

Pepwave MAX and Surf User Manual

Name	Profile 1						
Active	☒						
Remote Gateway IP Address / Host Name							
Local Networks	☒ 192.168.50.0/24 ☐						
Remote Networks	<table border="1"> <tr> <th>Network</th> <th>Subnet Mask</th> </tr> <tr> <td> </td> <td>255.255.255.0 (/24) ▼</td> </tr> </table>	Network	Subnet Mask		255.255.255.0 (/24) ▼	+	
Network	Subnet Mask						
	255.255.255.0 (/24) ▼						
Authentication	☒ Preshared Key ☐ X.509 Certificate						
Mode	☒ Main Mode (All WANs need to have Static IP) ☐ Aggressive Mode						
Force UDP Encapsulation	☐						
Preshared Key	 ☒ Hide Characters						
Local ID							
Remote ID							
Phase 1 (IKE) Proposal	1 AES-256 & SHA1 ▼ 2 ----- ▼						
Phase 1 DH Group	☒ Group 2: MODP 1024 ☐ Group 5: MODP 1536						
Phase 1 SA Lifetime	3600	seconds	Default				
Phase 2 (ESP) Proposal	1 AES-256 & SHA1 ▼ 2 ----- ▼						
Phase 2 PFS Group	☒ None ☐ Group 2: MODP 1024 ☐ Group 5: MODP 1536						
Phase 2 SA Lifetime	28800	seconds	Default				

IPsec VPN Settings	
Name	This field is for specifying a local name to represent this connection profile.
Active	When this box is checked, this IPsec VPN connection profile will be enabled. Otherwise, it will be disabled.
Connect Upon Disconnection of	Check this box and select a WAN to connect to this VPN automatically when the specified WAN is disconnected.
Remote Gateway IP Address / Host Name	Enter the remote peer's public IP address. For Aggressive Mode , this is optional.
Local Networks	Enter the local LAN subnets here. If you have defined static routes, they will be shown here.
Remote Networks	Enter the LAN and subnets that are located at the remote site here.

Pepwave MAX and Surf User Manual

Authentication	To access your VPN, clients will need to authenticate by your choice of methods. Choose between the Preshared Key and X.509 Certificate methods of authentication.
Mode	Choose Main Mode if both IPsec peers use static IP addresses. Choose Aggressive Mode if one of the IPsec peers uses dynamic IP addresses.
Force UDP Encapsulation	For forced UDP encapsulation regardless of NAT-traversal, tick this checkbox.
Pre-shared Key	This defines the peer authentication pre-shared key used to authenticate this VPN connection. The connection will be up only if the pre-shared keys on each side match.
Remote Certificate (pem encoded)	Available only when X.509 Certificate is chosen as the Authentication method, this field allows you to paste a valid X.509 certificate.
Local ID	In Main Mode , this field can be left blank. In Aggressive Mode , if Remote Gateway IP Address is filled on this end and the peer end, this field can be left blank. Otherwise, this field is typically a U-FQDN.
Remote ID	In Main Mode , this field can be left blank. In Aggressive Mode , if Remote Gateway IP Address is filled on this end and the peer end, this field can be left blank. Otherwise, this field is typically a U-FQDN.
Phase 1 (IKE) Proposal	In Main Mode , this allows setting up to six encryption standards, in descending order of priority, to be used in initial connection key negotiations. In Aggressive Mode , only one selection is permitted.
Phase 1 DH Group	This is the Diffie-Hellman group used within IKE. This allows two parties to establish a shared secret over an insecure communications channel. The larger the group number, the higher the security. Group 2: 1024-bit is the default value. Group 5: 1536-bit is the alternative option.
Phase 1 SA Lifetime	This setting specifies the lifetime limit of this Phase 1 Security Association. By default, it is set at 3600 seconds.
Phase 2 (ESP) Proposal	In Main Mode , this allows setting up to six encryption standards, in descending order of priority, to be used for the IP data that is being transferred. In Aggressive Mode , only one selection is permitted.
Phase 2 PFS Group	Perfect forward secrecy (PFS) ensures that if a key was compromised, the attacker will be able to access only the data protected by that key. None - Do not request for PFS when initiating connection. However, since there is no valid reason to refuse PFS, the system will allow the connection to use PFS if requested by the remote peer. This is the default value. Group 2: 1024-bit Diffie-Hellman group. The larger the group number, the higher the security. Group 5: 1536-bit is the third option.
Phase 2 SA Lifetime	This setting specifies the lifetime limit of this Phase 2 Security Association. By default, it is set at 28800 seconds.

Pepwave MAX and Surf User Manual

WAN Connection Priority	
Priority	WAN Selection
1	WAN 1 ▼
2	----- ▼

WAN Connection Priority

WAN Connection Select the appropriate WAN connection from the drop-down menu.

Pepwave MAX and Surf User Manual

14 Outbound Policy Management

Pepwave routers can flexibly manage and load balance outbound traffic among WAN connections.

Important Note

Outbound policy is applied only when more than one WAN connection is active.

The settings for managing and load balancing outbound traffic are located at **Advanced>Outbound Policy** or **Advanced>PepVPN**, depending on the model.

Service	Algorithm	Source	Destination	Protocol / Port	
HTTPS Persistence	Persistence (Src) (Auto)	Any	Any	TCP 443	X
Default	(Auto)				Add Rule

14.1 Outbound Policy

Outbound policies for managing and load balancing outbound traffic are located at **Network>Outbound Policy** or **Advanced>PepVPN>Outbound Policy**.

Policy		
Custom	?	High Application Compatibility Normal Application Compatibility Custom

There are three main selections for the outbound traffic policy:

- High Application Compatibility
- Normal Application Compatibility
- Custom

Note that some Pepwave routers provide only the **Send All Traffic To** setting here. See **Section 12.1** for details.

Outbound Policy Settings

High

Outbound traffic from a source LAN device is routed through the same WAN connection regardless of the destination Internet IP address and protocol. This option provides the

Pepwave MAX and Surf User Manual

Application Compatibility

highest application compatibility.

Normal Application Compatibility

Outbound traffic from a source LAN device to the same destination Internet IP address will be routed through the same WAN connection persistently, regardless of protocol. This option provides high compatibility to most applications, and users still benefit from WAN link load balancing when multiple Internet servers are accessed.

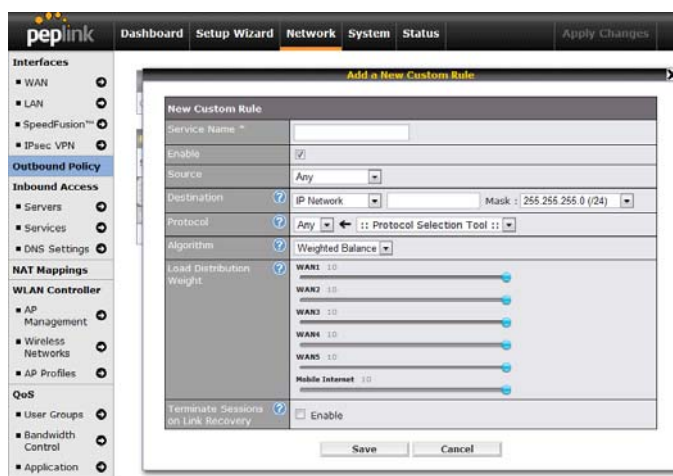
Custom

Outbound traffic behavior can be managed by defining rules in a custom rule table. A default rule can be defined for connections that cannot be matched with any of the rules.

The default policy is **Normal Application Compatibility**.

Tip

Want to know more about creating outbound rules? Visit our YouTube Channel for a video tutorial!



http://youtu.be/rKH4AS_bQnE

14.2 Custom Rules for Outbound Policy

Click  in the **Outbound Policy** form. Choose **Custom** and press the **Save** button.

Outbound Policy
Custom 

Rules (Drag and drop rows to change rule order)

Service	Algorithm	Source	Destination	Protocol / Port	
HTTPS Persistence	Persistence (Src) (Auto)	Any	IP Network 192.168.50.0/24	TCP 443	
PepVPN Routes					
Default	(Auto)				
Add Rule					

Expert Mode
Enabled 

Pepwave MAX and Surf User Manual

The bottom-most rule is **Default**. Edit this rule to change the device's default manner of controlling outbound traffic for all connections that do not match any of the rules above it. Under the **Service** heading, click **Default** to change these settings.

To rearrange the priority of outbound rules, drag and drop them into the desired sequence.

Edit Default Custom Rule	
Default Rule ?	☒ Custom ☐ Auto
Algorithm ?	Weighted Balance ▾
Load Distribution Weight ?	WAN 1 10
	WAN 2 10
	Wi-Fi WAN 10
	Cellular 1 10
	Cellular 2 10
	USB 10
Terminate Sessions on Link Recovery ?	☐ Enable
Save Cancel	

By default, **Auto** is selected as the **Default Rule**. You can select **Custom** to change the algorithm to be used. Please refer to the upcoming sections for the details on the available algorithms.

To create a custom rule, click **Add Rule** at the bottom of the table. Note that some Pepwave routers display this button at **Advanced>PepVPN>PepVPN Outbound Custom Rules**.

Pepwave MAX and Surf User Manual

Add a New Custom Rule

Service Name *	
Enable	☒
Source	Any ▾
Destination ?	Domain Name ▾
Protocol ?	Any ▾ ◀ :: Protocol Selection Tool :: ▾
Algorithm ?	Weighted Balance ▾
Load Distribution Weight ?	WAN 1 10 <input type="range"/> WAN 2 10 <input type="range"/> Wi-Fi WAN 10 <input type="range"/> Cellular 1 10 <input type="range"/> Cellular 2 10 <input type="range"/> USB 10 <input type="range"/>
Terminate Sessions on Link Recovery ?	☐ Enable

Save

Cancel

New Custom Rule Settings

Service Name This setting specifies the name of the outbound traffic rule.

Enable This setting specifies whether the outbound traffic rule takes effect. When **Enable** is checked, the rule takes effect: traffic is matched and actions are taken by the Pepwave router based on the other parameters of the rule. When **Enable** is unchecked, the rule does not take effect: the Pepwave router disregards the other parameters of the rule.

Source This setting specifies the source IP address, IP network, or MAC address for traffic that matches the rule.

Destination This setting specifies the destination IP address, IP network, or domain name for traffic that matches the rule.

Destination

Domain Name ▾

Protocol ?

Any

Algorithm ?

IP Address

IP Network

Domain Name

If **Domain Name** is chosen and a domain name, such as *foobar.com*, is entered, any outgoing accesses to *foobar.com* and **.foobar.com* will match this criterion. You may enter a wildcard (*) at the end of a domain name to match any host with a name having the domain name in the middle. If you enter *foobar.**, for example, *www.foobar.com*, *www.foobar.co.jp*, or *foobar.co.uk* will also match. Placing wildcards in any other position is not supported.

NOTE: if a server has one Internet IP address and multiple server names, and if one of the names is defined here, accesses to any one of the server names will also match this rule.

Protocol and Port This setting specifies the IP protocol and port of traffic that matches this rule.

Pepwave MAX and Surf User Manual

Algorithm

This setting specifies the behavior of the Pepwave router for the custom rule. One of the following values can be selected (note that some Pepwave routers provide only some of these options):

- Weighted Balance
- Persistence
- Enforced
- Priority
- Overflow
- Least Used
- Lowest Latency

The upcoming sections detail the listed algorithms.

Terminate Sessions on Link Recovery

This setting specifies whether to terminate existing IP sessions on a less preferred WAN connection in the event that a more preferred WAN connection is recovered. This setting is applicable to the **Weighted**, **Persistence**, and **Priority** algorithms. By default, this setting is disabled. In this case, existing IP sessions will not be terminated or affected when any other WAN connection is recovered. When this setting is enabled, existing IP sessions may be terminated when another WAN connection is recovered, such that only the preferred healthy WAN connection(s) is used at any point in time.

Pepwave MAX and Surf User Manual

14.2.1 Algorithm: Weighted Balance

This setting specifies the ratio of WAN connection usage to be applied on the specified IP protocol and port. This setting is applicable only when **Algorithm** is set to **Weighted Balance**.

Algorithm ?	Weighted Balance ▼
Load Distribution Weight ?	WAN 1 10 WAN 2 10 Wi-Fi WAN 10 Cellular 1 10 Cellular 2 10 USB 10

The amount of matching traffic that is distributed to a WAN connection is proportional to the weight of the WAN connection relative to the total weight. Use the sliders to change each WAN's weight.

For example, with the following weight settings:

- Ethernet WAN1: 10
- Ethernet WAN2: 10
- Wi-Fi WAN: 10
- Cellular 1: 10
- Cellular 2: 10
- USB: 10

Total weight is 60 = (10 + 10 + 10 + 10 + 10 + 10).

Matching traffic distributed to Ethernet WAN1 is 16.7% = $(10 / 60 \times 100\%)$.

Matching traffic distributed to Ethernet WAN2 is 16.7% = $(10 / 60) \times 100\%$.

Matching traffic distributed to Wi-Fi WAN is 16.7% = $(10 / 60) \times 100\%$.

Matching traffic distributed to Cellular 1 is 16.7% = $(10 / 60) \times 100\%$.

Matching traffic distributed to Cellular 2 is 16.7% = $(10 / 60) \times 100\%$.

Matching traffic distributed to USB is 16.7% = $(10 / 60) \times 100\%$.

Pepwave MAX and Surf User Manual

14.2.2 Algorithm: Persistence

The configuration of persistent services is the solution to the few situations where link load distribution for Internet services is undesirable. For example, for security reasons, many e-banking and other secure websites terminate the session when the client computer's Internet IP address changes mid-session.

In general, different Internet IP addresses represent different computers. The security concern is that an IP address change during a session may be the result of an unauthorized intrusion attempt. Therefore, to prevent damages from the potential intrusion, the session is terminated upon the detection of an IP address change.

Pepwave routers can be configured to distribute data traffic across multiple WAN connections. Also, the Internet IP depends on the WAN connections over which communication actually takes place. As a result, a LAN client computer behind the Pepwave router may communicate using multiple Internet IP addresses. For example, a LAN client computer behind a Pepwave router with three WAN connections may communicate on the Internet using three different IP addresses.

With the persistence feature, rules can be configured to enable client computers to persistently utilize the same WAN connections for e-banking and other secure websites. As a result, a client computer will communicate using one IP address, eliminating the issues mentioned above.

Algorithm	Persistence ▼
Persistence Mode	☒ By Source ☐ By Destination
Load Distribution	☐ Auto ☒ Custom
Load Distribution Weight	 WAN 1 10 WAN 2 10 Wi-Fi WAN 10 Cellular 1 10 Cellular 2 10 USB 10

There are two persistent modes: **By Source** and **By Destination**.

By Source:	The same WAN connection will be used for traffic matching the rule and originating from the same machine, regardless of its destination. This option will provide the highest level of application compatibility.
By Destination:	The same WAN connection will be used for traffic matching the rule, originating from the same machine, and going to the same destination. This option can better distribute loads to WAN connections when there are only a few client machines.

The default mode is **By Source**. When there are multiple client requests, they can be distributed (persistently) to WAN connections with a weight. If you choose **Auto** in **Load Distribution**, the weights will be automatically adjusted according to each WAN's **Downstream Bandwidth** which is specified in the WAN settings page). If you choose **Custom**, you can customize the weight of each WAN manually by using the sliders.

Pepwave MAX and Surf User Manual

14.2.3 Algorithm: Enforced

This setting specifies the WAN connection usage to be applied on the specified IP protocol and port. This setting is applicable only when **Algorithm** is set to **Enforced**.

Algorithm	?	Enforced
Enforced Connection	?	WAN: WAN 1
		WAN: WAN 1
		WAN: WAN 2
		WAN: Wi-Fi WAN
		WAN: Cellular 1
		WAN: Cellular 2
		WAN: USB
		VPN: Connection 1
		Save Cancel

Matching traffic will be routed through the specified WAN connection, regardless of the health check status of the WAN connection. Starting from Firmware 5.2, outbound traffic can be enforced to go through a specified SpeedFusion™ connection.

14.2.4 Algorithm: Priority

This setting specifies the priority of the WAN connections used to route the specified network service. The highest priority WAN connection available will always be used for routing the specified type of traffic. A lower priority WAN connection will be used only when all higher priority connections have become unavailable.

Algorithm	?	Priority
Priority Order	?	Highest Priority
		WAN: WAN 1
		WAN: WAN 2
		WAN: Wi-Fi WAN
		WAN: Cellular 1
		WAN: Cellular 2
		WAN: USB
		Lowest Priority
Not In Use		
VPN: Connection 1		
Terminate Sessions on Link Recovery	?	☐ Enable

Starting from Firmware 5.2, outbound traffic can be prioritized to go through SpeedFusion™ connection(s). By default, VPN connections are not included in the priority list.

Tip

Configure multiple distribution rules to accommodate different kinds of services.

14.2.5 Algorithm: Overflow

The traffic matching this rule will be routed through the healthy WAN connection that has the highest priority and is not in full load. When this connection gets saturated, new sessions will be routed to the next healthy WAN connection that is not in full load.

Pepwave MAX and Surf User Manual

Algorithm	?	Overflow
Overflow Order	?	Highest Priority WAN: WAN 1 WAN: WAN 2 WAN: Wi-Fi WAN WAN: Cellular 1 WAN: Cellular 2 WAN: USB Lowest Priority

Drag and drop to specify the order of WAN connections to be used for routing traffic. Only the highest priority healthy connection that is not in full load will be used.

14.2.6 Algorithm: Least Used

Algorithm	?	Least Used
Connection		☒ WAN 1 ☒ WAN 2 ☒ Wi-Fi WAN ☐ Cellular 1 ☐ Cellular 2 ☐ USB

The traffic matching this rule will be routed through the healthy WAN connection that is selected in **Connection** and has the most available download bandwidth. The available download bandwidth of a WAN connection is calculated from the total download bandwidth specified on the WAN settings page and the current download usage. The available bandwidth and WAN selection is determined every time an IP session is made.

14.2.7 Algorithm: Lowest Latency

Algorithm	?	Lowest Latency
		Note: Use of Lowest Latency will incur additional network usage.
Connection		☒ WAN 1 ☒ WAN 2 ☒ Wi-Fi WAN ☐ Cellular 1 ☐ Cellular 2 ☐ USB

The traffic matching this rule will be routed through the healthy WAN connection that is selected in **Connection** and has the lowest latency. Latency checking packets are issued periodically to a nearby router of each WAN connection to determine its latency value. The latency of a WAN is the packet round trip time of the WAN connection. Additional network usage may be incurred as a result.

Tip

The roundtrip time of a 6M down/640k uplink can be higher than that of a 2M down/2M up link because the overall round trip time is lengthened by its slower upload bandwidth, despite its higher downlink speed. Therefore, this algorithm is good for two scenarios:

- All WAN connections are symmetric; or
- A latency sensitive application must be routed through the lowest latency WAN, regardless of the WAN's

Pepwave MAX and Surf User Manual

available bandwidth.

14.2.8 Expert Mode

Expert Mode is available on some Pepwave routers for use by advanced users. To enable the feature, click on the help icon and click **turn on Expert Mode**.

In Expert Mode, a new special rule, **SpeedFusion™ Routes**, is displayed in the **Custom Rules** table. This rule represents all SpeedFusion™ routes learned from remote VPN peers. By default, this bar is on the top of all custom rules. This position means that traffic for remote VPN subnets will be routed to the corresponding VPN peer. You can create custom **Priority** or **Enforced** rules and move them above the bar to override the SpeedFusion™ routes.

Help [Close](#)

This table allows you to fine tune how the outbound traffic should be distributed to the WAN connections.

Click the *Add Rule* button to add a new rule. Click the *X* button to remove a rule. Drag a rule to promote or demote its precedence. A higher position of a rule signifies a higher precedence. You may change the default outbound policy behavior by clicking the *Default* link.

If you require advanced control of PepVPN traffic, [turn on Expert Mode](#).

Upon disabling Expert Mode, all rules above the bar will be removed.

Rules (👉 Drag and drop rows to change rule order) ?					
Service	Algorithm	Source	Destination	Protocol / Port	
HTTPS_Persistence	Persistence (Src) (Auto)	Any	Any	TCP 443	✖
PepVPN Routes					
Default	(Auto)				
Add Rule					

15 Inbound Access

15.1 Port Forwarding Service

Pepwave routers can act as a firewall that blocks, by default, all inbound access from the Internet. By using port forwarding, Internet users can access servers behind the Pepwave router. Inbound port forwarding rules can be defined at **Advanced>Port Forwarding**.

Service	IP Address(es)	Server	Protocol
No Services Defined			
Add Service			

To define a new service, click **Add Service**.

Enable	☒ Yes ☐ No																												
Service Name	Service_1																												
IP Protocol	TCP ← :: Protocol Selection Tool :: ↓																												
Port	Any Port																												
Inbound IP Address(es) (Require at least one IP address)	<table><tr><th colspan="2">Connection / IP Address(es)</th><th>All</th><th>Clear</th></tr><tr><td>☒ WAN 1</td><td>☒ 10.88.3.158 (Interface IP)</td><td></td><td></td></tr><tr><td>☐ WAN 2</td><td></td><td></td><td></td></tr><tr><td>☐ Wi-Fi WAN</td><td></td><td></td><td></td></tr><tr><td>☐ Cellular 1</td><td></td><td></td><td></td></tr><tr><td>☐ Cellular 2</td><td></td><td></td><td></td></tr><tr><td>☐ USB</td><td></td><td></td><td></td></tr></table>	Connection / IP Address(es)		All	Clear	☒ WAN 1	☒ 10.88.3.158 (Interface IP)			☐ WAN 2				☐ Wi-Fi WAN				☐ Cellular 1				☐ Cellular 2				☐ USB			
Connection / IP Address(es)		All	Clear																										
☒ WAN 1	☒ 10.88.3.158 (Interface IP)																												
☐ WAN 2																													
☐ Wi-Fi WAN																													
☐ Cellular 1																													
☐ Cellular 2																													
☐ USB																													
Server IP Address	120.78.95.7																												

Port Forwarding Settings

Enable

This setting specifies whether the inbound service takes effect. When **Enable** is checked, the inbound service takes effect: traffic is matched and actions are taken by the Pepwave router based on the other parameters of the rule. When this setting is disabled, the inbound service does not take effect: the Pepwave router disregards the other parameters of the rule.

Service Name

This setting identifies the service to the system administrator. Valid values for this setting consist of only alphanumeric and underscore “_” characters.

IP Protocol

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 the Pepwave router 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. 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.

Pepwave MAX and Surf User Manual

The **Port** setting specifies the port(s) that correspond to the service, and can be configured to behave in one of the following manners:

Any Port, Single Port, Port Range, Port Map, and Range Mapping

Port	?	Any Port
------	---	----------

Any Port: all traffic that is received by the Pepwave router via the specified protocol is forwarded to the servers specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Any Port**, all TCP traffic is forwarded to the configured servers.

Port	?	Single Port	Service Port: 80
------	---	-------------	------------------

Single Port: traffic that is received by the Pepwave router via the specified protocol at the specified port is forwarded via the same port to the servers specified by the **Servers** 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	?	Port Range	Service Ports: 80 - 88
------	---	------------	------------------------

Port Range: traffic that is received by the Pepwave router via the specified protocol at the specified port range is forwarded via the same respective ports to the LAN hosts specified by the **Servers** 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	?	Port Mapping	Service Port: 80	Map to Port: 88
------	---	--------------	------------------	-----------------

Port Mapping: traffic that is received by Pepwave router via the specified protocol at the specified port is forwarded via a different port to the servers specified by the **Servers** 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 servers via port 88. (Please see below for details on the **Servers** setting.)

Port	?	Range Mapping	Service Ports: 80 - 88	Map to Ports: 88 - 96
------	---	---------------	------------------------	-----------------------

Range Mapping: traffic that is received by the Pepwave router via the specified protocol at the specified port range is forwarded via a different port to the servers specified by the **Servers** setting.

Port

Inbound IP Address(es)

This setting specifies the WAN connections and Internet IP address(es) from which the service can be accessed.

Server IP Address

This setting specifies the LAN IP address of the server that handles the requests for the service.

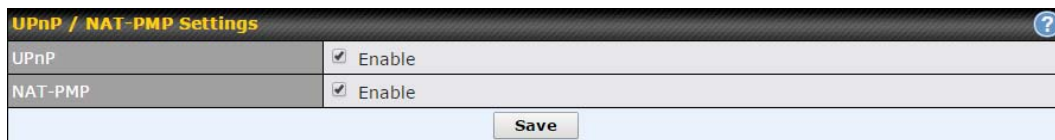
Pepwave MAX and Surf User Manual

15.1.1 UPnP / NAT-PMP Settings

UPnP and NAT-PMP are network protocols which allow a computer connected to the LAN port to automatically configure the router to allow parties on the WAN port to connect to itself. That way, the process of inbound port forwarding becomes automated.

When a computer creates a rule using these protocols, the specified TCP/UDP port of all WAN connections' default IP address will be forwarded.

Check the corresponding box(es) to enable UPnP and/or NAT-PMP. Enable these features only if you trust the computers connected to the LAN ports.



UPnP / NAT-PMP Settings	
UPnP	☒ Enable
NAT-PMP	☒ Enable
Save	

When the options are enabled, a table listing all the forwarded ports under these two protocols can be found at **Status>UPnP / NAT-PMP**.

16 NAT Mappings

NAT mappings allow IP address mapping of all inbound and outbound NAT'd traffic to and from an internal client IP address. Settings to configure NAT mappings are located at **Advanced>NAT Mappings**.

LAN Clients	Inbound Mappings	Outbound Mappings	
192.168.1.23	(WAN 1):10.88.3.158 (Interface IP)	Use Interface IP only	
Add NAT Rule			

To add a rule for NAT mappings, click **Add NAT Rule**.

LAN Client(s)	IP Address ▾												
Address													
Inbound Mappings	Connection / Inbound IP Address(es) ☐ WAN 1 ☐ WAN 2 ☐ Wi-Fi WAN ☐ Cellular 1 ☐ Cellular 2 ☐ USB												
Outbound Mappings	Connection / Outbound IP Address <table> <tr> <td>WAN 1</td> <td>10.88.3.158 (Interface IP) ▾</td> </tr> <tr> <td>WAN 2</td> <td>Interface IP ▾</td> </tr> <tr> <td>Wi-Fi WAN</td> <td>Interface IP ▾</td> </tr> <tr> <td>Cellular 1</td> <td>Interface IP ▾</td> </tr> <tr> <td>Cellular 2</td> <td>Interface IP ▾</td> </tr> <tr> <td>USB</td> <td>Interface IP ▾</td> </tr> </table>	WAN 1	10.88.3.158 (Interface IP) ▾	WAN 2	Interface IP ▾	Wi-Fi WAN	Interface IP ▾	Cellular 1	Interface IP ▾	Cellular 2	Interface IP ▾	USB	Interface IP ▾
WAN 1	10.88.3.158 (Interface IP) ▾												
WAN 2	Interface IP ▾												
Wi-Fi WAN	Interface IP ▾												
Cellular 1	Interface IP ▾												
Cellular 2	Interface IP ▾												
USB	Interface IP ▾												

NAT Mapping Settings	
LAN Client(s)	NAT mapping rules can be defined for a single LAN IP Address , an IP Range , or an IP Network .
Address	This refers to the LAN host's private IP address. The system maps this address to a number of public IP addresses (specified below) in order to facilitate inbound and outbound traffic. This option is only available when IP Address is selected.
Range	The IP range is a contiguous group of private IP addresses used by the LAN host. The system maps these addresses to a number of public IP addresses (specified below) to facilitate outbound traffic. This option is only available when IP Range is selected.
Network	The IP network refers to all private IP addresses and ranges managed by the LAN host. The system maps these addresses to a number of public IP addresses (specified below) to facilitate outbound traffic. This option is only available when IP Network is selected.

Pepwave MAX and Surf User Manual

Inbound Mappings	This setting specifies the WAN connections and corresponding WAN-specific Internet IP addresses on which the system should bind. Any access to the specified WAN connection(s) and IP address(es) will be forwarded to the LAN host. This option is only available when IP Address is selected in the LAN Client(s) field. Note that inbound mapping is not needed for WAN connections in drop-in mode or IP forwarding mode. Also note that each WAN IP address can be associated to one NAT mapping only.
Outbound Mappings	This setting specifies the WAN IP addresses that should be used when an IP connection is made from a LAN host to the Internet. Each LAN host in an IP range or IP network will be evenly mapped to one of each selected WAN's IP addresses (for better IP address utilization) in a persistent manner (for better application compatibility). Note that if you do not want to use a specific WAN for outgoing accesses, you should still choose default here, then customize the outbound access rule in the Outbound Policy section. Also note that WAN connections in drop-in mode or IP forwarding mode are not shown here.

Click **Save** to save the settings when configuration has been completed.

Important Note

Inbound firewall rules override the **Inbound Mappings** settings.

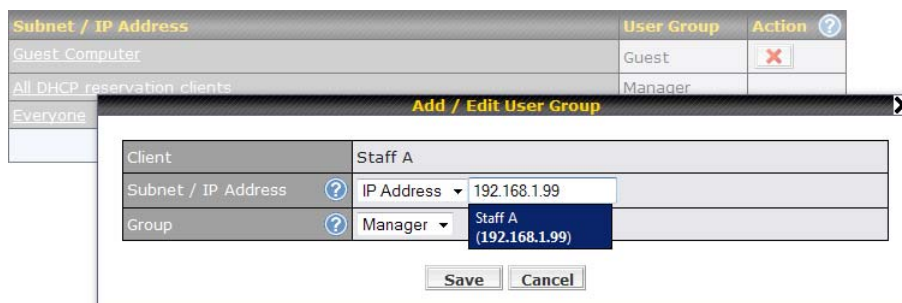
17 QoS

17.1 User Groups

LAN and PPTP clients can be categorized into three user groups: **Manager**, **Staff**, and **Guest**. This menu allows you to define rules and assign client IP addresses or subnets to a user group. You can apply different bandwidth and traffic prioritization policies on each user group in the **Bandwidth Control** and **Application** sections (note that the options available here vary by model).

The table is automatically sorted by rule precedence. The smaller and more specific subnets are put towards the top of the table and have higher precedence; larger and less specific subnets are placed towards the bottom.

Click the **Add** button to define clients and their user group. Click the  button to remove the defined rule. Two default rules are pre-defined and put at the bottom. They are **All DHCP reservation clients** and **Everyone**, and they cannot be removed. The **All DHCP reservation client represents** the LAN clients defined in the DHCP Reservation table on the LAN settings page. **Everyone** represents all clients that are not defined in any rule above. Click on a rule to change its group.



Subnet / IP Address	User Group	Action
Guest Computer	Guest	
All DHCP reservation clients	Manager	
Everyone		

Add / Edit User Group

Client	Staff A
Subnet / IP Address	IP Address 192.168.1.99
Group	Manager

Staff A (192.168.1.99)

Save Cancel

Add / Edit User Group	
Subnet / IP Address	From the drop-down menu, choose whether you are going to define the client(s) by an IP Address or a Subnet . If IP Address is selected, enter a name defined in DHCP reservation table or a LAN client's IP address. If Subnet is selected, enter a subnet address and specify its subnet mask.
Group	This field is to define which User Group the specified subnet / IP address belongs to.

Once users have been assigned to a user group, their internet traffic will be restricted by rules defined for that particular group. Please refer to the following two sections for details.

Pepwave MAX and Surf User Manual

17.2 Bandwidth Control

You can define a maximum download speed (over all WAN connections) and upload speed (for each WAN connection) that each individual Staff and Guest member can consume. No limit can be imposed on individual Manager members. By default, download and upload bandwidth limits are set to unlimited (set as **0**).

Individual Bandwidth Limit					
Enable	☒				
User Bandwidth Limit	Download		Upload		
	Manager: Unlimited		Unlimited		
	Staff:	0 Mbps	0	Mbps	(0: unlimited)
	Guest:	0 Mbps	0	Mbps	(0: unlimited)

17.3 Application

17.3.1 Application Prioritization

On many Pepwave routers, you can choose whether to apply the same prioritization settings to all user groups or customize the settings for each group.

Application Prioritization	
☒	Apply same settings to all users
☐	Customize

Three application priority levels can be set: **↑ High**, **— Normal**, and **↓ Low**. Pepwave routers can detect various application traffic types by inspecting the packet content. Select an application by choosing a supported application, or by defining a custom application manually. The priority preference of supported applications is placed at the top of the table. Custom applications are at the bottom.

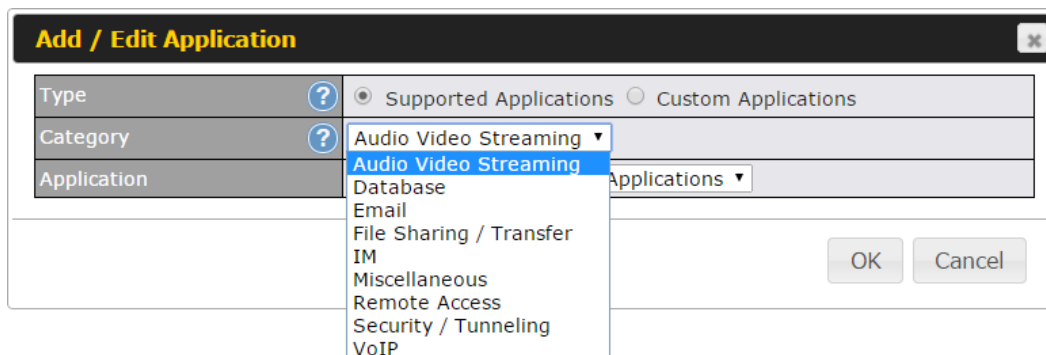
Application	Priority			
	Manager	Staff	Guest	
All Supported Streaming Applications	↑ High	— Normal	↑ High	✖
All Email Protocols	↑ High	↑ High	↑ High	✖
MySQL	↑ High	— Normal	↓ Low	✖
SIP	↑ High	↓ Low	↓ Low	✖
Add				

Pepwave MAX and Surf User Manual

17.3.2 Prioritization for Custom Applications

Click the **Add** button to define a custom application. Click the button  in the **Action** column to delete the custom application in the corresponding row.

When **Supported Applications** is selected, the Pepwave router will inspect network traffic and prioritize the selected applications. Alternatively, you can select **Custom Applications** and define the application by providing the protocol, scope, port number, and DSCP value.



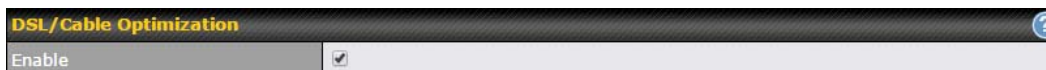
The dialog box titled "Add / Edit Application" contains a table with the following structure:

Type	Supported Applications ☒ Custom Applications ☐	
Category	Audio Video Streaming	
Application	Audio Video Streaming	Applications

A dropdown menu is open for the "Category" field, showing the following options: Database, Email, File Sharing / Transfer, IM, Miscellaneous, Remote Access, Security / Tunneling, and VoIP. The "Audio Video Streaming" option is currently selected. At the bottom right of the dialog are "OK" and "Cancel" buttons.

17.3.3 DSL/Cable Optimization

DSL/cable-based WAN connections have lower upload bandwidth and higher download bandwidth. When a DSL/cable circuit's uplink is congested, the download bandwidth will be affected. Users will not be able to download data at full speed until the uplink becomes less congested. **DSL/Cable Optimization** can relieve such an issue. When it is enabled, the download speed will become less affected by the upload traffic. By default, this feature is enabled.



The "DSL/Cable Optimization" settings window shows a single row with the label "Enable" and a checked checkbox, indicating that the feature is enabled.

18 Firewall

A firewall is a mechanism that selectively filters data traffic between the WAN side (the Internet) and the LAN side of the network. It can protect the local network from potential hacker attacks, access to offensive websites, and/or other inappropriate uses.

The firewall functionality of Pepwave routers supports the selective filtering of data traffic in both directions:

- Outbound (LAN to WAN)
- Inbound (WAN to LAN)

The firewall also supports the following functionality:

- Intrusion detection and DoS prevention
- Web blocking

With SpeedFusion™ enabled, the firewall rules also apply to VPN tunneled traffic.

Outbound Firewall Rules (Drag and drop rows to change rule order)

Rule	Protocol	Source IP Port	Destination IP Port	Policy
Default	Any	Any	Any	Allow

Add Rule

Inbound Firewall Rules (Drag and drop rows to change rule order)

Rule	Protocol	WAN	Source IP Port	Destination IP Port	Policy
Default	Any	Any	Any	Any	Allow

Add Rule

Apply Firewall Rules to PepVPN Traffic

Enabled

Intrusion Detection and DoS Prevention

Disabled

18.1 Outbound and Inbound Firewall Rules

18.1.1 Access Rules

The outbound firewall settings are located at **Advanced>Firewall>Access Rules>Outbound Firewall Rules**.

Outbound Firewall Rules (Drag and drop rows to change rule order)

Rule	Protocol	Source IP Port	Destination IP Port	Policy
Default	Any	Any	Any	Allow

Add Rule

Pepwave MAX and Surf User Manual

Click **Add Rule** to display the following screen:

The dialog box is titled "Add a New Outbound Firewall Rule". It contains a form for creating a new firewall rule. The form has the following fields:

New Firewall Rule	
Rule Name	
Enable	☒
Protocol	Any :: Protocol Selection Tool ::
Source IP & Port	Any Address
Destination IP & Port	Any Address
Action	☒ Allow ☐ Deny
Event Logging	☐ Enable

At the bottom right of the dialog box are two buttons: "Save" and "Cancel".

Inbound firewall settings are located at **Advanced>Firewall>Access Rules>Inbound Firewall Rules**.

The screenshot shows a table titled "Inbound Firewall Rules" with a subtitle "(Drag and drop rows to change rule order)". The table has the following columns: Rule, Protocol, WAN, Source IP Port, Destination IP Port, Policy, and a help icon. There is one row labeled "Default". Below the table is an "Add Rule" button.

Rule	Protocol	WAN	Source IP Port	Destination IP Port	Policy	
Default	Any	Any	Any	Any	Allow	

Below the table is a button labeled "Add Rule".

Click **Add Rule** to display the following screen:

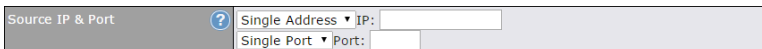
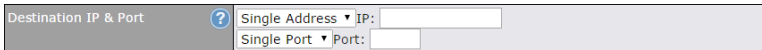
The dialog box is titled "Add a New Inbound Firewall Rule". It contains a form for creating a new firewall rule. The form has the following fields:

New Firewall Rule	
Rule Name	
Enable	☒
WAN Connection	Any
Protocol	Any :: Protocol Selection Tool ::
Source IP & Port	Any Address
Destination IP & Port	Any Address
Action	☒ Allow ☐ Deny
Event Logging	☐ Enable

At the bottom right of the dialog box are two buttons: "Save" and "Cancel".

Rules are matched from top to bottom. If a connection matches any one of the upper rules, the matching process will stop. If none of the rules match, the **Default** rule will be applied. By default, the **Default** rule is set as **Allow** for both outbound and inbound access.

Pepwave MAX and Surf User Manual

Inbound / Outbound Firewall Settings	
Rule Name	This setting specifies a name for the firewall rule.
Enable	This setting specifies whether the firewall rule should take effect. If the box is checked, the firewall rule takes effect. If the traffic matches the specified protocol/IP/port, actions will be taken by the Pepwave router based on the other parameters of the rule. If the box is not checked, the firewall rule does not take effect. The Pepwave router will disregard the other parameters of the rule.
WAN Connection (Inbound)	Select the WAN connection that this firewall rule should apply to.
Protocol	This setting specifies the protocol to be matched. Via a drop-down menu, the following protocols can be specified: • TCP • UDP • ICMP • IP Alternatively, the Protocol Selection Tool drop-down menu can be used to automatically fill in the protocol and 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 remains manually modifiable.
Source IP & Port	This specifies the source IP address(es) and port number(s) to be matched for the firewall rule. A single address, or a network, can be specified as the Source IP & Port setting, as indicated by the following screenshot:  In addition, a single port, or a range of ports, can be specified for the Source IP & Port settings.
Destination IP & Port	This specifies the destination IP address(es) and port number(s) to be matched for the firewall rule. A single address, or a network, can be specified as the Destination IP & Port setting, as indicated by the following screenshot:  In addition, a single port, or a range of ports, can be specified for the Destination IP & Port settings.
Action	This setting specifies the action to be taken by the router upon encountering traffic that matches the both of the following: • Source IP & port • Destination IP & port With the value of Allow for the Action setting, the matching traffic passes through the router (to be routed to the destination). If the value of the Action setting is set to Deny, the matching traffic does not pass through the router (and is discarded).
Event Logging	This setting specifies whether or not to log matched firewall events. The logged messages are shown on the page Status>Event Log . A sample message is as follows:

Pepwave MAX and Surf User Manual

```
Aug 13 23:47:44 Denied CONN=Ethernet WAN SRC=20.3.2.1  
DST=192.168.1.20 LEN=48 PROTO=TCP SPT=2260 DPT=80
```

- **CONN:** The connection where the log entry refers to
- **SRC:** Source IP address
- **DST:** Destination IP address
- **LEN:** Packet length
- **PROTO:** Protocol
- **SPT:** Source port
- **DPT:** Destination port

Click **Save** to store your changes. To create an additional firewall rule, click **Add Rule** and repeat the above steps.

To change a rule's priority, simply drag and drop the rule:

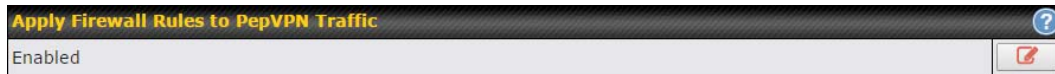
- Hold the left mouse button on the rule.
- Move it to the desired position.
- Drop it by releasing the mouse button.

Tip

If the default inbound rule is set to **Allow** for NAT-enabled WANs, no inbound Allow firewall rules will be required for inbound port forwarding and inbound NAT mapping rules. However, if the default inbound rule is set as **Deny**, a corresponding Allow firewall rule will be required.

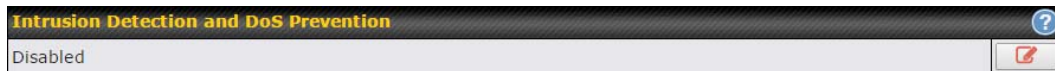
Pepwave MAX and Surf User Manual

18.1.2 Apply Firewall Rules to PepVpn Traffic



When this option is enabled, Outbound Firewall Rules will be applied to PepVPN traffic. To turn on this feature, click , check the **Enable** check box, and press the **Save** button.

18.1.3 Intrusion Detection and DoS Prevention



Pepwave routers can detect and prevent intrusions and denial-of-service (DoS) attacks from the Internet. To turn on this feature, click , check the **Enable** check box, and press the **Save** button.

When this feature is enabled, the Pepwave router will detect and prevent the following kinds of intrusions and denial-of-service attacks.

- Port scan
 - NMAP FIN/URG/PSH
 - Xmas tree
 - Another Xmas tree
 - Null scan
 - SYN/RST
 - SYN/FIN
- SYN flood prevention
- Ping flood attack prevention

18.2 Web Blocking

Web Blocking	
Web Site Domain Name	
	+

Exempted User Groups	
Manager	☐ Exempt
Staff	☐ Exempt
Guest	☐ Exempt

Exempted Subnets	
Network	Subnet Mask
	255.255.255.0 (/24) +

18.2.1 Web Blocking

Enter an appropriate website address, and the Pepwave router will block and disallow LAN/PPTP/SpeedFusion™ peer clients to access these websites. Exceptions can be added using the instructions in **Sections 18.2.2** and **18.2.3**.

You may enter a wildcard "."*" at the end of a domain name to block any web site with a host name having the domain name in the middle. For example, If you enter *foobar.**, *www.foobar.com*, *www.foobar.co.jp*, and *foobar.co.uk* will be blocked. Placing the wildcard in any other position is not supported. The Pepwave router will inspect and look for blocked domain names on all HTTP traffic. Secure web (HTTPS) traffic is not supported.

18.2.2 Exempted User Groups

Check and select pre-defined user group(s) who can be exempted from the access blocking rules. User groups can be defined at **QoS>User Groups** section. Please refer to **Section 17.1** for details.

18.2.3 Exempted Subnets

With the subnet defined in the field, clients on the particular subnet(s) can be exempted from the access blocking rules.

18.3 OSPF & RIPv2

The Peplink Balance supports OSPF and RIPv2 dynamic routing protocols. Click the **Network** tab from the top bar, and then click the **OSPF & RIPv2** item on the sidebar to reach the following menu:

Pepwave MAX and Surf User Manual

The top screenshot shows the **OSPF** configuration section. It includes a **Router ID** field with radio buttons for **LAN IP Address** (selected) and **Custom:** (with an empty text box). Below this is a table with columns **Area** and **Interfaces**. The first row shows Area **0** with interface **PepVPN**. An **Add** button is at the bottom right of the table. The bottom screenshot shows the **RIPv2** section with the text "No RIPv2 Defined." and a red edit icon.

OSPF	
Router ID	This field determines the ID of the router. By default, this is specified as the LAN IP address. If you want to specify your own ID, enter it in the Custom field.
Area	This is an overview of the OSPFv2 areas you have defined. Click on the area name to configure it. To set a new area, click Add . To delete an existing area, click  .

The **OSPF Settings** dialog box contains the following fields:

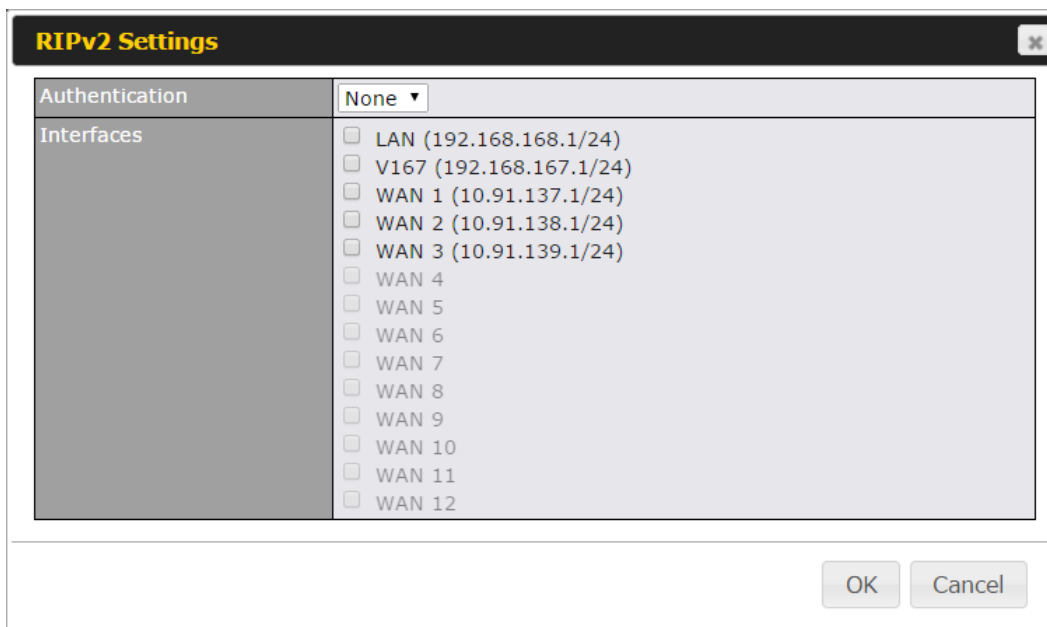
- Area ID**: A text input field.
- Link Type**: Radio buttons for **Broadcast** (selected) and **Point-to-Point**.
- Authentication**: A dropdown menu set to **MD5** and an adjacent text input field for the key.
- Interfaces**: A list of checkboxes for LAN (192.168.168.1/24), V167 (192.168.167.1/24), WAN 1 (10.91.137.1/24), WAN 2 (10.91.138.1/24), WAN 3 (10.91.139.1/24), WAN 4, WAN 5, WAN 6, WAN 7, WAN 8, WAN 9, WAN 10, WAN 11, and WAN 12.

At the bottom right are **OK** and **Cancel** buttons.

OSPF Settings	
Area ID	Determine the name of your Area ID to apply to this group. Machines linked to this group will send and receive related OSPF packets, while unlinked machines will ignore it.
Link Type	Choose the network type that this area will use.
Authentication	Choose an authentication method, if one is used, from this drop-down menu. Available options are MD5 and Text . Enter the authentication key next to the drop-down menu.
Interfaces	Determine which interfaces this area will use to listen to and deliver OSPF packets

Pepwave MAX and Surf User Manual

To access RIPv2 settings, click .



The RIPv2 Settings dialog box has a title bar with the text "RIPv2 Settings" and a close button. It contains two main sections: "Authentication" and "Interfaces". The "Authentication" section has a drop-down menu currently set to "None". The "Interfaces" section is a list of checkboxes for various network interfaces: LAN (192.168.168.1/24), V167 (192.168.167.1/24), WAN 1 (10.91.137.1/24), WAN 2 (10.91.138.1/24), WAN 3 (10.91.139.1/24), WAN 4, WAN 5, WAN 6, WAN 7, WAN 8, WAN 9, WAN 10, WAN 11, and WAN 12. At the bottom right of the dialog are "OK" and "Cancel" buttons.

RIPv2 Settings	
Authentication	Choose an authentication method, if one is used, from this drop-down menu. Available options are MD5 and Text . Enter the authentication key next to the drop-down menu.
Interfaces	Determine which interfaces this group will use to listen to and deliver RIPv2 packets.

18.4 Remote User Access

a Networks routed by a Peplink Balance can be remotely accessed via L2TP with IPsec or PPTP. To configure this feature, navigate to **Network > Remote User Access**

Pepwave MAX and Surf User Manual

Remote User Access Settings										
Enable	☒									
VPN Type	☒ L2TP with IPsec ☐ PPTP IPsec NAT-Traversal will be enabled to ensure compatibility for most of the devices									
Preshared Key	 ☒ Hide Characters									
Listen On	? Connection / IP Address(es)<table><tbody><tr><td>☒ WAN1</td><td>☒ 10.10.12.47 (Interface IP)</td></tr><tr><td>☒ WAN2</td><td>☒ Interface IP</td></tr><tr><td>☒ WAN3</td><td>☒ Interface IP</td></tr><tr><td>☒ Mobile Internet</td><td>☒ Interface IP</td></tr></tbody></table>	☒ WAN1	☒ 10.10.12.47 (Interface IP)	☒ WAN2	☒ Interface IP	☒ WAN3	☒ Interface IP	☒ Mobile Internet	☒ Interface IP	
☒ WAN1	☒ 10.10.12.47 (Interface IP)									
☒ WAN2	☒ Interface IP									
☒ WAN3	☒ Interface IP									
☒ Mobile Internet	☒ Interface IP									
User Accounts	? <table><thead><tr><th>Username</th><th>Password</th><th></th></tr></thead><tbody><tr><td>admin</td><td>.....</td><td>☒</td></tr><tr><td></td><td></td><td>☐</td></tr></tbody></table>	Username	Password		admin		☒			☐
Username	Password									
admin		☒								
		☐								

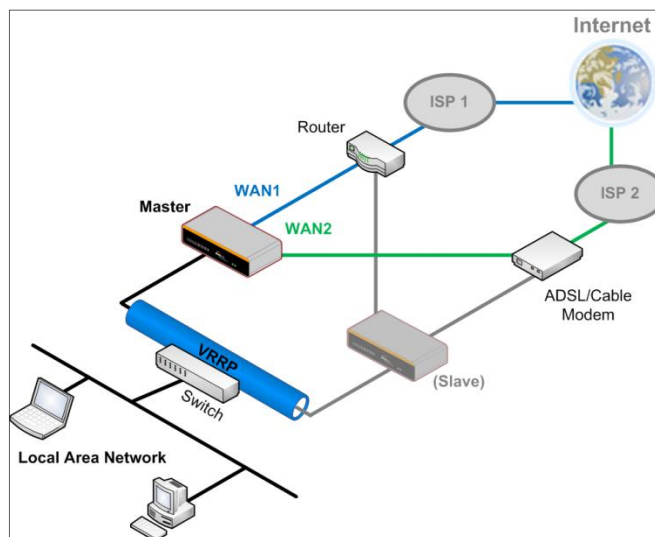
Remote User Access Settings	
Enable	Click the checkbox to enable Remote User Access.
VPN Type	Determine whether remote devices can connect to the Balance using L2TP with IPsec or PPTP. For greater security, we recommend you connect using L2TP with IPsec.
Preshared Key	Enter your preshared key in the text field. Please note that remote devices will need this preshared key to access the Balance.
Listen On	This setting is for specifying the WAN IP addresses where the PPTP server of the router should listen on.
User Accounts	This setting allows you to define the PPTP User Accounts. Click Add to input username and password to create an account. After adding the user accounts, you can click on a username to edit the account password. Click the button X to delete the account in its corresponding row. Click the  button to switch to enters user accounts by pasting the information in.CSV format.

Miscellaneous Settings

The miscellaneous settings include configuration for high availability, PPTP server, service forwarding, and service passthrough.

18.5 High Availability

Many Pepwave routers support high availability (HA) configurations via an open standard virtual router redundancy protocol (VRRP, RFC 3768). In an HA configuration, two Pepwave routers provide redundancy and failover in a master-slave arrangement. In the event that the master unit is down, the slave unit becomes active. High availability will be disabled automatically where there is a drop-in connection configured on a LAN bypass port.



In the diagram, the WAN ports of each Pepwave router connect to the router and to the modem. Both Pepwave routers connect to the same LAN switch via a LAN port.

An elaboration on the technical details of the implementation of the virtual router redundancy protocol (VRRP, RFC 3768) by Pepwave routers follows:

- In an HA configuration, the two Pepwave routers communicate with each other using VRRP over the LAN.
- The two Pepwave routers broadcast heartbeat signals to the LAN at a frequency of one heartbeat signal per second.
- In the event that no heartbeat signal from the master Pepwave router is received in 3 seconds (or longer) since the last heartbeat signal, the slave Pepwave router becomes active.
- The slave Pepwave router initiates the WAN connections and binds to a previously configured LAN IP address.
- At a subsequent point when the master Pepwave router recovers, it will once again become active.

Pepwave MAX and Surf User Manual

You can configure high availability at **Advanced>Misc. Settings>High Availability**.

Interface for Master Router

High Availability	
Enable	☒
Group Number	5
Preferred Role	☒ Master ☐ Slave
Resume Master Role Upon Recovery	☒
Virtual IP	
LAN Administration IP	192.168.1.1
Subnet Mask	255.255.255.0

Interface for Slave Router

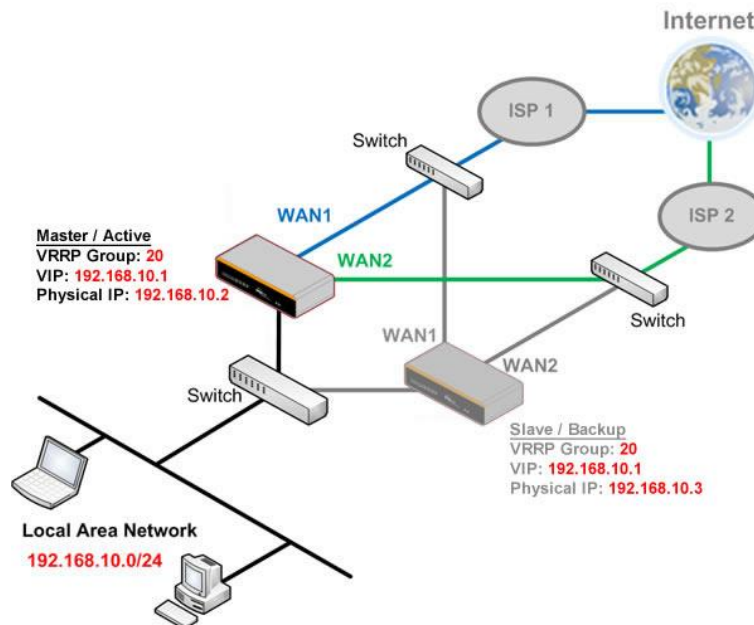
High Availability	
Enable	☒
Group Number	5
Preferred Role	☐ Master ☒ Slave
Configuration Sync.	☐ Master Serial Number: 54BF-5WEY-E37Q
Virtual IP	
LAN Administration IP	192.168.1.1
Subnet Mask	255.255.255.0

High Availability	
Enable	Checking this box specifies that the Pepwave router is part of a high availability configuration.
Group Number	This number identifies a pair of Pepwave routers operating in a high availability configuration. The two Pepwave routers in the pair must have the same Group Number value.
Preferred Role	This setting specifies whether the Pepwave router operates in master or slave mode. Click the corresponding radio button to set the role of the unit. One of the units in the pair must be configured as the master, and the other unit must be configured as the slave.
Resume Master Role Upon Recovery	This option is displayed when Master mode is selected in Preferred Role . If this option is enabled, once the device has recovered from an outage, it will take over and resume its Master role from the slave unit.
Configuration Sync.	This option is displayed when Slave mode is selected in Preferred Role . If this option is enabled and the Master Serial Number entered matches with the actual master unit's, the master unit will automatically transfer the configuration to this unit. Please make sure the LAN IP Address and the Subnet Mask fields are set correctly in the LAN settings page. You can refer to the Event Log for the configuration synchronization status.
Master Serial Number	If Configuration Sync. is checked, the serial number of the master unit is required here for the feature to work properly.
Virtual IP	The HA pair must share the same Virtual IP . The Virtual IP and the LAN Administration IP must be under the same network.
LAN Administration IP	This setting specifies a LAN IP address to be used for accessing administration functionality. This address should be unique within the LAN.
Subnet Mask	This setting specifies the subnet mask of the LAN.

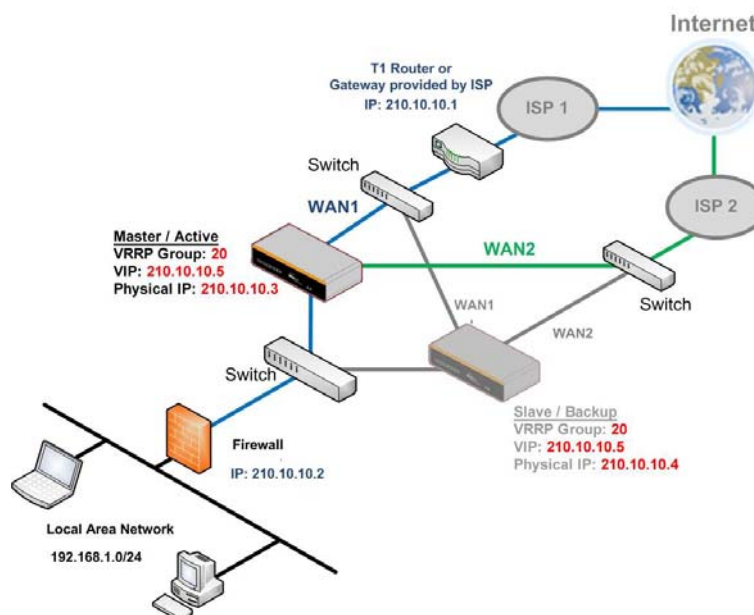
Pepwave MAX and Surf User Manual

Important Note

For Pepwave routers in NAT mode, the virtual IP (VIP) should be set as the default gateway for all hosts on the LAN segment. For example, a firewall sitting behind the Pepwave router should set its default gateway as the virtual IP instead of the IP of the master router.



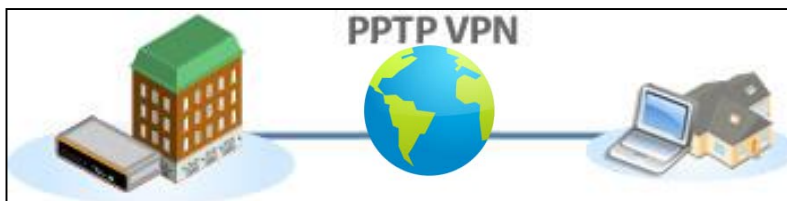
In drop-in mode, no other configuration needs to be set.



Please note that the drop-in WAN cannot be configured as a LAN bypass port while it is configured for high availability.

Pepwave MAX and Surf User Manual

18.6 PPTP Server



Pepwave routers feature a built-in PPTP server, which enables remote computers to conveniently and securely access the local network. PPTP server settings are located at **Advanced>Misc. Settings>PPTP Server**.

Check the box to enable PPTP server functionality. All connected PPTP sessions are displayed at **Status>Client List**. Please refer to **Section 21.3** for details. Note that available options vary by model.

PPTP Server		
Enable	☒	
Listen On	Connection / IP Address(es)	
	☒ WAN 1	☒ 10.88.3.158 (Interface IP)
	☒ WAN 2	☒ Interface IP
	☒ Wi-Fi WAN	☒ Interface IP
	☒ Cellular 1	☒ Interface IP
	☒ Cellular 2	☒ Interface IP
	☒ USB	☒ Interface IP
Authentication	? Local User Accounts ▼	
User Accounts	? Username	? Password
		+

Pepwave MAX and Surf User Manual

PPTP Server Settings	
Listen On	This setting is for specifying the WAN connection(s) and IP address(es) that the PPTP server should listen on.
Authentication	This setting is for specifying the user database source for PPTP authentication. Three sources can be selected: Local User Accounts, LDAP Server, or RADIUS Server. Local User Accounts - User accounts are stored in the Pepwave router locally. You can add/modify/delete accounts in the User Accounts table. LDAP Server - Authenticate with an external LDAP server. This has been tested with Open LDAP servers where passwords are NTLM hashed. Active Directory is not supported. (You can choose to use RADIUS to authenticate with a Windows server.) RADIUS Server - Authenticate with an external RADIUS server. This has been tested with Microsoft Windows Internet Authentication Service and FreeRADIUS servers where passwords are NTLM hashed or in plain text.
User Accounts	This setting allows you to define PPTP user accounts for authentication via local user accounts. Click Add to input username and password to create an account. After adding the user accounts, you can click on a username to edit the account password. Click  to delete the account in its corresponding row.

18.7 Certificate Manager

Certificate Manager			
VPN Certificate		No Certificate	Assign
Web Admin SSL Certificate		No Certificate	Assign
Captive Portal SSL Certificate		No Certificate	Assign

This section allows you to assign certificates for local VPN and web admin SSL. The local keys will not be transferred to another device by any means.

18.8 Service Forwarding

Service forwarding settings are located at **Advanced>Misc. Settings>Service Forwarding**.

SMTP Forwarding Setup		
SMTP Forwarding	☐ Enable	
Web Proxy Forwarding Setup		
Web Proxy Forwarding	☐ Enable	
DNS Forwarding Setup		
Forward Outgoing DNS Requests to Local DNS Proxy	☐ Enable	
Custom Service Forwarding Setup		
Custom Service Forwarding	☐ Enable	

Service Forwarding	
SMTP Forwarding	When this option is enabled, all outgoing SMTP connections destined for any host at TCP port 25 will be intercepted. These connections will be redirected to a specified SMTP server and port number. SMTP server settings for each WAN can be specified

Pepwave MAX and Surf User Manual

	after selecting Enable .
Web Proxy Forwarding	When this option is enabled, all outgoing connections destined for the proxy server specified in Web Proxy Interception Settings will be intercepted. These connections will be redirected to a specified web proxy server and port number. Web proxy interception settings and proxy server settings for each WAN can be specified after selecting Enable .
DNS Forwarding	When this option is enabled, all outgoing DNS lookups will be intercepted and redirected to the built-in DNS name server. If any LAN device is using the DNS name servers of a WAN connection, you may want to enable this option to enhance the DNS availability without modifying the DNS server setting of the clients. The built-in DNS name server will distribute DNS lookups to corresponding DNS servers of all available WAN connections. In this case, DNS service will not be interrupted, even if any WAN connection is down.
Custom Service Forwarding	When this option is enabled, incoming connections from specified ports will be intercepted and forwarded to a local server.

18.8.1 SMTP Forwarding

Some ISPs require their users to send e-mails via the ISP's SMTP server. All outgoing SMTP connections are blocked except those connecting to the ISP's. Pepwave routers support intercepting and redirecting all outgoing SMTP connections (destined for TCP port 25) via a WAN connection to the WAN's corresponding SMTP server.

SMTP Forwarding Setup			
SMTP Forwarding		☒ Enable	
Connection	Enable Forwarding?	SMTP Server	SMTP Port
WAN 1	☐		
WAN 2	☐		
Wi-Fi WAN	☐		
Cellular 1	☐		
Cellular 2	☐		
USB	☐		

To enable the feature, select **Enable** under **SMTP Forwarding Setup**. Check **Enable Forwarding** for the WAN connection(s) that needs forwarding. Under **SMTP Server**, enter the ISP's e-mail server host name or IP address. Under **SMTP Port**, enter the TCP port number for each WAN.

The Pepwave router will intercept SMTP connections. Choose a WAN port according to the outbound policy, and then forward the connection to the SMTP server if the chosen WAN has enabled forwarding. If the forwarding is disabled for a WAN connection, SMTP connections for the WAN will be simply be forwarded to the connection's original destination.

Note

If you want to route all SMTP connections only to particular WAN connection(s), you should create a custom rule in outbound policy (see **Section 14.2**).

Pepwave MAX and Surf User Manual

18.8.2 Web Proxy Forwarding

Web Proxy Forwarding Setup		
Web Proxy Forwarding	☒ Enable	
Web Proxy Interception Settings		
Proxy Server	IP Address Port (Current settings in users' browser)	
Connection	Enable Forwarding?	Proxy Server IP Address : Port
WAN 1	☐	:
WAN 2	☐	:
Wi-Fi WAN	☐	:
Cellular 1	☐	:
Cellular 2	☐	:
USB	☐	:

When this feature is enabled, the Pepwave router will intercept all outgoing connections destined for the proxy server specified in **Web Proxy Interception Settings**, choose a WAN connection with reference to the outbound policy, and then forward them to the specified web proxy server and port number. Redirected server settings for each WAN can be set here. If forwarding is disabled for a WAN, web proxy connections for the WAN will be simply forwarded to the connection's original destination.

18.8.3 DNS Forwarding

DNS Forwarding Setup	
Forward Outgoing DNS Requests to Local DNS Proxy	☐ Enable

When DNS forwarding is enabled, all clients' outgoing DNS requests will also be intercepted and forwarded to the built-in DNS proxy server.

18.8.4 Custom Service Forwarding

Custom Service Forwarding Setup			
Custom Service Forwarding	☒ Enable		
Settings	TCP Port	Server IP Address	Server Port
			+

After clicking the **enable** checkbox, enter your TCP port for traffic heading to the router, and then specify the IP Address and Port of the server you wish to forward to the service to.

Pepwave MAX and Surf User Manual

18.9 Service Passthrough

Service passthrough settings can be found at **Advanced>Misc. Settings>Service Passthrough**.

The screenshot shows the 'Service Passthrough Support' configuration page. It features a table with settings for various protocols:

Service Passthrough Support	
SIP	☒ Standard Mode ☐ Compatibility Mode ☒ Define custom signal ports 1. 2. 3.
H.323	☒ Enable
FTP	☒ Enable ☒ Define custom control ports 1. 2. 3.
TFTP	☒ Enable
IPsec NAT-T	☒ Enable ☒ Define custom ports 1. 2. 3. ☒ Route IPsec Site-to-Site VPN via WAN 1

(Registered trademarks are copyrighted by their respective owner)

Some Internet services need to be specially handled in a multi-WAN environment. Pepwave routers can handle these services such that Internet applications do not notice being behind a multi-WAN router. Settings for service passthrough support are available here.

Service Passthrough Support	
SIP	Session initiation protocol, aka SIP, is a voice-over-IP protocol. The Pepwave router can act as a SIP application layer gateway (ALG) which binds connections for the same SIP session to the same WAN connection and translate IP address in the SIP packets correctly in NAT mode. Such passthrough support is always enabled, and there are two modes for selection: Standard Mode and Compatibility Mode . If your SIP server's signal port number is non-standard, you can check the box Define custom signal ports and input the port numbers to the text boxes.
H.323	With this option enabled, protocols that provide audio-visual communication sessions will be defined on any packet network and pass through the Pepwave router.
FTP	FTP sessions consist of two TCP connections; one for control and one for data. In a multi-WAN situation, they must be routed to the same WAN connection. Otherwise, problems will arise in transferring files. By default, the Pepwave router monitors TCP control connections on port 21 for any FTP connections and binds TCP connections of the same FTP session to the same WAN. If you have an FTP server listening on a port number other than 21, you can check Define custom control ports and enter the port numbers in the text boxes.
TFTP	The Pepwave router monitors outgoing TFTP connections and routes any incoming TFTP data packets back to the client. Select Enable if you want to enable TFTP passthrough support.
IPsec NAT-T	This field is for enabling the support of IPsec NAT-T passthrough. UDP ports 500, 4500, and 10000 are monitored by default. You may add more custom data ports that your IPsec system uses by checking Define custom ports . If the VPN contains IPsec site-to-

Pepwave MAX and Surf User Manual

site VPN traffic, check **Route IPsec Site-to-Site VPN** and choose the WAN connection to route the traffic to.

18.10 GPS Forwarding

Using the GPS forwarding feature, some Pepwave routers can automatically send GPS reports to a specified server. To set up GPS forwarding, navigate to **Advanced>GPS Forwarding**.

GPS Forwarding				
Enable	☒			
Server	Server IP Address / Host Name	Port	Protocol	Report Interval
			UDP	1 second(s) 
GPS Report Format	☒ NMEA ☐ TAIP			
NMEA Sentence Type	☒ GPRMC ☐ GPGGA ☐ GPVTG ☐ GPGSA ☐ GPGSV			

GPS Forwarding	
Enable	Check this box to turn on GPS forwarding.
Server	Enter the name/IP address of the server that will receive GPS data. Also specify a port number, protocol (UDP or TCP), and a report interval of between 1 and 10 seconds. Click  to save these settings.
GPS Report Format	Choose from NMEA or TAIP format for sending GPS reports.
NMEA Sentence Type	If you've chosen to send GPS reports in NMEA format, select one or more sentence types for sending the data (GPRMC , GPGGA , GPVTG , GPGSA , and GPGSV).
TAIP Sentence Type/TAIP ID (optional)	If you've chosen to send GPS reports in TAIP format, select one or more sentence types for sending the data (PV—Position / Velocity Solution and CP—Compact Velocity Solution). You can also optionally include an ID number in the TAIP ID field.

Pepwave MAX and Surf User Manual

19 AP Controller

The AP controller acts as a centralized controller of Pepwave AP devices. With this feature, users can customize and manage multiple APs from a single Pepwave router interface.

Special Note

Each Pepwave router can control a limited number of routers without additional cost. To manage more, a Full Edition license is required. Please contact your Authorized Reseller or the Peplink Sales Team for more information and pricing details.

To configure, navigate to the **AP** tab.

19.1 Wireless SSID

This menu is the first one that appears after clicking the **AP** tab. This screen can also be reached by clicking **AP>Wireless SSID**. Note the appearance of this screen varies by model.

AP Controller

AP Management ? ☒ Integrated AP ☒ External AP

Permitted AP ? ☐ Any ☒ Approved List

(One serial number per line)

AP Controller

AP Management

The AP controller for managing Pepwave APs can be enabled by checking this box. When this option is enabled, the AP controller will wait for management connections originating from APs over the LAN on TCP and UDP port 11753. It will also wait for captive portal connections on TCP port 443. An extended DHCP option, **CAPWAP Access Controller addresses** (field 138), will be added to the DHCP server. A local DNS record, **AP Controller**, will be added to the local DNS proxy.

Permitted AP

Access points to manage can be specified here. If **Any** is selected, the AP controller will manage any AP that reports to it. If **Approved List** is selected, only APs with serial numbers listed in the provided text box will be managed.

SSID	Security Policy
PEPWAVE_8D1C	WPA/WPA2 - Personal

New SSID

Pepwave MAX and Surf User Manual

Current SSID information appears in the **SSID** section. To edit an existing SSID, click its name in the list. To add a new SSID, click **Add**. Note that the following settings vary by model.

SSID

SSID Settings

SSID	PEPWAVE_8D1C
VLAN ID	LAN (No VLAN) ▾
Broadcast SSID	☒
Data Rate	☒ Auto ☐ Fixed
Multicast Filter	☐
Multicast Rate	MCS8/MCS0/6M ▾
IGMP Snooping	☐
Layer 2 Isolation	☐
Band Steering	Disable ▾

Security Settings

Security Policy	Open (No Encryption) ▾
-----------------	------------------------

Access Control

Restricted Mode	None ▾
-----------------	--------

Save Cancel

SSID Settings	
SSID	This setting specifies the SSID of the virtual AP to be scanned by Wi-Fi clients.
Enable	Select Yes to enable the virtual AP.
VLAN ID	This setting specifies the VLAN ID to be tagged on all outgoing packets generated from this wireless network (i.e., packets that travel from the Wi-Fi segment through the Pepwave AP One unit to the Ethernet segment via the LAN port). The default value of this setting is 0 , which means VLAN tagging is disabled (instead of tagged with zero).
Broadcast SSID	This setting specifies whether or not Wi-Fi clients can scan the SSID of this wireless network. Broadcast SSID is enabled by default.
Data Rate ^A	Select Auto to allow the Pepwave router to set the data rate automatically, or select Fixed and choose a rate from the displayed drop-down menu.
Multicast Filter ^A	This setting enables the filtering of multicast network traffic to the wireless SSID.
Multicast Rate ^A	This setting specifies the transmit rate to be used for sending multicast network traffic. The selected Protocol and Channel Bonding settings will affect the rate

Pepwave MAX and Surf User Manual

	options and values available here.
IGMP Snooping ^A	To allow the Pepwave router to listen to internet group management protocol (IGMP) network traffic, select this option.
DHCP Option 82 ^A	If you use a distributed DHCP server/relay environment, you can enable this option to provide additional information on the manner in which clients are physically connected to the network.
Network Priority (QoS) ^A	Select from Gold , Silver , and Bronze to control the QoS priority of this wireless network's traffic.
Layer 2 Isolation ^A	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 isolated to that VLAN, SSID, or subnet, which can enhance security. Traffic is passed to upper communication layer(s). By default, the setting is disabled.
Band Steering ^A	Band steering allows the Pepwave router to steer AP clients from the 2.4GHz band to the 5GHz band for better usage of bandwidth. To make steering mandatory, select Enforce . To cause the Pepwave router to preferentially choose steering, select Prefer . The default for this setting is Disable .

^A - Advanced feature. Click the  button on the top right-hand corner to activate.

Security Settings	
Security Policy	WPA2 - Personal ▼
Encryption	AES:CCMP
Shared Key	 ☒ Hide Characters

Security Settings	
Security Policy	This setting configures the wireless authentication and encryption methods. Available options are Open (No Encryption) , WPA/WPA2 - Personal , WPA/WPA2 - Enterprise and Static WEP .

Access Control	
Restricted Mode	Deny all except listed ▼
MAC Address List	

Access Control	
Restricted Mode	The settings allow administrator to control access using MAC address filtering. Available options are None, Deny all except listed, Accept all except listed, and RADIUS MAC Authentication. When WPA/WPA2 - Enterprise is configured, RADIUS-based 802.1 x authentication is enabled. Under this configuration, the Shared Key option should be disabled. When using this method, select the appropriate version using the V1/V2 controls. The security level of this method is known to be very high.

Pepwave MAX and Surf User Manual

When **WPA/WPA2- Personal** is configured, a shared key is used for data encryption and authentication. When using this configuration, the **Shared Key** option should be enabled. Key length must be between eight and 63 characters (inclusive). The security level of this method is known to be high.

The configuration of **Static WEP** parameters enables pre-shared WEP key encryption. Authentication is not supported by this method. The security level of this method is known to be weak.

MAC Address List Connection coming from the MAC addresses in this list will be either denied or accepted based the option selected in the previous field.

RADIUS Server Settings	Primary Server	Secondary Server
Host		
Secret		
Authentication Port	1812 Default	1812 Default
Accounting Port	1813 Default	1813 Default

RADIUS Server Settings	
Host	Enter the IP address of the primary RADIUS server and, if applicable, the secondary RADIUS server.
Secret	Enter the RADIUS shared secret for the primary server and, if applicable, the secondary RADIUS server.
Authentication Port	In field, enter the UDP authentication port(s) used by your RADIUS server(s) or click the Default button to enter 1812 .
Accounting Port	In field, enter the UDP accounting port(s) used by your RADIUS server(s) or click the Default button to enter 1813 .

Pepwave MAX and Surf User Manual

19.2 Settings

On many Pepwave models, the AP settings screen (**AP>Settings**) looks similar to the example below:

AP Settings	
SSID	2.4 GHz 5 GHz Integrated AP supports 2.4 GHz only. PEPWAVE_8D1C
Operating Country	United States
Preferred Frequency	2.4 GHz 5 GHz Integrated AP supports 2.4 GHz only.
5 GHz Protocol	802.11n/ac
5 GHz Channel Bonding	Auto
5 GHz Channel	Auto Edit Channels: 36 40 44 48 ...
2.4 GHz Protocol	802.11ng
2.4 GHz Channel Bonding	20 MHz
2.4 GHz Channel	1 (2.412 GHz)
Management VLAN ID	LAN (No VLAN)
Power Boost	☐
Output Power	Max
Beacon Rate	1Mbps Default
Beacon Interval	100ms
DTIM	1 Default
Slot Time	9 μ s Default
ACK Timeout	48 μ s Default
Frame Aggregation	☒

AP Settings	
SSID	These buttons specify which wireless networks will use this AP profile. You can also select the frequencies at which each network will transmit. Please note that the Pepwave router does not detect whether the AP is capable of transmitting at both frequencies. Instructions to transmit at unsupported frequencies will be ignored by the AP.
Operating Country	This drop-down menu specifies the national/regional regulations which the AP should follow. - 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). 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 US. All US models are fixed to US channels only.
Preferred Frequency	These buttons determine the frequency at which access points will attempt to broadcast. This feature will only work for APs that can transmit at both 2.4GHz and 5GHz frequencies.
5 GHz Protocol	This section displays the 5 GHz protocols your APs are using.
5GHz Channel Bonding	There are three options: 20 MHz , 20/40 MHz , and 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.

Pepwave MAX and Surf User Manual

5 GHz Channel	This drop-down menu selects the 5 GHz 802.11 channel to be utilized. If Auto is set, the system will perform channel scanning based on the scheduled time set and choose the most suitable channel automatically.
2.4 GHz Protocol	This section displays the 2.4GHz protocols your APs are using.
2.4 GHz Channel Bonding	There are three options: 20 MHz , 20/40 MHz , and 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.
2.4 GHz Channel	This drop-down menu selects the 802.11 channel to be utilized. Available options are from 1 to 11 and from 1 to 13 for the North America region and Europe region, respectively. (Channel 14 is only available when the country is selected as Japan with protocol 802.11b.) If Auto is set, the system will perform channel scanning based on the scheduled time set and choose the most suitable channel automatically.
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.
Power Boost^A	With this option enabled, the AP under this profile will transmit using additional power. Please note that using this option with several APs in close proximity will lead to increased interference.
Output Power^A	This drop-down menu determines the power at which the AP under this profile will broadcast. When fixed settings are selected, the AP will broadcast at the specified power level, regardless of context. When Dynamic settings are selected, the AP will adjust its power level based on its surrounding APs in order to maximize performance. The Dynamic: Auto setting will set the AP to do this automatically. Otherwise, the Dynamic: Manual setting will set the AP to dynamically adjust only if instructed to do so. If you have set Dynamic: Manual, you can go to AP>Toolbox>Auto Power Adj. to give your AP further instructions.
Beacon Rate^A	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 .
Beacon Interval^A	This drop-down menu provides the option to set the time between each beacon send. Available options are 100ms , 250ms , and 500ms .
DTIM^A	This field provides the option to set the frequency for beacon to include delivery traffic indication messages (DTIM). The interval unit is measured in milliseconds.
Slot Time^A	This field provides the option to modify the unit wait time before it transmits. The default value is 9µs .
ACK Timeout^A	This field provides the option to set the wait time to receive acknowledgement packet before doing retransmission. The default value is 48µs .
Frame Aggregation^A	With this feature enabled, throughput will be increased by sending two or more data frames in a single transmission.

^A - Advanced feature. Click the  button on the top right-hand corner to activate.

Pepwave MAX and Surf User Manual

Web Administration Settings (on External AP)	
Enable	☒
Web Access Protocol	☐ HTTP ☒ HTTPS
Management Port	443
HTTP to HTTPS Redirection	☒
Admin Username	admin
Admin Password	25db591396e0 Generate

Web Administration Settings	
Enable	Check the box to allow the Pepwave router to manage the web admin access information of the AP.
Web Access Protocol	These buttons specify the web access protocol used for accessing the web admin of the AP. The two available options are HTTP and HTTPS .
Management Port	This field specifies the management port used for accessing the device.
HTTP to HTTPS Redirection	This option will be available if you have chosen HTTPS as the Web Access Protocol . With this enabled, any HTTP access to the web admin will redirect to HTTPS automatically.
Admin User Name	This field specifies the administrator username of the web admin. It is set as <i>admin</i> by default.
Admin Password	This field allows you to specify a new administrator password. You may also click the Generate button and let the system generate a random password automatically.

Pepwave MAX and Surf User Manual

Navigating to **AP>Settings** on some Pepwave models displays a screen similar to the one shown below:

 InControl management enabled. Settings can now be configured on [InControl](#).

Wi-Fi Radio Settings	
Operating Country	United States ▼
Wi-Fi Antenna	☐ Internal ☒ External

Wi-Fi AP Settings ?	
Protocol	802.11ng ▼
Channel	1 (2.412 GHz) ▼
Channel Width	Auto ▼
Output Power	Max ▼ ☐ Boost
Beacon Rate ?	1Mbps ▼
Beacon Interval ?	100ms ▼
DTIM ?	1
Slot Time ?	9 μs
ACK Timeout ?	48 μs
Frame Aggregation	☒ Enable
Guard Interval	☐ Short ☐ Long

Wi-Fi Radio Settings

Operating Country

This option sets the country whose regulations the Pepwave router follows.

Wi-Fi Antenna

Choose from the router's internal or optional external antennas, if so equipped.

Important Note

Per FCC regulations, the country selection is not available on all models marketed in the US. All US models are fixed to US channels only.

Wi-Fi AP Settings

Protocol

This option allows you to specify whether 802.11b and/or 802.11g client association requests will be accepted. Available options are **802.11ng** and **802.11na**. By default, **802.11ng** is selected.

Channel

This option allows you to select which 802.11 RF channel will be used. **Channel 1 (2.412 GHz)** is selected by default.

Channel Width

Auto (20/40 MHz) and **20 MHz** are available. The default setting is **Auto (20/40 MHz)**, which allows both widths to be used simultaneously.

Output Power

This option is for specifying the transmission output power for the Wi-Fi AP. There are 4 relative power levels available – **Max**, **High**, **Mid**, and **Low**. The actual output power will be bound by the regulatory limits of the selected country.

Beacon Rate^A

This option is for setting the transmit bit rate for sending a beacon. By default, **1Mbps** is

Pepwave MAX and Surf User Manual

selected.

Beacon Interval^A

This option is for setting the time interval between each beacon. By default, **100ms** is selected.

DTIM^A

This field allows you to set the frequency for the beacon to include a delivery traffic indication message. The interval is measured in milliseconds. The default value is set to **1 ms**.

Slot Time^A

This field is for specifying the wait time before the Surf SOHO transmits a packet. By default, this field is set to **9 µs**.

ACK Timeout^A

This field is for setting the wait time to receive an acknowledgement packet before performing a retransmission. By default, this field is set to **48 µs**.

Frame Aggregation^A

This option allows you to enable frame aggregation to increase transmission throughput.

Guard Interval^A

This setting allows choosing a short or long guard period interval for your transmissions.

^A - Advanced feature, please click the  button on the top right-hand corner to activate.

19.3 Toolbox

Tools for managing firmware packs can be found at **AP>Toolbox**.



Firmware Packs

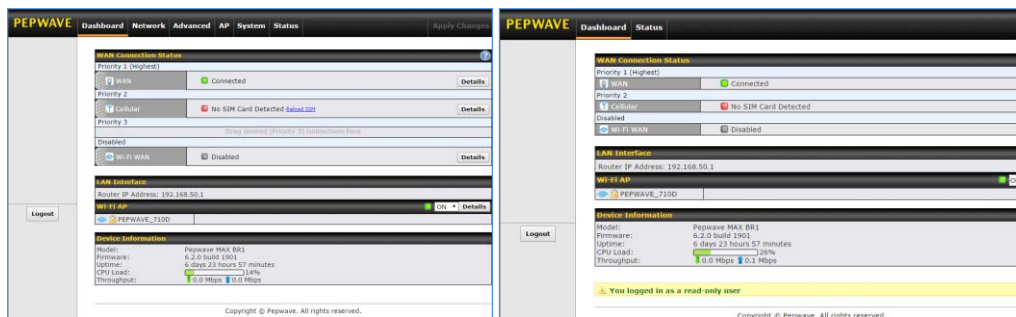
Here, you can manage the firmware of your AP. Clicking on  will result in information regarding each firmware pack. To receive new firmware packs, you can click **Check for Updates** to download new packs, or you can click **Manual Upload** to manually upload a firmware pack. Click **Default** to define which firmware pack is default.

Pepwave MAX and Surf User Manual

20 System Settings

20.1 Admin Security

There are two types of user accounts available for accessing the web admin: *admin* and *user*. They represent two user levels: the admin level has full administration access, while the user level is read-only. The user level can access only the device's status information; users cannot make any changes on the device.



Admin account UI

User account UI

A web login session will be logged out automatically when it has been idle longer than the **Web Session Timeout**. Before the session expires, you may click the **Logout** button in the web admin to exit the session.

0 hours 0 minutes signifies an unlimited session time. This setting should be used only in special situations, as it will lower the system security level if users do not log out before closing the browser. The **default** is 4 hours, 0 minutes.

For security reasons, after logging in to the web admin Interface for the first time, it is recommended to change the administrator password. Configuring the administration interface to be accessible only from the LAN can further improve system security. Administrative settings configuration is located at **System>Admin Security**.

Pepwave MAX and Surf User Manual

Admin Settings		?
Router Name	MAX_BR1_710D	hostname: max-br1-710d
Admin User Name	admin	
Admin Password	••••••••	
Confirm Admin Password	••••••••	
Read-only User Name	user	
User Password		
Confirm User Password		
Web Session Timeout	4 Hours 0 Minutes	
Authentication by RADIUS	☒ Enable	
Auth Protocol	MS-CHAP v2	
Auth Server		Port Default
Auth Server Secret		☒ Hide Characters
Auth Timeout	3 seconds	
Accounting Server		Port Default
Accounting Server Secret		☒ Hide Characters
CLI SSH	☒ Enable	
CLI SSH Port	8822	Default
CLI SSH Access	LAN/WAN	
Security	HTTP	
Web Admin Port	80	Default
Web Admin Access	LAN Only	

Admin Settings	
Router Name	This field allows you to define a name for this Pepwave router. By default, Router Name is set as MAX_XXXX or Surf_SOHO_XXXX , where XXXX refers to the last 4 digits of the unit's serial number.
Admin User Name	Admin User Name is set as <i>admin</i> by default, but can be changed, if desired.
Admin Password	This field allows you to specify a new administrator password.
Confirm Admin Password	This field allows you to verify and confirm the new administrator password.
Read-only User Name	Read-only User Name is set as <i>user</i> by default, but can be changed, if desired.
User Password	This field allows you to specify a new user password. Once the user password is set, the read-only user feature will be enabled.
Confirm User Password	This field allows you to verify and confirm the new user password.
Web Session Timeout	This field specifies the number of hours and minutes that a web session can remain idle before the Pepwave router terminates its access to the web admin interface. By default, it is set to 4 hours .

Pepwave MAX and Surf User Manual

Authentication by RADIUS	With this box is checked, the web admin will authenticate using an external RADIUS server. Authenticated users are treated as either "admin" with full read-write permission or "user" with read-only access. Local admin and user accounts will be disabled. When the device is not able to communicate with the external RADIUS server, local accounts will be enabled again for emergency access. Additional authentication options will be available once this box is checked.
Auth Protocol	This specifies the authentication protocol used. Available options are MS-CHAP v2 and PAP .
Auth Server	This specifies the access address and port of the external RADIUS server.
Auth Server Secret	This field is for entering the secret key for accessing the RADIUS server.
Auth Timeout	This option specifies the time value for authentication timeout.
Accounting Server	This specifies the access address and port of the external accounting server.
Accounting Server Secret	This field is for entering the secret key for accessing the accounting server.
Network Connection	This option is for specifying the network connection to be used for authentication. Users can choose from LAN, WAN, and VPN connections.
CLI SSH	The CLI (command line interface) can be accessed via SSH. This field enables CLI support. For additional information regarding CLI, please refer to Section 20.14 .
CLI SSH Port	This field determines the port on which clients can access CLI SSH.
CLI SSH Access	This menu allows you to choose between granting access to LAN and WAN clients, or to LAN clients only.
Security	This option is for specifying the protocol(s) through which the web admin interface can be accessed: • HTTP • HTTPS • HTTP/HTTPS
Web Admin Port	This field is for specifying the port number on which the web admin interface can be accessed.
Web Admin Access	This option is for specifying the network interfaces through which the web admin interface can be accessed: • LAN only • LAN/WAN If LAN/WAN is chosen, the WAN Connection Access Settings form will be displayed.

Pepwave MAX and Surf User Manual

WAN Connection Access Settings																													
Allowed Source IP Subnets	☐ Any ☒ Allow access from the following IP subnets only 																												
Allowed WAN IP Address(es)	<table border="1"><thead><tr><th colspan="2">Connection / IP Address(es)</th><th>All</th><th>Clear</th></tr></thead><tbody><tr><td>☒ WAN 1</td><td>☒ 10.88.3.158 (Interface IP)</td><td></td><td></td></tr><tr><td>☐ WAN 2</td><td></td><td></td><td></td></tr><tr><td>☐ Wi-Fi WAN</td><td></td><td></td><td></td></tr><tr><td>☐ Cellular 1</td><td></td><td></td><td></td></tr><tr><td>☐ Cellular 2</td><td></td><td></td><td></td></tr><tr><td>☐ USB</td><td></td><td></td><td></td></tr></tbody></table>	Connection / IP Address(es)		All	Clear	☒ WAN 1	☒ 10.88.3.158 (Interface IP)			☐ WAN 2				☐ Wi-Fi WAN				☐ Cellular 1				☐ Cellular 2				☐ USB			
	Connection / IP Address(es)		All	Clear																									
	☒ WAN 1	☒ 10.88.3.158 (Interface IP)																											
	☐ WAN 2																												
	☐ Wi-Fi WAN																												
	☐ Cellular 1																												
	☐ Cellular 2																												
☐ USB																													

WAN Connection Access Settings

Allowed Source IP Subnets

This field allows you to restrict web admin access only from defined IP subnets.

- **Any** - Allow web admin accesses to be from anywhere, without IP address restriction.
- **Allow access from the following IP subnets only** - Restrict web admin access only from the defined IP subnets. When this is chosen, a text input area will be displayed beneath:

The allowed IP subnet addresses should be entered into this text area. Each IP subnet must be in form of *w.x.y.z/m*, where *w.x.y.z* is an IP address (e.g., *192.168.0.0*), and *m* is the subnet mask in CIDR format, which is between 0 and 32 inclusively (For example, *192.168.0.0/24*).

To define multiple subnets, separate each IP subnet one in a line. For example:

- 192.168.0.0/24
- 10.8.0.0/16

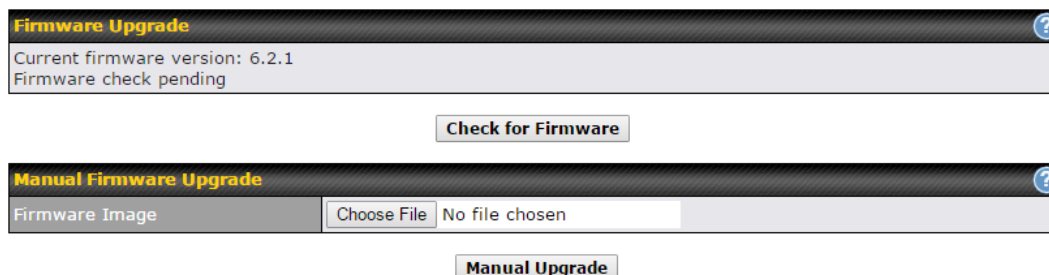
Allowed WAN IP Address(es)

This is to choose which WAN IP address(es) the web server should listen on.

Pepwave MAX and Surf User Manual

20.2 Firmware

Pepwave router firmware is upgradeable through the web admin interface. Firmware upgrade functionality is located at **System>Firmware**.



Firmware Upgrade ?

Current firmware version: 6.2.1
Firmware check pending

Check for Firmware

Manual Firmware Upgrade ?

Firmware Image Choose File No file chosen

Manual Upgrade

There are two ways to upgrade the unit. The first method is through an online download. The second method is to upload a firmware file manually.

To perform an online download, click on the **Check for Firmware** button. The Pepwave router will check online for new firmware. If new firmware is available, the Pepwave router will automatically download the firmware. The rest of the upgrade process will be automatically initiated.

You may also download a firmware image from the Peplink website and update the unit manually. To update using a firmware image, click **Choose File** to select the firmware file from the local computer, and then click **Manual Upgrade** to send the firmware to the Pepwave router. It will then automatically initiate the firmware upgrade process.

Please note that all Peplink devices can store two different firmware versions in two different partitions. A firmware upgrade will always replace the inactive partition. If you want to keep the inactive firmware, you can simply reboot your device with the inactive firmware and then perform the firmware upgrade.

Important Note

The firmware upgrade process may not necessarily preserve the previous configuration, and the behavior varies on a case-by-case basis. Consult the release notes for the particular firmware version before installing. Do not disconnect the power during firmware upgrade process. Do not attempt to upload a non-firmware file or a firmware file that is not supported by Peplink. Upgrading the Pepwave router with an invalid firmware file will damage the unit and may void the warranty.

Important Note

If the firmware is rolled back from 5.x to 4.x, the configurations will be lost.

Pepwave MAX and Surf User Manual

20.3 Time

Time Settings enables the system clock of the Pepwave router to be synchronized with a specified time server. Time settings are located at **System>Time**.

Time Settings	
Time Zone	(GMT+07:00) Krasnoyarsk ☐ Show all
Time Server	0.peplink.pool.ntp.org Default

Save

Time Settings	
Time Zone	This specifies the time zone (along with the corresponding Daylight Savings Time scheme). The Time Zone value affects the time stamps in the Pepwave router's event log and e-mail notifications. Check Show all to show all time zone options.
Time Server	This setting specifies the NTP network time server to be utilized by the Pepwave router.

20.4 Email Notification

Email notification functionality provides a system administrator with up-to-date information on network status. The settings for configuring email notifications are found at **System>Email Notification**.

Email Notification Setup	
Email Notification	☒ Enable
SMTP Server	smtp.mycompany.com ☒ Require authentication
SSL Encryption	☒ (Note: any server certificate will be accepted)
SMTP Port	465 Default
SMTP User Name	smtpuser
SMTP Password	•••••
Confirm SMTP Password	•••••
Sender's Email Address	admin@mycompany.com
Recipient's Email Address	system@mycompany.com staff@mycompany.com

Test Email Notification Save

Email Notification Settings	
Email Notification	This setting specifies whether or not to enable email notification. If Enable is checked, the Pepwave router will send email messages to system administrators when the WAN status changes or when new firmware is available. If Enable is not checked, email notification is disabled and the Pepwave router will not send email messages.

Pepwave MAX and Surf User Manual

SMTP Server	This setting specifies the SMTP server to be used for sending email. If the server requires authentication, check Require authentication .
SSL Encryption	Check the box to enable SMTPS. When the box is checked, SMTP Port will be changed to 465 automatically.
SMTP Port	This field is for specifying the SMTP port number. By default, this is set to 25 ; when SSL Encryption is checked, the default port number will be set to 465 . You may customize the port number by editing this field. Click Default to restore the number to its default setting.
SMTP User Name / Password	This setting specifies the SMTP username and password while sending email. These options are shown only if Require authentication is checked in the SMTP Server setting.
Confirm SMTP Password	This field allows you to verify and confirm the new administrator password.
Sender's Email Address	This setting specifies the email address the Pepwave router will use to send reports.
Recipient's Email Address	This setting specifies the email address(es) to which the Pepwave router will send email notifications. For multiple recipients, separate each email addresses using the enter key.

After you have finished setting up email notifications, you can click the **Test Email Notification** button to test the settings before saving. After **Test Email Notification** is clicked, you will see this screen to confirm the settings:

Test Email Notification	
SMTP Server	smtp.mycompany.com
SMTP Port	465
SMTP UserName	smtpuser
Sender's Email Address	admin@mycompany.com
Recipient's Email Address	system@mycompany.com staff@mycompany.com

Click **Send Test Notification** to confirm. In a few seconds, you will see a message with detailed test results.

Test email sent. Email notification settings are not saved, it will be saved after clicked the 'Save' button.

Pepwave MAX and Surf User Manual

Test Result

```
[INFO] Try email through connection #3
[<-] 220 ESMTP
[->] EHLO balance
[<-] 250-smtp Hello balance [210.210.210.210]
250-SIZE 100000000
250-8BITMIME
250-PIPELINING
250-AUTH PLAIN LOGIN
250-STARTTLS
```

20.5 Event Log

Event log functionality enables event logging at a specified remote syslog server. The settings for configuring the remote system log can be found at **System>Event Log**.

Send Events to Remote Syslog Server	
Remote Syslog	☒
Remote Syslog Host	

Push Events to Mobile Devices	
Push Events	☒

Event Log Settings

Remote Syslog This setting specifies whether or not to log events at the specified remote syslog server.

Remote Syslog Host This setting specifies the IP address or hostname of the remote syslog server.

The Pepwave router can also send push notifications to mobile devices that have our Mobile Router Utility installed. Check the box to activate this feature.

Push Events



For more information on the Router Utility, go to:
www.peplink.com/products/router-utility

Pepwave MAX and Surf User Manual

20.6 SNMP

SNMP or simple network management protocol is an open standard that can be used to collect information about the Pepwave router. SNMP configuration is located at **System>SNMP**.

SNMP Settings	
SNMP Device Name	MAX_HD2_8D1C
SNMP Port	161 Default
SNMPv1	☐ Enable
SNMPv2c	☐ Enable
SNMPv3	☐ Enable
Save	

Community Name	Allowed Source Network	Access Mode
No SNMPv1 / SNMPv2c Communities Defined		
Add SNMP Community		

SNMPv3 User Name	Authentication / Privacy	Access Mode
No SNMPv3 Users Defined		
Add SNMP User		

SNMP Settings	
SNMP Device Name	This field shows the router name defined at System>Admin Security .
SNMP Port	This option specifies the port which SNMP will use. The default port is 161 .
SNMPv1	This option allows you to enable SNMP version 1.
SNMPv2	This option allows you to enable SNMP version 2.
SNMPv3	This option allows you to enable SNMP version 3.

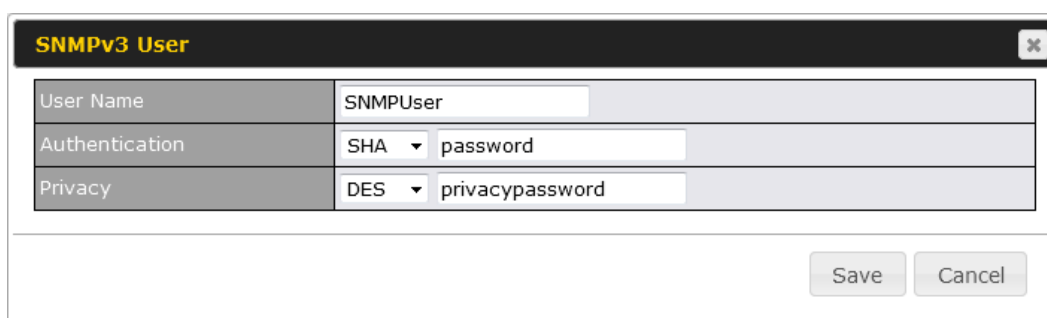
To add a community for either SNMPv1 or SNMPv2, click the **Add SNMP Community** button in the **Community Name** table, upon which the following screen is displayed:

SNMP Community	
Community Name	My Company
Allowed Network	192.168.1.25 / 255.255.255.0 (/24) ▼
Save Cancel	

Pepwave MAX and Surf User Manual

SNMP Community Settings	
Community Name	This setting specifies the SNMP community name.
Allowed Source Subnet Address	This setting specifies a subnet from which access to the SNMP server is allowed. Enter subnet address here (e.g., 192.168.1.0) and select the appropriate subnet mask.

To define a user name for SNMPv3, click **Add SNMP User** in the **SNMPv3 User Name**



The image shows a dialog box titled "SNMPv3 User" with a close button (X) in the top right corner. It contains three rows of configuration fields:

User Name	SNMPUser
Authentication	SHA password
Privacy	DES privacypassword

At the bottom right of the dialog are two buttons: "Save" and "Cancel".

table, upon which the following screen is displayed:

SNMPv3 User Settings	
User Name	This setting specifies a user name to be used in SNMPv3.
Authentication Protocol	This setting specifies via a drop-down menu one of the following valid authentication protocols: • NONE • MD5 • SHA When MD5 or SHA is selected, an entry field will appear for the password.
Privacy Protocol	This setting specifies via a drop-down menu one of the following valid privacy protocols: • NONE • DES When DES is selected, an entry field will appear for the password.

Pepwave MAX and Surf User Manual

20.7 InControl

InControl Management	
InControl Management	☒ Allow InControl Management
Privately Host InControl	☒
InControl Host	

InControl is a cloud-based service which allows you to manage all of your Peplink and Pepwave devices with one unified system. With it, you can generate reports, gather statistics, and configure your devices automatically. All of this is now possible with InControl.

When this check box is checked, the device's status information will be sent to the Peplink InControl system. This device's usage data and configuration will be sent to the system if you enable the features in the system.

Alternately, you could also privately host InControl. Simply check the box beside the "Privately Host InControl" open, and enter the IP Address of your InControl Host.

You can sign up for an InControl account at <https://incontrol2.peplink.com/>. You can register your devices under the account, monitor their status, see their usage reports, and receive offline notifications.

Pepwave MAX and Surf User Manual

20.8 Configuration

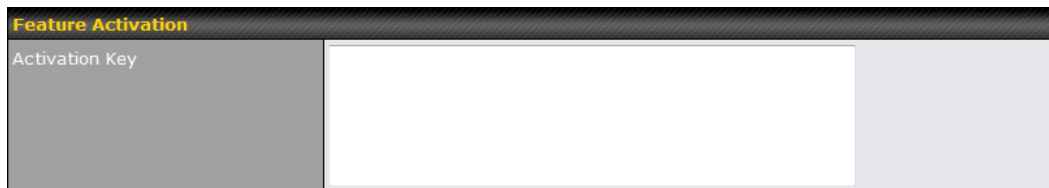
Backing up Pepwave router settings immediately after successful completion of initial setup is strongly recommended. The functionality to download and upload Pepwave router settings is found at **System>Configuration**. Note that available options vary by model.

The image displays four sequential screenshots of the 'Configuration' section in the Pepwave web interface. Each screenshot has a dark header bar with a title and a help icon (question mark).
1. **Restore Configuration to Factory Settings**: Shows a single button labeled 'Restore Factory Settings'.
2. **Download Active Configurations**: Shows a single button labeled 'Download'.
3. **Upload Configurations**: Shows a 'Configuration File' label, a 'Browse...' button, the text 'No file selected.', and an 'Upload' button.
4. **Upload Configurations from High Availability Pair**: Shows a 'Configuration File' label, a 'Browse...' button, the text 'No file selected.', and an 'Upload' button.

Configuration	
Restore Configuration to Factory Settings	The Restore Factory Settings button is to reset the configuration to factory default settings. After clicking the button, you will need to click the Apply Changes button on the top right corner to make the settings effective.
Download Active Configurations	Click Download to backup the current active settings.
Upload Configurations	To restore or change settings based on a configuration file, click Choose File to locate the configuration file on the local computer, and then click Upload . The new settings can then be applied by clicking the Apply Changes button on the page header, or you can cancel the procedure by pressing discard on the main page of the web admin interface.
Upload Configurations from High Availability Pair	In a high availability (HA) configuration, a Pepwave router can quickly load the configuration of its HA counterpart. To do so, click the Upload button. After loading the settings, configure the LAN IP address of the Pepwave router so that it is different from the HA counterpart.

20.9 Feature Add-ons

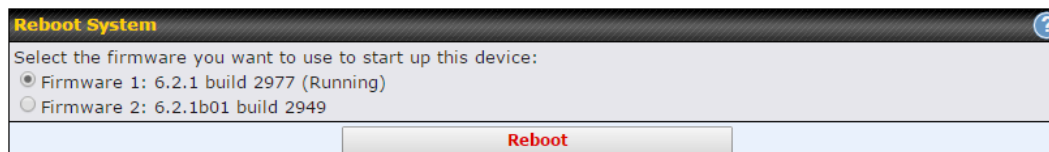
Some Pepwave routers have features that can be activated upon purchase. Once the purchase is complete, you will receive an activation key. Enter the key in the **Activation Key** field, click **Activate**, and then click **Apply Changes**.

A screenshot of the 'Feature Activation' web interface. It has a dark header with the title 'Feature Activation' in yellow. Below the header, there is a label 'Activation Key' on the left, followed by a large, empty white text input field. The background of the form is light gray.

20.10 Reboot

This page provides a reboot button for restarting the system. For maximum reliability, the Pepwave router can equip with two copies of firmware. Each copy can be a different version. You can select the firmware version you would like to reboot the device with. The firmware marked with **(Running)** is the current system boot up firmware.

Please note that a firmware upgrade will always replace the inactive firmware partition.

A screenshot of the 'Reboot System' web interface. It has a dark header with the title 'Reboot System' in yellow and a help icon (question mark in a blue circle) on the right. Below the header, there is a text prompt 'Select the firmware you want to use to start up this device:'. Underneath, there are two radio button options: 'Firmware 1: 6.2.1 build 2977 (Running)' which is selected, and 'Firmware 2: 6.2.1b01 build 2949'. At the bottom of the form, there is a light blue bar containing a gray button with the red text 'Reboot'.

Pepwave MAX and Surf User Manual

20.11 Ping

The ping test tool sends pings through a specified Ethernet interface or a SpeedFusion™ VPN connection. You can specify the number of pings in the field **Number of times**, to a maximum number of 10 times. **Packet Size** can be set to a maximum of 1472 bytes. The ping utility is located at **System>Tools>Ping**, illustrated below:

The screenshot displays the 'Ping' utility interface. The top section, titled 'Ping', contains configuration fields: 'Connection' set to 'WAN 1', 'Destination' set to '10.10.10.1', 'Packet Size' set to '56', and 'Number of times' set to '5' with a slider. Below these fields are 'Start' and 'Stop' buttons. The bottom section, titled 'Results', shows the output of the ping test, including individual ping results and summary statistics. A 'Clear Log' button is located in the top right corner of the Results section.

Ping	
Connection	WAN 1
Destination	10.10.10.1
Packet Size	56
Number of times	Times 5

Start Stop

Results	
PING 10.10.10.1 (10.10.10.1) from 10.88.3.158 56(84) bytes of data.	
64 bytes from 10.10.10.1: icmp_req=1 ttl=62 time=27.6 ms	
64 bytes from 10.10.10.1: icmp_req=2 ttl=62 time=26.5 ms	
64 bytes from 10.10.10.1: icmp_req=3 ttl=62 time=28.9 ms	
64 bytes from 10.10.10.1: icmp_req=4 ttl=62 time=28.3 ms	
64 bytes from 10.10.10.1: icmp_req=5 ttl=62 time=27.7 ms	
--- 10.10.10.1 ping statistics ---	
5 packets transmitted, 5 received, 0% packet loss, time 4005ms	
rtt min/avg/max/mdev = 26.516/27.855/28.933/0.814 ms	

Clear Log

Tip

A system administrator can use the ping utility to manually check the connectivity of a particular LAN/WAN connection.

Pepwave MAX and Surf User Manual

20.12 Traceroute Test

The traceroute test tool traces the routing path to the destination through a particular Ethernet interface or a SpeedFusion™ connection. The traceroute test utility is located at **System>Tools>Traceroute**.

Traceroute	
Connection	WAN 1
Destination	64.233.189.99
Start Stop	

Results	Clear Log
Tracing route to 64.233.189.99 over 20 hops (300 KB):	
0 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
1 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
2 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
3 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
4 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
5 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
6 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
7 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
8 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
9 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
10 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
11 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
12 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
13 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
14 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
15 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
16 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
17 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
18 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
19 10.0.0.1 [10.0.0.1] 0.000 ms 0.000 ms 0.000 ms	
20 64.233.189.99 [64.233.189.99] 0.000 ms 0.000 ms 0.000 ms	

Tip

A system administrator can use the traceroute utility to analyze the connection path of a LAN/WAN connection.

20.13 PepVPN Test

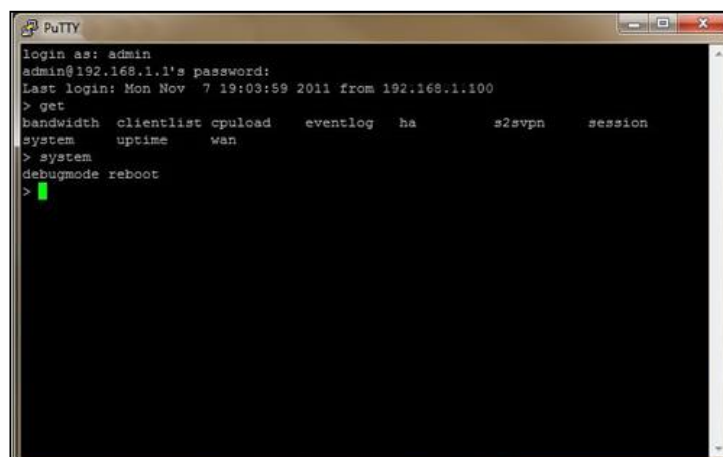
The **PepVPN Test** tool can help to test the throughput between different VPN peers. You can define the **Test Type**, **Direction**, and **Duration** of the test, and press **Go!** to perform the throughput test. The VPN test utility is located at **System>Tools>PepVPN Test**, illustrated as follows:

Pepwave MAX and Surf User Manual

PepVPN Throughput Test	
Profile	NY Office ▾
Type	☒ TCP ☐ UDP
Direction	☒ Upload ☐ Download
Duration	10 seconds (5 - 600)
Go!	
Results	
(Empty)	

20.14 CLI (Command Line Interface Support)

The CLI (command line interface) can be accessed via SSH. This field enables CLI support. The below settings specify which TCP port and which interface(s) should accept remote SSH CLI access. The user name and password used for remote SSH CLI access are the same as those used for web admin access.



```
login as: admin
admin@192.168.1.1's password:
Last login: Mon Nov  7 19:03:59 2011 from 192.168.1.100
> get
bandwidth clientlist cpuload eventlog ha s2svpn session
system uptime wan
> system
debugmode reboot
>
```

Pepwave MAX and Surf User Manual

21 Status

21.1 Device

System information is located at **Status>Device**.

System Information	
Router Name	MAX_HD2_8D1C
Model	Pepwave MAX HD2
Hardware Revision	2
Serial Number	2830-A48A-8D1C
Firmware	6.2.0 build 2891
PepVPN Version	4.0.0
Modem Support Version	1017 (Modem Support List)
Host Name	max-hd2-8d1c
Uptime	7 days 50 minutes
System Time	Mon Feb 23 11:14:13 WET 2015
Diagnostic Report	Download
Remote Assistance	Turn on

System Information	
Router Name	This is the name specified in the Router Name field located at System>Admin Security .
Model	This shows the model name and number of this device.
Product Code	If your model uses a product code, it will appear here.
Hardware Revision	This shows the hardware version of this device.
Serial Number	This shows the serial number of this device.
Firmware	This shows the firmware version this device is currently running.
PepVPN Version	This shows the current PepVPN version.
Modem Support Version	This shows the modem support version. For a list of supported modems, click Modem Support List .
Host Name	The host name assigned to the Pepwave router appears here.
Uptime	This shows the length of time since the device has been rebooted.
System Time	This shows the current system time.
Diagnostic Report	The Download link is for exporting a diagnostic report file required for system investigation.

Pepwave MAX and Surf User Manual

Remote Assistance

Click **Turn on** to enable remote assistance.

Interface	MAC Address
LAN	00:1A:DD:BD:54:40
WAN 1	00:1A:DD:BD:54:41
WAN 2	00:1A:DD:BD:54:42

The second table shows the MAC address of each LAN/WAN interface connected. To view your device's End User License Agreement (EULA), click .

Important Note

If you encounter issues and would like to contact the Pepwave Support Team (<http://www.pepwave.com/contact/>), please download the diagnostic report file and attach it along with a description of your issue. In Firmware 5.1 or before, the diagnostic report file can be obtained at **System>Reboot**.

21.1.1 GPS Data

The MAX HD2 and HD2 IP67 automatically store up to seven days of GPS location data in GPS eXchange format (GPX). To review this data using third-party applications, click **Status>Device** and then download your GPX file.

The Pepwave MAX BR1, HD2, and HD2 IP67 export real-time location data in NMEA format through the LAN IP address at TCP port 60660. It is accessible from the LAN or over a SpeedFusion connection. To access the data via a virtual serial port, install a virtual serial port driver. Visit <http://www.peplink.com/index.php?view=faq&id=294> to download the driver.

Pepwave MAX and Surf User Manual

21.2 Active Sessions

Information on active sessions can be found at **Status>Active Sessions>Overview**.

Overview	Search
----------	--------

Session data captured within one minute. [Refresh](#)

Service	Inbound Sessions	Outbound Sessions
AIM/ICQ	0	1
Bittorrent	0	32
DNS	0	51
Flash	0	1
HTTPS	0	76
Jabber	0	5
MSN	0	11
NTP	0	4
QQ	0	1
Remote Desktop	0	3
SSH	0	12
SSL	0	64
XMPP	0	4
Yahoo	0	1

Interface	Inbound Sessions	Outbound Sessions
WAN 1	0	176
WAN 2	0	32
Wi-Fi WAN	0	51
Cellular 1	0	64
Cellular 2	0	0
USB	0	0

Top Clients

Client IP Address	Total Sessions
10.9.66.66	1069
10.9.98.144	147
10.9.2.18	63
10.9.66.14	56
10.9.2.26	33

This screen displays the number of sessions initiated by each application. Click on each service listing for additional information. This screen also indicates the number of sessions initiated by each WAN port. In addition, you can see which clients are initiating the most sessions.

Pepwave MAX and Surf User Manual

You can also perform a filtered search for specific sessions. You can filter by subnet, port, protocol, and interface. To perform a search, navigate to **Status>Active Sessions>Search**.

Overview

Search

Session data captured within one minute. [Refresh](#)

IP / Subnet

Source or Destination ▾

255.255.255.255 (/32) ▾

Port

Source or Destination ▾

Protocol / Service

TCP ▾

Interface

☐ WAN 1

☐ WAN 2

☐ Wi-Fi WAN

☐ Cellular 1

☐ Cellular 2

☐ USB

☐ VPN

Search

Outbound

Protocol	Source IP	Destination IP	Service	Interface	Idle Time
No sessions					

Total searched results: 0

Inbound

Protocol	Source IP	Destination IP	Service	Interface	Idle Time
No sessions					

Total searched results: 0

Transit

Protocol	Source IP	Destination IP	Service	Interface	Idle Time
No sessions					

Total searched results: 0

This **Active Sessions** section displays the active inbound/outbound sessions of each WAN connection on the Pepwave router. A filter is available to sort active session information. Enter a keyword in the field or check one of the WAN connection boxes for filtering.

Pepwave MAX and Surf User Manual

21.3 Client List

The client list table is located at **Status>Client List**. It lists DHCP and online client IP addresses, names (retrieved from the DHCP reservation table or defined by users), current download and upload rate, and MAC address.

Clients can be imported into the DHCP reservation table by clicking the  button on the right. You can update the record after import by going to **Network>LAN**.

Filter	☐ Online Clients Only
	☐ DHCP Clients Only

Client List						?
IP Address ▲	Name	Download (kbps)	Upload (kbps)	MAC Address	Import	
192.168.1.100		0	0	00:50:56:99:E1:76		

Scale: ☒ kbps ☐ Mbps

If the PPTP server (see **Section 19.2**), SpeedFusion™ (see **Section 12.1**), or AP controller (see **Section 20**) is enabled, you may see the corresponding connection name listed in the **Name** field.

21.4 WINS Client

The WINS client list table is located at **Status>WINS Client**.

WINS Client List	
Name ▲	IP Address
UserA	10.9.2.1
UserB	10.9.30.1
UserC	10.9.2.4
	

The WINS client table lists the IP addresses and names of WINS clients. This option will only be available when you have enabled the WINS server (navigation: **Network>Interfaces>LAN**). The names of clients retrieved will be automatically matched into the Client List (see previous section). Click **Flush All** to flush all WINS client records.

WINS Client List	
Name ▲	IP Address
UserA	10.9.2.1
UserB	10.9.30.1
UserC	10.9.2.4
	

Pepwave MAX and Surf User Manual

21.5 UPnP / NAT-PMP

The table that shows the forwarded ports under UPnP and NAT-PMP protocols is located at **Status>UPnP/NAT-PMP**. This section appears only if you have enabled UPnP / NAT-PMP as mentioned in **Section 15.1.1**.

Forwarded Ports						
External	Internal	Internal Address	Type	Protocol	Description	
47453	3392	192.168.1.100	UPnP	UDP	Application 031	
35892	11265	192.168.1.50	NAT-PMP	TCP	NAT-PMP 58	
4500	3560	192.168.1.20	UPnP	TCP	Application 013	
5921	236	192.168.1.30	UPnP	TCP	Application 047	
22409	8943	192.168.1.70	NAT-PMP	UDP	NAT-PMP 97	
2388	27549	192.168.1.40	UPnP	TCP	Application 004	
						Delete All

Click  to delete a single UPnP / NAT-PMP record in its corresponding row. To delete all records, click **Delete All** on the right-hand side below the table.

Important Note

UPnP / NAT-PMP records will be deleted immediately after clicking the button  or **Delete All**, without the need to click **Save** or **Confirm**.

21.6 SpeedFusion Status

Current SpeedFusion™ status information is located at **Status>SpeedFusion™**. Details about SpeedFusion™ connection peers appears as below:

PepVPN with SpeedFusion - Remote Peer Details				☐ Show disconnected profiles
Search				
Remote Peer	Profile	Information		
 ▶ ADA0-FFFC-11F8	FH	192.168.77.0/24		
 ▶ 3ED2-8F63-1824	380-5 - NO NAT	192.168.3.0/24		

Click on the corresponding peer name to explore the WAN connection(s) status and subnet information of each VPN peer.

Pepwave MAX and Surf User Manual

Remote Peer	Profile	Information		
ADA0-FFFC-11F8	FH	192.168.77.0/24		
WAN 1	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 1 ms		
WAN 2	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 1 ms		
WAN 3	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 1 ms		
Total	Rx: < 1 kbps Tx: 1.1 kbps	Drop rate: 0.0 pkt/s		
3ED2-8F63-1824	380-5 - NO NAT	192.168.3.0/24		
WAN 1	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 4 ms		
WAN 2	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 4 ms		
WAN 3	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 4 ms		
Total	Rx: 1.6 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s		

Click the button for a chart displaying real-time throughput, latency, and drop-rate information for each WAN connection.



When pressing the button, the following menu will appear:

Pepwave MAX and Surf User Manual

PepVPN performance analysis - 9B0A-A29B-2931



PepVPN Test:
Check the general TCP/UDP throughput.



PepVPN Analyzer:
Check the uplink performance of each tunnel.

Warning: PepVPN Analyzer will temporarily interrupt VPN connectivity and will restore after test.

Close



PepVPN Test:
Check the general TCP/UDP throughput.

After clicking the icon, the following menu appears:

Configuration

Type	☒ TCP ☐ UDP	Start
Direction	☒ Upload ☐ Download	
Duration	10 seconds (5 - 600)	

WAN Statistics

WAN 1	Rx: 2.5 kbps Tx: 5.3 kbps Drop rate: 0.0 pkt/s Latency: 186 ms
WAN 3	Rx: n/a Tx: n/a Drop rate: n/a Latency: n/a
WAN 4	Rx: n/a Tx: n/a Drop rate: n/a Latency: n/a
Total	Rx: 2.5 kbps Tx: 5.3 kbps Drop rate: 0.0 pkt/s Latency: 186 ms

Select the L2 protocol (TCP/UDP), direction, and duration and click the **Start** button to begin the general throughput test.

Results	
0.1250 MB / 1.00 sec =	1.0485 Mbps
1.0000 MB / 1.00 sec =	8.3888 Mbps
1.3125 MB / 1.00 sec =	11.0098 Mbps
3.0000 MB / 1.00 sec =	25.1465 Mbps
5.6875 MB / 1.00 sec =	47.7473 Mbps
6.0625 MB / 1.00 sec =	50.8562 Mbps
4.9375 MB / 1.00 sec =	41.4188 Mbps
4.5000 MB / 1.00 sec =	37.7487 Mbps
5.0000 MB / 1.00 sec =	41.9438 Mbps
5.6875 MB / 1.00 sec =	47.7099 Mbps
37.3167 MB / 10.05 sec = 31.1504 Mbps 8 %TX 9 %RX 47 retrans 132.62 msRTT	
TEST DONE	

Pepwave MAX and Surf User Manual



PepVPN Analyzer:
Check the uplink performance of each tunnel.

The bandwidth bonding feature of PepVPN occurs when multiple WAN lines from one end merge with multiple WAN lines from the other end. For this to happen, each WAN line needs to form a connection with all the WAN lines on the opposite end. The function of the PepVPN analyzer is to report the throughput, packet loss, and latency of all possible combinations of connections. **Please note that the PepVPN Analyzer will temporarily interrupt VPN connectivity and will restore after test.**

After clicking the icon, the analyzer will require several minutes to perform its analysis depending the number of WAN links in the SpeedFusion™ Tunnel. Once the test the complete, the report will appear:

Results							
Estimated time: 150 s							
Time remaining: 0 s							
100%							
Local WAN1 > Remote WAN3	Local WAN1 > Remote WAN4	Local WAN1 > Remote WAN5	Local WAN1 > Remote WAN6	Tx Avg. (Mbps)	Tx Max. (Mbps)	Packet loss (%)	RTT (ms)
O				5.87	16.95	0.76	420.51
	O			20.72	26.39	1.59	29.89
		O		30.10	43.69	2.24	29.61
			O	45.01	55.93	2.16	28.24
O	O			24.87	33.56	0.86	49.86
O		O		19.30	31.28	0.01	49.78
	O	O		18.59	30.41	2.08	39.78
O	O	O		20.56	34.60	0.00	38.11
O			O	36.70	59.16	2.64	42.06
	O		O	19.98	30.40	4.40	38.01
O	O		O	31.63	42.99	0.72	37.99
		O	O	36.88	55.78	2.60	33.89
O		O	O	38.30	47.89	0.01	29.98
	O	O	O	33.21	55.23	2.69	30.48
O	O	O	O	30.02	46.66	3.77	28.68

"O" indicates that specific WAN / Tunnel is active for that particular test.

"Tx Avg." is the averaged throughput across the full 10 seconds time, while "Tx Max." is the averaged throughput of the fastest 30% of time.

Pepwave MAX and Surf User Manual

21.7 Event Log

Event log information is located at **Status>Event Log**.

Device Event Log	
Device Event Log ☒ Auto Refresh	
Feb 17 04:43:26	System: Changes applied
Feb 16 10:27:01	System: Time synchronization successful
Feb 16 10:26:25	WAN: WAN 1 connected (10.88.3.158)
Feb 16 10:26:01	WAN: Priority changed (Priority 1 - WAN 1, WAN 2 / Priority 2 - Cellular 1, Cellular 2 / Disabled - Wi-Fi WAN)
Feb 16 10:25:40	System: Started up (6.2.0 build 2891)
Feb 16 10:17:27	System: Changes applied
Feb 16 10:17:00	System: Time synchronization successful
Feb 16 10:19:23	WAN: WAN 1 connected (10.88.3.158)
Feb 16 10:18:58	WAN: Priority changed (Priority 1 - WAN 1, WAN 2 / Priority 2 - Cellular 1, Cellular 2 / Disabled - Wi-Fi WAN)
Feb 16 10:18:37	System: Started up (6.2.0.201501210247-r12145 build)
End of log	
Clear Log	

The log section displays a list of events that has taken place on the Pepwave router. Check **Auto Refresh** to refresh log entries automatically. Click the **Clear Log** button to clear the log.

21.8 Bandwidth

This section shows bandwidth usage statistics and is located at **Status>Bandwidth**. Bandwidth usage at the LAN while the device is switched off (e.g., LAN bypass) is neither recorded nor shown.

Pepwave MAX and Surf User Manual

21.8.1 Real-Time

The **Data transferred since installation** table indicates how much network traffic has been processed by the device since the first bootup. The **Data transferred since last reboot** table indicates how much network traffic has been processed by the device since the last bootup.

Data transferred since installation (Sun Oct 10 05:56:02 PST 2010)

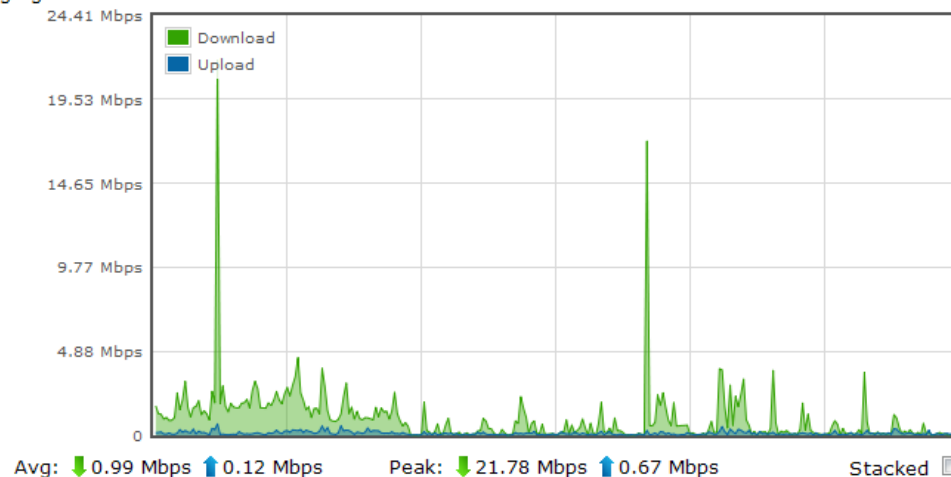
	Download	Upload	Total
All WAN Connections	216.68 GB	91.70 GB	308.38 GB

Data transferred since last reboot

[\[Hide Details \]](#)

	Download	Upload	Total
All WAN Connections	0.74 GB	0.63 GB	1.37 GB
WAN1	0.67 GB	0.61 GB	1.28 GB
WAN2	0.07 GB	0.02 GB	0.09 GB

Aggregated Transfer

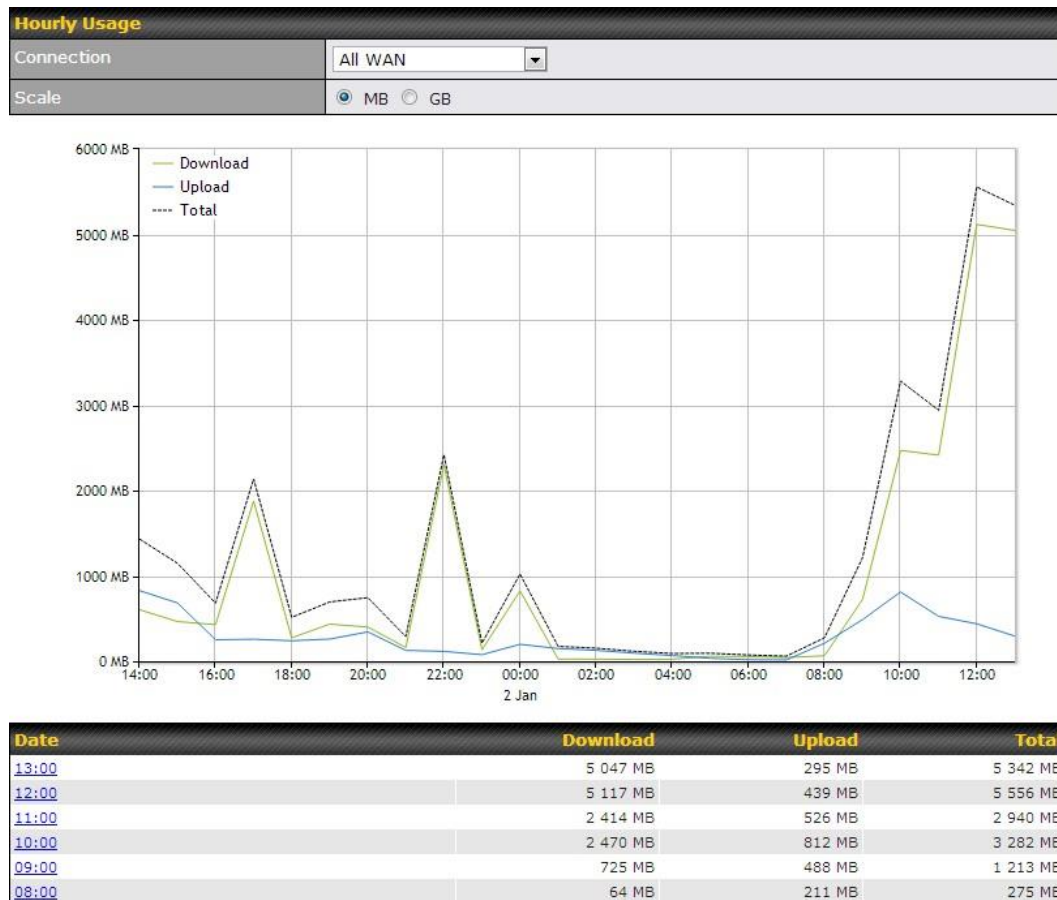


	Download	Upload	Total
Overall	61 kbps	75 kbps	136 kbps

Pepwave MAX and Surf User Manual

21.8.2 Hourly

This page shows the hourly bandwidth usage for all WAN connections, with the option of viewing each individual connection. Select the desired connection to check from the drop-down menu.



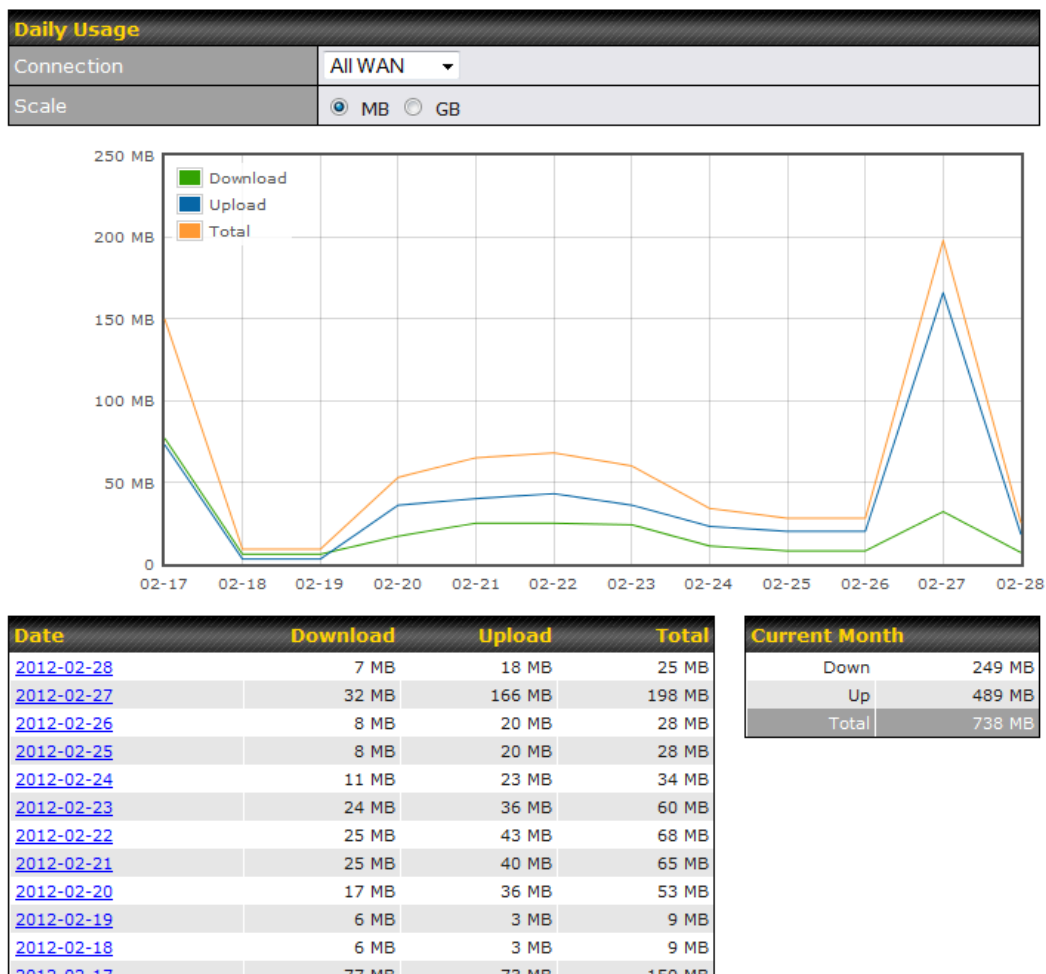
21.8.3 Daily

Pepwave MAX and Surf User Manual

This page shows the daily bandwidth usage for all WAN connections, with the option of viewing each individual connection.

Select the connection to check from the drop-down menu. If you have enabled the **Bandwidth Monitoring** feature, the **Current Billing Cycle** table for that WAN connection will be displayed.

Click on a date to view the client bandwidth usage of that specific date. This feature is not available if you have selected to view the bandwidth usage of only a particular WAN connection. The scale of the graph can be set to display megabytes (**MB**) or gigabytes (**GB**).



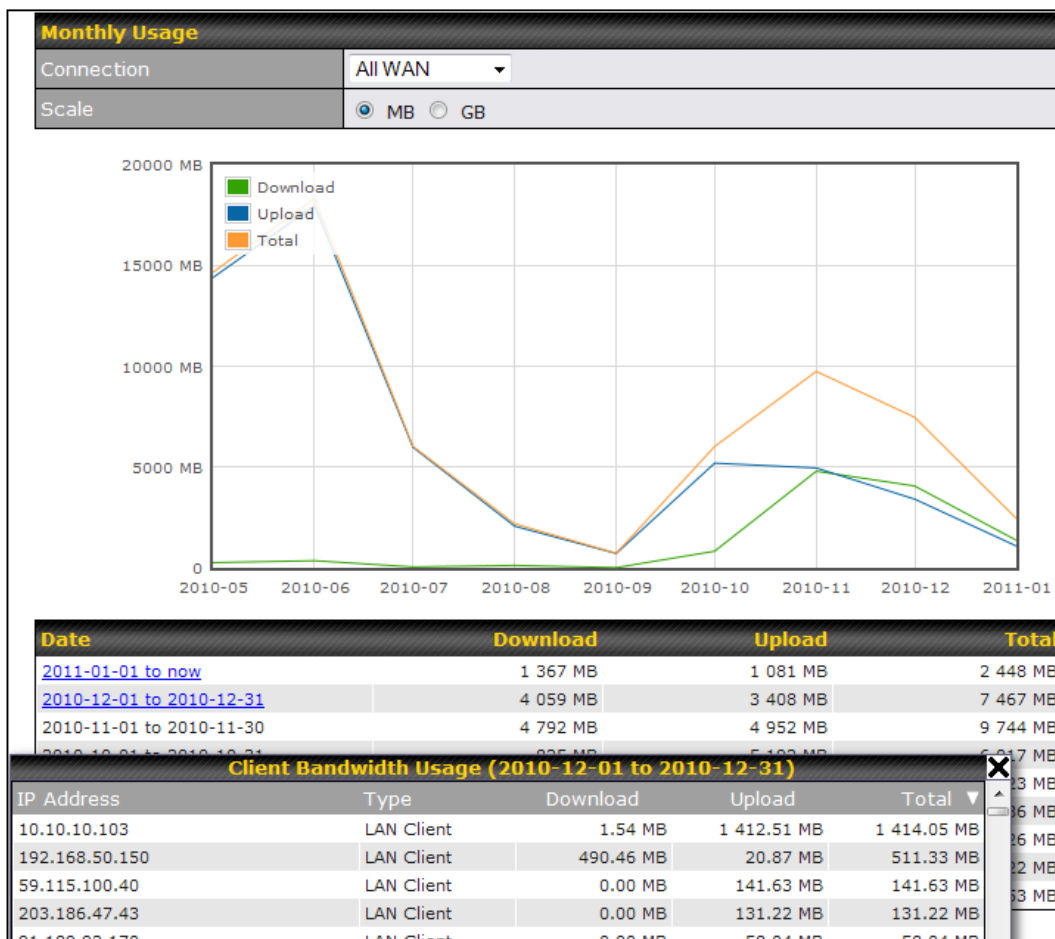
All WAN Daily Bandwidth Usage

Pepwave MAX and Surf User Manual

21.8.4 Monthly

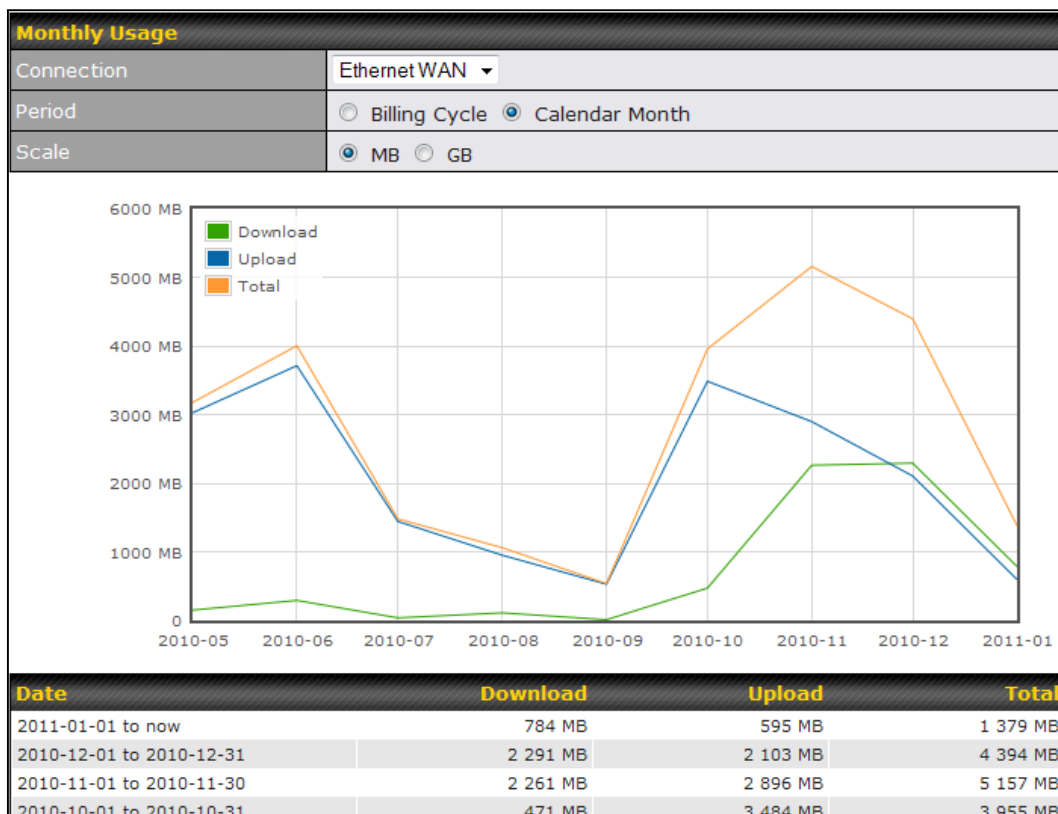
This page shows the monthly bandwidth usage for each WAN connection. If you have enabled the **Bandwidth Monitoring** feature, you can check the usage of each particular connection and view the information by **Billing Cycle** or by **Calendar Month**.

Click the first two rows to view the client bandwidth usage in the last two months. This feature is not available if you have chosen to view the bandwidth of an individual WAN connection. The scale of the graph can be set to display megabytes (**MB**) or gigabytes (**GB**).



All WAN Monthly Bandwidth Usage

Pepwave MAX and Surf User Manual



Ethernet WAN Monthly Bandwidth Usage

Tip

By default, the scale of data size is in **MB**. 1GB equals 1024MB.

Appendix A. Restoration of Factory Defaults

To restore the factory default settings on a Pepwave router, follow the steps below:

1. Locate the reset button on the front or back panel of the Pepwave router.
2. With a paper clip, press the reset button and hold it for at least 10 seconds, until the unit reboots itself.

After the Pepwave router finishes rebooting, the factory default settings will be restored.

Important Note

All previous configurations and bandwidth usage data will be lost after restoring factory default settings. Regular backup of configuration settings is strongly recommended.

Appendix B. Declaration

1. The device supports time division technology
2. Federal Communication Commission Interference Statement

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.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential 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:

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

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

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.

IMPORTANT NOTE

FCC Radiation Exposure Statement (for MAX700/ HD2/ HD2 IP67/ BR1)

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 25cm between the radiator & your body.

Pepwave MAX and Surf User Manual

FCC Radiation Exposure Statement (for MAX On-The-Go)

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

1. 20cm minimum when the product is operated alone without co-transmitting with a plug-in 3G USB dongle device.
2. 65cm minimum when the product is operated with a plug-in 3G USB device which has maximum of 7W ERP output power.
3. For co-transmission scenario which is not covered above, please consult the RF technician or device supplier.

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.

3. CE Statement for Pepwave Routers

Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

- EN 60950-1: 2006 + A11 : 2009+A1 : 2010+ A12: 2011
Safety of Information Technology Equipment
- EN50385 : 2002 / Article 3(1)(a)
Product standard to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields (110MHz - 40 GHz) - General public
- EN 300 328 V1.7.1: 2006
Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
- EN 301 908-1 V5.2.1: 2011
Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 1: Harmonized EN for IMT-2000, introduction and common

Pepwave MAX and Surf User Manual

requirements, covering essential requirements of article 3.2 of the R&TTE Directive

- EN 301 511 V9.0.2: 2003
Global System for Mobile communications (GSM); Harmonized standard for mobile stations in the GSM 900 and DCS 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC)
- EN 301 489-1 V1.9.2: 2008
Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
- EN 301 489-7 V1.3.1: 2005
ElectroMagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)
- EN 301 489-17 V2.2.1: 2012
Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance WLAN equipment
- EN 301 489-24 V1.5.1: 2010
Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 24: Specific conditions for IMT-2000 CDMA Direct Spread (UTRA) for Mobile and portable (UE) radio and ancillary equipment



Český [Czech]	<i>[Jméno výrobce]</i> tímto prohlašuje, že tento <i>[typ zařízení]</i> je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
Dansk [Danish]	Undertegnede <i>[fabrikantens navn]</i> erklærer herved, at følgende udstyr <i>[udstyrets typebetegnelse]</i> overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erkläre <i>[Name des Herstellers]</i> , dass sich das Gerät <i>[Gerätetyp]</i> in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab <i>[tootja nimi = name of manufacturer]</i> seadme <i>[seadme tüüp = type of equipment]</i> vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, <i>[name of manufacturer]</i> , declares that this <i>[type of equipment]</i> is in

Pepwave MAX and Surf User Manual

	compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
 Español [Spanish]	Por medio de la presente <i>[nombre del fabricante]</i> declara que el <i>[clase de equipo]</i> cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
 Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ <i>[name of manufacturer]</i> ΔΗΛΩΝΕΙ ΟΤΙ <i>[type of equipment]</i> ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK.
 Français [French]	Par la présente <i>[nom du fabricant]</i> déclare que l'appareil <i>[type d'appareil]</i> est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
 Italiano [Italian]	Con la presente <i>[nome del costruttore]</i> dichiara che questo <i>[tipo di apparecchio]</i> è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo <i>[name of manufacturer / izgatavotāja nosaukums]</i> deklarē, ka <i>[type of equipment / iekārtas tips]</i> atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo <i>[manufacturer name]</i> deklaruoja, kad šis <i>[equipment type]</i> atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
 Nederlands [Dutch]	Hierbij verklaart <i>[naam van de fabrikant]</i> dat het toestel <i>[type van toestel]</i> in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
 Malti [Maltese]	Hawnhekk, <i>[isem tal-manifattur]</i> , jiddikjara li dan <i>[il-mudel tal-prodott]</i> jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn rilevanti li hemm fid-Dirrettiva 1999/5/EC.
 Magyar [Hungarian]	Alulírott, <i>[gyártó neve]</i> nyilatkozom, hogy a <i>[... típus]</i> megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
 Polski [Polish]	Niniejszym <i>[nazwa producenta]</i> oświadczam, że <i>[nazwa wyrobu]</i> jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
 Português [Portuguese]	<i>[Nome do fabricante]</i> declara que este <i>[tipo de equipamento]</i> está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
 Slovensko [Slovenian]	<i>[Ime proizvajalca]</i> izjavlja, da je ta <i>[tip opreme]</i> v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	<i>[Meno výrobcu]</i> týmto vyhlasuje, že <i>[typ zariadenia]</i> spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
 Suomi [Finnish]	<i>[Valmistaja = manufacturer]</i> vakuuttaa täten että <i>[type of equipment = laitteen tyyppimerkintä]</i> tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
 Svenska [Swedish]	Härmed intygar <i>[företag]</i> att denna <i>[utrustningstyp]</i> står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.



PEP WAVE

Broadband Possibilities

www.pepwave.com

Contact Us:

Sales

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

Support

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

Business Development and Partnerships

<http://www.pepwave.com/partners/channel->