.
- IP** IP address to which ports are forwarded.
- Port** Choose **TCP** or **UDP** to forward the selected port or port range using the specified protocol. Select port options from the drop-down menus on the right, then click **Apply** to make the port forwarding rule active.

7.3 Wireless Networks

Select **Wireless Networks**, located in the **Configure** section on the left, to display your Pepwave access point's SSID configuration.

Wireless Networks

Wireless Networks

Wireless Network SSID	Security Policy	Default VLAN ID	Status	MAC Address (BSSID)	
PEPWAVE_6DE0	Open	0	Enable	00:1A:DD:00:00:00	Edit Delete Info

[Add](#)

PEPWAVE_6DE0 Close

Broadcast SSID	Enable
Web Portal Login	Disable
MAC Filter	None
Bandwidth Control	Disable
Layer 2 Isolation	Disable

General Wireless Network Settings

Wireless Network SSID	SSID of the virtual access point.
Security Policy	Wireless authentication and encryption used by your Pepwave access point.
Default VLAN ID	VLAN ID tagged on all outgoing packets generated by the virtual AP (i.e., packets traveling from the Wi-Fi segment through your access point to the Ethernet segment via the LAN port). If 802.1x is enabled, a per-user VLAN ID can be specified in the authentication reply from the RADIUS server. If a per-user VLAN ID is set, the default VLAN ID will be overridden.
Status	Virtual AP status of your access point. Displays Enable or Disable .
MAC Address (BSSID)	Detailed BSSID used by your access point.

User Manual

PEPWAVE AP Series

Click **Info** to check **Broadcast SSID**, **Web Portal Login**, **MAC Filter**, **Bandwidth Control**, and **Wireless Networks**

Wireless Networks

Wireless Network SSID	Security Policy	Default VLAN ID	Status	MAC Address (BSSID)	
PEPWAVE_6DE0	Open	0	Enable	00:1A:DD:00:00:00	Edit Delete Info

[Add](#)

PEPWAVE_6DE0 Close

Broadcast SSID	Enable
Web Portal Login	Disable
MAC Filter	None
Bandwidth Control	Disable
Layer 2 Isolation	Disable

Layer 2 Isolation.

General Wireless Networks Settings – Info

Broadcast SSID	Displays whether or not your Pepwave access point's SSID is broadcast.
Web Portal Login	Displays whether or not your access point can be accessed via Web portal.
MAC Filter	Displays whether or not your access point controls access with MAC address filters.
Bandwidth Control	Displays whether or not your access point is using bandwidth controls.
Layer 2 Isolation	Displays whether or not your access point is using Layer 2 isolation.

User Manual

PEPWAVE AP Series

To add a new virtual AP, click the **Add** button. To change network details for a virtual AP, click its **Edit** link, which give you access to **Wireless Network Details**, explained on the next page.

Wireless Networks

Wireless Networks

Wireless Network SSID	Security Policy	Default VLAN ID	Status	MAC Address (BSSID)	
PEPWAVE_6DE0	Open	0	Enable	00:1A:DD:00:00:00	Edit Delete Info

[Add](#)

PEPWAVE_6DE0 Close

Broadcast SSID	Enable
Web Portal Login	Disable
MAC Filter	None
Bandwidth Control	Disable
Layer 2 Isolation	Disable

7.3.1 Wireless Network Details - Basic

Wireless Network Details

Basic	Web Portal Login	Guest Protect	MAC Filter	Advanced	RADIUS Server
Enable	<input checked="" type="radio"/> Yes <input type="radio"/> No				
Wireless Network SSID	PEPWAVE_6DE0				
Broadcast SSID	<input checked="" type="checkbox"/> Enable				
Security Level	802.1X				
802.1X Version	<input type="radio"/> V1 <input checked="" type="radio"/> V2				
WEP Key Size	40 bits (64-bit WEP)				
Re-keying Period	14400 seconds (0: Disable)				
Go to RADIUS Server settings					
<input type="button" value="Save"/> <input type="button" value="Save to flash and activate"/>					

Wireless Network Details - Basic

Enable	Select Yes to enable the virtual AP. Select No to disable. The virtual AP is enabled by default.
Wireless Network SSID	SSID of the virtual AP as it appears to Wi-Fi clients.
Broadcast SSID	Check Enable to allow Wi-Fi clients to scan the virtual AP's ESSID. Note that the BSSID (i.e., the MAC address of the virtual AP) cannot be hidden from the scan. To associate with the virtual AP, clients must specify the correct ESSID upon association. Broadcast SSID is enabled by default.
Security Level	Configures wireless authentication and encryption methods used by the virtual AP. Available options are Open - No Encryption , Static WEP , 802.1X , WPA-TKIP , and WPA2-AES:CCMP . For details on setting encryption options, please see Static WEP Parameters , 802.1x Parameters , WPA Parameters in the following sections.

7.3.1.1 Static WEP Parameters

The configuration of **Static WEP** parameters enables pre-shared WEP key encryption. Please note that static WEP offers weak security and does not support authentication.

Wireless Network Details

Basic	Web Portal Login	Guest Protect	MAC Filter	Advanced	RADIUS Server
Enable	<input checked="" type="radio"/> Yes <input type="radio"/> No				
Wireless Network SSID	PEPWAVE_6DE0				
Broadcast SSID	<input checked="" type="checkbox"/> Enable				
Security Level	WEP				
Key Size	40 bits (64-bit WEP)				
Key Format	ASCII				
Passphrase	<input type="text"/>				Generate Key
Encryption Key	<input type="text"/>				Hide / Show Passphrase
Shared Key Authentication	<input type="checkbox"/> Enable				

Save

Save to flash and activate

Static WEP Parameters

Key Size	Choose 40 bits (64-bit WEP) or 104 bits (128-bit WEP) . When using the WDS setting, 128 bits will also be available.
Key Format	Choose ASCII or HEX . ASCII can be applied only to encryption keys that are manually entered. HEX can be applied to encryption keys that are manually entered or automatically generated.
Passphrase	Combination of words and characters used to generate an encryption key. Click Generate Key to create the key.
Encryption Key	User-specified encryption key value. For ASCII format, key length is either 5 or 13 . For HEX format, key length is either 10 or 26 .
Shared Key Authentication	Check to enable shared key authentication. Default is disabled , meaning open authentication is used.

7.3.1.2 802.1X Parameters

The configuration of 802.1X parameters enables RADIUS-based 802.1X authentication with a dynamic WEP key.

Wireless Network Details

Basic	Web Portal Login	Guest Protect	MAC Filter	Advanced	RADIUS Server
Enable	<input checked="" type="radio"/> Yes <input type="radio"/> No				
Wireless Network SSID	PEPWAVE_6DE0				
Broadcast SSID	<input checked="" type="checkbox"/> Enable				
Security Level	802.1X				
802.1X Version	<input type="radio"/> v1 <input checked="" type="radio"/> v2				
WEP Key Size	40 bits (64-bit WEP)				
Re-keying Period	14400 seconds (0: Disable)				

[Go to RADIUS Server settings](#)

802.1x Parameters

802.1X Version	Choose v1 or v2 of the 802.1x EAPOL. When v1 is selected, both v1 and v2 clients can associate with the access point. When v2 is selected, only v2 clients can associate with the access point. Most modern wireless clients support v2. For stations that do not support v2, select v1 . Default is v2 .
WEP Key Size	Choose 40 bits or 104 bits .
Re-keying Period	Length of time throughout which the broadcast key remains valid. When the re-keying period expires, the broadcast key is no longer valid, and broadcast key renewal is required. Default is 14400 seconds (four hours). 0 disables re-keying.

7.3.3.3 WPA parameters

The configuration of WPA parameters enables **WPA-TKIP**, **WPA2-AES:CCMP**, and **WPA-TKIP and WPA2-AES:CCMP**. To enable WPA and WPA-PSK, configure **WPA-TKIP**. To enable WPA2 and WPA2-PSK, configure **WPA2-AES**. When **WPA** or **WPA2** is configured, RADIUS-based 802.1x authentication with TKIP encryption method is enabled. When using this configuration, **Pre-Shared Key** should be **disabled**.

The security level of this method is known to be very high.

Wireless Network Details

Basic	Web Portal Login	Guest Protect	MAC Filter	Advanced	RADIUS Server
Enable	<input checked="" type="radio"/> Yes <input type="radio"/> No				
Wireless Network SSID	PEPWAVE_6DE0				
Broadcast SSID	<input checked="" type="checkbox"/> Enable				
Security Level	WPA and WPA2 ▾				
Pre-Shared Key	<input checked="" type="checkbox"/> Enable				
Passphrase	<input type="text"/> Hide / Show Passphrase				

[Save](#)

[Save to flash and activate](#)

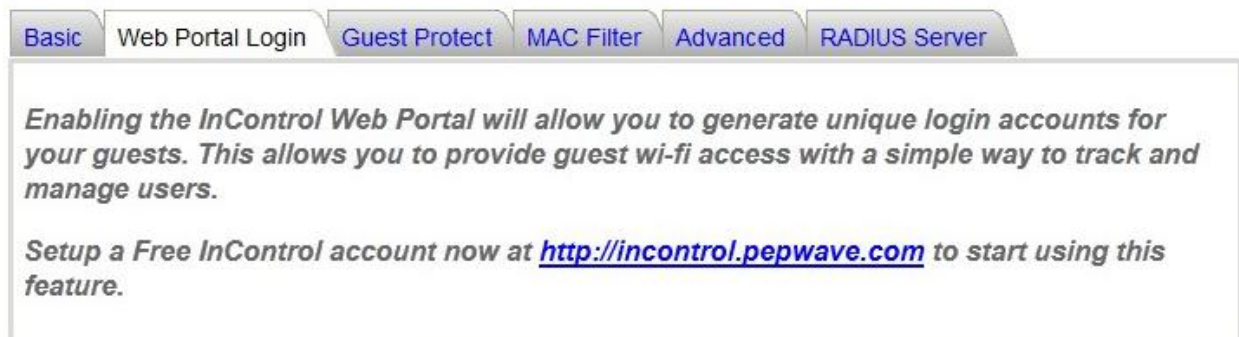
When **WPA-PSK** or **WPA2-PSK** is configured, a **Pre-Shared Key** or **Passphrase** is used for data encryption and authentication. When using this configuration, **Pre-Shared Key** should be **enabled**. Key length must be from 8 to 63 characters.

The security level of this method is known to be high.

7.3.4 Web Portal Login

Once your Pepwave access point is registered with Pepwave InControl, you can apply

Wireless Network Details



The screenshot shows a configuration page with tabs for 'Basic', 'Web Portal Login', 'Guest Protect', 'MAC Filter', 'Advanced', and 'RADIUS Server'. The 'Web Portal Login' tab is active. Below the tabs is a text box containing the following information:

Enabling the InControl Web Portal will allow you to generate unique login accounts for your guests. This allows you to provide guest wi-fi access with a simple way to track and manage users.

Setup a Free InControl account now at <http://incontrol.pepwave.com> to start using this feature.

[Save](#) [Save to flash and activate](#)

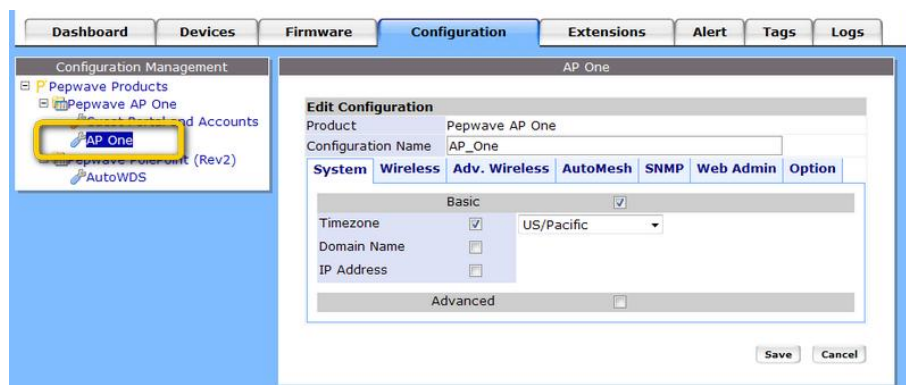
configurations, update firmware, and monitor network activity remotely using this centralized management system. For details, see <http://www.pepwave.com/products/incontrol/>.

7.3.4.1 Tip: How to Set Up a Pepwave AP Guest Portal in InControl

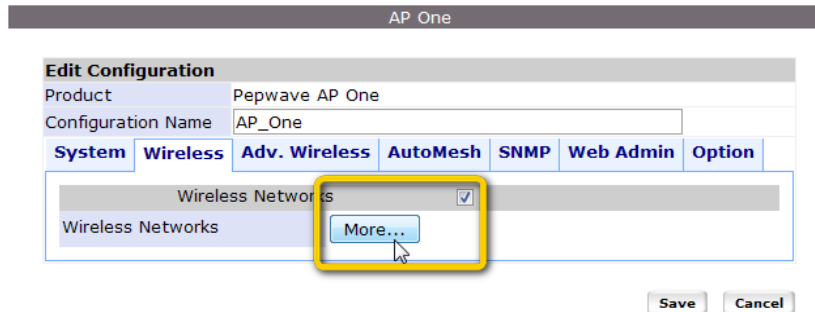
To set up a Guest Portal, (1) enable the guest portal function and (2) create guest accounts and set up a portal page.

Step One: Enable the Guest Portal

1. Log into InControl with your username and password. <<https://incontrol.pepwave.com/>>
2. Click the **Configuration** tab, then locate the desired configuration profile.



- To find your wireless network, click the **Wireless** tab. Next, check **Wireless Networks**, then click **More...**



- Click the name of the SSID you have set up. Note: If you have not added a wireless network, click **New wireless network...** to create one.
- On the **Edit a wireless network** page, click the **Web Portal Login** tab. Click **Enable** to enable Web portal logins. Click **OK** to continue.
- Click **Save** to save your changes.
- Click the **Web Admin** tag and setup the web access as follows:
 - Web Access Protocol: **HTTPS**
 - Management Port: **443**
 - HTTP to HTTPS Redirection: **Enable**
- Click **Save** to save your settings.

Step Two: Create Guest Accounts and Set Up a Portal Page

- Go to **Guest Portal and Accounts** by clicking on the link on the left.
- You can generate more than one account at one time. Change the parameters in **No. of accounts to be generated**, **Username prefix**, **Sequence number suffix**, and **Time Quota**. Default time limit is set to 24 hours. You can change the time limit.
- Click **Generate**.
- You should now have some guest accounts generated as shown **Unused Guest Accounts**. You can download account information in CSV format by clicking **All, Generated today**, or **Not generated today**.
- A standard portal page will be generated automatically after guest accounts are generated (<http://guest.pepwave.com>). You can customize the portal page by clicking on the **Portal Page Customization** tab, where you can upload your logo image and enter a message for guests. Preview your portal page, then publish it.

Your guest accounts and portal page are now ready for use.

7.3.5 Guest Protect

Wireless Network Details

Basic Web Portal Login **Guest Protect** MAC Filter Advanced RADIUS Server

Block LAN Access Block all private IPs Custom Subnet Block Exception
 Enable

Block SpeedFusion™ Enable

Bandwidth Management Enable

Upstream Limit Per VAP Per Client
0 kbps (0: Unlimited)

Downstream Limit Per VAP Per Client
0 kbps (0: Unlimited)

Maximum Number of Clients 0 (0: unlimited)

Firewall Mode
 Lockdown - Block all traffic except for the following exceptions:
 Flexible - Allow all traffic except for the following exceptions:
 Disable

Exceptions

Name	Type	Item
No Active Exceptions		
	Port	<input type="radio"/> TCP <input type="radio"/> UDP port: <input type="text"/> - <input type="text"/>

[Save](#) [Save to flash and activate](#)

Wireless Network Details - Guest Protect

Enables settings to **Block all private IPs / Custom Subnet / Block Exception**. If you have selected **Block all private IPs** or **Custom Subnet**, these IPs / subnets will be blocked no matter what **Firewall Mode** is selected. When **Block Exception** is selected, IPs entered will be excluded from the blocking list.

- Block LAN Access**
- **Private IP** – Blocks common private IPs:
 - 192.168.0.0 – 192.168.255.255
 - 172.16.0.0 – 172.31.255.255
 - 10.0.0.0 – 10.255.255.255
 - **Custom Subnet** – Blocks user-specified IP subnets.
 - **Block Exception** – Blocks all IPs except those specified.

Block SpeedFusion™ Block SpeedFusion™ traffic.

Bandwidth Management Enables settings to control upstream and downstream limits. You can control bandwidth usage **Per VAP** or **Per Client**.

Upstream Limit Upstream bandwidth limit in kbps. Default is **0: Unlimited**.

Downstream Limit Downstream bandwidth limit in kbps. Default is **0: Unlimited**.

Maximum Number of Clients Maximum number of clients that can be simultaneously connected to your Pepwave access point. Default is **0: unlimited**.

Enables one of three firewall modes: **Lockdown**, **Flexible**, and **Disable**.

Firewall Mode

- **Lockdown** – Block all traffic except pre-defined exceptions.
- **Flexible** – Allow all traffic except pre-defined exceptions.
- **Disable** – Firewall mode is disabled. (Default)

Exceptions Specifies exceptions when **Lockdown** or **Flexible Firewall Mode** is selected. Exceptions can be added by type, including **Port**, **Domain**, **IP Address**, **MAC Address**, and **Application/Service**. Click **Apply** to save changes and make them active.

7.3.6 MAC Filter

These settings allow your administrator to control access using Mac address filtering. Choose from **None**, **Deny all except listed**, **Accept all except listed**, and **RADIUS MAC Authentication**. To delete MAC addresses from the list, select them, then click **Delete highlighted**. To add MAC addresses to the list, select them, then click **<<<Add to list**.

Wireless Network Details

The screenshot displays the 'MAC Filter' configuration page. At the top, there are tabs for 'Basic', 'Web Portal Login', 'Guest Protect', 'MAC Filter', 'Advanced', and 'RADIUS Server'. The 'MAC Filter' tab is active. Below the tabs, there is a dropdown menu for selecting a filter policy. The dropdown menu is open, showing the following options: 'None', 'Deny all except listed', 'Accept all except listed', and 'RADIUS MAC Authentication'. The 'None' option is currently selected. Below the dropdown menu, there is a large empty box labeled 'Listed MAC Addresses'. To the right of this box, there is a section for 'Connected clients' which contains a list with one entry: 'CC:FE:3C:46:34:5A*'. Below the 'Listed MAC Addresses' box, there is a button labeled 'Delete highlighted'. Below the 'Connected clients' list, there is a button labeled '<<< Add to list'. At the bottom left of the page, there is a note: '* suffix = client connected to PEPWAVE_6DE0'.

Save

Save to flash and activate

7.3.7 Advanced

Wireless Network Details

Basic	Web Portal Login	Guest Protect	MAC Filter	Advanced	RADIUS Server
Data Rate	<input checked="" type="radio"/> Auto <input type="radio"/> Fixed		MCS0	MCS Index	
Multicast Filter	<input type="checkbox"/> Enable				
Multicast Rate	MCS0/6M		MCS Index		
IGMP Snooping (Multicast Enhancement)	<input type="checkbox"/> Enable				
DHCP Setting	None				
Default VLAN ID	None				
VLAN Pooling	Relay				
VLAN Pool	Server				
VLAN Pool	<input type="text"/>		(CSV: e.g. 1,3,9-11,15)		
Network Priority (QoS)	Gold				
Layer 2 Isolation	<input type="checkbox"/> Enable				

Save

Save to flash and activate

Wireless Network Details - Advanced

Data Rate	Choose Fixed or Auto . Fixed forces all data packets to be transmitted using the selected transmit rate. Auto selects the best transmit rate, using the selected transmit rate as the minimum auto transmit rate. The rate options and values chosen here will be affected by selected Protocol and Channel Bonding .
Multicast Filter	Enables filtering multicast network traffic to the wireless SSID.
Multicast Rate	Transmit rate used for sending multicast network traffic. The rate value chosen here will be affected by selected Protocol and Channel Bonding .
IGMP Snooping (Multicast Enhancement)	Enables listening to Internet Group Management Protocol traffic between your Pepwave access point and hosts. Enabling this option ensures that hosts receive multicast traffic only from groups they have joined.
DHCP Setting	Choose None , Relay , or Server . Choosing Relay or Server will forward DHCP requests to a specified DHCP server and prevent broadcast messages from being propagated on the Ethernet segment. Upon selecting this option, the DHCP server IP address (or DHCP server settings) will be prompted.
Default VLAN ID	VLAN ID to be tagged on all outgoing packets generated from the virtual AP (i.e., packets that travel from the Wi-Fi segment through your Pepwave access point to Ethernet segment via the LAN port). If 802.1x is enabled and a per-user VLAN ID is specified in authentication reply from the Radius server , then the value specified by Default VLAN ID will be overridden. Default value is 0 , which means that tagging is disabled , not that management sessions will be tagged with 0 .
VLAN Pooling	Enables VLAN pooling using the values specified in VLAN Pool .
Network Priority (QoS)	802.1p QoS value marked on all outgoing packets generated from the virtual AP (i.e., packets traveling from the Wi-Fi segment through your Pepwave access point to the Ethernet segment via the LAN port). Choose Gold , Silver , or Bronze .
Layer 2 Isolation	Layer 2 refers to the second layer in the ISO Open System Interconnect model. When this option is enabled, clients on the same VLAN, SSID, or subnet are not allowed to communicate directly via the Layer 2 Protocol(s). Traffic is passed to upper communication layer(s). With this option disabled, clients on the same VLAN communicate with each other directly. (Windows network resources browsing is possible.) Default is disabled .

7.3.8 RADIUS Server

Wireless Network Details

Basic	Web Portal Login	Guest Protect	MAC Filter	Advanced	RADIUS Server
Primary Host	<input type="text"/>				
Secret	<input type="password"/>				
Authentication Port	<input type="text"/>	Default AuthPort			
Accounting Port	<input type="text"/>	Default AcctPort			
Secondary Host	<input type="text"/>				
Secret	<input type="password"/>				
Authentication Port	<input type="text"/>	Default AuthPort			
Accounting Port	<input type="text"/>	Default AcctPort			
Maximum Retransmission	<input type="text" value="3"/>				
Radius Request Interval	<input type="text" value="3"/>	s (initial value, double upon every retransmission)			

Save

Save to flash and activate

RADIUS Server Settings

Primary Host	When 802.1x authentication is configured, the RADIUS server specified by this setting will be used for authentication and accounting.
Secret	Shared secret password for accessing the RADIUS server.
Authentication Port	UDP port number for the authentication port of the RADIUS server.
Accounting Port	UDP port number for the accounting port of the RADIUS server.
Secondary Host	This setting allows the RADIUS server to be used for authentication and accounting in the event that the Primary Host is unavailable.
Maximum Retransmission	Maximum number of retries for RADIUS authentication. Default is 3 .
Radius Request Interval	Time interval, in seconds, between each RADIUS request attempt. Note that the request time interval doubles after every retransmission. Default is 3 .

7.4 Advanced Wireless Settings

Advanced Wireless Settings provides more options to fine-tune system parameters for optimal performance.

Advanced Wireless Settings

Radio Settings	Advanced Features	Performance Tuning
Protocol	802.11ng ▾	
Operating Country	United States ▾	
Channel Bonding	20 MHz ▾	
Channel	1 (2.412 GHz) ▾	
Power Boost	<input type="checkbox"/> Enable	
Tx Output Power	Max ▾	

[Save](#) [Save to flash and activate](#)

7.4.1 Radio Settings

Advanced Wireless Settings - Radio Settings

Protocol	<p>802.11bgn: Pepwave access point accepts 802.11b, 802.11g, and 802.11n client association requests.</p> <p>802.11b/g: Pepwave access point accepts both 802.11b and 802.11g client association requests.</p> <p>802.11b Only: Pepwave access point accepts only 802.11b client association requests.</p> <p>802.11g Only: Pepwave access point accepts only 802.11g client association requests.</p> <p>802.11n Only: Pepwave access point accepts only 802.11n client association requests.</p>
Operating Country	<p>Note: The country code selection is for non-US model only and is not available to all US model. Per FCC regulation, all WiFi product marketed in US must fixed to US operation channels only.</p>
Channel Bonding	<p>Only available when Protocol is set to 802.11bgn or 802.11n Only. Choose 20MHz, 20/40MHz, or 40MHz.</p>
Channel	<p>802.11 channel. Choose from 1 to 11. In North America and Europe, choose from 1 to 13. (Channel 14 is only available in Japan when using the 802.11b protocol.) If Auto is set, the system scans channels based on the scheduled time and automatically chooses the most suitable channel.</p>
Power Boost	<p>Enables the power boost feature, which maximizes your access point's Wi-Fi capacity. Please enable only if local regulations permit.</p>
Tx Output Power	<p>Choose Max, High, Medium, or Low transmission output power.</p>

7.4.2 Advanced Features

Advanced Wireless Settings

Radio Settings | Advanced Features | Performance Tuning

Discover Nearby Networks Enable

Scanning Interval 10 s

Scanning Time 50 ms

Scheduled Radio Availability Radio Off Period * No enabled entries, radio will be started. Add

Status	Schedule	Option	Start Time	End Time
		No Entry		

WMM Enable

Save Save to flash and activate

Advanced Wireless Settings – Advanced Features

Discover Nearby Networks	Enables your Pepwave access point to scan and discover nearby networks.
Scanning Interval	Specifies how often your access point goes to other channels to discover nearby networks.
Scanning Time	Specifies how long your access point stays on other channels to discover nearby networks.
Scheduled Radio Availability	Click Add to specify radio availability schedule options. If no options are specified, the radio defaults to On .
WMM	Enables Wi-Fi Multimedia (WMM), also known as Wireless Multimedia Extensions (WME), on your access point. Default is enabled .

7.4.3 Performance Tuning

Advanced Wireless Settings

Radio Settings	Advanced Features	Performance Tuning
Beacon Rate	1Mbps	* 6Mbps will be used for 5GHz radio
Beacon Interval	100ms	
DTIM	1	
RTS Threshold	0	
Distance / Time Convertor	4050	m (input distance for recommended values)
Slot Time	9	µs <input type="button" value="Default"/>
ACK Timeout	48	µs <input type="button" value="Default"/>
Frame Aggregation	<input checked="" type="checkbox"/>	Enable
Aggregation Length	50000	
Maximum Number of Clients	0	(0: Unlimited)

Advanced Wireless Settings – Performance Tuning

Beacon Rate	Choose 1Mbps , 2Mbps , 5.5Mbps , 6Mbps , or 11Mbps beacon rate. Default is 6Mbps when using a 5Ghz radio.
Beacon Interval	Time between each beacon transmission: 100ms , 250ms , or 500ms .
DTIM	Frequency for beacon to include Delivery Traffic Indication Message (DTIM) in milliseconds.
RTS Threshold	Minimum packet size needed to send an RTS using the RTS/CTS handshake. A setting of 0 disables this feature.
Distance / Time Convertor	Automatically adjusts Slot Time and ACK Timeout based on the distance entered in meters.
Slot Time	Provides option to modify unit wait time before it transmits. Default is 9µs .
ACK Timeout	Provides the option to set the wait time to receive acknowledgement packet before doing retransmission. Default is 48µs .
Frame Aggregation	Enables frame aggregation when 802.11bgn or 802.11n Only is selected.
Aggregation Length	Length of aggregation data frames. Available only when Frame Aggregation is enabled.
Maximum Number of Clients	Maximum number of connected clients. Default is 0: Unlimited .

7.5 WDS

Wireless Distributed System, or WDS, provides a way to link APs when wired cabling is not

WDS

WDS

Local MAC Address	00:1A:DD:00:00:00			
Current Channel	1			
Manufacturer	MAC Address	Status	Encryption	
Pepwave	00:1D:00:00:00:00	Disable	Open	Edit Delete Info

[Add](#)

preferable. WDS also extends wireless network coverage for wireless clients.

WDS Details

Settings

Enable	<input type="radio"/> Yes <input checked="" type="radio"/> No
MAC Address	<input type="text" value="00:1D:00:00:00:00"/>
Encryption	None <input type="button" value="v"/>

[Save](#)

[Save to flash and activate](#)

Click **Add** to add and configure a new WDS peer connection.

WDS Settings

Enable	Enables WDS.
MAC Address	MAC address of the other AP with which to form a WDS link.
Encryption	Security policy used for WDS peer connections.

7.6 SpeedFusion™

Select **SpeedFusion™**, located under **Configure** on the left, to begin configuring SpeedFusion connection parameters.

SpeedFusion™

SpeedFusion™ Certificate

Local ID Save

Name	Peer Serial Number	Peer Address(es)	Status
NY-CA Office	2830-4567-4567	00:1D:00:00:00:00	Connected

Add

SpeedFusion™ - SpeedFusion™

Local ID	Local ID to be recognized by peers.
Name	Name representing this profile. The name can be any combination of alphanumeric characters (0-9, A-Z, a-z), underscore (_), dash (-), and/or non-leading/trailing spaces ().
Peer Serial Number	Remote peer serial number. Note that your Pepwave access point will establish a VPN connection with a remote peer identified with a serial number.
Peer Address	IP address of the remote peer.
Status	Peer connection status.

7.6.1 SpeedFusion™ Settings

Click **Add** to add a new SpeedFusion connection.

SpeedFusion™ Details

Settings	
Enable	<input checked="" type="radio"/> Yes <input type="radio"/> No
Name	<input type="text" value="NY-CA Office"/>
Encryption	<input checked="" type="radio"/> 256-bit AES <input type="radio"/> Off
Remote ID	<input type="text" value="AP_1234"/>
Authentication	<input checked="" type="radio"/> By Remote ID only <input type="radio"/> Preshared Key <input type="radio"/> X.509
Pre-shared Key	<input type="text"/> (optional) Hide / Show Passphrase
Remote Certificate	<div style="border: 1px solid #ccc; height: 150px; width: 100%;"></div> Show Details
Remote IP Addresses / Host Names	<input type="text" value="2830-4567-4567"/> (optional)
Layer 2 Bridging	<input type="radio"/> Yes <input checked="" type="radio"/> No
Management VLAN ID	<input type="text" value="0"/>
IP Address Mode	<input type="text" value="None"/> ▾
IP Address	<input type="text"/>
Subnet Mask	<input type="text" value="255.255.255.0 (/24)"/> ▾
Data Port	<input checked="" type="radio"/> Default <input type="radio"/> Custom <input type="text"/>

[Save](#)

[Save to flash and activate](#)

SpeedFusion™ - SpeedFusion™ Settings

Enable	Select Yes to enable this SpeedFusion profile.
Name	Name representing this profile. The name can be any combination of alphanumeric characters (0-9, A-Z, a-z), underscore (_), dash (-), and/or non-leading/trailing spaces ().
Encryption	Select 256-bit AES to enable encryption or select Off to disable it.
Remote ID	Name representing the remote peer. The VPN profile will be established only if the remote unit's ID or serial number matches Remote ID . This ensures that connections are made only with authorized remote units. If a remote unit is later replaced, Remote ID must be updated to match the unit's ID or serial number.
Authentication	Peer authentication method. Choose from By Remote ID only or Preshared key .
Pre-shared Key	Optional field which defines the pre-shared key used for this particular VPN connection. The VPN connection's session key will be further protected by the factor of the pre-shared key. The connection will be up only if the pre-shared keys on each side match. When the peer is running firmware 5.0 or 5.1, this setting will be ignored.
Remote IP Addresses / Host Names	Enter Internet host names and/or the IP addresses of the remote unit in this field. You may enter only one of the remote unit's WAN IP addresses/host names here even if the remote unit has multiple WAN connections. Note that IP addresses/host names must be separated by a space or a carriage return. When this field is filled, connection to the remote unit will be attempted. If this field is left blank, the corresponding field at the remote unit must be filled. When the state of any WAN connection changes, the WAN IP addresses will be exchanged.
Layer 2 Bridging	When this check box is unchecked, traffic between local and remote networks will be IP forwarded. To bridge the Ethernet network of an Ethernet port on a local and remote network, select this check box. When this check box is selected, the two networks will become a single LAN, and any broadcast (e.g., ARP requests) or multicast traffic (e.g., Bonjour) will be sent over the VPN.
Management VLAN ID	This field specifies the VLAN ID with which the VPN's traffic should be tagged before sending the traffic to the bridge port. If no VLAN tagging is needed, select No VLAN . To define a new VLAN ID, click New... and input the VLAN ID. VLAN IDs that are not referenced by any VPN profiles will be removed from the list automatically. Default is No VLAN .

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IP Address Mode	IP Address Mode options are Automatic and Manual . Automatic : The IP address of your access point is acquired from a DHCP server on the Ethernet segment. Manual : A user-specified IP address is used for your access point.
IP Address	User-specified IP address for use with Manual IP Address Mode , above.
Subnet Mask	Subnet mask used by your access point.
Data Port	This field specifies the outgoing UDP port number for transporting VPN data. If Default is selected, port 4500 will be used by default. Port 32015 will be used if the remote unit's firmware version is prior to 5.4 or the port 4500 is unavailable for use. If Custom is selected, you can input a custom outgoing port number between 1 and 65535.

7.7 SNMP

7.7.1 SNMP Settings

Select **SNMP**, located under **Configure** on the left, to begin configuring SNMP server settings.

SNMP

SNMP Settings	SNMPv1/v2 Communities	SNMPv3 Users
Server Name	AP One	
SNMPv1	<input checked="" type="checkbox"/> Enable	
SNMPv2	<input checked="" type="checkbox"/> Enable	
SNMPv3	<input type="checkbox"/> Enable	
SNMP Trap	<input type="checkbox"/> Enable	
Save	Save to flash and activate	

SNMP - SNMP Settings

Server Name	Name identifying the SNMP server.
SNMPv1	Enable support for Version 1 of SNMP.
SNMPv2	Enable support for Version 2 of SNMP.
SNMPv3	Enable support for Version 3 of SNMP.
SNMP Trap	Enable SNMP trap messaging, which is initiated by a client and sent to your Pepwave access point.

SNMP

Community Name	IP Address	IP Mask	Access Mode	Status	
office	10.10.10.8	255.255.255.0	Read Only	Enable	Edit Remove

[New](#)

7.7.2 SNMPv1 / SNMPv2 Communities

Using SNMPv1/v2 communities, access rights can be controlled. Click **New** to add a new SNMP v1/v2 community, or click **Edit** to change the settings of an existing community. Click **Remove** to delete a community.

SNMPv1/v2 Community

Settings

Community Name	<input type="text" value="public"/>
IP Address	<input type="text" value="10.10.10.8"/>
IP Mask	<input type="text" value="255.255.255.0 (/24)"/>
Access Mode	<input type="text" value="Read Only"/>
Status	<input checked="" type="radio"/> Enable <input type="radio"/> Disable

[Save](#) [Save to flash and activate](#)

SNMPv1 / SNMPv2 Community - Settings

Community Name	Password for getting or setting SNMP values.
IP Address and IP Mask	IP and subnet address that is allowed to access the SNMP server.
Access Mode	Choose Read Only or Read & Write .
Status	Enable or Disable this community.

7.7.3 SNMPv3 Users

SNMP Settings SNMPv1/v2 Communities **SNMPv3 Users**

User Name	Authentication Protocol	Privacy Protocol	Access Mode	Status	
user1	HMAC-SHA	CBC-DES	Read Only	Enable	Edit Remove
user2	HMAC-MD5	None	Read & Write	Disable	Edit Remove

[New](#)

By adding SNMPv3 users, access rights can be controlled. Click **New** to add a new SNMPv3 user, or click **Edit** to change the settings of an existing user. Click **Remove** to delete an SNMPv3 user.

SNMPv3 User

Settings

SNMPv3 User Name	<input type="text" value="user2"/>
Authentication Protocol	HMAC-MD5 ▾
Authentication Password	<input type="password" value="••••••"/> <input type="password" value="••••••"/> (Retype)
Privacy Protocol	None ▾
Access Mode	Read & Write ▾
Status	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

[Save](#) [Save to flash and activate](#)

SNMPv3 User - Settings

SNMPv3 User Name User ID allowed to access the SNMP agent.

Authentication Protocol Protocol for authenticating the user. Choose **HMAC-MD5** or **HMAC-SHA**.

Authentication Password Users provided with a correct password will be granted the right to access the SNMP agent.

Web Administration

Web Access Settings | Admin Username | Admin Password | Web Administration

Web Access Protocol HTTP HTTPS

Management Port 443

HTTP to HTTPS Redirection Enable

Save | Save to flash and activate

Privacy Protocol Encryption method to be used in SNMPv3 communication. Choose **None** or **CBC-DES**.

Privacy Password Shown only if **CBC-DES** is chosen as the **Privacy Protocol**. This is the key for decrypting encrypted data.

Access Mode Grant **Read** or **Read & Write** access to this user.

Status **Enable** or **Disable** this user.

7.8 Web Administration

Select **Web Administration**, located under **Configure** on the left, to begin configuring the Web management interface.

7.8.1 Web Access Settings

Web Access Settings configures the protocol and TCP port number of the web server. If **HTTPS** is enabled, the **HTTP to HTTPS Redirection** option will be provided.

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7.8.2 Admin Username

Admin Username configures the administrator username used to access the Web Admin Interface. To change the administrator username, enter a new username in **New Admin Username**.

Web Access Settings | Admin Username | Admin Password | Web Administration

New Admin Username

7.8.3 Admin Password

Admin Password configures the administrator password used to access the Web Admin Interface. To change to the administrator password, enter the new password into **New Password** and **New Password (confirmation)**. Note that the two entries must match exactly.

Web Access Settings | Admin Username | Admin Password | Web Administration

New Password

New Password (confirmation) (confirmation)

7.8.4 Web Administration

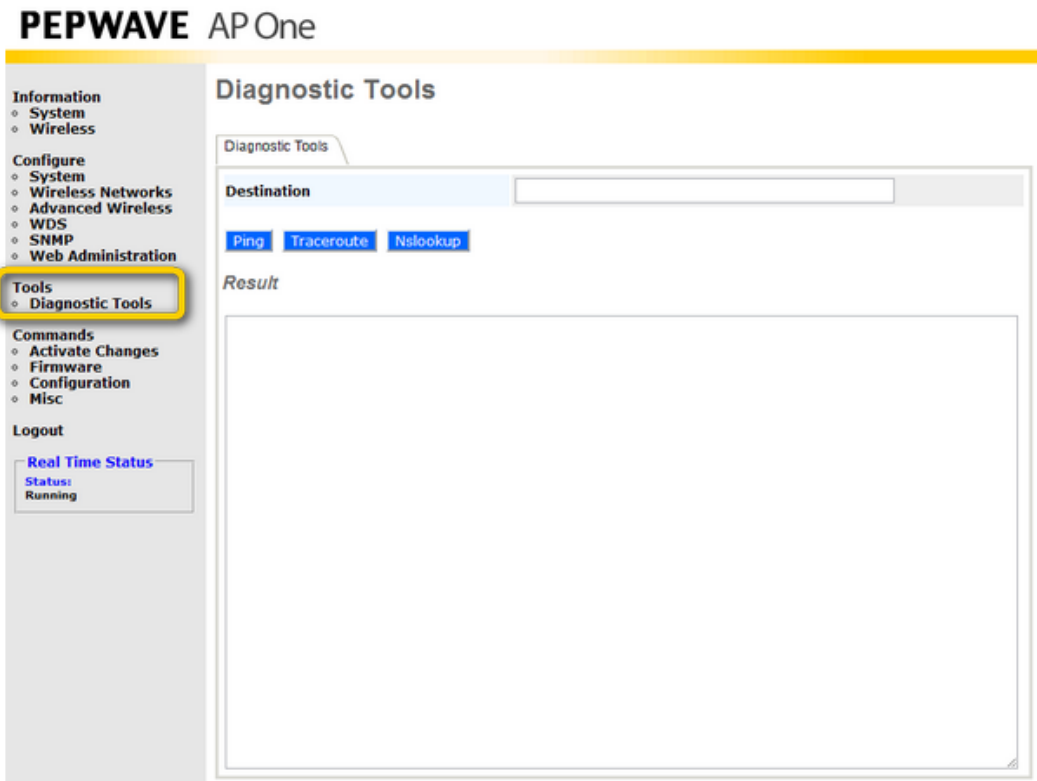
Disable Web Administration turns off access to Web Admin Interface. After being turned off, the Web Admin Interface can be re-enabled using SNMP.

Web Access Settings | Admin Username | Admin Password | Web Administration

Web Admin Interface Enable Disable

8. Tools - Diagnostic Tools

This selection provides three useful tools for diagnosing problems on your network: **Ping**, **Traceroute**, and **Nslookup**.



9. Commands

Commands, located on the left side of the Main Menu, puts a number of system control commands at your fingertips.

The screenshot displays the PEPWAVE web interface. On the left is a sidebar menu with the following sections:

- Information**
 - System
 - Wireless
- Configure**
 - System
 - LAN
 - Wireless Networks
 - Advanced Wireless
 - WDS
 - SpeedFusion™
 - SNMP
 - Web Administration
- Tools**
 - Diagnostic Tools
- Commands** (highlighted with a yellow box)
 - Activate Changes
 - Firmware
 - Configuration
 - Misc
- Logout**

Below the sidebar is a box titled **Real Time Status** containing:

Controller:
Connecting to Balance
(10.9.1.1)

Status:
Running

The main content area is titled **Miscellaneous** and contains three buttons: **Download Debug Information**, **Remote Assistance**, and **Reboot AP**. Below these buttons is a **Proceed** button.

9.1 Activate Changes

Click **Activate Changes**, located under **Commands** on the left, and confirm to save your configuration and activate your Pepwave access point.

PEPWAVE

The screenshot displays the Pepwave web interface. On the left sidebar, the 'Commands' section is expanded, and 'Activate Changes' is highlighted with a blue arrow. The main content area shows the 'Miscellaneous' page with tabs for 'Download Debug Information', 'Remote Assistance', and 'Reboot AP'. A 'Proceed' button is visible below these tabs. A confirmation dialog box is overlaid on the right, titled 'The page at https://10.10.10.167 says:', with the message 'Save configuration and activate?' and 'OK' and 'Cancel' buttons. A blue arrow points from the 'Activate Changes' menu item to the dialog box.

9.2 Firmware

Click **Firmware**, located under **Commands** on the left, to check firmware versions, select a boot ROM, and update your Pepwave access point's firmware.

Firmware

Upgrade Firmware

	Flash 1	Flash 2
Firmware Version	3.2.1	3.3.1
Flash Status	Bootable	Bootable
Boot from		🔴
Firmware Upgrade Target	🔴	

Firmware Upgrade

No new firmware. (Last checked: Never)

Commands – Upgrade Firmware

Firmware Version The firmware version loaded into the flash partitions.

Flash Status The firmware status on the flash partitions.

Boot from Indicates which flash partition boots up the system.

Firmware Upgrade Target Indicates which flash partition will be upgraded with the next firmware upgrade.

Firmware Upgrade Select **Online**, then click **Check** to look for firmware upgrade files online. Select **Manual** to choose a downloaded firmware update. In either case, a reboot is required after upgrading the firmware.

9.3 Configuration

Click **Configuration**, located under **Commands** on the left side of the main menu, to restore factory default settings, backup configurations, and restore backed up configurations.

Configuration

Restore Factory Default | Download Active Configuration To File | Upload Configuration File

Preserve Settings Network Settings (Server IP, Subnet Mask, Default Gateway, DNS Server, Management VLAN ID)

Proceed

Commands - Configuration

Restore Factory Default

Used to restore your Pepwave access point's factory default settings. Preserve the network settings by checking **Preserve Settings**, then click **Proceed**. Settings, including **Server IP**, **Subnet Mask**, **Default Gateway**, **DNS Server**, and **Management VLAN ID** will be preserved.

Download Active Configuration To File

Used to download the active configuration for backup purposes.

Upload Configuration File

Used to upload the configuration from a backed up configuration file.

9.4 Misc

Miscellaneous



Commands - Misc

Download Debug Information

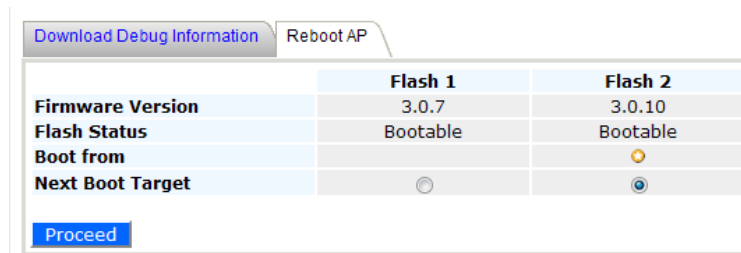
Download debugging information from your Pepwave access point. To facilitate prompt resolution by Pepwave technical support in the event of technical issues, please send a debug file with your support request.

Remote Assistance

Get remote assistance with technical issues.

Reboot AP

Reboot your Pepwave access point using firmware saved in **Flash 1** or **Flash 2**.



10. Real Time Status

Real Time Status displays the current status of your Pepwave access point device. If your

The screenshot shows the PEPWAVE web interface. On the left is a navigation menu with categories: Information (System, Wireless), Configure (System, LAN, Wireless Networks, Advanced Wireless, WDS, SpeedFusion™, SNMP, Web Administration), Tools (Diagnostic Tools), Commands (Activate Changes, Firmware, Configuration, Misc), and Logout. The 'Real Time Status' link under Logout is highlighted with a yellow box. The main content area is titled 'System' and has two tabs: 'Basic' and 'Advanced'. The 'Advanced' tab is selected, showing a configuration table with the following fields: AP Name (text input: AP One), Location (text input: site1), Timezone (dropdown: UTC (Coordinated Universal Time)), Keep Default IP (checkbox: checked, label: Enable), and IP Address Mode (dropdown: Automatic). Below the table are two buttons: 'Save' and 'Save to flash and activate'.

access point is managed by a Peplink Balance, the default access of the Balance will be shown.

11. Peplink Balance AP Controller

Since firmware 3.0.6, Pepwave access points can be managed and configured using a Peplink Balance. For details, including the Captive Portal configuration or how Peplink Balance works as

The screenshot displays the Peplink Balance web interface. The top navigation bar includes 'Dashboard', 'Setup Wizard', 'Network' (selected), 'System', and 'Status', along with an 'Apply Changes' button. The left sidebar menu is organized into sections: 'Interfaces' (WAN, LAN, Site-to-Site VPN), 'Outbound Policy', 'Inbound Access' (Servers, Services, DNS Settings), 'NAT Mappings', and 'WLAN Controller' (AP Management, Wireless Networks, AP Profiles). The 'AP Management' option is selected and highlighted. The main content area is titled 'Pepwave AP Management' and features an image of a Peplink AP labeled 'for AP One'. Below the title is the 'Access Point Management' configuration table:

Access Point Management	
Enable	<input checked="" type="checkbox"/>
Manage Remote AP	<input type="checkbox"/>
Access Point to be Managed	<input checked="" type="radio"/> Any <input type="radio"/> Access points listed below:

A 'Save' button is located below the configuration table.

an AP Controller, please refer to the [Peplink website](#), FAQs, and Peplink Balance User Manual.

12. Restoring Factory Defaults

The following procedure restores the settings of your Pepwave to factory defaults:

Power on the unit and wait for one minute.

Press and hold the reset button for at least five seconds, then release.

The unit will automatically reboot.

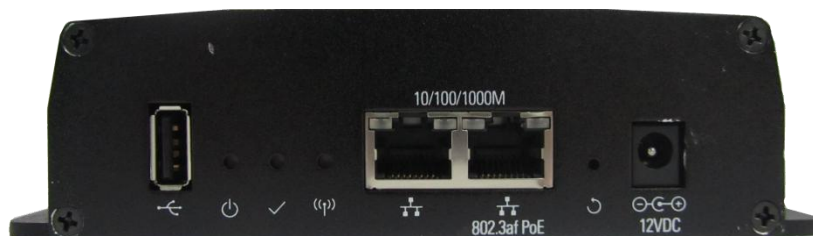
Wait for one minute or until the Status LED turns green, upon which the settings of the device will have been restored to the factory defaults.

By default, the unit will acquire an IP address from a DHCP server.

12.1 AP One



12.2 AP One 300M



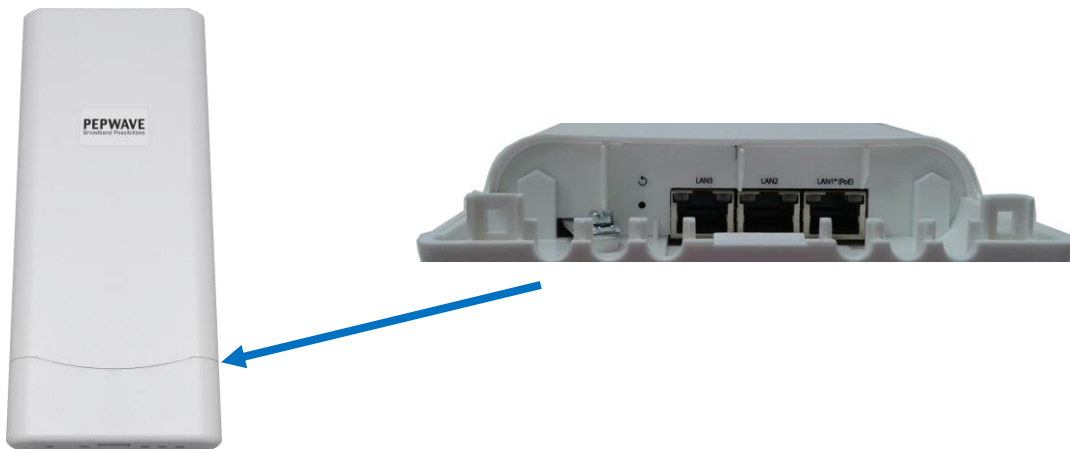
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12.3 AP One Mini



12.4 AP One Flex



12.5 AP One In-Wall



12.6 AP Pro

You can restore AP Pro via the Console Adapter.



13. Appendix

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- 1) Reorient or relocate the receiving antenna.
- 2) Increase the separation between the equipment and receiver.
- 3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- 4) Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

IMPORTANT NOTE

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination.

PEP WAVE

Broadband Possibilities

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