

MAX mobile router

User Manual

PepwaveMAX Series:

MAX 700 / HD2 /HD2 IP67 / BR1 / On-The-Go

Pepwave MAX Firmware 6.1
March 2014

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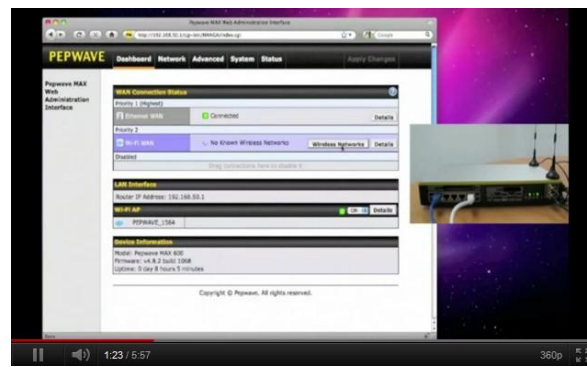
1 Introduction and Scope

The Pepwave MAX Mobile Router provides link aggregation and load balancing across multiple WAN connections, allowing a combination of technologies like 3G HSDPA, EVDO, 4G LTE, Wi-Fi, external WiMAX dongle, and Satellite to be utilized to connect to the Internet.

This manual presents how to set up the Pepwave MAX Mobile Router and provides an introduction to the features and usage of Pepwave MAX Mobile Router.

Tips

Want to know more about Pepwave MAX? Visit our [YouTube Channel](#) for a [video introduction!](#)



<http://youtu.be/UckVQThLKO4>

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2 Glossary

The following terms, acronyms, and abbreviations are frequently used in this manual:

| Term | Definition |
|-------------|--|
| 3G | 3rd Generation standards for wireless communications (e.g. HSDPA) |
| 4G | 4th Generation standards for wireless communications (e.g. WiMAX, LTE) |
| DHCP | Dynamic Host Configuration Protocol |
| DNS | Domain Name System |
| EVDO | Evolution-Data Optimized |
| HSDPA | High-Speed Downlink Packet Access |
| HTTP | Hyper-Text Transfer Protocol |
| ICMP | Internet Control Message Protocol |
| IP | Internet Protocol |
| LAN | Local Area Network |
| MAC Address | Media Access Control Address |
| MTU | Maximum Transmission Unit |
| MSS | Maximum Segment Size |
| NAT | Network Address Translation |
| PPPoE | Point to Point Protocol over Ethernet |
| QoS | Quality of Service |
| SNMP | Simple Network Management Protocol |
| TCP | Transmission Control Protocol |
| UDP | User Datagram Protocol |
| VPN | Virtual Private Network |
| VRRP | Virtual Router Redundancy Protocol |
| WAN | Wide Area Network |
| WINS | Windows Internet Name Service |
| WLAN | Wireless Local Area Network |

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3 Product Features

PepwaveMAX enables all LAN users to share broadband Internet connections, and provide advanced features to enhance Internet access. The following is the list of supported features on Pepwave MAX Mobile Router:

3.1 Supported Network Features

3.1.1 WAN

- Ethernet WAN Connection in Full/Half Duplex
- Static IP support for PPPoE
- Built-in HSPA and EVDO cellular modems (**Available on Pepwave MAX HD2 and HD2 IP67**)
- USB mobile connection(s)
- Wi-Fi WAN connection
- Network address translation (NAT)/ port address translation (PAT)
- Inbound and outbound NATmapping
- IPsec NAT-T and PPTP packet passthrough
- MAC address clone and passthrough
- Customizable MTU and MSS values
- WAN connection health check
- Dynamic DNS (supported service providers: changeip.com, dyndns.org, no-ip.org, tzo.com and DNS-O-Matic)
- Ping, DNS lookup and HTTP based health check

3.1.2 LAN

- Wi-Fi AP
- Ethernet LAN ports
- DHCP server on LAN
- Extended DHCP option support
- Static routing rules
- VLAN on LAN support

3.1.3 VPN

- SpeedFusion™
- SpeedFusion performance analyzer
- X.509 certificate support (**supported for MAX 700, and MAX HD2, available on the Max BR1 and MAX_OTG_U4_SF as an activated feature**)
- VPN load balancing and failover among selected WAN connections
- Bandwidth bonding & failover among selected WAN connections
- IPsec VPN for Network-to-Network connection (Works with Cisco, Juniper only)
- Ability to route Internet traffic to a remote VPN peer
- Optional pre-shared key setting
- SpeedFusion™ throughput, ping and traceroute tests
- PPTP server

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- PPTP and IPsec passthrough

3.1.4 Firewall

- Outbound (LAN to WAN) firewall rules
- Inbound (WAN to LAN) firewall rules per WAN connection
- Intrusion detection and prevention
- Specification of NAT mappings
- Outbound firewall rules can be defined by destination domain name

3.1.5 Captive Portal

- Splash screen of open networks, login page for secure networks
- Customizable built-in captive portal
- Supports linking to outside page for captive portal

3.1.6 Outbound Policy

- Link load distribution per TCP/UDP service
- Persistent routing for specified source and/or destination IP addresses per TCP/UDP service
- Traffic Prioritization and DSL optimization
- Prioritize and route traffic to VPN tunnels with Priority and Enforced algorithms

3.1.7 AP Controller(Available on the Pepwave MAX 700 and MAX HD2)

- Configure and manage Pepwave AP devices
- Review the status of connected AP

3.1.8 QoS

- Quality of Service for different applications and custom protocols
- User Group classification for different service levels
- Bandwidth usage control and monitoring on group- and user- level
- Application Prioritization for custom protocols and DSL/Cable optimization

3.2 Other Supported Features

- User-friendly web-based administration interface
- HTTP and HTTPS support for Web Admin Interface
- Configurable web administration port and administrator password
- Firmware upgrades, configuration backups, Ping, and Traceroute via Web Admin Interface
- Remote web based configuration (via WAN and LAN interfaces)
- Time server synchronization
- SNMP
- Email notification

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- Read-only user for Web Admin
- SharedIP drop-in mode (**Available on the Pepwave MAX 700 and MAX HD2**)
- Authentication and Accounting by RADIUS server for Web Admin
- Built-in WINS Servers
- Syslog
- SIP passthrough
- PPTP packet passthrough
- Event Log
- Active Sessions
- Client List
- WINS Client List
- UPnP / NAT-PMP
- Real-Time, Hourly, Daily and Monthly Bandwidth Usage reports and charts
- IPv6 support(**Available on Pepwave MAX 700, HD2 and HD2 IP67**)
- Support USB tethering on Android 2.2+ phones

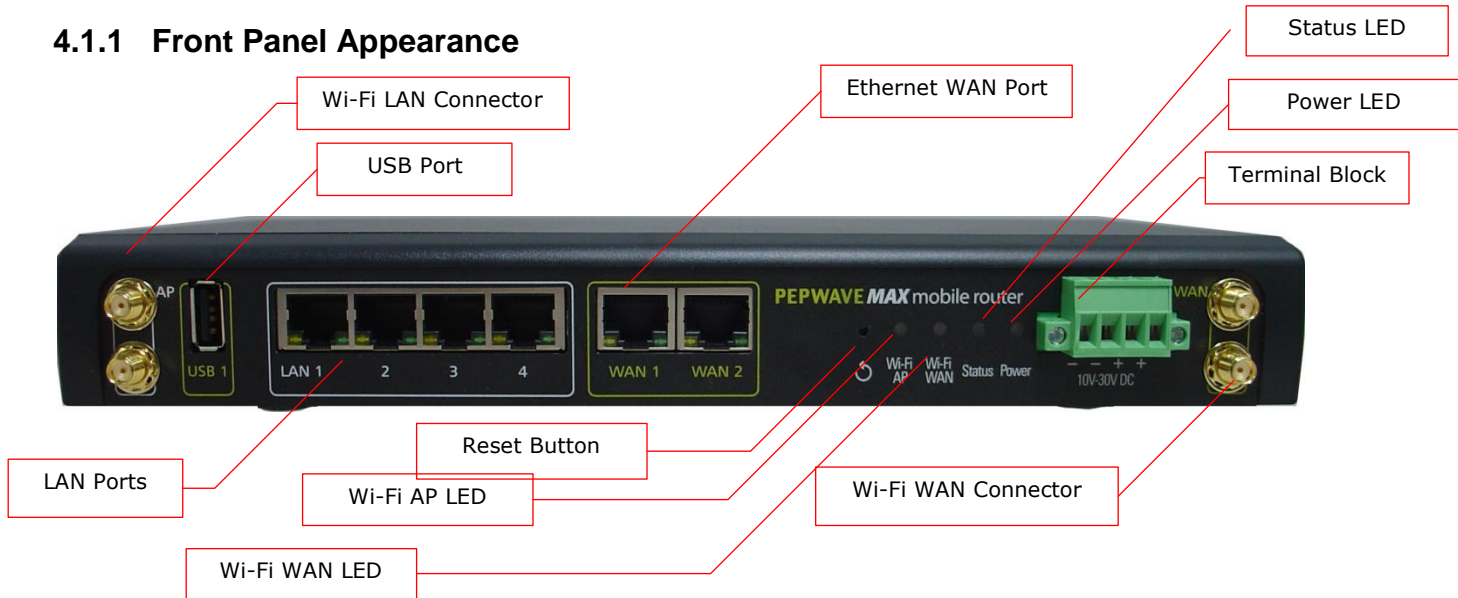
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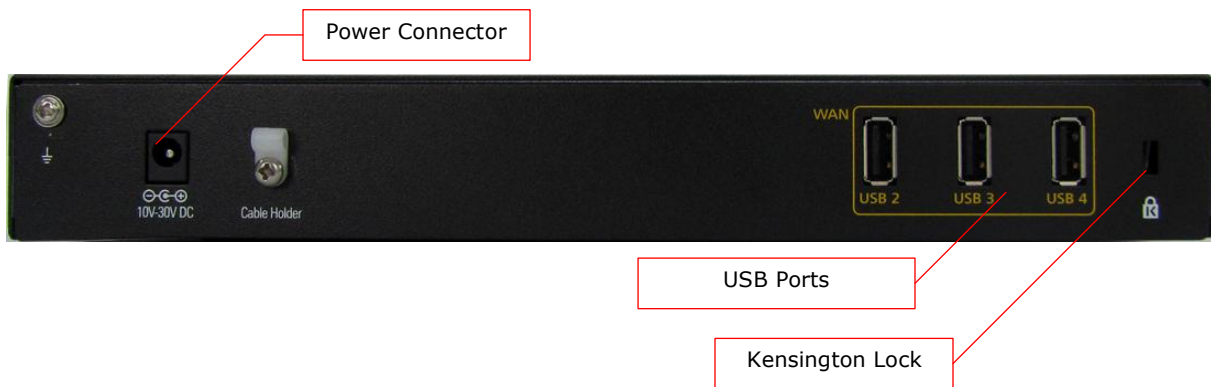
4 Pepwave MAX Mobile Router Overview

4.1 MAX 700

4.1.1 Front Panel Appearance



4.1.2 Rear Panel Appearance



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4.1.3 LED Indicators

The statuses indicated by the front panel LEDs are as follows:

| Status Indicators | | |
|-------------------|--------------|---------------------|
| Status | OFF | System initializing |
| | Red | Booting up or busy |
| | Blinking red | Boot up error |
| | Green | Ready |

| Wi-Fi AP and Wi-Fi WAN Indicators | | |
|-----------------------------------|-----------------|---|
| Wi-Fi WAN | OFF | Disconnected |
| | Blinking slowly | Connecting to network |
| | Blinking | Connected to network with traffic |
| | ON | Connected to network without traffic |
| Wi-Fi AP | OFF | Disabled |
| | Blinking slowly | Enabled but no client connected |
| | Blinking | Connected to network with traffic |
| | ON | Client(s) connected to wireless network |

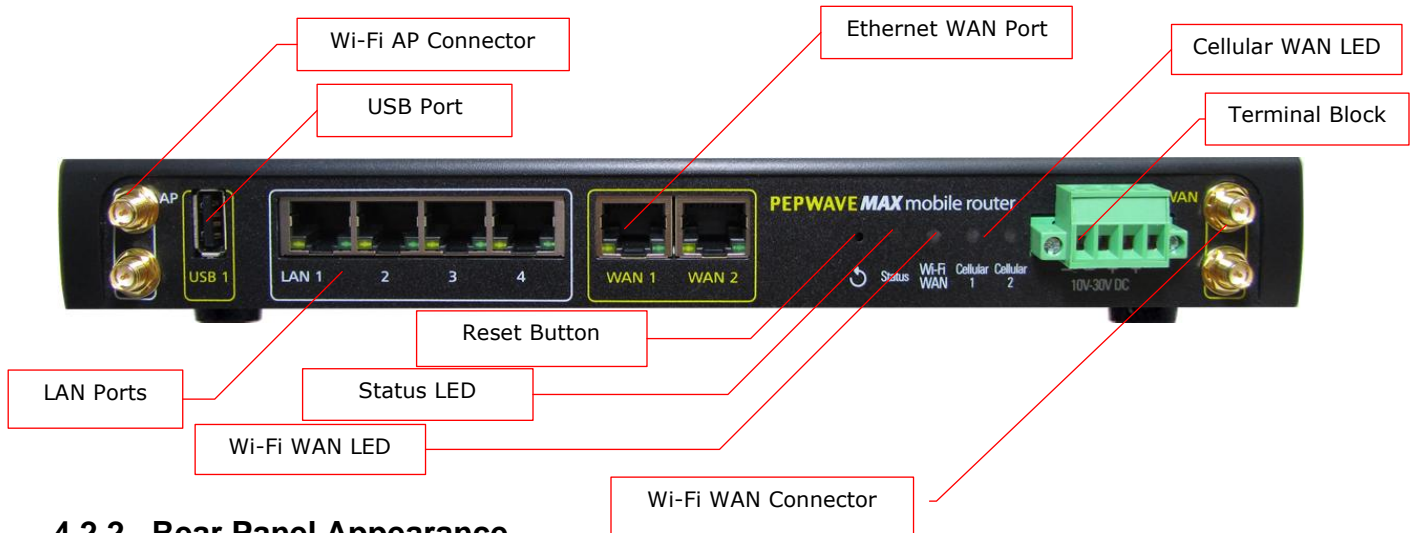
| LAN and Ethernet WAN Ports | | |
|----------------------------|----------------------|---|
| Green LED | ON | 10 / 100/ 1000 Mbps |
| Orange LED | Blinking | Data is transferring |
| | OFF | No data is being transferred or port is not connected |
| Port Type | Auto MDI/MDI-X ports | |

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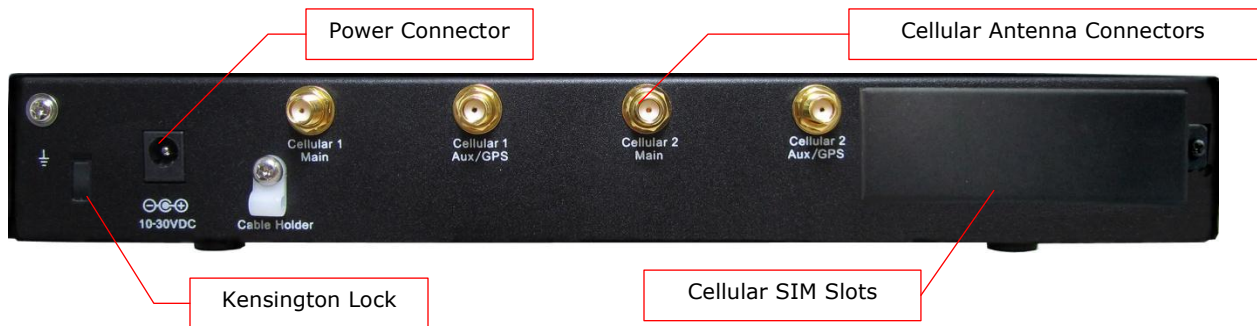
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4.2 MAX HD2

4.2.1 Front Panel Appearance



4.2.2 Rear Panel Appearance



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4.2.3 LED Indicators

The statuses indicated by the front panel LEDs are as follows:

| Status Indicators | | |
|-------------------|--------------|---------------------|
| Status | OFF | System initializing |
| | Red | Booting up or busy |
| | Blinking red | Boot up error |
| | Green | Ready |

| Wi-Fi AP and Wi-Fi WAN Indicators | | |
|---|-----------------|--|
| Wi-Fi WAN / Cellular 1 / Cellular 2 | OFF | Disabled Intermittent |
| | Blinking slowly | Connecting to wireless network(s) |
| | Blinking | Connected to wireless network(s) with traffic |
| | ON | Connected to wireless network(s) without traffic |

| LAN and Ethernet WAN Ports | | |
|----------------------------|-----------|---|
| Green LED | ON | 10 / 100 / 1000 Mbps |
| | Blinking | Data is transferring |
| Orange LED | OFF | No data is being transferred or port is not connected |
| | Port Type | Auto MDI/MDI-X ports |

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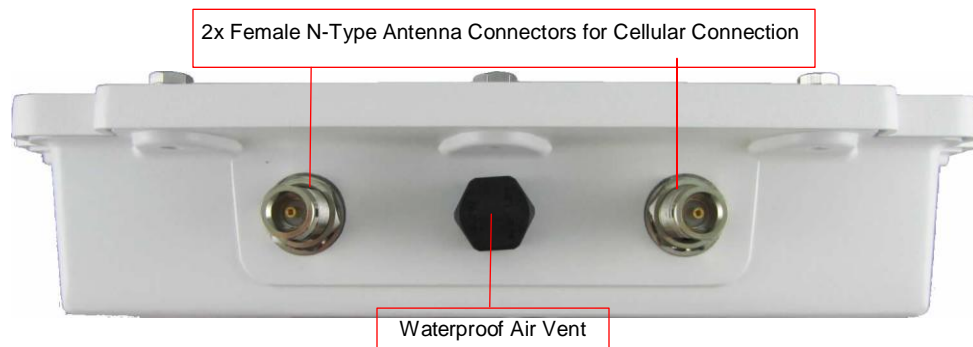
PEPWAVE *MAX* mobile router

4.3 MAX HD2 IP67

4.3.1 Front Panel Appearance



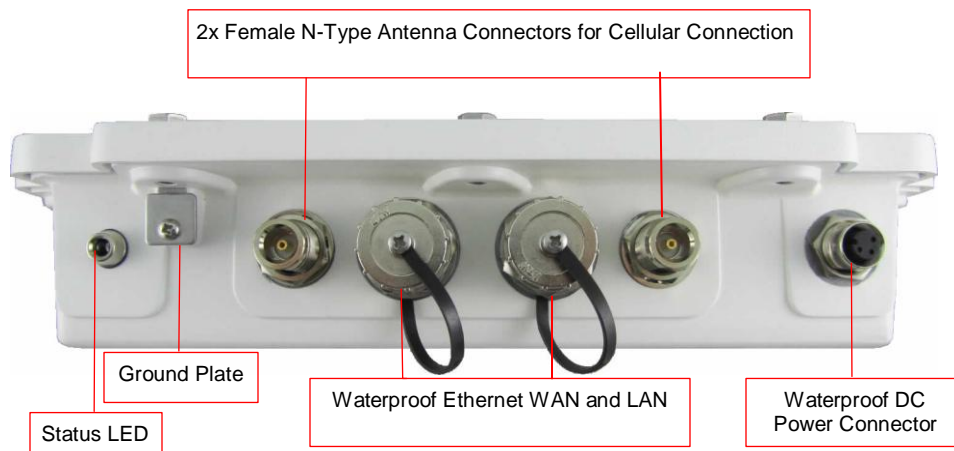
4.3.2 TopPanelAppearance



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4.3.3 Rear Panel Appearance



The statuses indicated by the front panel LEDs are as follows:

| Status Indicators | | |
|-------------------|--------------|---------------------|
| Status | OFF | System initializing |
| | Red | Booting up or busy |
| | Blinking red | Boot up error |
| | Green | Ready |

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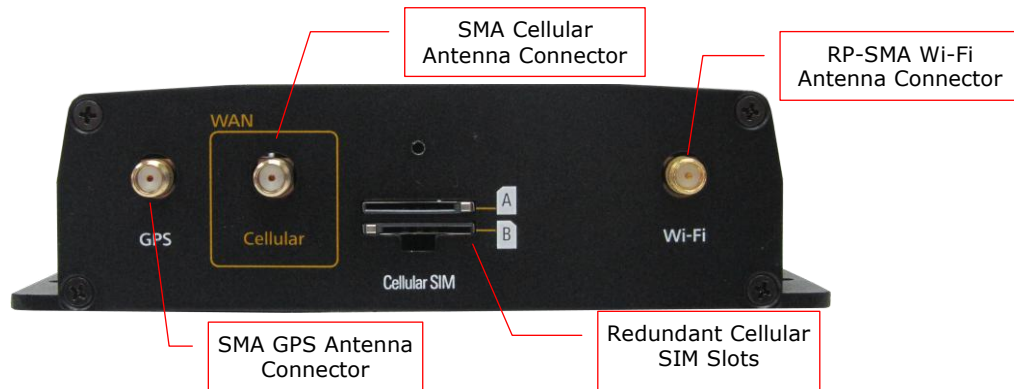
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4.4 MAX BR1

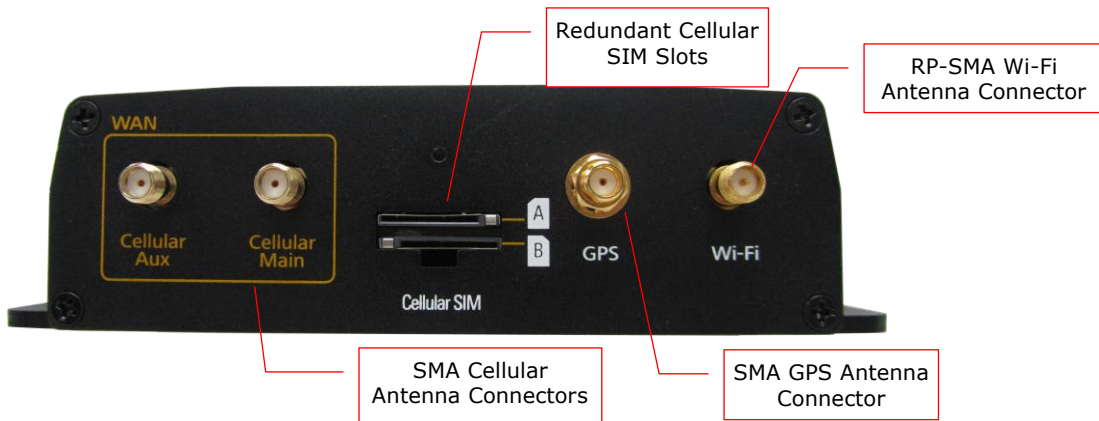
4.4.1 Front Appearance



4.4.2 Top Panel Appearance (MAX-BR1 Version)



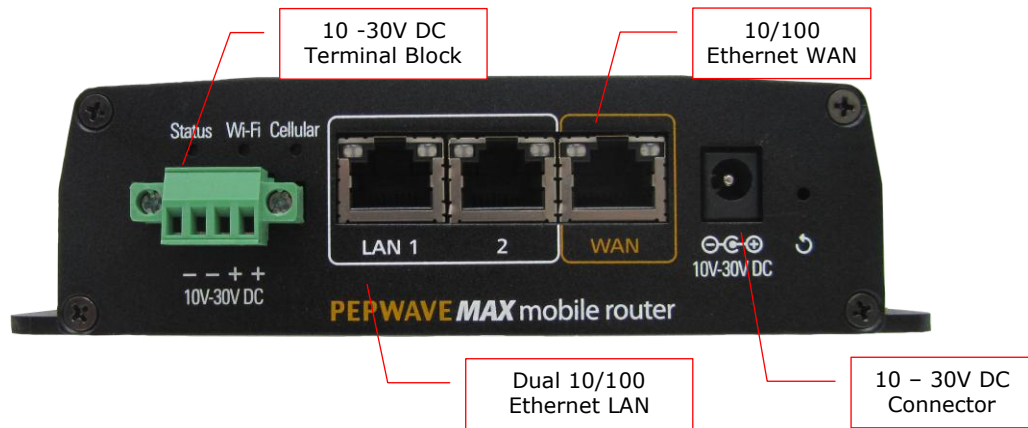
(MAX-BR1-LTE Version)



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4.4.3 Rear Panel Appearance



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4.4.4 LED Indicators

The statuses indicated by the front panel LEDs are as follows:

| Status Indicators | | |
|-------------------|--------------|---------------------|
| Status | OFF | System initializing |
| | Red | Booting up or busy |
| | Blinking red | Boot up error |
| | Green | Ready |

| Wi-Fi Indicators | | |
|------------------|-----------------|--|
| Wi-Fi | OFF | Disabled Intermittent |
| | Blinking slowly | Connecting to wireless network(s) |
| | Blinking | Connected to wireless network(s) with traffic |
| | ON | Connected to wireless network(s) without traffic |

| Cellular Indicators | | |
|---------------------|-----|---------------------------------------|
| Cellular | OFF | Disabled or no SIM card inserted |
| | ON | Connecting or connected to network(s) |

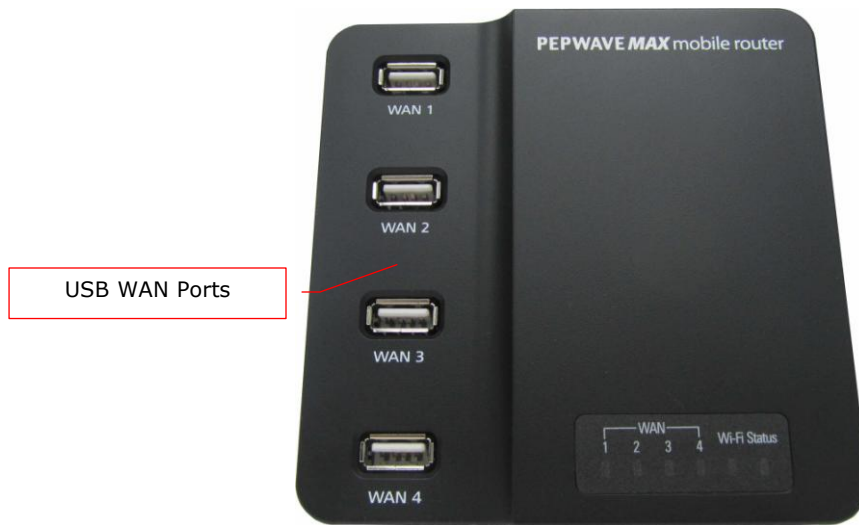
| LAN and Ethernet WAN Ports | | |
|----------------------------|----------------------|-----------------------------------|
| Green LED | ON | 100 Mbps |
| | OFF | 10 Mbps |
| Orange LED | ON | Port is connected without traffic |
| | Blinking | Data is transferring |
| | OFF | Port is not connected |
| Port Type | Auto MDI/MDI-X ports | |

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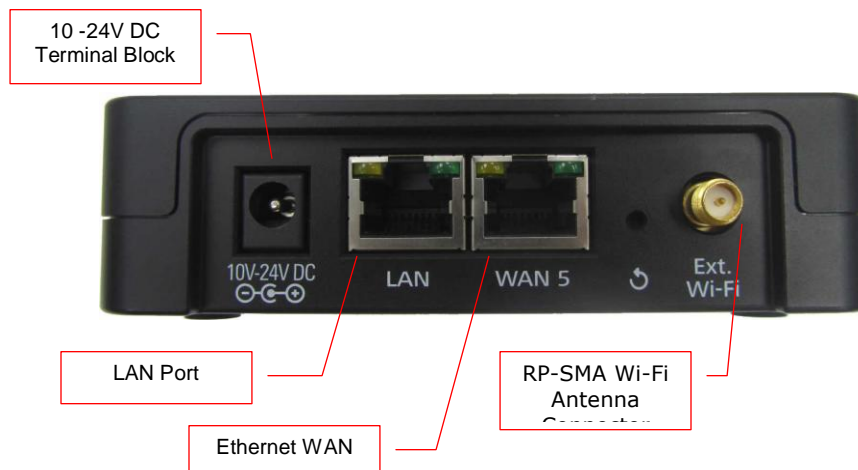
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4.5 MAX On-The-Go

4.5.1 Top Panel Appearance



4.5.2 Rear Panel Appearance



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4.5.3 LED Indicators

The statuses indicated by the front panel LEDs are as follows:

| Cellular Indicators | | |
|---------------------|-------|------------------------------------|
| WAN | OFF | Modem is not attached to the port. |
| | Green | Modem is attached to the port. |

| Wi-Fi Indicators | | |
|------------------|-------|---------------------|
| Wi-Fi | OFF | Disconnected to AP. |
| | Green | Connected to AP. |

| Status Indicators | | |
|-------------------|-------|---------------------|
| Status | OFF | System initializing |
| | Red | Booting up or busy |
| | Green | Ready |

| LAN and Ethernet WAN Ports | | |
|----------------------------|----------------------|-----------------------------------|
| Green LED | ON | 100 Mbps |
| | OFF | 10 Mbps |
| Orange LED | ON | Port is connected without traffic |
| | Blinking | Data is transferring |
| Port Type | Auto MDI/MDI-X ports | |

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5 Installation

The following section details connecting the Pepwave MAX Mobile Router to your network:

5.1 Preparation

Before installing your Pepwave MAX Mobile Router, please prepare the following:

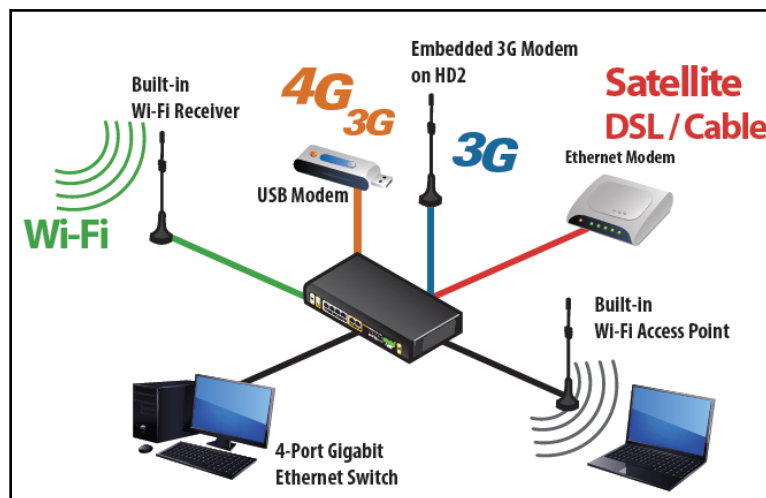
- At least one Internet/WAN access account and/or Wi-Fi access information.
- For each network connection,
 - **Ethernet WAN:** A 10/100/1000BaseT UTP cable with RJ45 connector
 - **USB:** A USB modem
 - **Embedded Modem:** A SIM card for GSM/HSPA service
 - **Wi-Fi WAN:** Wi-Fi antennas
 - **PC Card / Express Card WAN:** A PC Card/ExpressCard for the corresponding card slot.
- A computer with TCP/IP network protocol and a web browser installed. Supported browsers include Microsoft Internet Explorer 8.0 or above, Mozilla Firefox 10.0 or above, Apple Safari 5.1 or above, and Google Chrome 18 or above.

5.2 Constructing the Network

At the high level, construct the network according to the following steps:

1. With an Ethernet cable, connect a computer to one of the LAN ports on the Pepwave MAX. Repeat with different cables for up to 4 computers to be connected.
2. With another Ethernet cable or a USB modem / Wi-Fi antenna / PC Card / Express Card, connect it to one of the WAN ports on the Pepwave MAX. Repeat the same procedure for other WAN ports.
3. Connect the power adapter to the power connector on the rear panel of the Pepwave MAX, and then plug it into a power outlet.

The following figure schematically illustrates the configuration that results:



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5.3 Configuring the Network Environment

To ensure that the Pepwave MAX works properly in the LAN environment and can access the Internet via the WAN connections, please refer to the following setup procedures:

- LAN Configuration
For basic configuration, refer to Section 6, Connecting to Web Admin Interface.
For advanced configuration, go to Section 7, Configuration of LAN Interface(s).
- WAN Configuration
For basic configuration, refer to Section 6, Connecting to Web Admin Interface.
For advanced configuration, go to Section 7.2, Captive Portal
- The Captive Portal serves as gateway that clients have to pass if they wish to access the internet using your router. To configure, navigate to **Network > Captive Portal** to see the following screen:

| Captive Portal Settings | |
|-------------------------|---|
| Enable | <input checked="" type="checkbox"/> edit Guest_LAN (25) |
| Access Mode | <input checked="" type="radio"/> Open Access <input type="radio"/> User Authentication |
| Access Quota | 720 mins (0: Unlimited) 0 MB (0: Unlimited) |
| Quota Reset Time | <input checked="" type="radio"/> Daily at 00 :00 <input type="radio"/> 1440 minutes after quota reached |
| Splash Page | <input checked="" type="radio"/> Built-in <input type="radio"/> External, URL: <input type="text" value="http://"/> |

Captive Portal Settings

Clicking the **edit** button trigger a dialogue where you can choose which LAN / VLAN to apply your captive portal.

Apply On

LAN / VLAN

- (LAN)
- Guest_LAN (25)

OK Cancel

Click all LAN / VLAN that you wish to apply the captive portal to.

Access Mode Click **Open Access** to allow clients to freely access your router. Click **User Authentication** to force your clients to authenticate before accessing your router.

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This authenticates your clients through a Radius Server. Upon selecting this option, you will see the following fields:

Radius Server

| | | | |
|--------------------------|----------------------|---|---------|
| Authentication | RADIUS Server ▾ | | |
| Auth Server | <input type="text"/> | Port 1812 | Default |
| Auth Server Secret | <input type="text"/> | <input checked="" type="checkbox"/> Hide Characters | |
| Accounting Server | <input type="text"/> | Port 1813 | Default |
| Accounting Server Secret | <input type="text"/> | <input checked="" type="checkbox"/> Hide Characters | |
| Network Connection | LAN ▾ | | |

Fill in the necessary information to complete your connection to the server and enable authentication.

This authenticates your clients through a LDAP Server. Upon selecting this option, you will see the following fields:

LDAP Server

| | | | |
|----------------|---|----------|---------|
| Authentication | LDAP Server ▾ | | |
| LDAP Server | <input type="text"/> | Port 389 | Default |
| | <input type="checkbox"/> Use DN/Password to bind to LDAP Server | | |
| Base DN | <input type="text"/> | | |
| Base Filter | <input type="text"/> | | |

Fill in the necessary information to complete your connection to the server and enable authentication.

Access Quota




Set a time and data cap to each user's Internet usage.

Quota Reset Time

This menu determines how your usage quota resets. Setting it to **daily** will reset it at a specified time every day. Setting a number of **minutes after quota reached** establish a timer for each user that begins after the quota has been reached.

Splash Page

Here, you can choose between using the MAX router's built-in captive portal and redirecting clients to a URL you define.

The Portal Customization menu has two options:  and . Clicking will result in a pop-up previewing the captive portal that your clients will see. Clicking  will result in the appearance of following menu:

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| Portal Customization | |
|----------------------|--|
| Logo Image | <input checked="" type="radio"/> No image [Use default Logo Image] <input type="radio"/> Use default Logo Image <input type="radio"/> <input type="button" value="Choose File"/> No file chosen <small>NOTE: Size max 512KB. Supported images types: JPEG, PNG and GIF.</small> |
| Message | <div style="border: 1px solid gray; height: 100px;"></div> |
| Terms & Conditions | <div style="border: 1px solid gray; height: 100px;">[Use default Terms & Conditions]</div> |
| Custom Landing Page | <input checked="" type="checkbox"/> <input type="text" value="http://"/> |

| Portal Customization | |
|-------------------------------|--|
| Logo Image | Click the Choose File button to select an logo to use for the built-in portal |
| Message | If you have any additional messages for your users, place it on this field. |
| Terms & Conditions | If you would like to use your own set of terms and conditions, please place it here. If left empty, the built-in portal will display the default terms and conditions. |
| Custom Landing Page | Fill in this field to redirect clients to an external URL. |

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6 Configuration of WAN Interface(s)

6.1 Mounting the Unit

6.1.1 Wall Mount

The Pepwave MAX 700/HD2/On-The-Go can be mounted on the wall by screwing. After adding the screw on the wall, slide the MAX in the screw whole socket as indicated below. Recommended Screw Specification: M3.5 x 20mm, Head Diameter 6mm, Head Thickness 2.4mm

The Pepwave MAX BR1 can be mounted by screwing the four holes on the device to the wall.

6.1.2 Car Mount

The Pepwave MAX700/HD2 can be mounted in a vehicle using the included mounting brackets. Place the mounting brackets by the two sides, and screw it onto the device.



7 Connecting to Web Admin Interface

1. Start a Web browser on a computer that is connected with the Pepwave MAX through LAN.
2. To connect to Web Admin Interface of the Pepwave MAX, enter the following LAN IP address in the address field of the web browser:

`http://192.168.50.1`

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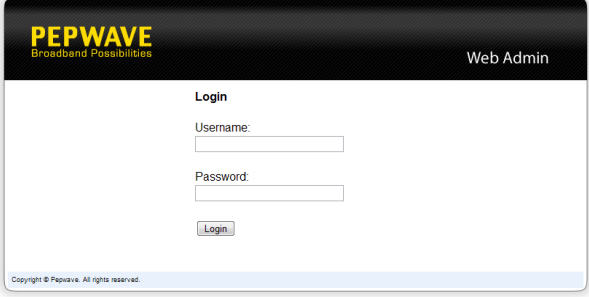
(This is the default LAN IP address of the Pepwave MAX.)

3. Enter the following to access the Web Admin Interface.

Username: admin

Password: admin

(This is the default Username and Password of the Pepwave MAX. The Admin and Read-only User Password can be changed at **System > Admin Security** of the Web Admin Interface.)



The screenshot shows the Web Admin login page for a Pepwave MAX mobile router. The page has a black header with the 'PEPWAVE Broadband Possibilities' logo on the left and 'Web Admin' on the right. Below the header, the word 'Login' is centered. There are two input fields: 'Username:' and 'Password:'. Below the password field is a 'Login' button. At the bottom of the page, there is a small copyright notice: 'Copyright © Pepwave. All rights reserved.'

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4. After successful login, the **Dashboard** of the Web Admin Interface will be displayed:

| WAN Connection Status | | |
|--|---|----------------------------|
| Priority 1 (Highest) | | |
| 1 WAN 1 | Connected | Details |
| 2 WAN 2 | No Cable Detected | Details |
| Priority 2 | | |
| 1 Cellular 1 | No SIM Card Detected Reload SIM | Details |
| 2 Cellular 2 | No SIM Card Detected Reload SIM | Details |
| Priority 3 | | |
| Drag desired (Priority 3) connections here | | |
| Disabled | | |
| Wi-Fi WAN | Disabled | Details |
| LAN Interface | | |
| Router IP Address: 192.168.50.1 | | |
| Wi-Fi AP | | |
| | | ON Details |
| PEPWAVE_DEF1 | | |
| Device Information | | |
| Model: | Pepwave MAX HD2 | |
| Firmware: | 6.1.0 build 2472 | |
| Uptime: | 0 day 0 hour 17 minutes | |
| CPU Load: | 9% | |
| Throughput: | ↓ 0.0 Mbps ↑ 0.1 Mbps | |

The **Dashboard** shows the current WAN, LAN, Wi-Fi AP settings and status. Here, you can change priority of WAN connections and switch on / off Wi-Fi AP. For further information on how to set up these connections, please refer to Section 0 and 8.2.

Device Information shows the details about the device, including Model name, Firmware version and Uptime. For further information, please refer to Section 21.

Important Note

Configuration changes (e.g. WAN, LAN, Admin settings, etc.) will only take effect after clicking the **Save** button at the bottom of each page. The **Apply Changes** button causes the changes to be saved and applied.

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PEPWAVE *MAX* mobile router

8 Configuration of LAN Interface(s)

8.1 Basic Settings

The LAN Interface settings are located in **Network > LAN > Basic Settings**

| IP Settings | |
|-------------|----------------------------------|
| IP Address | 192.168.50.1 255.255.255.0 (/24) |

| IP Settings | |
|-------------------|---|
| IP Address | The IP address of the Pepwave MAX on LAN. |
| Speed | <p>This setting specifies the speed of the LAN Ethernet Port.</p> <p>By default, Auto is selected and the appropriate data speed is automatically detected by the Pepwave MAX.</p> <p>In the event of negotiation issues, the port speed can be manually specified to circumvent the issues. You can also choose whether or not to advertise the speed to the peer by selecting the Advertise Speed checkbox.</p> |

| Port Settings | |
|---------------|------|
| Speed | Auto |

| Port Settings | |
|---------------|---|
| Speed | <p>This is the port speed of the LAN interface. It should be set to the same speed as the connected device to avoid any port negotiation problem.</p> <p>When a static speed is set, you may choose whether to advertise its speed to the peer device or not. <i>Advertise Speed</i> is selected by default. You can choose not to advertise the port speed if the port has difficulty in negotiating with the peer device.</p> |











| Drop-In Mode Settings | |
|---|--|
| Enable | <input checked="" type="checkbox"/> |
| WAN for Drop-In Mode | WAN 1 |
| Share Drop-In IP | <input checked="" type="checkbox"/> |
| Shared IP Address | 255.255.255.0 (/24) |
| WAN Default Gateway | |
| WAN DNS Servers | DNS server 1: <input type="text"/> DNS server 2: <input type="text"/> |
| NOTE: The DHCP Server Settings will be overwritten. | |
| The following WAN 1 settings will be overwritten: Connection Method, MTU, Health Check, Additional Public IP, and Dynamic DNS Settings. | |
| The PPTP Server will be disabled. | |
| Tip: please review the DNS Forwarding setting under the Service Forwarding section. | |

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| Drop-in Mode Settings | |
|--|---|
| Enable | <p>Drop-in Mode eases the installation of the Peplink MAX on a live network between the existing firewall and router, such that no configuration changes are required on existing equipment. Check the box to enable the Drop-in Mode feature.</p> <p>Please refer to SectionError! Reference source not found., Error! Reference source not found.for details.</p> |
| WAN for Drop-In Mode | Select the WAN port to be used for Drop-in Mode. If WAN 1 with LAN Bypass is selected, the High Availability feature will be disabled automatically. |
| Shared Drop-In Mode^A | <p>When this option is enabled, the passthrough IP address will be used to connect to WAN hosts (email notification, remote syslog, etc.). The MAX Router will listen for this IP address when WAN hosts access services provided by the MAX Router (Web Admin access from the WAN, DNS server requests, etc.).</p> <p>To connect to hosts on the LAN (email notification, remote syslog, etc.), the default gateway address will be used. The MAX Router will listen for this IP address when LAN hosts access services provided by the MAX Router (Web Admin access from the WAN, DNS proxy, etc.).</p> |
| Shared IP Address^A | Access to this IP address will be passed through to the LAN port if this device is not serving the service being accessed. The shared IP Address will be used in connecting to hosts on the WAN (e.g. email notification, remote syslog, etc.) The device will also listen on the IP address when hosts on the WAN access services served on this device (e.g. web admin accesses from WAN, DNS server, etc.) |
| WAN Default Gateway | Enter the WAN router's IP address in this field. If there are more hosts in addition to the router on the WAN segment, check the I have other host(s) on WAN segment box and enter the IP address of the hosts that need to access LAN devices or be accessed by others. |
| WAN DNS Servers | Enter the selected WAN's corresponding DNS server IP addresses. |



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



| DHCP Server Settings | | | | | | | | | |
|------------------------------------|---|---|--|--------|-------------|--------------------------------|--|------------------------------------|--|
| DHCP Server |  | <input checked="" type="checkbox"/> Enable | | | | | | | |
| IP Range |  | 192.168.50.10 - 192.168.50.200 | | | | | | | |
| Subnet Mask |  | 255.255.255.0 (/24)  | | | | | | | |
| Lease Time |  | 1 Days 0 Hours 0 Mins | | | | | | | |
| DNS Servers |  | <input checked="" type="checkbox"/> Assign DNS server automatically | | | | | | | |
| WINS Server |  | <input checked="" type="checkbox"/> Assign WINS server <input type="radio"/> Built-in <input checked="" type="radio"/> External WINS server 1: <input type="text"/> WINS server 2: <input type="text"/> | | | | | | | |
| Extended DHCP Option |  | <table border="1"> <thead> <tr> <th>Option</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="text-align: center;"><i>No Extended DHCP Option</i></td> </tr> <tr> <td colspan="2" style="text-align: center;"><input type="button" value="Add"/></td> </tr> </tbody> </table> | | Option | Value | <i>No Extended DHCP Option</i> | | <input type="button" value="Add"/> | |
| Option | Value | | | | | | | | |
| <i>No Extended DHCP Option</i> | | | | | | | | | |
| <input type="button" value="Add"/> | | | | | | | | | |
| DHCP Reservation |  | <table border="1"> <thead> <tr> <th>Name</th> <th>MAC Address</th> <th>Static IP</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>  | | Name | MAC Address | Static IP | | | |
| Name | MAC Address | Static IP | | | | | | | |
| | | | | | | | | | |

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DHCP Server Settings

| | |
|-----------------------------------|--|
| DHCP Server | <p>When this setting is enabled, the DHCP server of thePepwave MAX automatically assigns an IP address to each computer that is connected via LAN and is configured to obtain an IP address via DHCP.</p> <p>The Pepwave MAX's DHCP server can prevent IP address collision on the LAN.</p> |
| IP Range & Subnet Mask | <p>Thesettings allocate a range of IP address that will be assigned to LAN computers by the DHCP server of thePepwave MAX.</p> |
| Lease Time | <p>This setting specifies the length of time throughout which an IP address of a DHCP client remains valid. Upon expiration of the Lease Time, the assigned IP address will no longer be valid and the renewal of the IP address assignment will be required.</p> |
| DNS Servers | <p>This option allows you to input the DNS server addresses to be offered to the DHCP clients. If Assign DNS server automatically is selected, the Pepwave MAX's built-in DNS server address (i.e. LAN IP address) will be offered.</p> |
| WINS Server | <p>This option allows you to specify the Windows Internet Name Service (WINS) server. You may choose to use the built-in WINS server or external WINS servers.</p> <p>When this unit is connected using SpeedFusion™, other VPN peers can share this unit's built-in WINS server by entering this unit's LAN IP address in their DHCP WINS Servers setting. Therefore, all PC clients in the VPN can resolve the NetBIOS names of other clients in remote peers.</p> <p>If you have enabled this option, a list of WINS clients will be displayed at Status > WINS Clients.</p> |
| Extended DHCP Option | <p>In addition to standard DHCP options (e.g. DNS server address, gateway address, subnet mask), you can specify the value of additional extended DHCP options, asdefined in RFC 2132. With these extended options enabled, you can pass additional configuration information to LAN hosts.</p> <p>To define an extended DHCP option, click the Add button, choose the option that you want to define and enter its value. For values that are in IP address list format, you can enter one IP address per line in the provided text area input control. Each option is allowed to be defined once only.</p> |
| DHCP Reservation | <p>This setting reserves the assignment of fixed IP addresses for a list of computers on the LAN. The computers to be assigned fixed IP addresses on the LAN are identified by their MAC addresses.</p> <p>The fixed IP address assignment is displayed as a cross-reference list between the computers' names, MAC addresses and fixed IP addresses.</p> <p>Name (an optional field) allows you to specifya name to represent the device. MAC addresses should be in the format of 00:AA:BB:CC:DD:EE</p> <p>Press  to create a new record. Press  to remove a record</p> <p>Reserved clients information can be imported from the Client List, located at Status > Client List. For more details, please refer to section 21.3.</p> |

| Static Route Settings | | | |
|-----------------------|---|---------------------|---|
| Static Route |  | Destination Network | Subnet Mask |
| | | | Gateway |
| | | 255.255.255.0 (/24) |  |

Static Route Settings



| | |
|---------------------|---|
| Static Route | <p>This table is for defining static routing rules for the LAN segment. A static route consists of the network address, subnet mask, and gateway address. The address and subnet mask</p> |
|---------------------|---|

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values are in w.x.y.zformat.




The local LAN subnet and subnets behind the LAN will be advertised to the VPN. Remote routes sent over the VPN will also be accepted. Any VPN member will be able to route to the local subnets.

Press  to create a new route. Press  to remove a route.

| WINS Server Settings | |
|----------------------|--------------------------|
| Enable | <input type="checkbox"/> |

WINS Server Settings

Enable Check the box to enable the WINS Server. A list of WINS clients will be displayed at **Status > WINS Clients**.



| DNS Proxy Settings | | | | | | | |
|-----------------------------------|---|---|------------|--|--|--|---|
| Enable | <input checked="" type="checkbox"/> | | | | | | |
| DNS Caching | <input type="checkbox"/> | | | | | | |
| Include Google Public DNS Servers | <input type="checkbox"/> | | | | | | |
| Local DNS Records | <table border="1"> <thead> <tr> <th>Host Name</th> <th>IP Address</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> | Host Name | IP Address | | | |  |
| Host Name | IP Address | | | | | | |
| | |  | | | | | |

DNS Proxy Settings

| | |
|--|---|
| Enable | <p>A check box to enable to DNS Proxy feature.</p> <p>Network > LAN > DNS Proxy Settings table</p> <p>A DNS proxy server can be enabled to serve DNS requests originating from LAN/PPTP/SpeedFusion™ peers. Requests are forwarded to the DNS servers/resolvers defined in each WAN connection</p> |
| DNS Caching | <p>This field is to enable DNS caching on the built-in DNS proxy server. When the option is enabled, queried DNS replies will be cached until the records' TTL has been reached. This feature can help improve the DNS lookup time. However, it cannot return the most updated result for those frequently updated DNS records.</p> <p>By default, it is disabled.</p> |
| Include Google Public DNS Servers | <p>When this option is enabled, the DNS proxy server will also forward DNS requests to Google's Public DNS Servers in addition to the DNS servers defined in each WAN. This could increase the DNS service's availability.</p> <p>Default: disabled</p> |
| Local DNS Records | <p>This table is for defining custom local DNS records.</p> <p>A static local DNS record consists of a Host Name and an IP Address. When looking up the Host Name from the LAN to LAN IP of the Pepwave MAX, the corresponding IP Address will be returned.</p> |

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Press  to create a new record. Press  to remove a record.

Check the box to enable the WINS Server. A list of WINS clients will be displayed at **Network > LAN > DNS Proxy Settings > DNS Resolvers**.

This field specifies which DNS resolvers will receive forwarded DNS requests. If no WAN/VPN/LAN DNS resolver is selected, all of the WAN's DNS resolvers will be selected.

LAN DNS

Resolver Settings

If a SpeedFusion™ peer is selected, you may enter the VPN peer's DNS resolver IP address(es).

Queries will be forwarded to the selected connections' resolvers. If all of the selected connections are down, queries will be forwarded to all resolvers on healthy WAN connections.

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8.2 Captive Portal

The Captive Portal serves as gateway that clients have to pass if they wish to access the internet using your router. To configure, navigate to **Network >Captive Portal** to see the following screen:

| Captive Portal Settings | |
|-------------------------|---|
| Enable | <input checked="" type="checkbox"/> edit Guest_LAN (25) |
| Access Mode | <input checked="" type="radio"/> Open Access <input type="radio"/> User Authentication |
| Access Quota | 720 mins (0: Unlimited) 0 MB (0: Unlimited) |
| Quota Reset Time | <input checked="" type="radio"/> Daily at 00 :00 <input type="radio"/> 1440 minutes after quota reached |
| Splash Page | <input checked="" type="radio"/> Built-in <input type="radio"/> External, URL: <input type="text" value="http://"/> |

Captive Portal Settings

Apply On

Clicking the **edit** button trigger a dialogue where you can choose which LAN / VLAN to apply your captive portal.

LAN / VLAN ✖

(LAN)

Guest_LAN (25)

Click all LAN / VLAN that you wish to apply the captive portal to.

Access Mode

Click **Open Access** to allow clients to freely access your router. Click **User Authentication** to force your clients to authenticate before accessing your router.

Radius Server

This authenticates your clients through a Radius Server. Upon selecting this option, you will see the following fields:

| | | | |
|--------------------------|----------------------|---|--|
| Authentication | RADIUS Server ▾ | | |
| Auth Server | <input type="text"/> | Port 1812 | <input type="button" value="Default"/> |
| Auth Server Secret | <input type="text"/> | <input checked="" type="checkbox"/> Hide Characters | |
| Accounting Server | <input type="text"/> | Port 1813 | <input type="button" value="Default"/> |
| Accounting Server Secret | <input type="text"/> | <input checked="" type="checkbox"/> Hide Characters | |
| Network Connection | LAN ▾ | | |

Fill in the necessary information to complete your connection to the server and enable authentication.

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This authenticates your clients through a LDAP Server. Upon selecting this option, you will see the following fields:

LDAP Server

| | |
|----------------|--|
| Authentication | LDAP Server |
| LDAP Server | <input type="text"/> Port 389 <input type="button" value="Default"/> |
| | <input type="checkbox"/> Use DN/Password to bind to LDAP Server |
| Base DN | <input type="text"/> |
| Base Filter | <input type="text"/> |

Fill in the necessary information to complete your connection to the server and enable authentication.

Access Quota

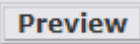


Set a time and data cap to each user's Internet usage.

Quota Reset Time

This menu determines how your usage quota resets. Setting it to **daily** will reset it at a specified time every day. Setting a number of **minutes after quota reached** establish a timer for each user that begins after the quota has been reached.

Splash Page

Here, you can choose between using the MAX router's built-in captive portal and redirecting clients to a URL you define.

The Portal Customization menu has two options:  and . Clicking will result in a pop-up previewing the captive portal that your clients will see. Clicking  will result in the appearance of following menu:

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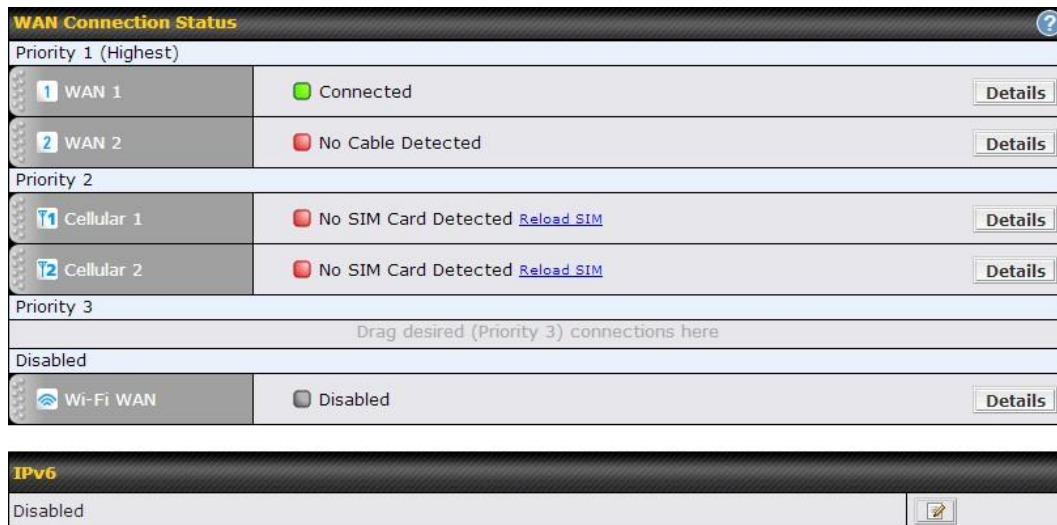
| Portal Customization | |
|----------------------|--|
| Logo Image | <input checked="" type="radio"/> No image [Use default Logo Image] <input type="radio"/> Use default Logo Image <input type="radio"/> <input type="button" value="Choose File"/> No file chosen <small>NOTE: Size max 512KB. Supported images types: JPEG, PNG and GIF.</small> |
| Message | <div style="border: 1px solid gray; height: 100px;"></div> |
| Terms & Conditions | <div style="border: 1px solid gray; height: 150px;">[Use default Terms & Conditions]</div> |
| Custom Landing Page | <input checked="" type="checkbox"/> <input type="text" value="http://"/> |

| Portal Customization | |
|-------------------------------|--|
| Logo Image | Click the Choose File button to select an logo to use for the built-in portal |
| Message | If you have any additional messages for your users, place it on this field. |
| Terms & Conditions | If you would like to use your own set of terms and conditions, please place it here. If left empty, the built-in portal will display the default terms and conditions. |
| Custom Landing Page | Fill in this field to redirect clients to an external URL. |

9 Configuration of WAN Interface(s)

The WAN Interface settings are located at: **Network > WAN**

To reorder different WANs' priority, just drag on the appropriate WAN by holding the left mouse button, move it to the desired priority (the first one would be the highest priority, the second one would be lower priority and so on) and drop it by releasing the mouse button.



To disable a particular WAN connection, just drag on the appropriate WAN by holding the left mouse button, move it to the **Disabled** row and drop it by releasing the mouse button. You can also do the above priority setting on the **Dashboard**, please refer to Section 0 for information. Click the **Details** button in the corresponding row of connection to modify the connection setting.

Important Note

Connection Details will be changed and become effective right after clicking the **Save and Apply** button.

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9.1 Ethernet WAN

From **Network > WAN**, choose a WAN connection and click the **Details** button:

| WAN Port | |
|---------------------|--|
| WAN Connection Name | WAN 1 Default |
| Connection Method | <input type="radio"/> DHCP |
| Routing Mode | <input checked="" type="radio"/> NAT |
| IP Address | 10.8.9.86 |
| Subnet Mask | 255.255.0.0 |
| Default Gateway | 10.8.8.1 |
| DNS Servers | <input checked="" type="checkbox"/> Obtain DNS server address automatically 10.8.8.1 <input type="checkbox"/> Use the following DNS server address(es) DNS Server 1: <input type="text"/> DNS Server 2: <input type="text"/> |
| Hostname (Optional) | <input type="text"/> <input type="checkbox"/> Use custom hostname |

WAN Port –1

WAN

Connection Name This field is for defining a name to represent this WAN connection.

There are three possible connection methods for Ethernet WAN:

Connection Method



- DHCP
- Static IP
- PPPoE

The connection method and details are determined by, and can be obtained from, the ISP.

See the Sections **9.1.1**, **9.1.2**, and **9.1.3** for details of each connection method.

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| | |
|------------------------------|--|
| Standby State |  <input checked="" type="radio"/> Remain connected <input type="radio"/> Disconnect |
| Upstream Bandwidth | <input type="text" value="1000"/> <input type="text" value="Mbps"/> |
| Downstream Bandwidth | <input type="text" value="1000"/> <input type="text" value="Mbps"/> |
| Health Check Settings | |
| Health Check Method |  <input type="text" value="Disabled"/> <small>Health Check disabled. Network problem cannot be detected.</small> |
| Dynamic DNS Service Provider | <input type="text" value="Disabled"/> |

WAN Port – 2

| | |
|-------------------------------------|--|
| Standby State | <p>This setting specifies the state of the WAN connection. The available options are Remain connected and Disconnect.</p> <p>The default state is Remain Connected.</p> |
| Upstream Bandwidth | <p>This setting specifies the data bandwidth in the outbound direction from the LAN through the WAN interface.</p> |
| Downstream Bandwidth | <p>This setting specifies the data bandwidth in the inbound direction from the WAN interface to the LAN.</p> <p>This value is referenced as the default weight value when using the algorithm Least Used, or the algorithm Persistence (Auto) in Outbound Policy with Managed by Custom Rules chosen (see Section 13.2).</p> |
| Health Check Method | <p>This setting specifies the health check method for the WAN connection. The value of method can be configured as Disabled, Ping or DNS Lookup.</p> <p>The default method is Disabled.</p> <p>See Section 9.4 for configuration details.</p> |
| Dynamic DNS Service Provider | <p>This setting specifies the dynamic DNS service provider to be used for the WAN based on supported dynamic DNS service providers:</p> <ul style="list-style-type: none"> • changeip.com • dyndns.org • no-ip.org • tzo.com • DNS-O-Matic <p>Select Disabled to disable this feature.</p> <p>See Section 1.1 for configuration details.</p> |

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| | | |
|-----------------------------|---|--|
| Bandwidth Allowance Monitor |  | <input type="checkbox"/> Enable |
| Port Speed |  | Auto  |
| MTU |  | <input type="radio"/> Auto <input checked="" type="radio"/> Custom Value: <input type="text" value="1440"/> <input type="button" value="Default"/> |

WAN Port – 3

Bandwidth Allowance Monitor

This option allows you to enable bandwidth usage monitoring on this WAN connection for each billing cycle. When this is not enabled, bandwidth usage of each month is still being tracked but no action will be taken.

See Section 9.5 for configuration details. (Action, Start Day, Monthly Allowance)

Port Speed

This setting specifies port speed and duplex configurations of the WAN Port.

By default, **Auto** is selected and the appropriate data speed is automatically detected by the Pepwave MAX.

In the event of negotiation issues, the port speed can be manually specified to circumvent the issues. You can also choose whether or not to advertise the speed to the peer by selecting the **Advertise Speed** checkbox.

MTU

This setting specifies the Maximum Transmission Unit.

By default, MTU is set to **Custom 1440**.

You may adjust the MTU value by editing the text field. Click **Default** to restore the default MTU value. Select **Auto** and the appropriate MTU value will be automatically detected. The auto-detection will run each time when the WAN connection establishes.

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| | | | | | | | | | | | |
|---|--|------------|----------------------|-------------|--|----------------------------------|--|---|--|---------------------------------------|--|
| MSS | <input checked="" type="radio"/> Auto <input type="radio"/> Custom Value: <input type="text"/> | | | | | | | | | | |
| MAC Address Clone | 00 : 1A : DD : BD : 1D : 81 <input type="button" value="Default"/> | | | | | | | | | | |
| VLAN | <input type="checkbox"/> | | | | | | | | | | |
| Reply to ICMP PING | <input checked="" type="radio"/> Yes <input type="radio"/> No | | | | | | | | | | |
| Additional Public IP Address | <table border="1"> <tr> <td>IP Address</td> <td><input type="text"/></td> </tr> <tr> <td>Subnet Mask</td> <td>255.255.255.0 (/24) <input type="button" value="v"/></td> </tr> <tr> <td colspan="2" style="text-align: center;"><input type="button" value="↓"/></td> </tr> <tr> <td colspan="2"><div style="border: 1px solid gray; height: 20px;"></div></td> </tr> <tr> <td colspan="2" style="text-align: right;"><input type="button" value="Delete"/></td> </tr> </table> | IP Address | <input type="text"/> | Subnet Mask | 255.255.255.0 (/24) <input type="button" value="v"/> | <input type="button" value="↓"/> | | <div style="border: 1px solid gray; height: 20px;"></div> | | <input type="button" value="Delete"/> | |
| IP Address | <input type="text"/> | | | | | | | | | | |
| Subnet Mask | 255.255.255.0 (/24) <input type="button" value="v"/> | | | | | | | | | | |
| <input type="button" value="↓"/> | | | | | | | | | | | |
| <div style="border: 1px solid gray; height: 20px;"></div> | | | | | | | | | | | |
| <input type="button" value="Delete"/> | | | | | | | | | | | |

WAN Port – 5

MSS

This setting should be configured based on the maximum payload size that the local system can handle. The MSS (Maximum Segment Size) is computed from the MTU minus 40 bytes for TCP over IPv4.

If MTU is set to Auto, the MSS will also be set automatically.

By default, MSS is set to **Auto**.

MAC Address Clone

This setting allows you to configure the MAC address.

Some service providers (e.g. cable providers) identify the client's MAC address and require the client to always use the same MAC address to connect to the network. In such cases, change the WAN interface's MAC address to the original client PC's one via this field.

The default MAC Address is a unique value assigned at the factory. In most cases, the default value is sufficient. Clicking the Default button restores the MAC Address to the default value.

VLAN

Click the square if you wish to enable VLAN functionality and enable multiple broadcast domains. Once you enable VLAN, you will be able to enter a name for your network.

Reply to ICMP PING

If this field is disabled, the WAN connection will not respond to ICMP PING requests.

By default, this is **enabled**.

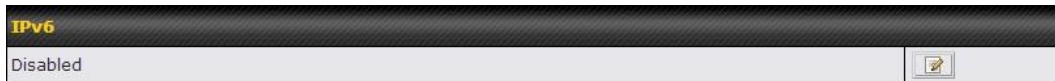
Additional Public IP Address

The IP Address List represents the list of fixed Internet IP addresses assigned by the ISP, in the event that more than one Internet IP addresses are assigned to this WAN connection.

Enter the fixed Internet IP addresses and the corresponding subnet mask, and then click the Down Arrow button to populate IP address entries to the IP Address List.

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IPv6

IPv6

IPv6 support can be enabled on one of the available Ethernet WAN ports. On this screen, you can choose which WAN will support IPv6.

To enable IPv6 support on a WAN, the WAN router must respond to Stateless Address Auto configuration advertisements and DHCPv6 requests. IPv6 clients on the LAN will acquire their IPv6, gateway, and DNS server addresses from it. The device will also acquire an IPv6 address for performing ping/traceroute checks and accepting web admin accesses.

Note: This feature is only available on the Pepwave MAX 700,HD2 and HD2 IP67.

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9.1.1 DHCP Connection

The DHCP connection method is suitable if the ISP provides an IP address automatically by DHCP (e.g. Satellite Modem, WiMAX Modem, Cable, Metro Ethernet, etc.).

There are three possible connection methods:

1. DHCP
2. Static IP
3. PPPoE

| | |
|---------------------|--|
| Connection Method |  DHCP |
| Routing Mode |  <input checked="" type="radio"/> NAT |
| IP Address | 10.10.10.123 |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 10.10.10.1 |
| DNS Servers | <input checked="" type="checkbox"/> Obtain DNS server address automatically <input type="checkbox"/> Use the following DNS server address(es) DNS Server 1: <input type="text"/> DNS Server 2: <input type="text"/> |
| Hostname (Optional) | <input type="text"/> <input type="checkbox"/> Use custom hostname |



| DHCP Settings | |
|---|---|
| Routing Mode | This is to substitute the real address in a packet with a mapped address that is routable on the destination network |
| IP Address/ Subnet Mask/ Default Gateway | This information is obtained from the ISP automatically. |
| DNS Servers | <p>Each ISP may provide a set of DNS servers for DNS lookups. This setting specifies the DNS (Domain Name System) Servers to be used when a DNS lookup is routed through this connection.</p> <p>Selecting Obtain DNS server address automatically results in the DNS Servers to be assigned by the WAN DHCP Server to be used for outbound DNS lookups over the connection. (The DNS Servers are obtained along with the WAN IP address assigned from the DHCP server.)</p> <p>When Use the following DNS server address(es) is selected, you may enter custom DNS server addresses for this WAN connection into the DNS Server 1 and DNS Server 2 fields.</p> |
| Hostname (Optional) | If your service provider's DHCP server requires you to supply a hostname value upon acquiring an IP address, you may enter the value here. If your service provider does not provide you with the value, you can safely bypass this option. |

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9.1.2 Static IPConnection

This Static IP connection method is suitable if ISP provides a static IP address to connect directly.

| | |
|-------------------|--|
| Connection Method |  Static IP ▾ |
| Routing Mode |  <input checked="" type="radio"/> NAT |
| IP Address | <input type="text"/> |
| Subnet Mask | 255.255.255.0 (/24) ▾ |
| Default Gateway | <input type="text"/> |
| DNS Servers | <input checked="" type="checkbox"/> Use the following DNS server address(es) DNS Server 1: <input type="text"/> DNS Server 2: <input type="text"/> |



| Static IP Settings | |
|---|--|
| Routing Mode | This is to substitute the real address in a packet with a mapped address that is routable on the destination network |
| IP Address / Subnet Mask / Default Gateway | <p>These settings allow you to specify the information required in order to communicate on the Internet via a fixed Internet IP address.</p> <p>The information is typically determined by and can be obtained from the ISP.</p> |
| DNS Servers | <p>Each ISP may provide a set of DNS servers for DNS lookups. This field specifies the DNS (Domain Name System) Servers to be used when a DNS lookup is routed through this connection.</p> <p>You can input the ISP provided DNS server addresses into the DNS Server 1 and DNS Server 2 fields. If no address is entered here, this link will not be used for DNS lookups.</p> |

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9.1.3 PPPoE Connection

This connection method is suitable if ISP provides login ID/ password to connect via PPPoE.

| | |
|-------------------------|---|
| Connection Method |  PPPoE ▾ |
| Routing Mode |  <input checked="" type="radio"/> NAT |
| IP Address | 10.10.10.123 |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 10.10.10.1 |
| PPPoE User Name | <input type="text"/> |
| PPPoE Password | <input type="password"/> |
| Confirm PPPoE Password | <input type="password"/> |
| Service Name (Optional) | <input type="text"/> Leave it blank unless it's provided by ISP |
| DNS Servers | <input type="checkbox"/> Obtain DNS server address automatically <input type="checkbox"/> Use the following DNS server address(es) DNS Server 1: <input type="text"/> DNS Server 2: <input type="text"/> |

| PPPoE Settings | |
|---|--|
| Routing Mode | This is to substitute the real address in a packet with a mapped address that is routable on the destination network |
| IP Address / Subnet Mask / Default Gateway | This information is obtained from the ISP automatically. |
| PPPoE User Name / Password | Enter the required information in these fields in order to connect via PPPoE to the ISP. The parameter values are determined by and can be obtained from the ISP. |
| Confirm PPPoE Password | Verify your password by entering it again in this field. |
| Service Name | Service Name is provided by the ISP. Note: Leave this field blank unless it is provided by your ISP. |
| DNS Servers | <p>Each ISP may provide a set of DNS servers for DNS lookups. This setting specifies the DNS (Domain Name System) Servers to be used when a DNS lookup is routed through this connection.</p> <p>Selecting Obtain DNS server address automatically results in the DNS Servers assigned by the PPPoE server to be used for outbound DNS lookups over the WAN connection. (The DNS Servers are obtained along with the WAN IP address assigned from the PPPoE server.)</p> <p>When Use the following DNS server address(es) is selected, you can put custom DNS server addresses for this WAN connection into the DNS Server 1 and DNS Server 2 fields.</p> |

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9.2 Cellular WAN

Network > WAN > Click on Detail [Details](#)

| WAN Connection Status | | |
|--|---|-------------------------|
| Priority 1 (Highest) | | |
| 1 WAN 1 | <input checked="" type="checkbox"/> Connected | Details |
| 2 WAN 2 | <input checked="" type="checkbox"/> Connected | Details |
| Priority 2 | | |
| 1 Cellular 1 | Standby | Details |
| Priority 3 | | |
| Drag desired (Priority 3) connections here | | |
| Disabled | | |
| Wi-Fi WAN | <input type="checkbox"/> Disabled | Details |
| 2 Cellular 2 | <input type="checkbox"/> Disabled | Details |

(Available on the Pepwave BR1, MAX HD2, and HD2 IP67 only)

| Cellular 1 Status | |
|-------------------|----------------------|
| IMSI | No SIM Card Detected |
| MEID | HEX: DEC: |
| ESN | |
| IMEI | |

| Cellular Status | |
|-----------------|--|
| IMSI | This is the International Mobile Subscriber Identity which uniquely identifies the SIM card. This is applicable to 3G modems only. |
| MEID | The Pepwave MAX supports both HSPA and EV-DO. For Sprint or Verizon Wireless EV-DO users, a unique MEID identifier code (in hexadecimal format) is used by the carrier to associate the EV-DO device with the user. This information is presented in hex and decimal format. |
| ESN | This serves the same purpose as MEID HEX but uses an older format. |
| IMEI | This is the unique ID for identifying the modem in GSM/HSPA mode. |

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| WAN Connection Settings | |
|-------------------------|---|
| WAN Connection Name | Cellular 1 Default |
| Network Mode | <input checked="" type="radio"/> HSPA <input type="radio"/> Sprint,EV-DO <input type="radio"/> Verizon Wireless,EV-DO |
| Routing Mode | <input checked="" type="radio"/> NAT <input type="radio"/> IP Forwarding |

WAN Connection Settings


WAN Connection Name


This field is for defining a name to represent this WAN connection.

Network Mode

Users have to specify the Network they are on accordingly.


Routing Mode

This option allows you to select the routing method to be used in routing IP frames via the WAN connection. The mode can be either *NAT* (Network Address Translation) or *IP Forwarding*. Click the  button to enable IP Forwarding.

| Cellular Settings | |
|--|--|
| 3G/2G  | Auto |
| Authentication | Auto |
| Data Roaming | <input type="checkbox"/> |
| Operator Settings | <input checked="" type="radio"/> Auto <input type="radio"/> Custom |
| APN | |
| Username | |
| Password | |
| SIM PIN (Optional) | |

Cellular Settings

3G/2G

Band selection to restrict cellular on particular band. Click on the  button to enable the selection of specific bands.

Data Roaming

This checkbox enables data roaming on this particular SIM card. Please check your service provider's data roaming policy before proceeding.

Operator Settings

This setting applies to 3G / EDGE / GPRS modem only. It does not apply to EVDO / EVDO Rev. A modem.

This allows you to configure the APN settings of your connection. If **Auto** is selected, the mobile operator should be detected automatically. The connected device will be configured and connection will be made automatically afterwards. If there is any difficulty in making connection, you may select **Custom** to enter your carrier's **APN, Login,**

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Password, and Dial Number settings manually. The correct values can be obtained from your carrier.

The default and recommended Operator Settings is **Auto**.

APN / Login / Password / SIM PIN

When **Auto** is selected, the information in these fields will be filled automatically.

Select the option **Custom** and you may customize these parameters. The parameters values are determined by and can be obtained from the ISP.

| General Settings | |
|------------------|--|
| DNS Servers | <input checked="" type="checkbox"/> Obtain DNS server address automatically <input type="checkbox"/> Use the following DNS server address(es) DNS Server 1: <input type="text"/> DNS Server 2: <input type="text"/> |
| Standby State | <input checked="" type="radio"/> Remain Connected <input type="radio"/> Disconnected |
| Idle Disconnect | <input checked="" type="checkbox"/> <input type="text" value="3"/> minutes <small>Time value is global. A change will affect all WAN profiles.</small> |

General Settings

DNS Servers

Each ISP may provide a set of DNS servers for DNS lookups. This setting specifies the DNS (Domain Name System) Servers to be used when a DNS lookup is routed through this connection.

Selecting **Obtain DNS server address automatically** results in the DNS Servers assigned by the PPPoE server to be used for outbound DNS lookups over the WAN connection. (The DNS Servers are obtained along with the WAN IP address assigned from the PPPoE server.)

When **Use the following DNS server address(es)** is selected, you can put custom DNS server addresses for this WAN connection into the **DNS Server 1 and DNS Server 2** fields.

Standby State

This option allows you to choose whether to remain the connection connected or disconnected when this WAN connection is no longer in the highest priority and has entered the standby state. When **Remain connected** is chosen, upon bringing up this WAN connection to active, it will be immediately available for use.

Idle Disconnect

When Internet traffic is not detected within the user specified timeframe, the modem will automatically disconnect. Once the traffic is resumed by the LAN host, the connection will be re-activated,

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| Health Check Settings | |
|-----------------------|--------------|
| Health Check Method | SmartCheck |
| Timeout | 5 second(s) |
| Health Check Interval | 10 second(s) |
| Health Check Retries | 3 |
| Recovery Retries | 3 |

| Health Check Settings | |
|------------------------------|--|
| Health Check Method | This setting allows you to specify the health check method for the Cellular connection. The available options are Disabled , Ping , DNS Lookup , HTTP , and SmartCheck . The default method is DNS Lookup . See Section 9.4 for configuration details. |
| Timeout | If a health check test cannot be completed within the specified amount of time, the test will be treated as failed. |
| Health Check Interval | This is the time interval between each health check test. |
| Health Check Retries | This is the number of consecutive check failures before treating a connection as down. |
| Recovery Retries | This is the number of responses required after a health check failure before treating a connection as up again. |

| Dynamic DNS Settings | |
|------------------------------|----------|
| Dynamic DNS Service Provider | Disabled |

| Dynamic DNS Settings | |
|-------------------------------------|---|
| Dynamic DNS Service Provider | <p>This setting specifies the dynamic DNS service provider to be used for the WAN based on supported dynamic DNS service providers:</p> <ul style="list-style-type: none">• changeip.com• dyndns.org• no-ip.org• tzo.com• DNS-O-Matic <p>Select Disabled to disable this feature. See Section 1.1 for configuration details.</p> |

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| Bandwidth Allowance Settings | |
|------------------------------|---|
| Bandwidth Allowance Monitor | <input type="checkbox"/> |
| MTU | 1428 <input type="button" value="Default"/> |

| Bandwidth Allowance Settings | |
|------------------------------------|--|
| Bandwidth Allowance Monitor | <p>This option allows you to enable bandwidth usage monitoring on this WAN connection for each billing cycle. When this is not enabled, bandwidth usage of each month is still being tracked but no action will be taken.</p> <p>See Section 9.5 for configuration details.</p> |
| MTU | <p>This setting specifies the Maximum Transmission Unit.</p> <p>By default, MTU is set to Custom 1440.</p> <p>You may adjust the MTU value by editing the text field. Click Default to restore the default MTU value. Select Auto and the appropriate MTU value will be automatically detected. The auto-detection will run each time when the WAN connection establishes</p> |

Wi-Fi WAN

Network>WAN>Click on **Wi-Fi WAN**

| WAN Connection Status | | |
|---|---|--|
| Priority 1 (Highest) | | |
| 1 WAN 1 | <input checked="" type="checkbox"/> Connected | <input type="button" value="Details"/> |
| 2 WAN 2 | <input checked="" type="checkbox"/> Connected | <input type="button" value="Details"/> |
| Priority 2 | | |
| 1 Cellular 1 | <input checked="" type="checkbox"/> Standby | <input type="button" value="Details"/> |
| Priority 3 | | |
| Drag desired (Priority 3) connections here | | |
| Disabled | | |
| <input checked="" type="checkbox"/> Wi-Fi WAN | <input type="checkbox"/> Disabled | <input type="button" value="Details"/> |
| 1 Cellular 2 | <input type="checkbox"/> Disabled | <input type="button" value="Details"/> |

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| Wi-Fi WAN | |
|------------------------------|--|
| WAN Connection Name | Wi-Fi WAN Default |
| Standby State | <input checked="" type="radio"/> Remain connected <input type="radio"/> Disconnect |
| Health Check Settings | |
| Health Check Method | Disabled ? <small>Health Check disabled. Network problem cannot be detected.</small> |
| Dynamic DNS Settings | |
| Dynamic DNS Service Provider | Disabled |
| Bandwidth Allowance Monitor | <input type="checkbox"/> Enable |
| MTU | <input type="radio"/> Auto <input checked="" type="radio"/> Manual Value: 1500 Default |
| Connect to Any Open Mode AP | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| Reply to ICMP PING | <input checked="" type="radio"/> Yes <input type="radio"/> No |

| Wi-Fi Connection Profiles ? | | |
|--|-------------------|----------------|
| Network Name (SSID) | Security | |
| Hotspot 2 | WPA/WPA2-Personal | ✖ |
| Hotspot 1 | Open | ✖ |

[Create Profile...](#)

| Wi-Fi WAN Settings | |
|---------------------|--|
| WAN Connection Name | This field is for defining a name to represent this WAN connection. |
| Standby State | This setting specifies the state of the WAN connection while in standby. The available options are Remain Connected (hot standby) and Disconnect (cold standby). |
| Health Check Method | This setting allows you to specify the health check method for the WAN connection. The available options are Disabled , Ping , and DNS Lookup . The default method is Disabled . See Section 9.4 for configuration details. |
| Dynamic DNS | This setting specifies the dynamic DNS service provider to be used for the WAN based on supported dynamic DNS service providers: <ul style="list-style-type: none"> • changeip.com • dyndns.org • no-ip.org • tzo.com • DNS-O-Matic |

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| | |
|-----------------------------|--|
| | Select Disabled to disable this feature. See Section 1.1 for configuration details. |
| Bandwidth Allowance Monitor | <p>This option allows you to enable bandwidth usage monitoring on this WAN connection for each billing cycle. When this is not enabled, bandwidth usage of each month is still being tracked but no action will be taken.</p> <p>See Section 9.5 for configuration details.</p> |
| MTU | <p>This setting specifies the Maximum Transmission Unit.</p> <p>By default, MTU is set to Custom 1440.</p> <p>You may adjust the MTU value by editing the text field. Click Default to restore the default MTU value. Select Auto and the appropriate MTU value will be automatically detected. The auto-detection will run each time when the WAN connection establishes</p> |
| Connect to Any Open Mode AP | <p>This option is to specify whether the Wi-Fi WAN will connect to any open mode access point it finds. By default, this is disabled.</p> |
| Reply to ICMP PING | <p>If this field is disabled, the WAN connection will not respond to ICMP PING requests.</p> <p>By default, this is enabled.</p> |

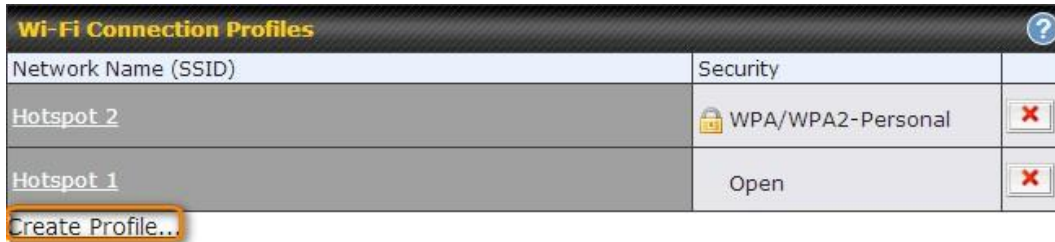
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9.3.1 Create Wi-Fi Connection Profile

You can manually create a profile to connect to a Wi-Fi connection. It is useful for creating a profile for connecting to hidden-SSID access points. Click on the link **Create Profile...** and the following window will be displayed.

Network > WAN click on **Details** and then click on **Create Profile...**



This will open a window similar to the shown below



Create Wi-Fi Connection Profile Settings

Network Name (SSID)

Security

This field is for defining a name to represent this Wi-Fi connection.

This option allows you to select which security policy is used for this wireless network. Available options:

- **Open**

| | |
|----------|------|
| Security | Open |
|----------|------|
- **WEP**

| | |
|----------------|---|
| Security | WEP |
| Encryption Key | <input type="text"/> |
| | <input checked="" type="checkbox"/> Hide Characters |
- **WPA/WPA2 – Personal**

| | |
|------------|---|
| Security | WPA/WPA2-Personal |
| Shared Key | <input type="text"/> |
| | <input checked="" type="checkbox"/> Hide Characters |
- **WPA/WPA2 – Enterprise**

| | |
|----------------|----------------------|
| Security | WPA/WPA2-Enterprise |
| Login ID | <input type="text"/> |
| Password | <input type="text"/> |
| Password Again | <input type="text"/> |

The settings to be displayed under this row will vary depending on the selected security policy.

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9.4 WAN Health Check

To ensure traffic is routed to healthy WAN connections only, the Pepwave MAX provides the functionality to periodically check the health of each WAN connection.

The Health Check settings for each WAN connection can be independently configured via **Network > WAN > Details**:

| Health Check Settings | |
|--|---|
| Method | <p>This setting specifies the health check method for the WAN connection. The value of Method can be configured as Disabled, Ping or DNS Lookup. The default method is DNS Lookup.</p> <p>For Mobile Internet connection, the value of Method can be configured as Disabled or SmartCheck.</p> |
| Health Check Disabled | |
| Health Check Method | <input type="text" value="Disabled"/> Health Check disabled. Network problem cannot be detected. |
| When Disabled is chosen in the Method field, the WAN connection will always be considered as up. The connection will not be treated as down in the event of IP routing errors. | |
| Health Check Method: PING | |
| PING Hosts | <p>Host 1: <input type="text"/></p> <p>Host 2: <input type="text"/></p> <p><input checked="" type="checkbox"/> Use first two DNS servers as PING Hosts</p> |
| The ICMP PING packets will be issued to test the connectivity with a configurable target IP address or host name. A WAN connection is considered as up if PING responses are received from either one or both of the PING Hosts. | |
| PING Hosts | <p>This setting specifies IP addresses or host names with which connectivity is to be tested via ICMP Ping.</p> <p>If Use first two DNS servers as Ping Hosts is checked, the target PING Host will be the first DNS server for the corresponding WAN connection.</p> <p>Reliable PING hosts with a high uptime should be considered.</p> <p>By default, the first two DNS servers of the WAN connection are used as the PING Hosts.</p> |
| Health Check Method: DNS Lookup | |
| Health Check Method | <input type="text" value="DNS Lookup"/> |
| Health Check DNS Servers | <p>Host 1: <input type="text"/></p> <p>Host 2: <input type="text"/></p> <p><input checked="" type="checkbox"/> Use first two DNS servers as Health Check DNS Servers</p> <p><input type="checkbox"/> Include public DNS servers</p> |
| DNS lookups will be issued to test the connectivity with target DNS servers. The connection will be treated as up if DNS responses are received from either one or both of the servers, regardless of whether the result was positive or | |

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negative.

Health Check DNS Servers

This field allows you to specify two DNS hosts' IP address with which connectivity is to be tested via DNS Lookup.




If **Use first two DNS servers as Health Check DNS Servers** is checked, the first two DNS servers will be the DNS lookup targets for checking a connection's health. If the box is not checked, field Host 1 must be filled and field Host 2 is optional.

If the box **Include public DNS servers** is selected and no response is received from all specified DNS servers, DNS lookups will also be issued to some public DNS servers. A WAN connection will be treated as down only if there is also no response received from the public DNS servers.

Connections will be considered up if DNS responses are received from any one of the health check DNS servers, regardless of a positive or negative result.

By default, the first two DNS servers of the WAN connection are used as the Health Check DNS Servers.

Health Check Method: HTTP

| | | |
|---------------------|---|---|
| Health Check Method |  | HTTP |
| URL 1 |  | http:// <input type="text"/> Matching String: <input type="checkbox"/> |
| URL 2 |  | http:// <input type="text"/> Matching String: <input type="checkbox"/> |

URL 1

HTTP connections will be issued to test the connectivity with configurable URLs and strings to match.

WAN Settings > WAN Edit > Health Check Settings > URL 1

The URL will be retrieved when performing an HTTP health check. When *String to Match* is left blank, a health check will pass if the HTTP return code is between 200 and 299 (Note: HTTP redirection codes 301 or 302 are treated as failures). When *String to Match* is filled, a health check will pass if the HTTP return code is between 200 and 299 and if the HTTP response content contains the string

URL 2





WAN Settings > WAN Edit > Health Check Settings > URL 2

If URL 2 is also provided, a health check will pass if either one of the tests passed.

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Other Health Check Settings

| | | | |
|-----------------------|---|---|-----------|
| Timeout |  | 5 | second(s) |
| Health Check Interval |  | 5 | second(s) |
| Health Retries |  | 3 | |
| Recovery Retries |  | 3 | |

Timeout

This setting specifies the timeout, in seconds, for ping/DNS lookup requests. Default Timeout is set to **5** second.

Health Check Interval

This setting specifies the time interval, in seconds, between ping or DNS lookup requests. Default Health Check Interval is **5** seconds.

Health Check Retries

This setting specifies the number of consecutive ping/DNS lookup timeouts after which the Pepwave MAX is to treat the corresponding WAN connection as down. Default Health Retries is set to **3**.

For example, with the default Health Retries setting of 3, after consecutive 3 timeouts, the corresponding WAN connection will be treated as down.


Recovery Retries

This setting specifies the number of consecutive successful ping/DNS lookup responses that must be received before the Pepwave MAX treats a previously down WAN connection to be up again.

By default, Recover Times is set to **3**. For example, a WAN connection that is treated as down will be considered to be up again upon receiving 3 consecutive successful ping/DNS lookup responses.

Automatic Public DNS Server Check on DNS Test Failure

In case the health check method is set to DNS Lookup and checks failed, the MAX will automatically perform DNS lookups on some public DNS servers. If the tests are success, it means the WAN may not be down but rather the target DNS server became malfunctioned. You will see the following warning message on the Main page.

 **Failed to receive DNS response from the health-check DNS servers for WAN connection 3. But public DNS server lookup test via the WAN passed. So please check the DNS server settings.**

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9.5 Bandwidth Allowance Monitor

Bandwidth Allowance Monitor helps keep track of your network usage. Click **Enable** to begin.

| | |
|-----------------------------|---|
| Bandwidth Allowance Monitor | <input checked="" type="checkbox"/> Enable |
| Action | <input type="checkbox"/> Email notification is currently disabled. You can get notified when usage hits 75%/95% of monthly allowance by enabling Email Notification . <input checked="" type="checkbox"/> Disconnect when usage hits 100% of monthly allowance |
| Start Day | On <input type="text" value="1st"/> of each month at 00:00 midnight |
| Monthly Allowance | <input type="text"/> GB |

| Bandwidth Allowance Monitor | |
|-----------------------------|---|
| Action | <p>If the feature Email Notification is enabled, you will be notified through email when usage hits 75% and 95% of the monthly allowance.</p> <p>If the box Disconnect when usage hits 100% of monthly allowance is checked, this WAN connection will be disconnected automatically when the usage hits the monthly allowance. It will not resume connection unless this option has been turned off or the usage has been reset when a new billing cycle starts.</p> |
| Start Day | This option allows you to define which day in the month each billing cycle begins. |
| Monthly Allowance | This field is for defining the maximum bandwidth usage allowed for the WAN connection each month. |

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9.6 Dynamic DNS Settings

The Pepwave MAX is capable of registering the domain name relationships to dynamic DNS service providers. Through registration with dynamic DNS service provider(s), the default public Internet IP address of each WAN connection can be associated with a host name. With Dynamic DNS service enabled for a WAN connection, you can connect to your WAN's IP address from the external even if its IP address is dynamic. You have to register for an account from the listed dynamic DNS service providers before enabling this option.

If the WAN connection's IP address is a reserved private IP address (i.e. behind a NAT router), the Public IP of each WAN will be automatically reported to the DNS service provider.

Either upon a change in IP addresses or every 23 days without link reconnection, the Pepwave MAX will connect to the dynamic DNS service provider to perform an IP address update within the provider's records.

| Dynamic DNS Settings | |
|------------------------------|---|
| Dynamic DNS Service Provider | <input type="text" value="changeip.com"/> |
| User ID | <input type="text"/> |
| Password | <input type="password"/> |
| Confirm Password | <input type="password"/> |
| Hosts | <input type="text"/> |

| Dynamic DNS Settings | |
|-------------------------------------|--|
| Dynamic DNS | <p>This setting specifies the dynamic DNS service provider to be used for the WAN based on supported dynamic DNS service providers:</p> <ul style="list-style-type: none">• changeip.com• dyndns.org• no-ip.org• tzo.com• DNS-O-Matic <p>Select Disabled to disable this feature.</p> |
| Account Name / Email Address | <p>This setting specifies the registered user name for the dynamic DNS service.</p> |
| Password / TZO Key | <p>This setting specifies the password for the dynamic DNS service.</p> |
| Hosts / Domain | <p>This field allows you to specify a list of host names or domains to be associated with the public Internet IP address of the WAN connection.</p> <p>If you need to enter more than one host, you can use a carriage return to separate them.</p> |

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Important Note

In order to use dynamic DNS services, appropriate host name registration(s) as well as a valid account with a supported dynamic DNS service provider are required.

A dynamic DNS update is performed whenever a WAN's IP address changes. E.g. IP is changed after a DHCP IP refresh, reconnection, etc.

Due to dynamic DNS service providers' policy; a dynamic DNS host will automatically expire if the host record has not been updated for a long time. Therefore the Pepwave MAX performs an update every 23 days even if a WAN's IP address has not changed.

10 Advanced Wi-Fi Settings

Wi-Fi settings can be configured at **Advanced > Wi-Fi Settings**. Please note that menus displayed will vary with model.

| Wi-Fi Radio Settings | |
|----------------------|--|
| Operating Country | United States ▾ |
| Wi-Fi Antenna | <input checked="" type="radio"/> Internal <input type="radio"/> External |

| Wi-Fi Radio Settings | |
|--------------------------|--|
| Operating Country | <p>This drop-down menu specifies the national / regional regulations which the Wi-Fi Radio should follow.</p> <ul style="list-style-type: none">• If a North American region is selected, RF channels 1 to 11 will be available and the maximum transmission power will be 26 dBm (400 mW).• If European region is selected, RF channels 1 to 13 will be available. The maximum transmission power will be 20 dBm (100 mW). <p>NOTE: Users are required to choose an option suitable to local laws and regulations.</p> |
| Wi-Fi Antenna | <p>This setting determines whether the Wi-Fi radio will use its internal antenna, or rely on an outside one installed on its SMA or Type-N connectors.</p> |

Important Note

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

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| Wi-Fi AP Settings | |
|-------------------|------------------------------------|
| Protocol | 802.11ng |
| Channel | 1 (2.412 GHz) |
| Channel Width | Auto (20/40 MHz) |
| Output Power | Max <input type="checkbox"/> Boost |

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 802.11b/g , 802.11b Only , and 802.11g Only . By default, 802.11b/g is selected. |
| Channel | This option allows you to select which 802.11 RF channel will be utilized. Channel 1 (2.412 GHz) is selected by default. |
| Channel Width | Options Auto (20/40 MHz) and 20 MHz are available. Default 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. By default, 23 dBm (200 mW) or 20 dBm (100 mW) (depending on which operating country you have chosen in the previous section) is selected. |


| Wi-Fi WAN Settings | |
|--------------------|------------------------------------|
| Channel Width | 20/40 MHz |
| Bit Rate | Auto |
| Output Power | Max <input type="checkbox"/> Boost |

Wi-Fi WAN Settings

| | |
|----------------------|---|
| Channel Width | Options Auto (20/40 MHz) and 20 MHz are available. Default is Auto (20/40 MHz) , which allows both widths to be used simultaneously. |
| Bit Rate | This option allows you to select a specific bit rate for data transfer over the device's Wi-Fi network. By default, Auto is selected. |
| 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. By default, 23 dBm (200 mW) or 20 dBm (100 mW) (depending on which operating country you have chosen in the previous section) is selected. |

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| Wi-Fi AP Advanced Settings | | |
|----------------------------|---|---|
| Beacon Rate |  | 1Mbps ▾ |
| Beacon Interval |  | 100ms ▾ |
| DTIM |  | 1 |
| Slot Time |  | 9 μ s |
| ACK Timeout |  | 48 μ s |
| Frame Aggregation | | <input checked="" type="checkbox"/> Enable |
| Guard Interval | | <input type="radio"/> Short <input checked="" type="radio"/> Long |

Wi-Fi AP Advanced Settings

| | |
|--------------------------|---|
| Beacon Rate | This option is for setting the transmit bit rate for sending a beacon. By default, 1Mbps is selected. |
| Beacon Interval | This option is for setting the time interval between each beacon. By default, 100ms is selected. |
| DTIM | This field allows you to set the frequency for the beacon to include Delivery Traffic Indication Message. The interval is measured in millisecond. The default value is set to 1 ms . |
| Slot Time | This field is for specifying the unit wait time before it transmits a packet. By default, this field is set to 9 μs . |
| ACK Timeout | 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 | This option allows you to enable frame aggregation to increase transmission throughput. |
| Guard Interval | This is where you opt for a short or long guard period interval for your transmissions. |

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11 Bandwidth Bonding SpeedFusion™



The Pepwave Bandwidth Bonding SpeedFusion™ functionality securely connects your MAX router to another Pepwave MAX or Peplink device (only Peplink Balance 210/310/380/580/710/1350 are available for this function). The data, voice, or video communications between these locations are kept confidential across the public Internet.

The Bandwidth Bonding SpeedFusion™ of the Pepwave MAX is specifically designed for multi-WAN environment. The Pepwave MAX can aggregate all WAN connections' bandwidth for routing SpeedFusion™ traffic. Unless all the WAN connections of one site are down, the Pepwave MAX can still maintain VPN up and running.

VPN Bandwidth Bonding is supported in firmware 5.1 or above. All available bandwidth will be utilized to establish the VPN tunnel, and all traffic will be load balanced at packet level across all links. VPN Bandwidth Bonding is enabled by default.

11.1 PepVPN

PepVPN with SpeedFusion™



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

| Profile | Remote ID | Remote Address(es) | |
|-----------------------------|----------------|--------------------|---|
| EL Office | 8345-5F7A-DE97 | | X |
| New Profile | | | |

Send All Traffic To
No PepVPN profile selected

PepVPN
Local ID: MAX_HD2_DEF1

Link Failure Detection
Link Failure Detection Time: Recommended (Approx. 15 secs)
 Fast (Approx. 6 secs)
 Faster (Approx. 2 secs)
 Extreme (Under 1 sec)
Shorter detection time incurs more health checks and higher bandwidth overhead

[Save](#)

The local LAN subnet and subnets behind the LAN (defined under **Static Route** in the LAN settings page) will be advertised to the VPN. All VPN members (branch offices and headquarters) will be able to route to the local subnets. Note that all LAN subnet and subnets behind it have to be unique. Otherwise, VPN members will not be able to access each other.

All data can be routed over the VPN with 256-bit AES encryption standard.

To configure, navigate to **Advanced > PepVPN**, click the **New Profile** button

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New Profile

to create a new VPN profile. Each profile is for making VPN connection with one remote Peplink Balance/Pepwave MAX. Once you click on New Profile button this will open a window:

| PepVPN Profile | |
|---|--|
| Name | <input type="text"/> |
| Active | <input checked="" type="checkbox"/> |
| SpeedFusion™ | Supported |
| Encryption | <input checked="" type="radio"/> 256-bit AES <input type="radio"/> OFF |
| Remote ID | <input type="text"/> |
| Authentication | <input checked="" type="radio"/> By Remote ID only <input type="radio"/> Preshared Key <input type="radio"/> X.509 |
| NAT Mode | <input type="checkbox"/> |
| Remote IP Address / Host Names (Optional) | <input type="text"/> If this field is empty, this field on the remote unit must be filled |
| Data Port | <input checked="" type="radio"/> Default <input type="radio"/> Custom <input type="text"/> |

PepVPN Profile

Active Check this box to enable VPN functionality.

Encryption By default, VPN traffic is encrypted with 256-bit AES standard. If the option Off is selected on both sides of a VPN connection, no encryption will be applied.

Remote ID The Pepwave MAX establishes VPN connection with a remote peer that has a serial number or a remote ID here.

Select from **By Remote ID Only**, **Preshared Key**, or **X.509** to specify the method the Pepwave MAX will use to authenticate peers. When selecting **By Remote ID Only**, be sure to enter a unique peer ID number in the **Remote ID** field.

Remote ID:

| | |
|----------------|--|
| Authentication | <input checked="" type="radio"/> By Remote ID only <input type="radio"/> Preshared Key <input type="radio"/> X.509 |
|----------------|--|

To allow the Pepwave MAX to establish a VPN connection with a specific remote peer using a unique identifying number.

Authentication

Preshared Key:

| | |
|----------------|--|
| Authentication | <input type="radio"/> By Remote ID only <input checked="" type="radio"/> Preshared Key <input type="radio"/> X.509 |
| Pre-shared Key | <input type="text"/> <input checked="" type="checkbox"/> Hide Characters |

Pre-shared Key defines the pre-shared key used for this particular VPN connection. The connection will be up only if the pre-shared keys on each side match. When the peer is running firmware 5.0+, this setting will be ignored. If you would like to prevent the display of the pre-shared key, check **Hide Characters**.

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X.509

| | |
|--------------------|--|
| Authentication | <input type="radio"/> By Remote ID only <input type="radio"/> Preshared Key <input checked="" type="radio"/> X.509 |
| Remote Certificate | <div style="border: 1px solid gray; height: 100px;"></div> |
| | Show Details |

To authenticate VPN connections using X.509 certificates, copy and paste certificate details into this field. To get more information on a listed X.509 certificate, click the **Show Details** link below the field.

NAT Mode

By selecting this option, the remote unit VPN will be assigned with an IP address from the local DHCP server. All the remote side traffic via this VPN will go through Network Address Translation (NAT) using the assigned IP address.

RemoteIP Addresses / Host Names

Enter the remote peer's WAN IP address(es) or host name(s) here. Dynamic-DNS host names are accepted.

This field is optional. With this field filled, the Pepwave MAX will initiate connection to each of the remote IP addresses until success. If the field is empty, the Pepwave MAX will wait for connection from the remote peer. Therefore, at least one side of the two VPN peers has to have the field filled. Otherwise, VPN connection cannot be established.

Enter one IP address or host name per line.









Data Port

If **Default** is selected, VPN data will go through UDP port 4500.

Select **Custom** and enter a port number if a specific outgoing port is desired.

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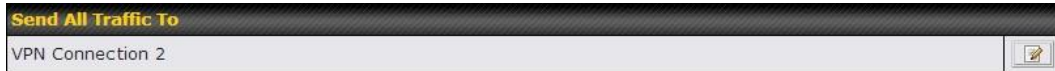
| | | |
|--------------------------------------|---|---|
| Layer 2 Bridging |  | <input checked="" type="checkbox"/> |
| Bridging Port |  | <input type="radio"/> LAN |
| VLAN Tagging |  | No VLAN  More... |
| STP |  | <input type="checkbox"/> |
| Preserve LAN Settings Upon Connected |  | <input type="checkbox"/> After this VPN profile is established, most routing functionalities will cease to work. The device will practically become an Ethernet extender of the remote unit. |
| Configure |  | Using DHCP  |

^ALayer 2 Bridging is an advanced feature, click the  icon next to PepVPN profile to activate it, then click the box next to Layer 2 Bridging to see all configuration options.


| Layer 2 Bridging | |
|---|---|
| Layer 2 Bridging^A | <p>When this check box is unchecked, traffic between local and remote networks will be IP forwarded.</p> <p>To bridge the Ethernet network of an Ethernet port on a local and remote network, select this check box. When this check box is selected, the two networks will become a single LAN, and any broadcast (e.g., ARP requests) or multicast traffic (e.g., Bonjour) will be sent over the VPN.</p> <p>The L2 bridging feature is hidden from the user interface by default. To enable this feature, user has to click the hidden link at the upper right corner of the SpeedFusion™ Profile table.</p> |
| Bridge port^A | <p>This field specifies the port to be bridged to the remote site.</p> <p>If you choose WAN X (internal: replace the X by the WAN port number) that WAN will be disabled for WAN purposes. Instead, the WAN port will be dedicated to bridging with the remote site. The LAN port will remain unchanged.</p> |
| VLAN Tagging^A | <p>This field specifies the VLAN ID with which the VPN's traffic should be tagged before sending the traffic to the bridge port. If no VLAN tagging is needed, select No VLAN. To define a new VLAN ID, click New... and input the VLAN ID. VLAN IDs that are not referenced by any VPN profiles will be removed from the list automatically. Default: No VLAN</p> |
| STP^A | <p>Checking this box enables Spanning Tree Protocol.</p> <p>Default: Unchecked.</p> |
| Preserve LAN Settings Upon Connected^A | <p>The LAN port is chosen as the bridge port. Selecting this option preserves LAN settings (e.g., LAN port IP address, DHCP server, etc.) when the Layer 2 VPN is connected. Uncheck this option if the LAN IP address and gateway will use remote LAN settings. Check this option if the LAN IP address and local DHCP server should remain unchanged after the VPN is up.</p> <p>If you choose not to preserve LAN settings when the VPN is connected, the device will not act as a router, and most Layer 3 routing functions will cease to work.</p> |
| Configure^A | <p>Use this setting to specify how a management IP address is acquired for the bridge port in the specified VLAN (if defined) when the Layer 2 bridge is connected. If you choose As None, no IP address will be assigned to the bridge port for the Layer 2 connection.</p> |

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Send All Traffic To


This feature allows you to redirect all traffic to a specified PepVPN connection. Click the  button to select your connection and the following menu will appear:



You could also specify a DNS server to resolve incoming DNS requests



PepVPN Local ID


The Local ID is a text string to identify this local unit when establishing a VPN connection. When creating a profile on a remote unit, this Local ID has to be inputted in the remote unit's "Remote ID" field. Click the  icon to edit your Local ID.



| WAN Connection Priority  | | |
|---|-------------------------|--------------------------|
| 1. WAN 1 | Priority: 1 (Highest) ▼ | Connect to Remote: All ▼ |
| 2. WAN 2 | Priority: 1 (Highest) ▼ | Connect to Remote: All ▼ |
| 3. Wi-Fi WAN | Priority: 1 (Highest) ▼ | Connect to Remote: All ▼ |
| 4. Cellular 1 | Priority: 1 (Highest) ▼ | Connect to Remote: All ▼ |
| 5. Cellular 2 | Priority: 1 (Highest) ▼ | Connect to Remote: All ▼ |
| 6. USB | Priority: 1 (Highest) ▼ | Connect to Remote: All ▼ |

WAN Connection Priority

WAN Connection Priority

You can specify the priority of the WAN connections to be used for making VPN connections. WAN connections set to **OFF** will never be used. Only available WAN connections with the highest priority will be utilized. To enable connection mapping to remote WAN, click the  button.

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Link Failure Detection

Link Failure Detection Time ?

- Recommended (Approx. 15 secs)
- Fast (Approx. 6 secs)
- Faster (Approx. 2 secs)
- Extreme (Under 1 sec)

Shorter detection time incurs more health checks and higher bandwidth overhead

Link Failure Detection

Link Failure Detection Time

The bonded SpeedFusion™ can detect routing failures on the path between two sites over each WAN connection. Failed WAN connections will not be used to route VPN traffic. Health check packets are sent to the remote unit to detect any failure. The more frequent checks it sends, the shorter detection time, but the higher bandwidth overhead will be consumed.

When **Recommended** is selected, a health check packet is sent out every 5 seconds, and the expected detection time is 15 seconds.

When **Fast** is selected, a health check packet is sent out every 3 seconds, and the expected detection time is 6 seconds.

When **Faster** is selected, a health check packet is sent out every 1 second, and the expected detection time is 2 seconds.

When **Extreme** is selected, a health check packet is sent out every 0.1 second, and the expected detection time is under 1 second.

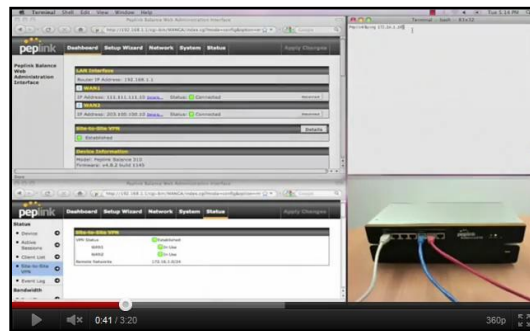
By default, **Recommended** is selected.

Important Note

Pepwave's proprietary SpeedFusion™ used TCP port 32015 and UDP port 4500 for establishing VPN connections. If you have a firewall in front of the devices, you will need to add firewall rules for these port and protocols which will allow inbound and outbound traffic pass-through the firewall.

Tip

Want to know more about VPN Sub-Second Session Failover? Visit our [YouTube Channel](#) for a video tutorial!



<http://youtu.be/TLQgdpPSY88>

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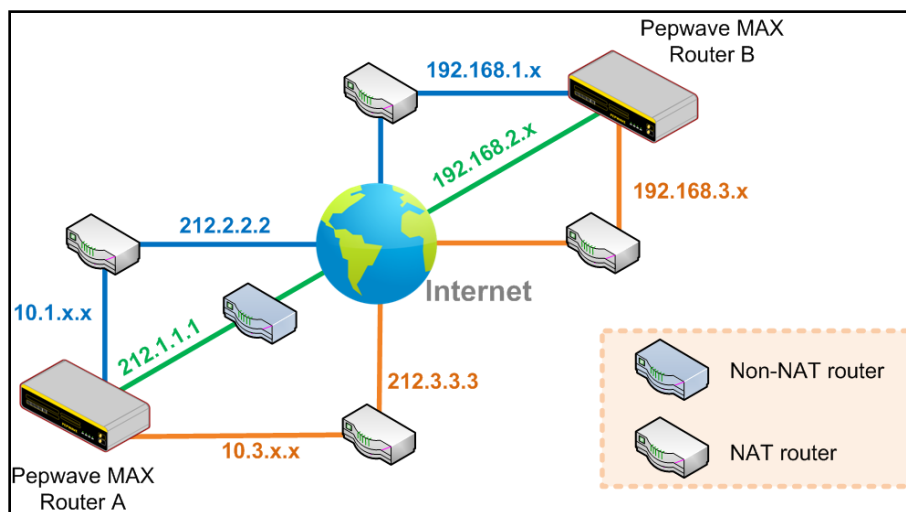
11.2 Pepwave MAX Behind NAT Router

The Pepwave MAX supports establishing SpeedFusion™ over WAN connections which are behind a NAT (Network Address Translation) router.

To be able for a WAN connection behind a NAT router to accept VPN connections, you can configure the NAT router in front of the WAN connection to forward TCP port 32015 to it.

If one or more WAN connections on **Unit A** can accept VPN connections (by means of port forwarding or not) while none of the WAN connections on the peer **Unit B** can do so, you should put all public IP addresses or host names of the **Unit A** to the **Unit B's RemoteIP Addresses / Host Names** field. Leave the field in **Unit A** blank. With such setting, SpeedFusion™ connection can be set up and all WAN connections on both sides will be utilized.

For example, see the following diagram:



One of the WANs of RouterA is non-NAT'd (212.1.1.1).The rest of the WANs on RouterA and all WANs on RouterB are NAT'd. In such case, the **RemoteIP Addresses / Host Names** field in RouterB should be filled with all of the RouterA's host names or public IP addresses (i.e. 212.1.1.1, 212.2.2.2 and 212.3.3.3), and the field in RouterA can be left blank. The two NAT routers on WAN1 and WAN3 of Router A should inbound port forward TCP port 32015 to the Router A so that all WANs would be utilized to establish VPN.

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11.3 SpeedFusion™ Status

VPN Status is shown in the **Status > SpeedFusion™**. The connection status of each connection profile is shown as below:



By clicking the **Details** button at the top-right hand corner of SpeedFusion™ table, you will be forwarded to **Status >SpeedFusion™**. You can view the subnet and WAN connection information of each VPN peer. Please refer to Section 21.5 for details.

IP subnets must be unique among VPN peers

The entire inter-connected SpeedFusion™ network is one single non-NAT IP network. No two subnets in two sites shall be duplicated. Otherwise, connectivity problems will be experienced in accessing those subnets.

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12 IPsec VPN

The Pepwave MAX's IPsec VPN functionality securely connects one or more branch offices to your company's main headquarters or to other branches. The data, voice, or video communications between these locations are thus kept safe and confidential across the public Internet.

The IPsec VPN of the Pepwave MAX is especially designed for a multi-WAN environment. For instance, a user sets up multiple IPsec profiles for his multi- WAN1 ~ WAN3 environment, if WAN1 is connected and its health check turns up good, the IPsec traffic will go through this link. However, should unforeseen problems (e.g. physically unplugged or ISP problems) arise and cause WAN1 to go down, our IPsec implementation will make use of WAN2 and WAN3 accordingly, as failover purposes.

12.1 IPsec VPN Settings

All of our Pepwave products can make multiple IPsec VPN connections with Peplink, Pepwave as well as Cisco or Juniper Routers.

Note that all LAN subnet and subnets behind it have to be unique. Otherwise, VPN members will not be able to access each other.

All data can be routed over the VPN with a selection of encryption standards such as 3DES, AES-128 and AES-256.

To configure, navigate to **Advanced > IPsec VPN**:



Pepwave MAX IPsec only supports network-to-network connection with Cisco, Juniper or Pepwave MAX devices.

A **NAT-Traversal** option and list of defined **IPsec VPN** profiles will be shown.

The NAT-Traversal option should be enabled if your system is behind a NAT router.

Click the **New Profile** button to create new IPsec VPN profiles that make VPN connections to remote Peplink Balance, Pepwave MAX, Cisco or Juniper Routers via the available WAN connections. To edit any of the profiles, click on its associated connection name in the leftmost column.

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| IPsec VPN Profile ✕ | | |
|--|---|--|
| Name | bzz-bzz | |
| Active | <input checked="" type="checkbox"/> | |
| Remote Gateway IP Address | 11.22.33.44 | |
| Local Networks | <input checked="" type="checkbox"/> 10.0.0.1/24 | |
| Remote Networks | Network | Subnet Mask |
| | 192.168.11.193 | 255.255.255.240 (/28) ✖ |
| | | 255.255.255.0 (/24) + |
| Mode | <input checked="" type="radio"/> Main Mode (All WANs need to have Static IP) <input type="radio"/> Aggressive Mode | |
| Force UDP Encapsulation | <input type="checkbox"/> | |
| Preshared Key | ●●●●●●●● <input checked="" type="checkbox"/> Hide Characters | |
| Local ID | | |
| Remote ID | | |
| Phase 1 (IKE) Proposal | 1. 3DES & MD5 2. ----- | |
| Phase 1 DH Group | <input checked="" type="checkbox"/> Group 2: MODP 1024 <input type="checkbox"/> Group 5: MODP 1536 | |
| Phase 1 SA Lifetime | 3600 seconds | Default |
| Phase 2 (ESP) Proposal | 1. 3DES & MD5 2. ----- | |
| Phase 2 PFS Group | <input checked="" type="radio"/> None <input type="radio"/> Group 2: MODP 1024 <input type="radio"/> 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. |
| Remote Gateway IP Address | 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 too. |
| Remote Networks | Enter the LAN and subnets that are located at the remote site here. |
| Main Mode | Choose this Main Mode if both IPsec peers use static IP addresses. |
| Aggressive Mode | Choose this Aggressive Mode if one of the IPsec peers use dynamic IP addresses. |
| Force UDP Encapsulation | For UDP encapsulation to be forced regardless of the NAT-Traversal, tick this checkbox. |
| Pre-shared Key | This defines the peer authentication pre-shared key to be used to authenticate this VPN |

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| | |
|-------------------------------|---|
| | connection. The connection will be up only if the pre-shared keys on each side match. |
| Local ID | Under Main Mode, this field can be left blank. Under Aggressive Mode, if Remote Gateway IP Address field 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 | Under Main Mode, this field can be left blank. Under Aggressive Mode, if Remote Gateway IP Address field 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 | Under Main Mode, this allows the setting of up to 6 encryption standards, in descending order of priority, to be used in the initial connection key negotiations. For 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 | Under Main Mode, this allows the setting of up to 6 encryption standards, in descending order of priority, to be used for the IP data that is being transferred. For Aggressive Mode, only one selection is permitted. |
| Phase 2 PFS Group | The 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 but not any other data. 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. |

| WAN Connection Priority | |
|-------------------------|--|
| Priority | WAN Selection |
| 1 | WAN 1 <input type="button" value="v"/> |
| 2 | ----- <input type="button" value="v"/> |

| WAN Connection Priority | |
|-------------------------|--|
| WAN Connection | Select the appropriate WAN connection with the help of drop down |