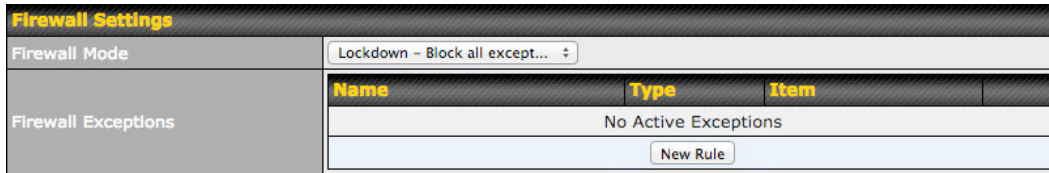


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PEPWAVE AP Series

Downstream Limit unlimited downstream bandwidth.

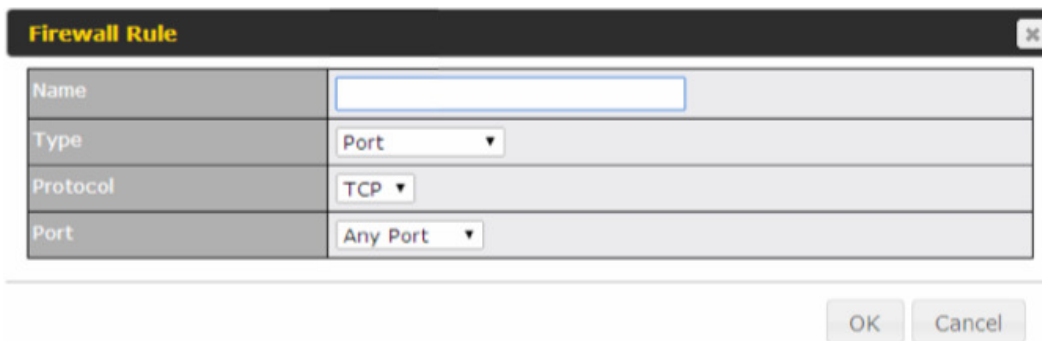


The screenshot shows the 'Firewall Settings' window. At the top, there's a title bar 'Firewall Settings'. Below it, 'Firewall Mode' is set to 'Lockdown - Block all except...'. Underneath, there's a table for 'Firewall Exceptions' with columns 'Name', 'Type', and 'Item'. The table is currently empty, showing 'No Active Exceptions'. A 'New Rule' button is located at the bottom right of the table area.

Firewall Settings

Firewall Mode

Choose **Flexible – Allow all except...** or **Lockdown – Block all except...** to turn on the firewall, then create rules for the firewall exceptions by clicking **New Rule**. See the discussion below for details on creating a firewall rule. To delete a rule, click the associated **X** button. To turn off the firewall, select **Disable**.



The screenshot shows the 'Firewall Rule' dialog box. It has a title bar 'Firewall Rule' with a close button. The dialog contains four fields: 'Name' (text input), 'Type' (dropdown menu set to 'Port'), 'Protocol' (dropdown menu set to 'TCP'), and 'Port' (dropdown menu set to 'Any Port'). At the bottom right, there are 'OK' and 'Cancel' buttons.

Firewall Rule

Name

Enter a descriptive name for the firewall rule in this field.

Type

Choose **Port**, **Domain**, **IP Address**, or **MAC Address** to allow or deny traffic from any of those identifiers. Depending on the option chosen, the following fields will vary.

Protocol / Port

Choose **TCP** or **UDP** from the **Protocol** drop-down menu to allow or deny traffic using either of those protocols. From the **Port** drop-down menu, choose **Any Port** to allow or deny TCP or UDP traffic on any port. Choose **Single Port** and then enter a port number in the provided field to allow or block TCP or UDP traffic from that port only. You can also choose **Port Range** and enter a range of ports in the provided fields to allow or deny TCP or UDP traffic from the specified port range.

IP Address / Subnet Mask

If you have chosen **IP Address** as your firewall rule type, enter the IP address and subnet mask identifying the subnet to allow or deny.

MAC Address

If you have chosen **MAC Address** as your firewall rule type, enter the MAC address identifying the machine to allow or deny.

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7.2.2 Settings


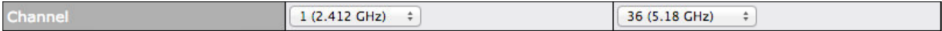
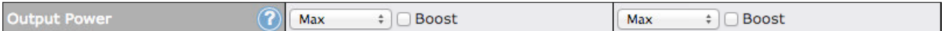
Basic access point operation settings, such as the protocol and channels used, as well as scanning interval and other advanced settings, can be defined and managed in this section.

AP Settings	5GHz
Protocol	802.11na
Operating Country	United States
Channel Bonding	20 MHz
Channel	Auto Edit
Output Power	Max <input type="checkbox"/> Boost
Beacon Rate	6Mbps
Beacon Interval	100ms
DTIM	1
RTS Threshold	0
Fragmentation Threshold	0
Distance / Time Convertor	<input type="text" value="4050"/> m (input distance for recommended values)
Slot Time	<input type="radio"/> Auto <input checked="" type="radio"/> Custom <input type="text" value="9"/> μ s Default
ACK Timeout	<input type="text" value="48"/> μ s Default
Frame Aggregation	<input checked="" type="checkbox"/>
Aggregation Length	<input type="text" value="50000"/>
Maximum Number of Clients	<input type="text" value="0"/> (0: Unlimited)
Client Signal Strength Threshold	<input type="text" value="0"/> (0: Unlimited)

AP Settings							
Protocol	<p>Choose 802.11ng or 802.11na as your access point's Wi-Fi protocol. The AP One AC mini provides the 802.11ng protocol for the 2.4 GHz band and the 802.11ac protocol for the 5GHz band, as shown below.</p> <table border="1"> <thead> <tr> <th>AP Settings</th> <th>2.4GHz</th> <th>5GHz</th> </tr> </thead> <tbody> <tr> <td>Protocol</td> <td>802.11ng</td> <td>802.11ac</td> </tr> </tbody> </table>	AP Settings	2.4GHz	5GHz	Protocol	802.11ng	802.11ac
AP Settings	2.4GHz	5GHz					
Protocol	802.11ng	802.11ac					
Operating Country	<p>This drop-down menu specifies the national / regional regulations the AP should follow.</p> <ul style="list-style-type: none"> If a North American region is selected, RF channels 1 to 11 will be available and the maximum transmission power will be 26 dBm (400 mW). If European region is selected, RF channels 1 to 13 will be available. The maximum transmission power will be 20 dBm (100 mW). <p>NOTE: Users are required to choose an option suitable to local laws and regulations. Per FCC regulation, the country selection is not available on all models marketed in the US. All US models are fixed to US channels only.</p>						
Channel Bonding	<p>There are three options: 20 MHz, 40 MHz, and 20/40 MHz. With this feature enabled, the Wi-Fi system can use two channels at once. Using two channels improves the performance of the Wi-Fi connection.</p> <p>The AP One AC mini offers channel bonding options for the 2.4GHz and 5GHz bands, as shown below. In addition to 20 MHz, 40 MHz, and 20/40 MHz, the 5Ghz band offers 80Mhz, which is the default setting.</p>						

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PEPWAVE AP Series

	
Channel	<p>This drop-down menu selects the 5GHz 802.11 channel to be used. If Auto is set, the system will perform channel scanning based on the scheduled time set and choose the most suitable channel automatically.</p> <p>The AP One AC mini allows setting channels on the 2.4GHz and 5GHz bands, as shown below.</p> 
Output Power	<p>This drop-down menu determines the power at which your access point will broadcast. When fixed settings are selected, the AP will broadcast at the specified power level, regardless of context. When Auto is selected, the AP will adjust its power level based on surrounding APs to maximize performance.</p> <p>While single-radio models allow setting power output levels for one frequency band only, the AP One AC mini provide output power settings for both the 2.4GHz and 5GHz bands, as shown below.</p> 
Beacon Rate	<p>This drop-down menu provides the option to send beacons in different transmit bit rates. The bit rates are 1Mbps, 2Mbps, 5.5Mbps, 6Mbps, and 11Mbps.</p>
Beacon Interval	<p>Set the time between each beacon send. Available options are 100ms, 250ms, and 500ms.</p>
DTIM	<p>Set the frequency for the beacon to include delivery traffic indication messages (DTIM). The interval unit is measured in milliseconds.</p>
RTS Threshold	<p>Set the minimum packet size for your access point to send an RTS using the RTS/CTS handshake. Setting 0 disables this feature.</p>
Fragmentation Threshold	<p>Enter a value to limit the maximum frame size, which can improve performance.</p>
Distance / Time Convertor	<p>This slider and text entry field can be used to interactively set slot time.</p>
Slot Time	<p>This field provides the option to modify the unit wait time before your access point transmits. The default value is 9µs.</p>
ACK Timeout	<p>Set the wait time to receive an acknowledgement packet before retransmitting. The default value is 48µs.</p>
Frame Aggregation	<p>With this feature enabled, throughput will be increased by sending two or more data frames in a single transmission.</p>
Aggregation Length	<p>This field is only available when Frame Aggregation is enabled. It specifies the frame length for frame aggregation. By default, it is set to 50000.</p>
Max number of Clients	<p>Enter the maximum clients that can simultaneously connect to your access point or set the value to 0 to allow unlimited clients.</p>
Client Signal	<p>This field determines the minimum acceptable client signal strength, specified in</p>

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PEPWAVE AP Series

Strength Threshold

megawatts. If client signal strength does not meet this minimum, the client will not be allowed to connect.

Advanced Features																																																									
Discover Nearby Networks	<input checked="" type="checkbox"/> * Discover Nearby Networks will be enabled if Channel is set to Auto																																																								
Scanning Interval	10 s																																																								
Scanning Time	50 ms																																																								
Scheduled Radio Availability	<input type="radio"/> Always On <input checked="" type="radio"/> Custom Schedule																																																								
	<table border="1"><thead><tr><th></th><th>Midnight</th><th>4am</th><th>8pm</th><th>Noon</th><th>4pm</th><th>8pm</th></tr></thead><tbody><tr><td>Sunday</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Monday</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Tuesday</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Wednesday</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Thursday</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Friday</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Saturday</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>		Midnight	4am	8pm	Noon	4pm	8pm	Sunday							Monday							Tuesday							Wednesday							Thursday							Friday							Saturday						
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Saturday																																																									
	On <input type="checkbox"/> Off <input checked="" type="checkbox"/>																																																								
WMM	<input checked="" type="checkbox"/>																																																								

Advanced Features	
Discover Nearby Networks	Check this box to enable network discovery. Note that setting Channel to Auto will activate this feature automatically.
Scanning Interval	This setting controls the interval, in seconds, that your access point scans for nearby networks.
Scanning Time	This setting specifies the time, in milliseconds, that your access point scans any particular channel while searching for nearby networks.
Scheduled Radio Availability	Click Custom Schedule to specify radio availability schedule options or select Always On to make the radio continuously available.
WMM	This checkbox enables Wi-Fi Multimedia (WMM), also known as Wireless Multimedia Extensions (WME), on your access point. The default is enabled .

7.2.3 WDS

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A wireless distribution system (WDS) provides a way to link access points when wires are not feasible or desirable. A WDS can also extend wireless network coverage for wireless clients. Note that your access point's channel setting should not be set to **Auto** when using WDS.

The screenshot shows the PEPWAVE AP configuration interface. The top navigation bar includes 'Dashboard', 'Network', 'AP', 'System', and 'Status'. The 'AP' section is active, and the 'WDS' option is selected in the left sidebar. The main content area displays WDS configuration options for 2.4GHz and 5GHz bands. The 2.4GHz band shows a Local MAC Address of 00:1A:DD:DA:E7:40 and a Current Channel of 1. The 5GHz band shows a Local MAC Address of 00:1A:DD:DA:E7:50 and a Current Channel of 36. Below this, a table lists WDS entries with columns for MAC Address, Manufacturer, Status, and Encryption. The current status is 'No WDS' and there is an 'Add' button.

	2.4GHz	5GHz
Local MAC Address	00:1A:DD:DA:E7:40	00:1A:DD:DA:E7:50
Current Channel	1	36

MAC Address	Manufacturer	Status	Encryption
No WDS			
<input type="button" value="Add"/>			

To create a new WDS, click **Add**.

WDS	
Enable	Check this box to enable WDS.
MAC Address	Enter the MAC address of the access point with which to form a WDS link.
Encryption	Select AES to enable encryption for WDS peer connections. Selecting None disables encryption.

7.3 Network

The settings on the **AP** tab control WAN and LAN settings, as well as allow you to set up PepVPN profiles.

7.3.1 WAN

This section provides basic and advanced WAN settings.

The screenshot shows the PEPWAVE web interface with the 'Network' tab selected. The 'WAN' interface is active. The 'Basic' section includes: 'Keep Default IP' (checked), 'IP Address Mode' (Manual), 'Static IP Address' (empty), 'Subnet Mask' (255.255.255.0 (/24)), 'Default Gateway' (empty), and 'DNS Server' (empty). The 'Advanced' section includes: 'Management VLAN ID' (0), 'Spanning Tree Protocol' (unchecked), 'Scheduled Reboot' (unchecked), 'Ethernet Speed/Duplex' (100Mbps Full Duplex, Advertise Speed checked), and 'AP Mode' (Router/NAT). A 'Save' button is at the bottom.

Basic	
Keep Default IP	When enabled, this option maintains 192.168.0.3 as your access point's IP address.
IP Address Mode	IP Address Mode options are Automatic and Manual . In Automatic mode, the IP address of your access point is acquired from a DHCP server on the Ethernet segment. In Manual mode, a user-specified IP address is used for your access point, as described below.
Static IP Address / Subnet Mask	You can use these fields to specify a unique IP address that your access point will use to communicate on the Ethernet segment. This IP address is distinct from the admin IP address (192.168.0.3) on the Ethernet segment.
Default Gateway	Enter the IP address of the default gateway to the internet.
DNS Server	Enter the DNS server address that your access point will use to resolve host names.

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Advanced			
Management VLAN ID	0		
Spanning Tree Protocol	<input type="checkbox"/>		
Scheduled Reboot	<input checked="" type="checkbox"/>		
	Schedule	Day	Time
	Weekly ▾	Sunday ▾	00 ▾ : 00 ▾
Ethernet Speed/Duplex	100Mbps Full Duplex ▾ <input checked="" type="checkbox"/> Advertise Speed		
AP Mode	Router ▾ NAT ▾		

Advanced	
Management VLAN ID	This field specifies the VLAN ID to tag to management traffic, such as AP-to-AP controller communication traffic. The value is 0 by default, meaning that no VLAN tagging will be applied. NOTE: change this value with caution as alterations may result in loss of connection to the AP controller.
Spanning Tree Protocol	Checking this box enables spanning tree protocol, used to prevent loops in bridged Ethernet LANs
Scheduled Reboot	When this box is checked, your access point can be scheduled to reboot automatically on a recurring basis, as indicated by the values under the Schedule , Day , and Time headings.
Ethernet Speed/Duplex	Select a speed and duplex setting for sending and receiving. When selecting a speed manually, you can also control whether the access point's speed will be advertised on the network by checking or unchecking the Advertise Speed box. When Auto is selected, your access point will automatically negotiate speeds.
AP Mode	Your access point can act as a bridge or as a router, depending on your selection here. When Router is selected, you can additionally select whether the access point will function in NAT or IP Forwarding mode.

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7.3.2 LAN

This section offers a variety of settings that affect your access point's operation on the LAN, such as settings for DHCP, DMZ, and port forwarding. Note that the following settings will be available only when your access point is operating in router mode.

The screenshot shows the PEPWAVE web interface with the following sections:

- PEPWAVE** navigation bar with tabs: Dashboard, Network (selected), AP, System, Status, and Apply Changes.
- Interfaces** sidebar with options: WAN, LAN (selected), and PepVPN. A Logout button is also present.
- IP Settings** section:
 - IP Address: 192.168.1.1, Subnet Mask: 255.255.255.0 (/24)
- DHCP Server Settings** section:
 - DHCP Server:
 - IP Range: 192.168.1.100 - 192.168.1.200, Subnet Mask: 255.255.255.0 (/24)
 - Broadcast Address: 192.168.1.255
 - Gateway: 192.168.1.1
 - DNS 1: 192.168.1.1
 - DNS 2: (optional)
 - DNS 3: (optional)
 - Lease Time: 1 Days 0 Hours 0 Mins
 - DHCP Reservation table with columns for MAC Address and Static IP, and a + button.
- DMZ** section:
 - DMZ:
 - DMZ IP: [Empty field]
- Port Forwarding** section:
 - Table with columns: Server, Protocol
 - Content: No Services Defined
 - Buttons: Add Service, Save

IP Settings

IP Address

Enter the LAN IP address and subnet mask to assign to your access point on the LAN.

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DHCP Server Settings			
DHCP Server	<input checked="" type="checkbox"/>		
IP Range	192.168.1.100	-	192.168.1.200 255.255.255.0 (/24)
Broadcast Address	192.168.1.255		
Gateway	192.168.1.1		
DNS 1	192.168.1.1		
DNS 2	<input type="text"/> (optional)		
DNS 3	<input type="text"/> (optional)		
Lease Time	1	Days 0	Hours 0 Mins
DHCP Reservation	MAC Address	Static IP	<input type="button" value="+"/>
	<input type="text"/>	<input type="text"/>	

DHCP Server Settings	
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 the DHCP server.
IP Range	Enter the first and last IP addresses of the range of addresses that your access point will make available to DHCP clients. The default range is from 192.168.1.100 to 192.168.1.200 , with 24-bit subnet mask.
Broadcast Address	Enter the broadcast address that DHCP clients will use when communicating with the entire LAN segment. The default value is 192.168.1.255 .
Gateway	Enter the default gateway address that DHCP clients will use to access the internet. By default, this address will be the same as your access point's IP address on the LAN.
DNS 1/2/3	In DNS 1 , enter the IP address of the primary DNS server offered to DNS clients or accept the default of 192.168.1.1 , which is your access point's address on the LAN. You can also specify up to two additional DNS servers to use when the primary server is busy or down.
Lease Time	Specify the length of time that an IP address of a DHCP client remains valid. When an address lease time has expired, the assigned IP address is no longer valid, and renewal of the IP address assignment is required. By default, this value is set to one day.
DHCP Reservation	To reserve certain addresses for specific clients, such as network printers, enter the device's MAC Address and a static IP to be assigned to the device. Click <input type="button" value="+"/> to add the DHCP reservation. To delete a DHCP reservation, click <input type="button" value="X"/> .

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DMZ	
DMZ	<input type="checkbox"/>
DMZ IP	<input type="text"/>

DMZ	
DMZ	Check this box to forward traffic sent to the WAN IP address to the DMZ IP address.
DMZ IP	Enter an IP address clients will use to connect to the DMZ.

Port Forwarding	Server	Protocol
No Services Defined		
<input type="button" value="Add Service"/>		

To create a port forwarding rule, first click the **Add Service** button, located in the **Port Forwarding** section.

Port Forwarding

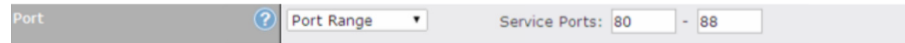
Service Name	<input type="text"/>
IP Protocol	TCP <input type="button" value="←"/> -- Selection Tool -- <input type="button" value="→"/>
Port	Single Port <input type="button" value="↓"/> Service Port: <input type="text"/>
Server IP Address	<input type="text"/>

Port Forwarding	
Service Name	Enter a name for the new port forwarding rule. Valid values for this setting consist of alphanumeric and underscore “_” characters only.
IP Protocol	<p>The IP Protocol setting, along with the Port setting, specifies the protocol of the service as TCP, UDP, ICMP, or IP. Traffic that is received by your access point via the specified protocol at the specified port(s) is forwarded to the LAN hosts specified by the Servers setting. Please see below for details on the Port and Servers settings.</p> <p>Alternatively, the Protocol Selection Tool drop-down menu can be used to automatically fill in the protocol and a single port number of common Internet services (e.g., HTTP, HTTPS, etc.). After selecting an item from the Protocol Selection Tool drop-down menu, the protocol and port number remain manually modifiable.</p>
Port	<p>The Port setting specifies the port(s) that correspond to the service, and can be configured to behave in one of the following manners:</p> <p>Single Port, Port Range, Port Mapping</p> <div><p>Port <input type="button" value="?"/> Single Port <input type="button" value="↓"/> Service Port: <input type="text" value="80"/></p></div>

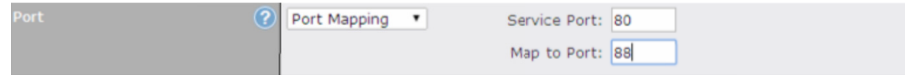
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Single Port: Traffic that is received by your access point via the specified protocol at the specified port is forwarded via the same port to the servers specified by the **Server IP Address** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Single Port** and **Service Port** 80, TCP traffic received on port 80 is forwarded to the configured servers via port 80.



Port Range: Traffic that is received by your access point via the specified protocol at the specified port range is forwarded via the same respective ports to the LAN hosts specified by the **Server IP Address** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Port Range** and **Service Ports** 80-88, TCP traffic received on ports 80 through 88 is forwarded to the configured servers via the respective ports.



Port Mapping: Traffic that is received by your access point via the specified protocol at the specified port is forwarded via a different port to the servers specified by the **Server IP Address** setting.

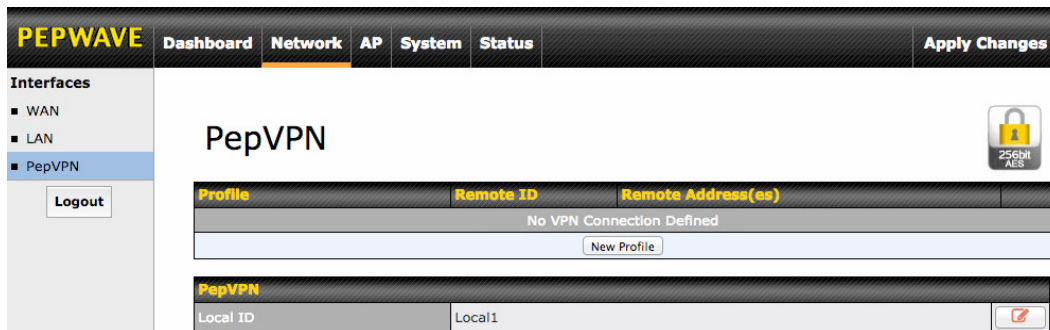
For example, with **IP Protocol** set to **TCP**, and **Port** set to **Port Mapping**, **Service Port** 80, and **Map to Port** 88, TCP traffic on Port 80 is forwarded to the configured server via Port 88.

Server IP Address

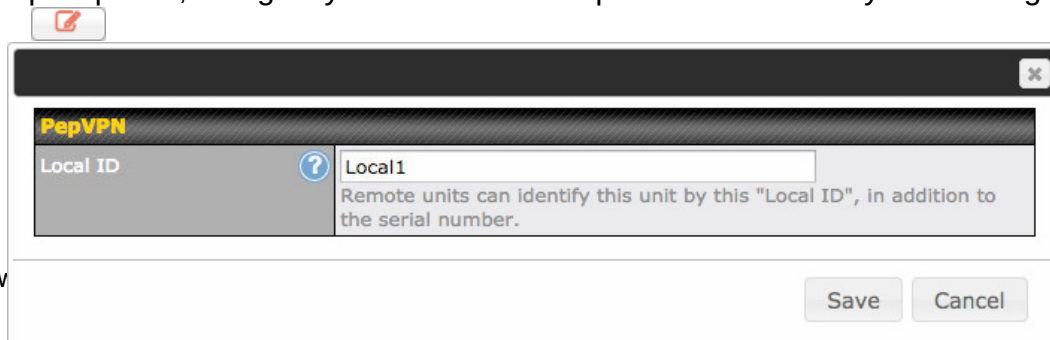
Enter the LAN IP address of the server that handles requests for the forwarded service.

7.3.3 PepVPN

PepVPN securely connects one or more remote sites to the site running your access point.



To set up PepVPN, first give your site a local PepVPN ID. To modify an existing local ID,



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click

Once you've specified a local ID, click the **New Profile** button to configure PepVPN.

Settings	
Enable	<input checked="" type="radio"/> Yes <input type="radio"/> No
Name	<input type="text"/>
Encryption	<input checked="" type="radio"/> 256-bit AES <input type="radio"/> Off
Remote ID	<input type="text"/>
Authentication	<input checked="" type="radio"/> By Remote ID only <input type="radio"/> Preshared Key
Pre-shared Key	<input type="text"/> (optional) Hide / Show Passphrase
Remote IP Addresses / Host Names	<input type="text"/> (optional)
Layer 2 Bridging	<input type="radio"/> Yes <input checked="" type="radio"/> No
Management VLAN ID	<input type="text" value="0"/>
IP Address Mode	None ▾
IP Address	<input type="text"/>
Subnet Mask	255.255.255.0 (/24) ▾
Data Port	<input checked="" type="radio"/> Default <input type="radio"/> Custom <input type="text"/>

PepVPN Profile Settings	
Enable	Check this box to enable PepVPN.
Name	Enter a name to represent this profile. The name can be any combination of alphanumeric characters (0-9, A-Z, a-z), underscores (_), dashes (-), and/or non-leading/trailing spaces ().
Encryption	By default, VPN traffic is encrypted with 256-bit AES . If Off is selected on both sides of a VPN connection, no encryption will be applied.
Remote ID	To allow your access point to establish a VPN connection with a specific remote peer using a unique identifying number, enter the peer's ID or serial number here.
Authentication	Select By Remote ID Only or Preshared Key to specify the method your access point will use to authenticate peers. When selecting By Remote ID Only , be sure to enter a unique peer ID number in the Remote ID field.
Pre-shared Key	This optional field becomes available when Pre-shared Key is selected as the VPN Authentication method, as explained above. Pre-shared Key defines the pre-shared key used for this particular VPN connection. The VPN connection's session key will be further protected by the pre-shared key. The connection will be up only if the pre-shared keys on each side match. Click Hide / Show Passphrase to toggle passphrase visibility.
Remote IP Address / Host Names (Optional)	Optionally, you can enter a remote peer's WAN IP address or hostname(s) here. If the remote client uses more than one address, enter only one of them here. Multiple hostnames are allowed and can be separated by a space character or carriage return. Dynamic-DNS host names are also accepted. With this field filled, your access point will initiate connection to each of the remote IP addresses until it succeeds in making a connection. If the field is empty, your access point will wait for connection from the remote peer. Therefore, at least one of the two VPN peers must specify this value. Otherwise, VPN connections cannot be established.

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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 Layer 2 Bridging . 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 that will be tagged to management traffic, such as AP-to-AP controller communication traffic. A value of 0 indicates that no VLAN tagging will be applied.
IP Address Mode	Choose Automatic or Manual . In automatic mode, your access point acquires an IP from a DHCP server on the Ethernet segment. In manual mode, your access point uses a user-specified IP address.
IP Address/Subnet Mask	When using manual IP addressing (above), enter an IP address and subnet mask in these fields.
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 port 4500 is unavailable. If Custom is selected, you can input a custom outgoing port number between 1 and 65535.

8 Tools

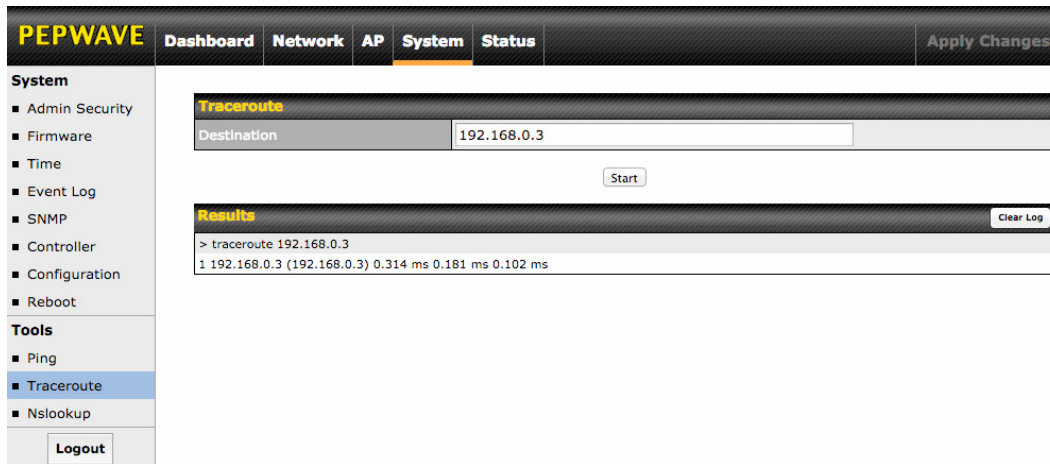
8.1 Ping

The ping test tool tests connectivity pinging the specified destination IP address. The ping utility is located at **System>Tools>Ping**.

The screenshot displays the PEPWAVE web interface. The top navigation bar includes 'PEPWAVE', 'Dashboard', 'Network', 'AP', 'System', and 'Status', with 'System' selected. An 'Apply Changes' button is on the right. A left sidebar lists 'System' (Admin Security, Firmware, Time, Event Log, SNMP, Controller, Configuration, Reboot) and 'Tools' (Ping, Traceroute, Nslookup), with 'Ping' selected. The main content area shows the 'Ping' tool interface with a 'Destination' field containing '8.8.8.8' and a 'Start' button. Below, the 'Results' section shows the command '> ping -c 10 8.8.8.8' and the output 'PING 8.8.8.8 (8.8.8.8): 56 data bytes'. A 'Clear Log' button is also present. The URL 'http://w' is visible at the bottom left, and the 'epwave' logo is at the bottom right.

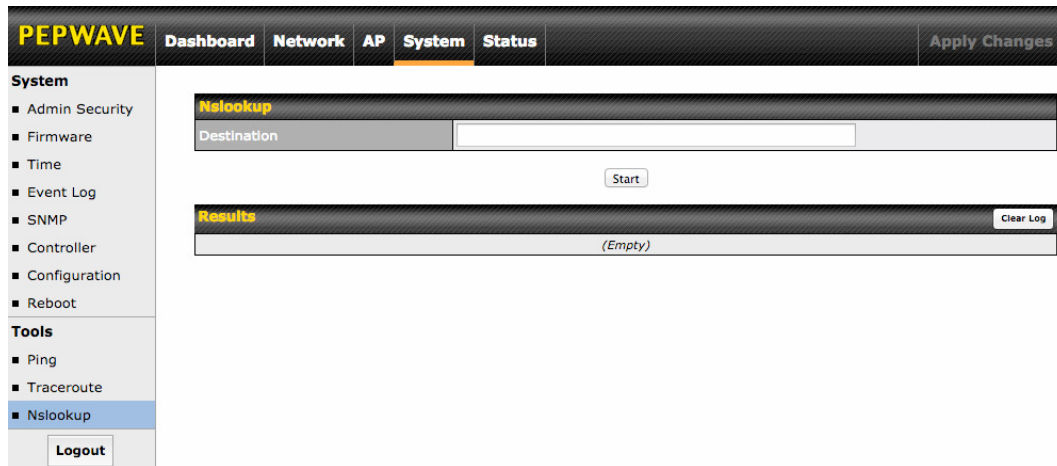
8.2 Traceroute

The traceroute test tool traces the routing path to the specified IP address. The traceroute test utility is located at **System>Tools>Traceroute**.



8.3 Nslookup

The nslookup tool is used to test DNS name servers. The nslookup utility can be found at **System>Tools>Nslookup**.



9 Monitoring Device Status

User Manual

PEPWAVE AP Series

The displays available on the **Status** tab help you monitor device data, client activity, rogue device access, and more.

9.1 Device

Here you can access a variety of data about your access point, download a diagnostic report, and check MAC addresses. To download a diagnostic report, click the **Download** link.

The screenshot shows the PEPWAVE web interface with the 'Status' tab selected. The left sidebar contains a 'Logout' button and a menu with options: Device, Client List, WDS Info, Portal, Rogue AP, and Event Log. The main content area is divided into two sections:

System Information	
AP Name	AP One
Model	AP One AC
Location	site1
Serial Number	2438-3B91-493A
Firmware	3.5.2 build 1538
Host Name	ap---a6
Uptime	9 hours 34 minutes
System Time	Mon Jun 22 19:58:27 HKT 2015
Diagnostic Report	Download

Interface	MAC Address
WAN	00:1A:DD:EC:25:20
Radio 2.4GHz	00:1A:DD:EC:25:20
Radio 5GHz	00:1A:DD:EC:25:30

9.2 Client List

The **Client List** displays all currently connected clients. Use the **Expand** and **Collapse** buttons to control the amount of data displayed.

The screenshot shows the PEPWAVE web interface with the 'Status' tab selected. The left sidebar contains a 'Logout' button and a menu with options: Device, Client List, WDS Info, Portal, Rogue AP, and Event Log. The main content area displays the 'Connected Clients' section with a table and control buttons:

MAC Address	IP Address	Type	Signal	Duration	TX/RX Rate	TX/RX Bytes (Packets)
No Connected Clients						

Buttons:

9.3 WDS Info

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PEPWAVE AP Series

Here you can monitor the status of your wireless distribution system (WDS) and track activity by MAC address. If you're using the AP One AC mini, this section will display information for both the 2.4GHz and 5GHz radios.

The screenshot shows the PEPWAVE web interface. The top navigation bar includes 'PEPWAVE', 'Dashboard', 'Network', 'AP', 'System', 'Status' (highlighted), and 'Apply Changes'. On the left, a sidebar menu lists 'Status' (expanded), 'Device', 'Client List', 'WDS Info' (highlighted), 'Portal', 'Rogue AP', and 'Event Log', with a 'Logout' button below. The main content area displays 'WDS Info' with a table for radio frequencies and 'WDS Clients' with an empty table.

	2.4GHz	5GHz
Local MAC Address	00:1A:DD:DA:E7:40	00:1A:DD:DA:E7:50
Current Channel	1	36

WDS Clients				
Peer MAC Address	Encryption	Type	Signal	TX/RX Bytes (Packets)
No WDS				

9.4 Portal

If you've turned on your access point's captive portal, client connection data will appear here. Use the **Expand** and **Collapse** buttons to control the amount of data displayed.

The screenshot shows the PEPWAVE web interface with the 'Portal' menu item selected in the sidebar. The main content area displays 'Portal Users' with a table header and a 'No Portal Users' message. 'Expand' and 'Collapse' buttons are visible in the top right of the table area.

MAC Address	IP Address	User Name	Status	Last Login Time	Remaining Quota
No Portal Users					

9.5 Rogue AP

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PEPWAVE AP Series

This section displays a list of nearby suspected rogue access points.

The screenshot shows the PEPWAVE dashboard with the 'Status' tab selected. The 'Suspected Rogue APs' table lists various access points with their BSSIDs, SSIDs, channels, signal strengths, encryption types, and last seen times. A 'Logout' button is visible in the left sidebar.

BSSID	SSID	Channel	Signal	Encryption	Last Seen
E4:F4:C6:05:CA:D6	NETGEAR73	8	▲■■ 35	WPA2	44 years ago
C8:D7:19:86:8C:8B	WS Wireless	11	▲... 17	WPA2	44 years ago
C4:04:15:52:CD:76		157	▲■■ 37	WPA2	44 years ago
A0:F3:C1:BE:17:20	EK-Wireless	1	▲... 6	WPA2	44 years ago
90:72:40:22:CD:6B	Apple 11ac Wi-Fi Network 5GHz	149	▲■■ 46	WPA2	44 years ago
90:72:40:22:CD:6A	Apple 11ac Wi-Fi Network	11	▲■■ 23	WPA2	44 years ago
6C:AA:B3:62:D0:7C	WinVIP	100	▲... 7	WPA	44 years ago
6C:AA:B3:5D:58:6C	WinVIP	60	▲... 8	WPA	44 years ago
6C:AA:B3:5D:58:68	WinVIP	4	▲... 13	WPA	44 years ago
6C:AA:B3:1D:58:6C	Winbo-01	60	▲... 8	WPA	44 years ago
6C:AA:B3:1D:58:68	Winbo-01	4	▲... 12	WPA	44 years ago
28:C6:8E:1E:C8:40	WN203-WHITE	13	▲■■ 34	WPA2	44 years ago
28:C6:8E:1E:C7:A0	ssid10	11	▲■■ 24	WPA2	44 years ago
1C:7E:E5:55:90:45	Winsports	11	▲... 12	WPA	44 years ago
10:56:CA:60:85:F4	PEPLINK_0D8C	1	▲... 5	WPA & WPA2	44 years ago
10:56:CA:60:85:34	PEPLINK_0D40	1	▲... 6	WPA & WPA2	44 years ago
10:56:CA:60:6C:35	peplink_public	13	▲... 19	WPA & WPA2	44 years ago
10:56:CA:60:6C:34	balanceOne	13	▲... 20	WPA & WPA2	44 years ago
10:56:CA:60:53:C4	A0805_2G	11	▲■■ 22	WPA & WPA2	44 years ago
10:56:CA:60:4A:18	PEPLINK_F669	153	▲... 14	WPA & WPA2	44 years ago

9.6 Event Log

The **Event Log** displays a list of all events associated with your access point. Check **Auto Refresh** to refresh log entries automatically. Click the **Clear Log** button to clear the log.

The screenshot shows the PEPWAVE dashboard with the 'Status' tab selected. The 'Device Event Log' is displayed, showing a list of events for the device 'ap-one-ac-mini-1398'. The 'Auto Refresh' checkbox is checked. A 'Clear Log' button is visible at the bottom of the log.

Time	Event
Jan 01 00:00:54	ap-one-ac-mini-1398 [root] System: Started up (3.5.0 build 1448)
Jan 01 00:00:17	ap-one-ac-mini-1398 [root] Reboot: Last Reboot Reason - no reason stored
Jan 01 00:04:42	ap-one-ac-mini-1398 [hostapd] WLAN: Client (24:fd:52:44:e4:ab) connected to "PEPWAVE_E740_2GHz" (00:1a:dd:da:e7:41) (2.4 GHz) IEEE 802.11
Jan 01 00:04:41	ap-one-ac-mini-1398 [hostapd] WLAN: Client (24:fd:52:44:e4:ab) disconnected from "PEPWAVE_E740_5GHz" (00:1a:dd:da:e7:51) (5 GHz) IEEE 802.11 [RX:391736032bytes,302270pkts TX:462457848bytes,389058pkts Duration:28sec] 192.168.0.22
Jan 01 00:04:16	ap-one-ac-mini-1398 [hostapd] WLAN: Client (24:fd:52:44:e4:ab) connected to "PEPWAVE_E740_5GHz" (00:1a:dd:da:e7:51) (5 GHz) IEEE 802.11
Jan 01 00:04:11	ap-one-ac-mini-1398 [root] System: Changes applied
Jan 01 00:02:22	ap-one-ac-mini-1398 [hostapd] WLAN: Client (24:fd:52:44:e4:ab) connected to "PEPWAVE_E740_2GHz" (00:1a:dd:da:e7:41) (2.4 GHz) IEEE 802.11
Jan 01 00:02:21	ap-one-ac-mini-1398 [hostapd] WLAN: Client (24:fd:52:44:e4:ab) disconnected from "PEPWAVE_E740_5GHz" (00:1a:dd:da:e7:51) (5 GHz) IEEE 802.11 [RX:455525152bytes,351490pkts TX:820875062bytes,621082pkts Duration:36sec] 192.168.0.22
Jan 01 00:01:49	ap-one-ac-mini-1398 [root] System: Changes applied
Jan 01 00:01:48	ap-one-ac-mini-1398 [hostapd] WLAN: Client (24:fd:52:44:e4:ab) connected to "PEPWAVE_E740_5GHz" (00:1a:dd:da:e7:51) (5 GHz) IEEE 802.11
Jan 01 00:01:02	ap-one-ac-mini-1398 [root] System: Started up (3.5.0a3 build 1442)
Jan 01 00:17:41	ap-one-ac-mini-1398 [hostapd] WLAN: Client (24:fd:52:44:e4:ab) connected to "PEPWAVE_E740_2GHz" (00:1a:dd:da:e7:41) (2.4 GHz) IEEE 802.11
Jan 01 00:17:40	ap-one-ac-mini-1398 [hostapd] WLAN: Client (24:fd:52:44:e4:ab) disconnected from "PEPWAVE_E740_5GHz" (00:1a:dd:da:e7:51) (5 GHz) IEEE 802.11 [RX:399556352bytes,308304pkts TX:342803543bytes,316172pkts Duration:60sec] 192.168.0.22

10 Restoring Factory Defaults

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PEPWAVE AP Series

The following procedure restores the settings of your access point 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.

11 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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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.

5.15 ~ 5.25GHZ is for indoor user only.

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.

12 Datasheets

PEP WAVE

Broadband Possibilities

www.pepwave.com

Contact Us:

Sales

<http://www.pepwave.com/contact/sales/>

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**Business Development and
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