

# **BiPAC 9800 VNX(L)**

## **Point-to-Point Fibre Wireless-N (VPN) VoIP Gateway**

### **User Manual**

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# Chapter 1

## Introduction the BiPAC 9800VNX(L)

### 1.1 Introducing the BiPAC 9800VNX(L)

The BiPAC 9800VNX(L) is a point-to-point (Active Ethernet) Fibre Optical Gateway future ultra-fast connectivity (FTTP/FTTH) – with uniquely Small Form Factor Pluggable (SFP) interface that can support 100Base or 1000Base connectivity in a box. With WAN throughput in excess of 900Mbps and one USB ports on the rear of the router will support 3G/4G LTE services from selected dongles for high-speed mobile connectivity. Failover between fixed line and mobile connectivity also quickly and smoothly ensures maximum Internet uptime. The BiPAC 9800VNX(L) is designed for home and office environment extending reliable, high-speed, and long-reach last-mile connectivity to people living and working building.

With an integrated 802.11n wireless access point and 4-port Gigabit Ethernet LAN ports, the gateway enables faster wireless speeds of up to 300Mbps and LAN connection 10 times faster than regular 10/100Mbps Ethernet LAN. The BiPAC 9800VNX(L) provides a unique Management Center, enabling users to monitor 3G/4G LTE signal strength, bandwidth, download speed, and much more.

Furthermore, the BiPAC 9800VNX(L) supports remote management which facilitate FTTH service provider deliver more efficient management. The gateway leverages the extraordinary bandwidth to deliver high-speed Internet applications to home and office users. The full-featured fibre router providing is an ideal solution for FTTH deployments.

#### FTTH Applications

The BiPAC 9800VNX(L) can be used for a point-to-point fibre access network. Since the Fibre WAN interface allows faster rates over even longer distances, it can support Telcom operators or ISPs to provide high quality and reliable Internet broadband services to either business users or home users. The 4-port Gigabit Switch incorporated into the BiPAC 9800VNX(L) enables blistering LAN transfer rates for multimedia applications such as interactive gaming, IPTV video streaming and real-time audio.

#### 3G/ 4G-LTE Mobility and Always-on Connection

With the BiPAC 9800VNX(L) you can connect a 3G/4G LTE USB modem to built-in USB ports. The auto failover feature ensures maximum connectivity and minimum interruption by quickly and smoothly connecting to a 3G/4G LTE network in the event that your fixed line fails. The BiPAC 9800VNX(L) will then automatically reconnect to the fixed line connection when it's restored, ideal for office situations where a constant and uninterrupted connection is critical.

#### Wireless Mobility and Security

With an integrated 802.11n Wireless Access Point, the router delivers up to 3 times the wireless coverage of a 802.11b/g network device, so that wireless access is available everywhere in the house or office. If your network requires wider coverage, the built-in Wireless Distribution System (WDS) allows you to expand your wireless network without additional wires or cables. The BiPAC 9800VNX(L) also supports the Wi-Fi Protected Setup (WPS) standard and allows users to establish a secure wireless network just by pressing a button. Multiple SSIDs allow users to access different networks through a single access point. Network managers can assign

different policies and functions for each SSID, increasing the flexibility and efficiency of the network infrastructure.

### **Cost saving (VoIP)**

Making VoIP calls is extremely simple; just connect the router to your existing telephones. The BiPAC 9800VNX(L) complies with the most popularly adopted VoIP standard, SIP protocol, to ensure interoperability with SIP devices and major VoIP Gateways. The router also supports a wider range of telephony features, such as Call Waiting, Conference Call, Speed Dial, Return Call, Redial, Don't Disturb, etc.

### **IPv6 supported – Pathway to Future**

The BiPAC 9800VNX(L) fully supports IPv6 (Internet Protocol Version 6), launched as the current IPv4 range is filling up, and IPv6 is gradually becoming the indispensable addressing system for savvy cloud computing users. Dual stack means the router is capable of running IPv4 and IPv6 in parallel during the transition period. With Billion IPv6 enabled devices, three major transition mechanisms such as Dual-Stack, Dual-Stack Lite, and 6RD (IPv6 rapid deployment) are supported to be adapted easily into service provider's IPv4/IPv6 network.\*1

### **Quick Start Wizard**

Support a WEB GUI page to install this device quickly. With this wizard, end users can enter the information easily which they get from ISP, then surf the Internet immediately.

### **Firmware Upgradeable**

Device can be upgraded to the latest firmware through the WEB based GUI.

## 1.2 Features of the BiPAC 9800VNX(L)

- WAN Interface supports up to 1000Mbps downstream and upstream wire-speed (over 900Mbps) rates
- SFP interface supports 100Base or 1000Base fibre connectivity
- Extra Rj-45 EWAN WAN port for connecting to ADSL/VDSL/Cable/Fibre modem devices
- 4-port Gigabit LAN Switch
- IPv6 ready (IPv4/IPv6 dual stacks)
- Dual-Stack Lite and 6RD (IPv6 rapid development) <sup>\*2</sup>
- Embedded 8 VPN tunnels IPSec VPN endpoint/server with powerful encryption (BiPAC 9800VNX), up to 30 tunnels <sup>\*1</sup>
- USB port supports 3G/4G-LTE for broadband connectivity
- Auto failover feature to ensure an always-on WAN connectivity
- 802.11 wireless AP with high-speed wireless connection rate of up to 300Mbps
- Support Wi-Fi Protected Setup (WPS) and WPA-PSK/WPA2-PSK
- Multiple wireless SSIDs with wireless guest access and client isolation
- Wi-Fi Protected Access (WPA-PSK/ WPA2-PSK) and Wired Equivalent Privacy (WEP)
- Two FXS ports for connecting to regular telephones
- Supports FAX Transmission: T.38 fax relay, G.711 pass-through
- USB ports for NAS and 3G/4G-LTE USB modem
- QoS for traffic prioritization and bandwidth management
- Supports IPTV Applications <sup>\*3</sup>

### Network Protocols and Features

- IPv4, IPv6 or IPv4/IPv6 Dual Stack
- Dual-Stack Lite and 6RD (IPv6 rapid development) <sup>\*2</sup>
- DHCPv4/ v6
- NAT, Static Routing and RIP-1/ 2
- Dual WAN failover and failback
- Virtual Server and DMZ
- SNTP, DNS Proxy
- Universal Plug and Play (UPnP) Compliant
- Dynamic Domain Name System (DDNS)
- IGMP Snooping and IGMP Proxy
- MLD Snooping and MLD Proxy

### WAN Protocol

- DHCP Client
- PPPoE
- Static IP

## Firewall

- Built-in NAT Firewall
- Stateful Packet Inspection (SPI)
- DoS attack prevention including Land Attack, Ping of Death, etc
- Access Control
- IP&MAC filter, URL Content Filter
- Password protection for system management
- VPN pass-through

## Quality of Service Control

- Traffic prioritization management based-on Protocol, Port Number and IP Address (IPv4/ IPv6)

## USB Application Server

- 3G/4G-LTE USB modem
- Storage/NAS: FTP server, SAMBA server

## Virtual Private Network (VPN)

- 8 IPSec VPN tunnels (up to 30 tunnels <sup>\*1</sup>)
- 4 L2TP VPN tunnels
- 4 PPTP VPN tunnels

## Wireless LAN

- Compliant with IEEE 802.11 b/ g/ n standards
- 2.4 GHz - 2.484GHz radio band for wireless
- Up to 300 Mbps wireless operation rate
- 64/ 128 bits WEP supported for encryption
- WPS (Wi-Fi Protected Setup) for easy setup
- Wireless Security with WPA-PSK/ WPA2-PSK support
- Multiple wireless SSIDs with wireless guest access and isolation
- WDS repeater function support

## VoIP

- Compliant with SIP standard: RFC3261
- Two RJ-11 FXS ports for connecting to regular telephones
- Supports two SIP accounts for connecting to Internet Telephony Service Provider (ITSP)
- Supports G.711 A /  $\mu$  law, and G.729\*3 Audio CODEC standards
- Supports FAX Transmission: T.38 fax relay, G.711 pass-through
- Supports Telephony Features: silence suppression, Voice Activity Detection (VAD), Comfort Noise Generation (CNG), G.168 echo cancellation, packet loss concealment
- Adaptive jitter buffer support
- DTMF: In-band / out-of-band (RFC2833) / SIP INFO



## **IPTV Applications<sup>\*3</sup>**

- IGMP Snooping and IGMP Proxy
- MLD Snooping and MLD Proxy
- Virtual LAN (VLAN)
- Quality of Service (QoS)

## **Management**

- Quick Installation Wizard
- Web-based GUI for remote and local management (IPv4/ IPv6)
- Firmware upgrades and configuration data upload and download via web-based GUI
- Supports DHCP Server/ Client/ Relay
- Supports SNMP v1, v2, v3. MIB-I and MIB-II
- TR-069<sup>\*4</sup> supports remote management



1. Future release
2. Future release and upon request for Telco/ISP tender projects
3. IPTV application may require subscription to IPTV services from a Telco / ISP.
4. Only upon requests for Telco/ISP tender projects
5. Specifications on this datasheet are subject to change without prior notice.

## 1.3 Hardware Specifications

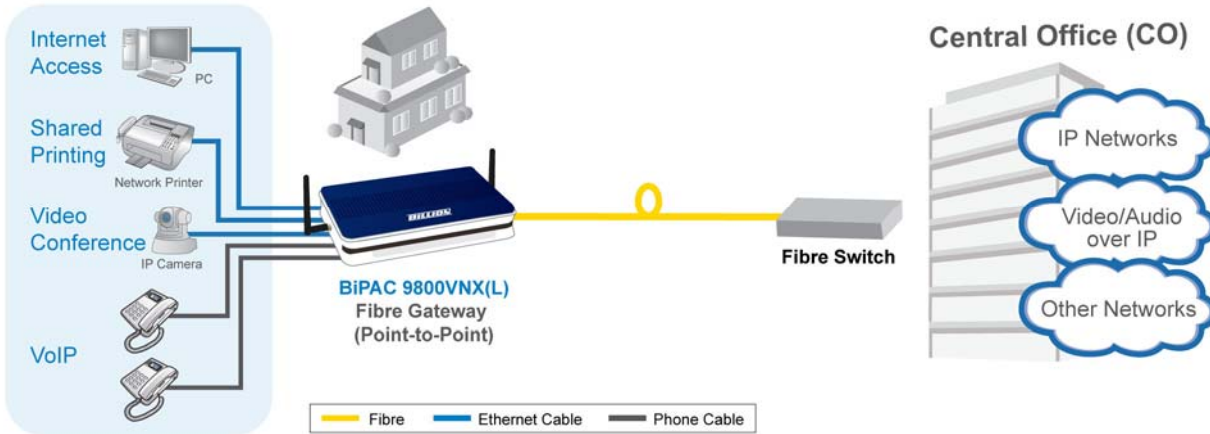
### Physical Interface

- WAN: 100/1000BASE SFP interface for direct connection to Fibre
- EWAN: RJ-45 Gigabit Ethernet port for connecting to ADSL/Cable/VDSL/Fibre modem device
- Ethernet LAN: 4-port 10/100/1000Mbps auto-crossover (MDI/ MDI-X) switch
- VoIP Phone port: 2 RJ-11 FXS for connecting to regular telephones
- USB: USB 2.0 type A ports support storage service or 3G/4G LTE USB modem
- WLAN: 2 detachable antennas
- Factory default reset button
- Wireless on/off and WPS push button
- Power jack
- Power switch

## 1.4 Applications for the BIPAC 9800VNX(L)

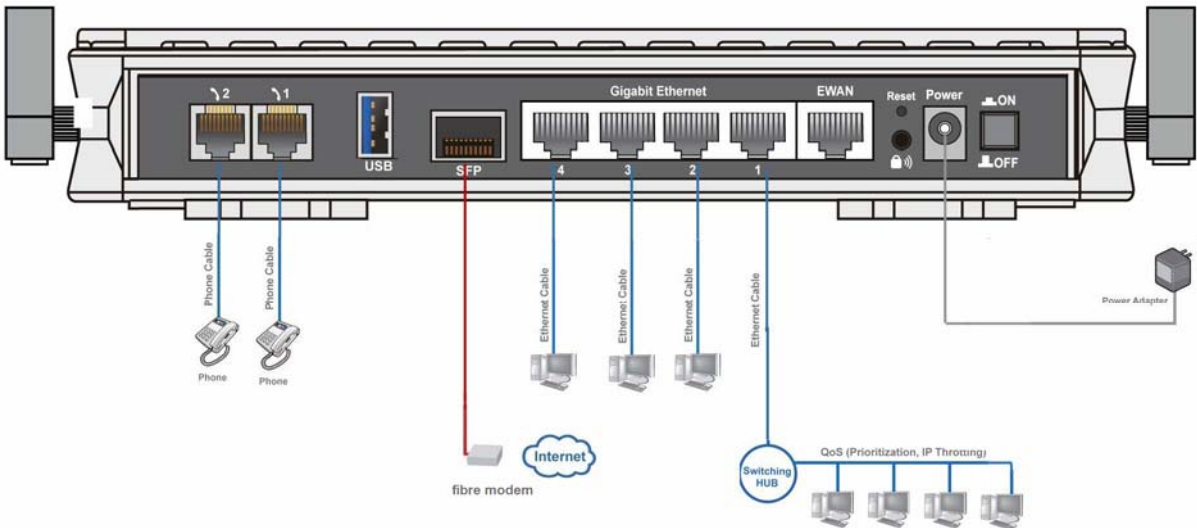
BIPAC 9800VNX(L) is an all-in-one router, supporting alternative ways (3G/4G-LTE, EWAN) to connect to the Internet. Then users can choose one of the ways to connect to the Internet or ISP.

### overview



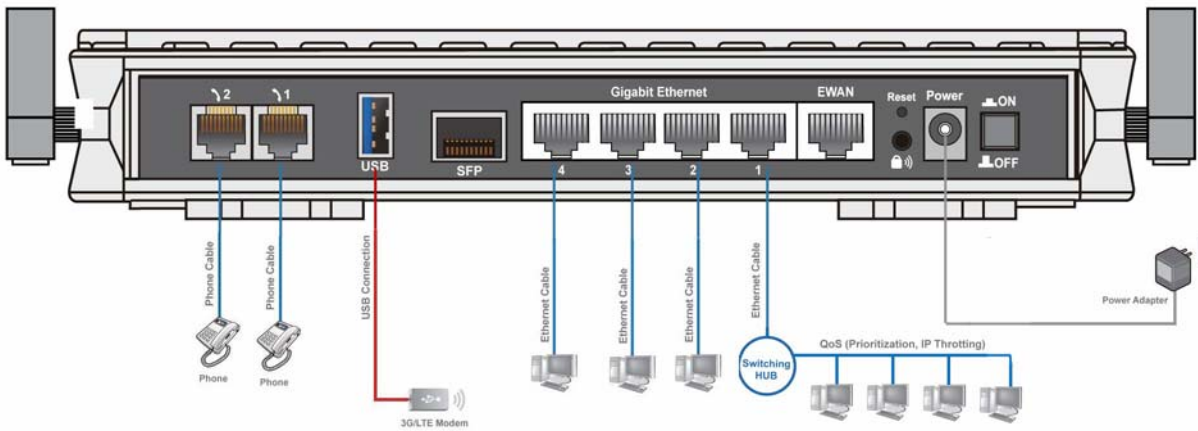
### SFP (direct connection to fibre) mode

BIPAC 9800VNX(L) has a SFP interface for direct fibre connection.



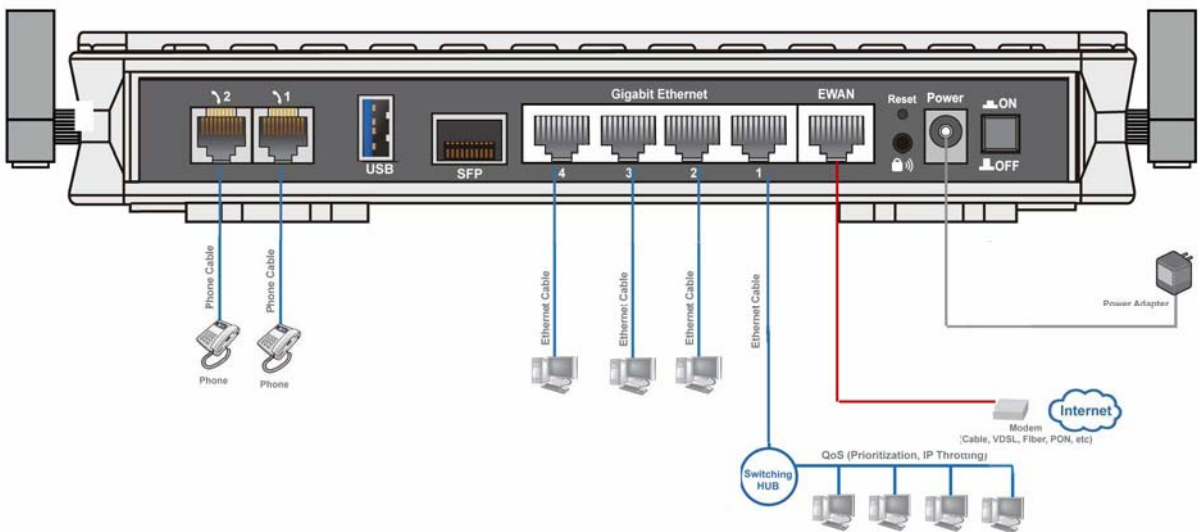
### 3G/ 4G-LTE router mode

BIPAC 9800VNX(L) supports one USB ports for your 3G/ 4G-LTE dongle. It can be used to connect to 3G/ 4G-LTE connection.



### Broadband router mode

BIPAC 9800VNX(L) has a Gigabits Ethernet WAN port to connect to your Fibre/ Cable/ xDSL modem.



# Chapter 2

## Installing the BIPAC 9800VNX(L)

### 2.1 Important note for using the BIPAC 9800VNX(L)



#### **Warning**

- ✓ Do not use the BIPAC 9800VNX(L) in high humidity or high temperatures.
- ✓ Do not use the same power source for the BIPAC 9800VNX(L) as other equipment.
- ✓ Do not open or repair the case yourself. If the BIPAC 9800VNX(L) is too hot, turn off the power immediately and have it repaired at a qualified service center.
- ✓ Avoid using this product and all accessories outdoors.



#### **Attention**

- ✓ Place the BIPAC 9800VNX(L) on a stable surface.
- ✓ Only use the power adapter that comes with the package. Using a different voltage rating power adaptor may damage the router.

## 2.2 Package Contents

- BIPAC 9800VNX(L) - Point-to-Point Fibre Wireless-N (VPN) VoIP Gateway
- Quick Start Guide
- CD containing user manual
- Two detachable wireless Antennas
- Ethernet (RJ-45 CAT-5) cable
- Power adapter

**Fibre Router**



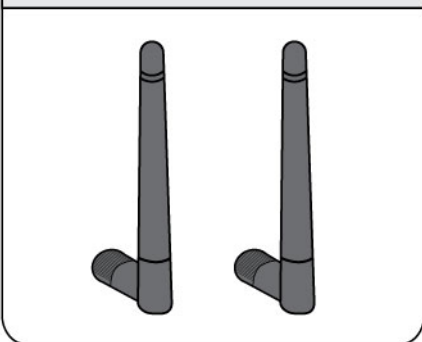
**Quick Start Guide**



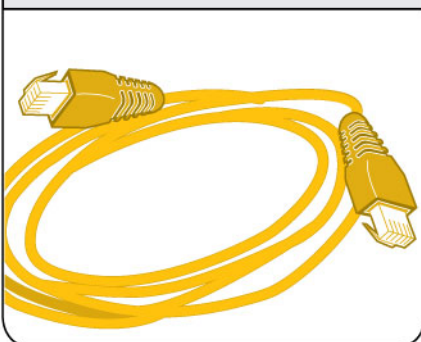
**CD**



**Antennas**

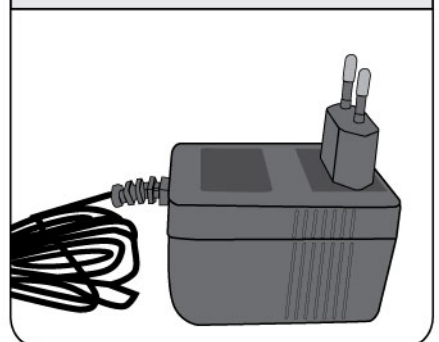


**RJ-45  
Ethernet cable**

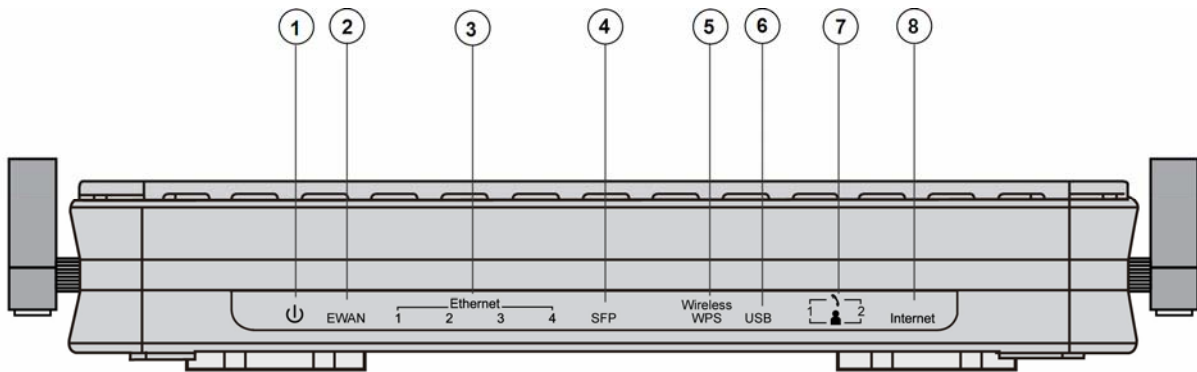


**Power Adapter**

(The type may differ by different country)

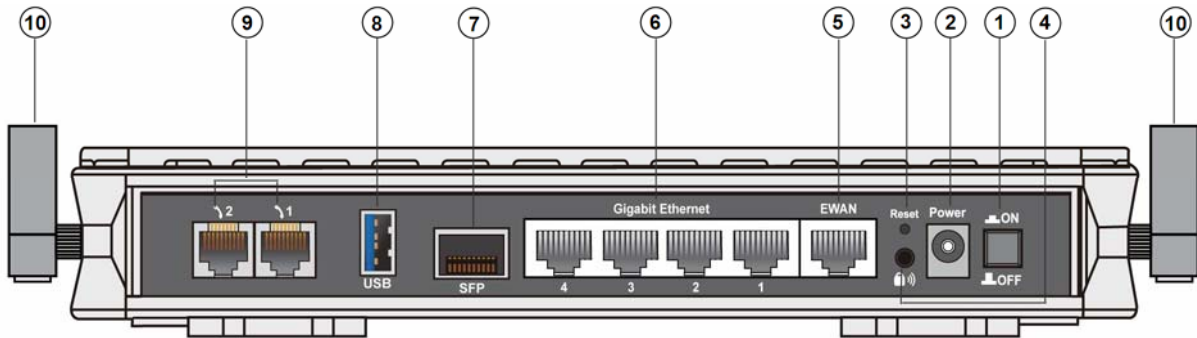


## 2.3 The Front LEDs



LED		Status	Meaning
1	Power	Green	System ready
		Red	Boot failed
2	EWAN	Green	Transmission speed hitting 1000Mbps
		Orange	Transmission speed hitting 10/100Mbps
		Blinking	Data being transmitted/received
3	Ethernet (1-4)	Green	Transmission speed hitting 1000Mbps
		Orange	Transmission speed hitting 10/100Mbps
		Blinking	Data being transmitted/ received
4	SFP	Green	Successfully connected the Fibre.
5	Wireless/ WPS	Green	Wireless connection established
		Green blinking	Sending/ Receiving data
		Orange	WPS on
6	USB	Green	Connected to a 3G/ 4G-LTE modem or storage device
7	Phone (1-2)	Green	Successfully registered
		Orange	Phone being in use
9	Internet	Red	Obtaining IP failure
		Green	Having obtained an IP address successfully
		Off	Router in bridged mode or WAN connection not present.

## 2.4 The Rear Ports



Port		Meaning
1	<b>Power Switch</b>	Power on/off the router.
2	<b>Power Jack</b>	Connect the supplied DC power adapter to this jack.
3	<b>RESET</b>	After the device is powered on, press it <b>6 seconds or above</b> : to restore to factory default settings (this is used when you can not login to the router, e.g. forgot the password)
4	<b>Wireless On/Off WPS</b>	By controlling the pressing time, users can achieve two different effects: (1) <u>Wireless ON/OFF</u> button: Press over 6 seconds to switch on wireless function when wireless is off and press over 6 seconds again to disable wireless function. (2) <u>WPS</u> : Press less than 6 seconds to trigger WPS function.
5	<b>EWAN</b>	Connect to Fibre/ Cable/ xDSL Modem with your RJ-45 cable.
6	<b>Gigabit Ethernet</b>	Connect a UTP Ethernet cable (Cat-5 or Cat-5e) to one of the LAN ports when connecting to a PC or an office/home network of 10Mbps /100Mbps /1000Mbps.
7	<b>SFP</b>	Connect the fibre to this port.
8	<b>USB</b>	Connect the 3G/ 4G-LTE USB modem or storage device to this port.
9	<b>Phone (1-2)</b>	Connect your analog phone set to this port with the RJ-11 cable.
10	<b>Wireless Antenna</b>	Connect to the supplied two high performance external antennas



## 2.6 Cabling

One of the most common causes of problems is bad cabling. Make sure that all connected devices are turned on. On the front panel of the product is a bank of LEDs. Verify that the LAN Link and LEDs are lit. If they are not, verify that you are using the proper cables.

Make sure that all other devices (e.g. telephones, fax machines, analogue modems) connected to the same telephone line as your Billion router have a line filter connected between them and the wall socket (unless you are using a Central Splitter or Central Filter installed by a qualified and licensed electrician), and that all line filters are correctly installed in a right way. If the line filter is not correctly installed and connected, it may cause problems to your connection or may result in frequent disconnections.

# Chapter 3

## Basic Installation

The router can be configured with your web browser. A web browser is included as a standard application in the following operating systems: Windows 98/NT/2000/XP/Vista/Win7, Linux, Mac OS, etc. The product provides an easy and user-friendly interface for configuration.

### 3.1 Before Configuration

PCs must have an Ethernet interface installed properly and be connected to the router either directly or through an external repeater hub, and have TCP/IP installed and configured to obtain an IP address through a DHCP server or a fixed IP address that must be in the same subnet as the router. The default IP address of the router is **192.168.1.254** and the subnet mask is **255.255.255.0** (i.e. any attached PC must be in the same subnet, and have an IP address in the range of 192.168.1.1 to 192.168.1.253). The best and easiest way is to configure the PC to get an IP address automatically from the router using DHCP. If you encounter any problems accessing the router's web interface it may also be advisable to **uninstall** any kind of software firewall on your PCs, as they can cause problems accessing the 192.168.1.254 IP address of the router. Users should make their own decisions on how to best protect their network.

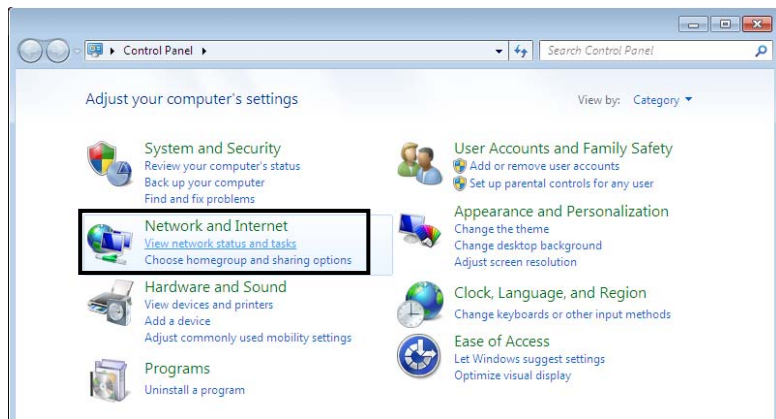
Please follow the steps below for your PC's network environment installation. First of all, please check your PC's network components. The TCP/IP protocol stack and Ethernet network adapter must be installed. If not, please refer to your Windows-related or other operating system manuals.



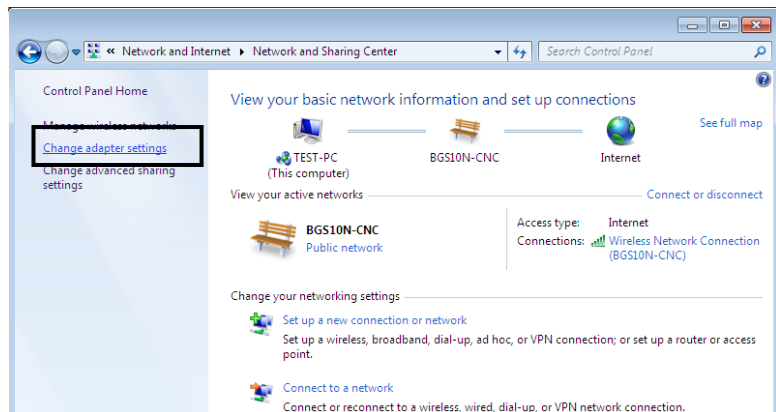
Any TCP/IP capable workstation can be used to communicate with or through the BIPAC 9800VNX(L). To configure other types of workstations, please consult the manufacturer's documentation.

### 3.1.1 Configuring a PC in Windows 7

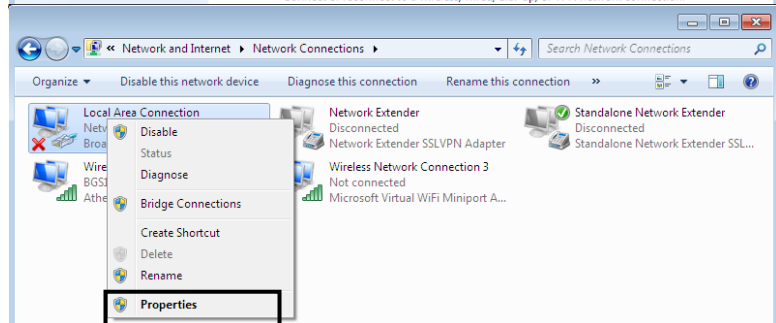
1. Go to **Start**. Click on **Control Panel**. Then click on **Network and Internet**.



2. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.

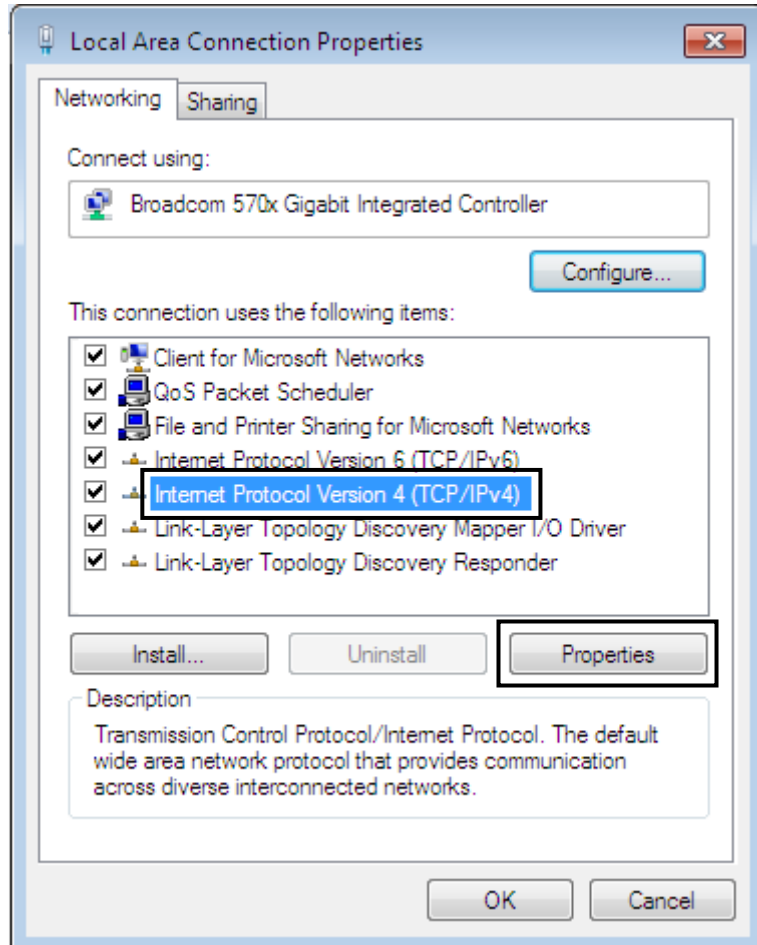


3. Select the **Local Area Connection**, and right click the icon to select **Properties**.

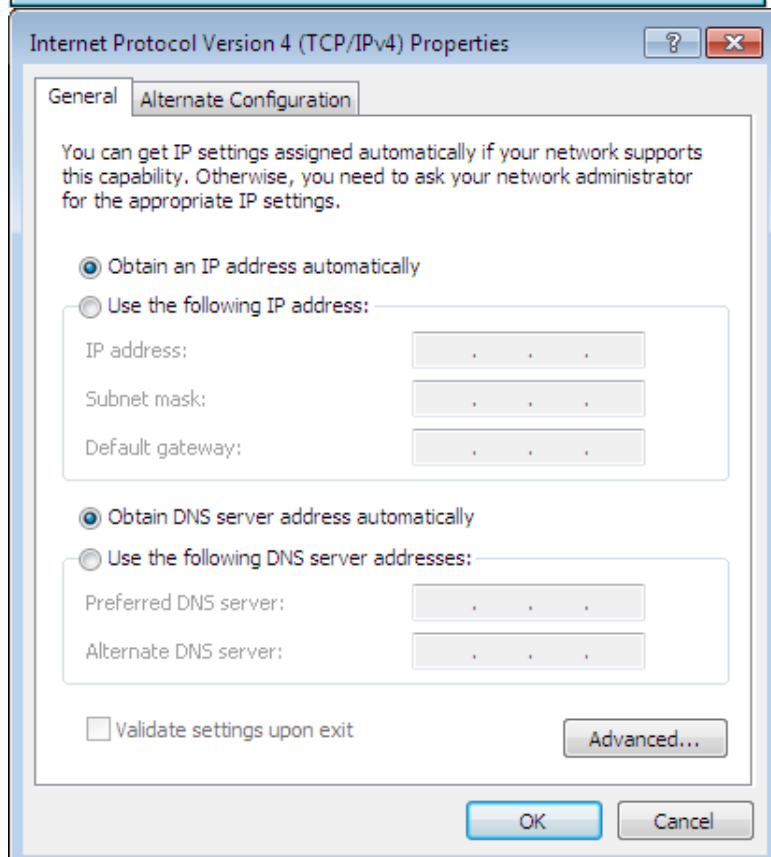


**IPv4:**

4. Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**

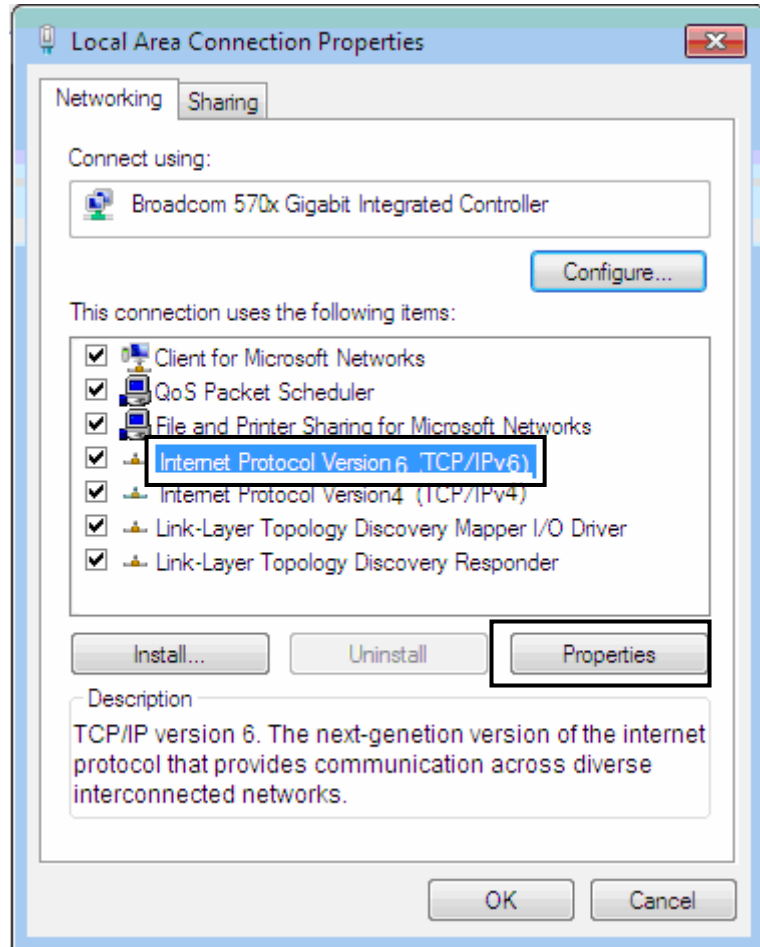


5. In the **TCP/IPv4 properties** window, select the **Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.
6. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.

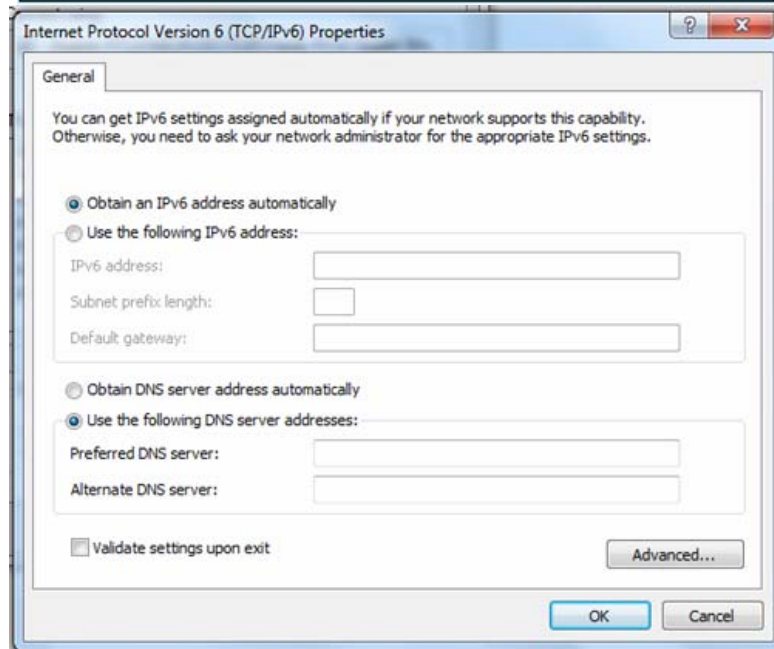


**IPv6:**

4. Select **Internet Protocol Version 6 (TCP/IPv6)** then click **Properties**

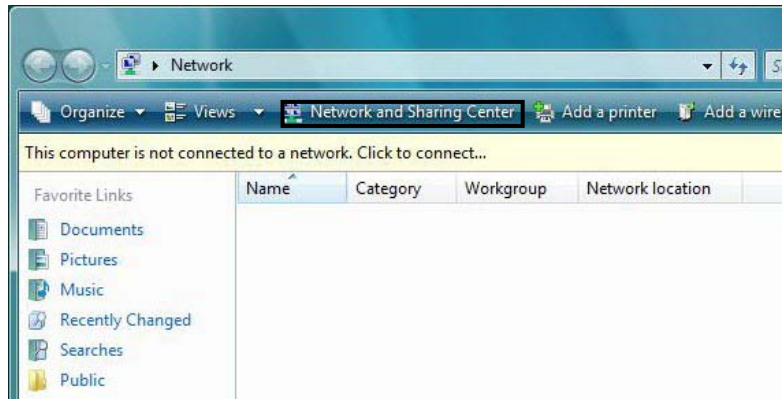


5. In the **TCP/IPv6 properties** window, select the **Obtain an IPv6 address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.
6. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



### 3.1.2 Configuring a PC in Windows Vista

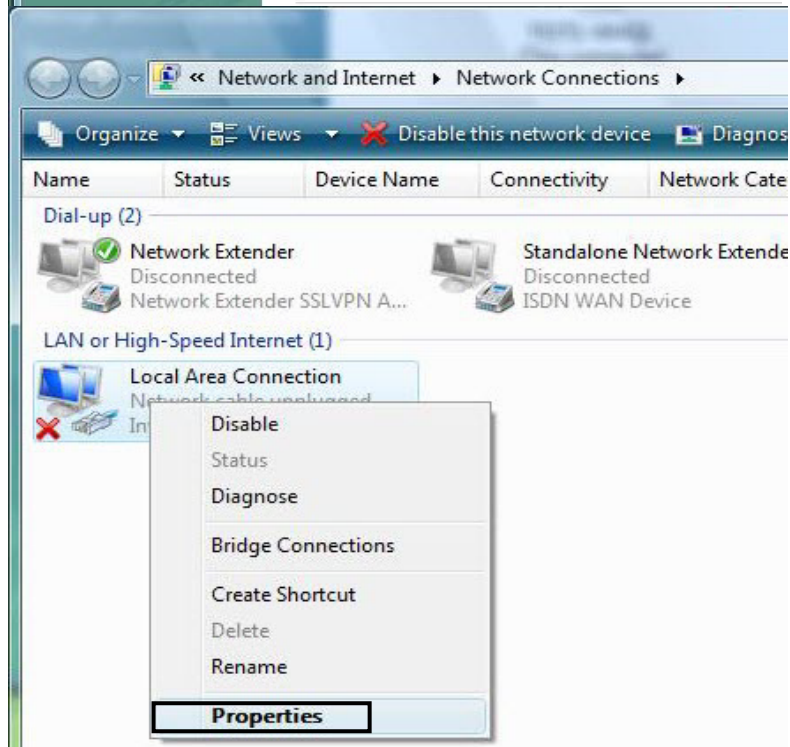
1. Go to **Start**. Click on **Network**. Then click on **Network and Sharing Center** at the top bar.



2. When the **Network and Sharing Center** window pops up, select and click on **Manage network connections** on the left window pane.

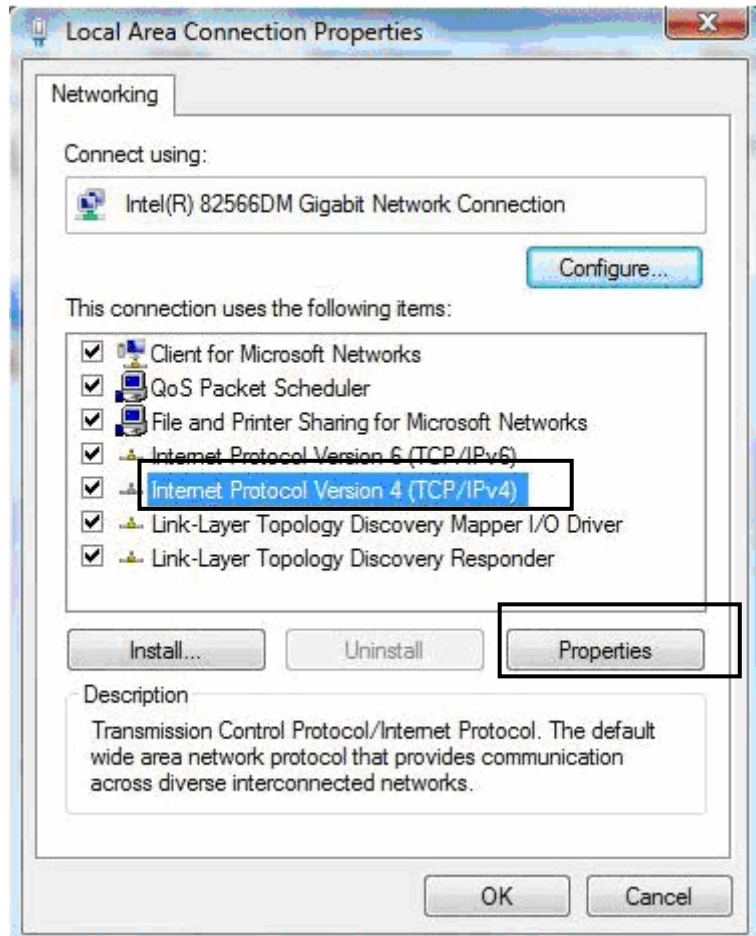


3. Select the **Local Area Connection**, and right click the icon to select **Properties**.

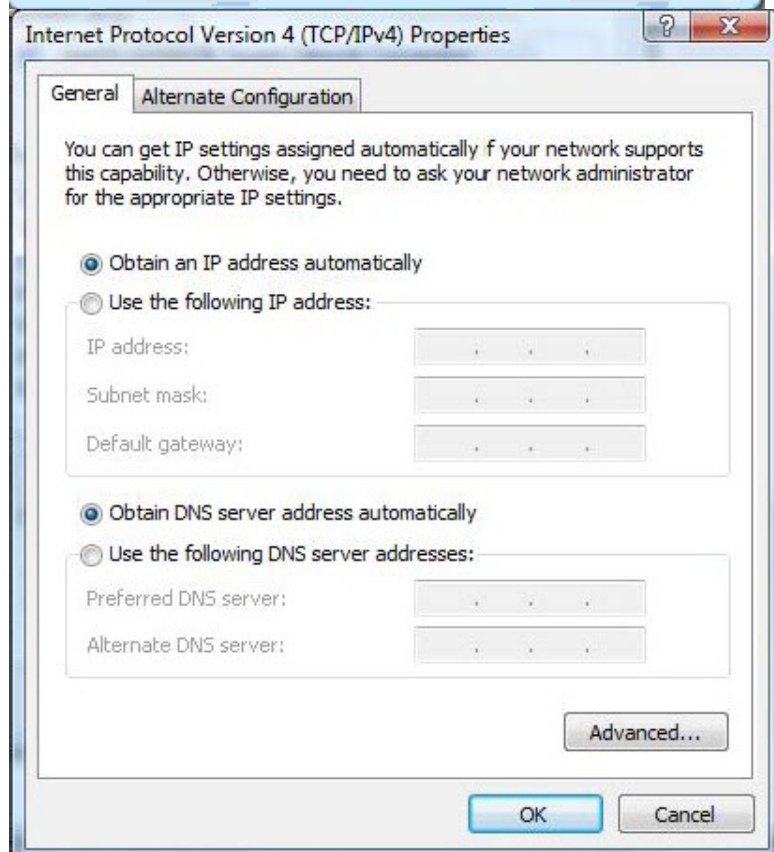


**IPv4:**

4. Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**.



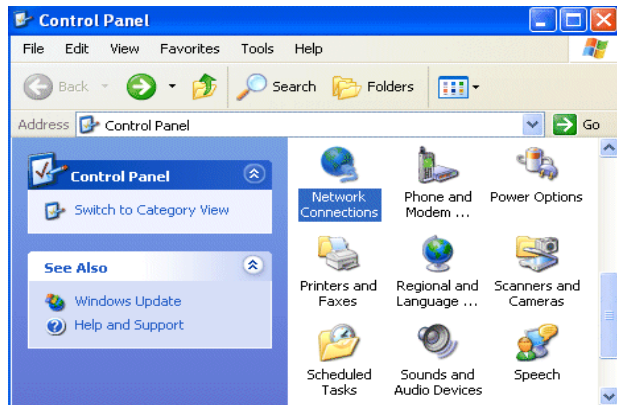
5. In the **TCP/IPv4 properties** window, select the **Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.
6. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



### 3.1.3 Configuring a PC in Windows XP

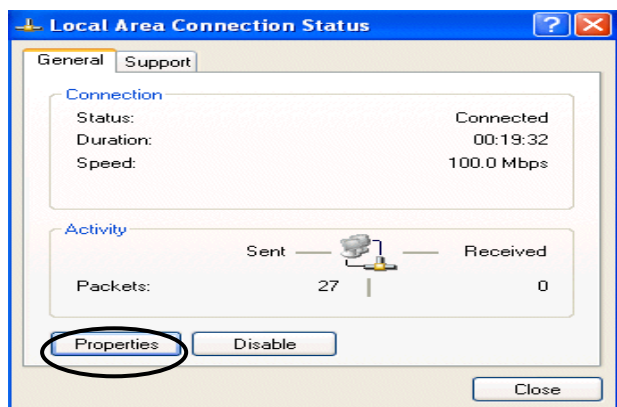
#### IPv4:

1. Go to **Start / Control Panel (in Classic View)**. In the Control Panel, double-click on **Network Connections**

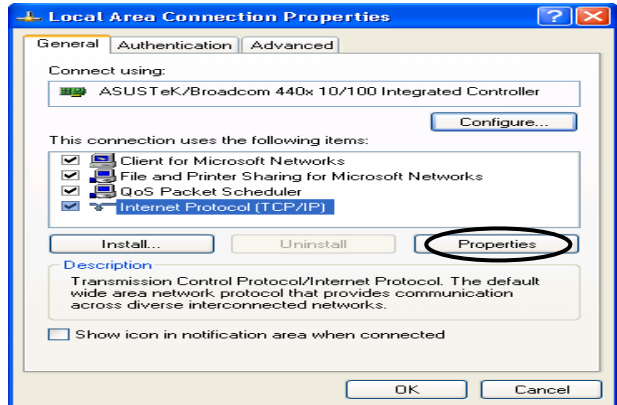


2. Double-click **Local Area Connection**.

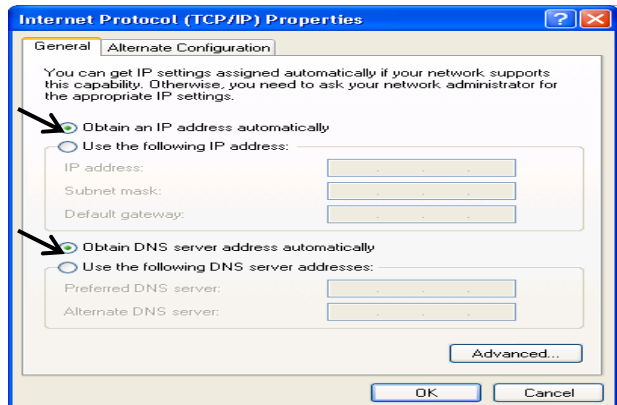
3. In the **Local Area Connection Status** window, click **Properties**.



4. Select **Internet Protocol (TCP/IP)** and click **Properties**.



5. Select the **Obtain an IP address automatically** and the **Obtain DNS server address automatically** radio buttons.



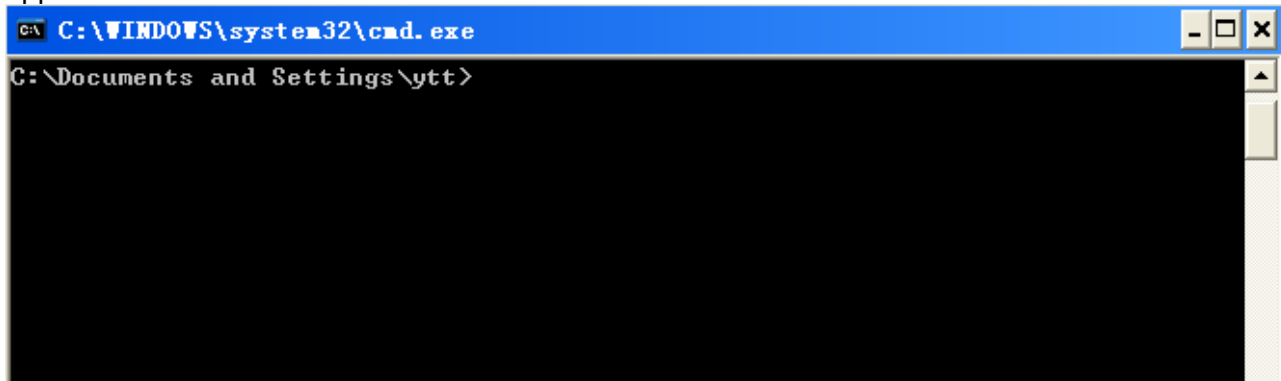
6. Click **OK** to finish the configuration.



### IPv6:

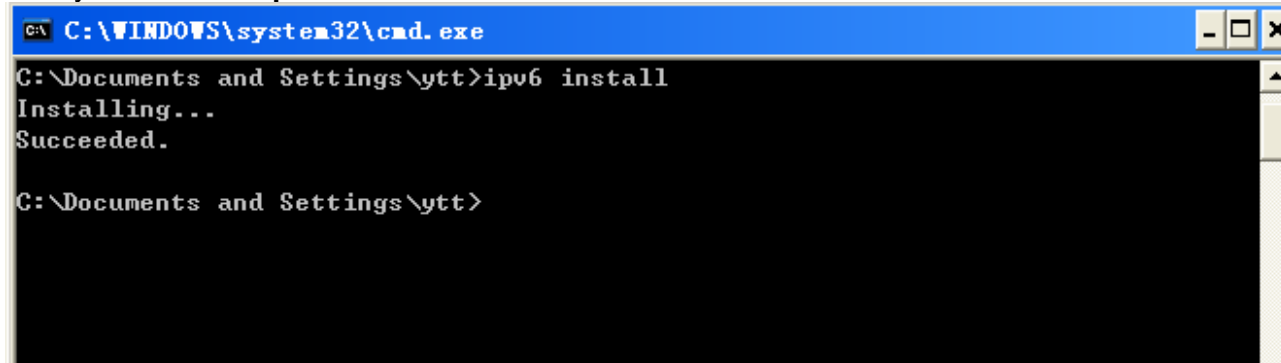
IPv6 is supported by Windows XP, but you should install it first.  
Act as shown below:

1. On the desktop, Click Start > Run, type cmd, then press Enter key in the keyboard, the following screen appears.



```
C:\WINDOWS\system32\cmd.exe
C:\Documents and Settings\ytt>
```

2. Key in command **ipv6 install**



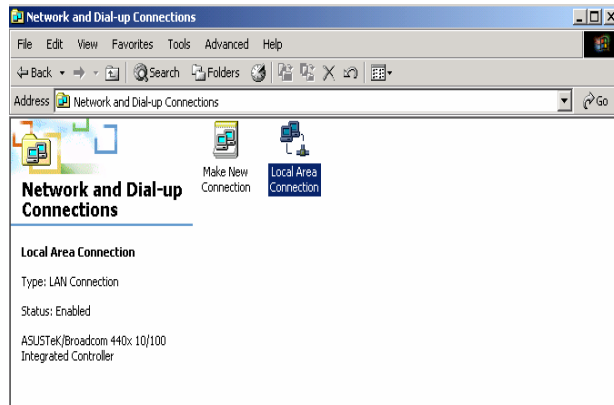
```
C:\WINDOWS\system32\cmd.exe
C:\Documents and Settings\ytt>ipv6 install
Installing...
Succeeded.
C:\Documents and Settings\ytt>
```

Configuration is OK now, you can test whether it works ok.

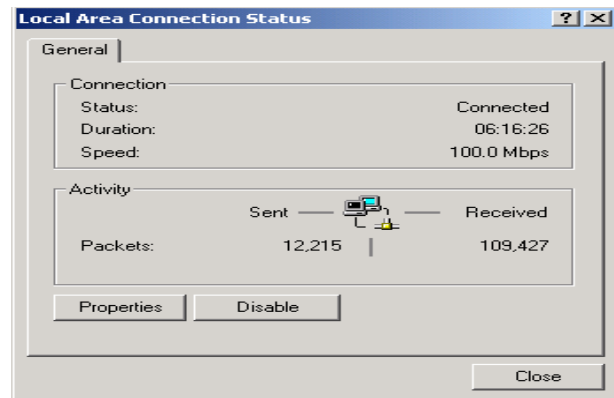
### 3.1.4 Configuring a PC in Windows 2000

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click on **Network and Dial-up Connections**.

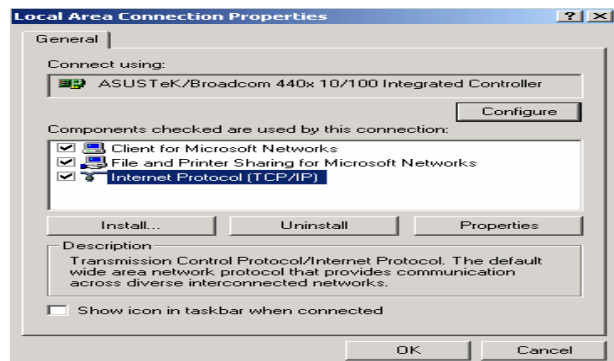
2. Double-click **Local Area Connection**.



3. In the **Local Area Connection Status** window click **Properties**.

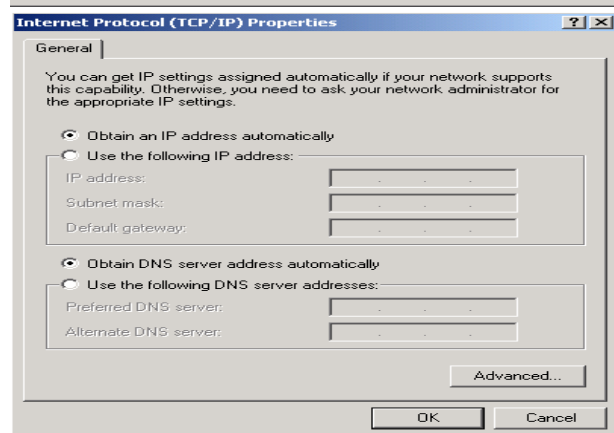


4. Select **Internet Protocol (TCP/IP)** and click **Properties**.



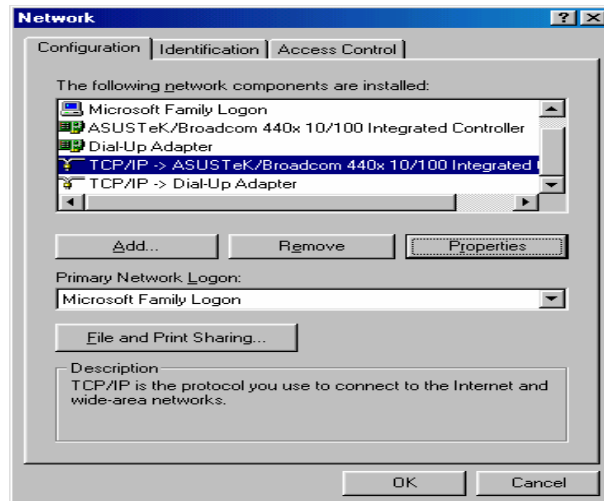
5. Select the **Obtain an IP address automatically** and the **Obtain DNS server address automatically** radio buttons.

6. Click **OK** to finish the configuration.

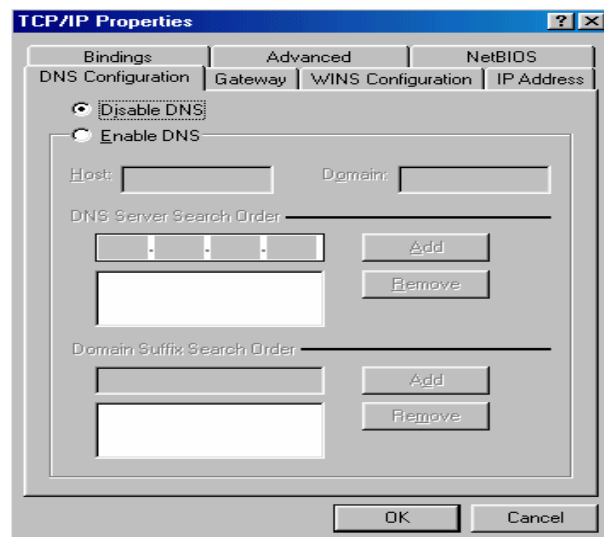
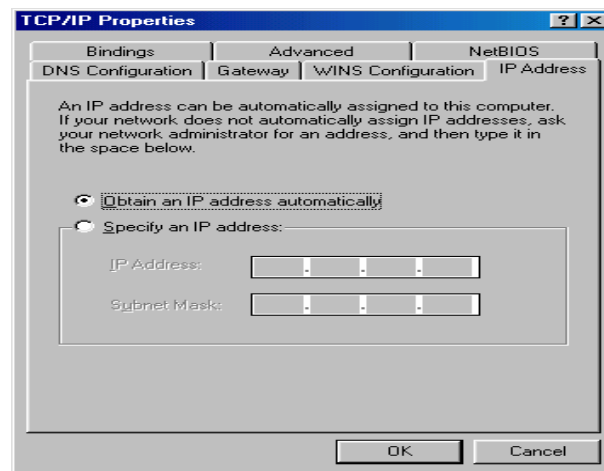


### 3.1.5 Configuring a PC in Windows 98/Me

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click on **Network** and choose the **Configuration** tab.
2. Select **TCP/IP ->NE2000 Compatible**, or the name of your Network Interface Card (NIC) in your PC.
3. Select the **Obtain an IP address automatically** radio button.

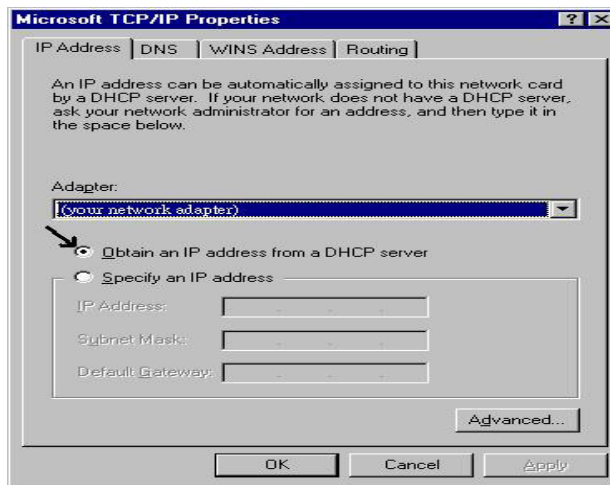
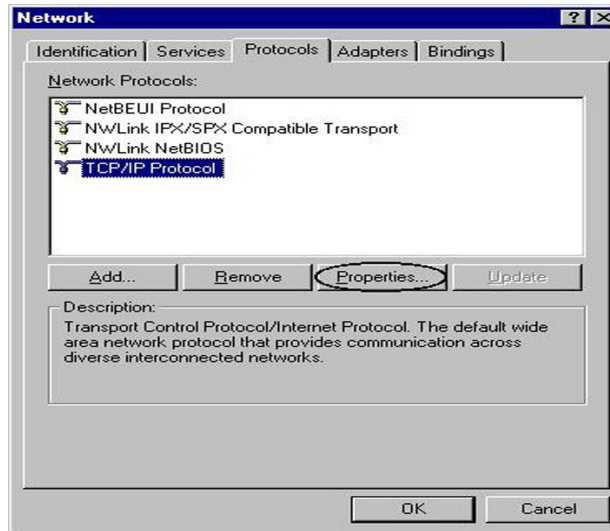


4. Then select the **DNS Configuration** tab.
5. Select the **Disable DNS** radio button and click **OK** to finish the configuration.



### 3.1.6 Configuring a PC in Windows NT4.0

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click on **Network** and choose the **Protocols** tab.
2. Select **TCP/IP Protocol** and click **Properties**.
3. Select the **Obtain an IP address from a DHCP server** radio button and click **OK**.



## 3.2 Factory Default Settings

Before configuring your router, you need to know the following default settings.

### Web Interface:

- ✘ Username: admin
- ✘ Password: admin

### LAN Device IP Settings:

- ✘ IP Address: 192.168.1.254
- ✘ Subnet Mask: 255.255.255.0

### DHCP server:

- ✘ DHCP server is enabled.
- ✘ Start IP Address: 192.168.1.100
- ✘ IP pool counts: 20

### 3.2.1 Username and Password

The default username and password are “**admin**” and “**admin**” respectively.



If you ever forget the password to log in, you may press the **RESET** button up to **6** seconds to restore the factory default settings.

#### **Attention**

### 3.3 LAN Port Addresses

The parameters of LAN ports are pre-set in the factory. The default values are shown below.

#### IPv4:

<b>IP address</b>	192.168.1.254
<b>Subnet Mask</b>	255.255.255.0
<b>DHCP server function</b>	Enabled
<b>IP addresses for distribution to PCs</b>	20 IP addresses continuing from 192.168.1.100 through 192.168.1.119

### 3.4 Information from your ISP

Before configuring this device, you have to check with your ISP (Internet Service Provider) what kind of service is provided such as **EWAN** (Dynamic IP address, Static IP address, PPPoE, Bridge Mode), **SFP**(Dynamic IP address, Static IP address, PPPoE, Bridge Mode).

Gather the information as illustrated in the following table and keep it for reference.

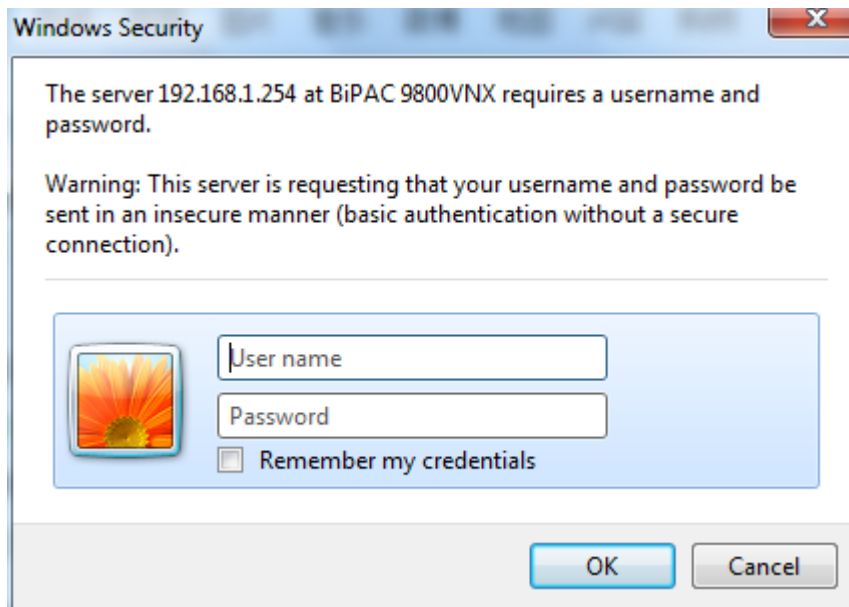
#### EWAN/SFP:

<b>PPPoE</b>	Username, Password, Service Name, and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
<b>Dynamic IP Address</b>	Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
<b>Static IP Address</b>	Static IP Address, IP Subnet Mask, Gateway IP Address, and Domain Name System (DNS) IP address.
<b>Bridge Mode</b>	Pure bridge.

# Chapter 4 Configuration

## 4.1 Configuring BiPAC 9800VNX(L) with your Web Browser

Open your web browser, enter the IP address of your router, which by default is **192.168.1.254**, and click **“OK”**, a user name and password window prompt will appear. The default username and password are **“admin”** and **“admin”**.



**Congratulation! You are now successfully logged on to the BiPAC 9800VNX!**

At the configuration homepage, the left navigation pane where bookmarks are provided links you directly to the desired setup page, including:

- **Status**(Device Info, System Log, 3G/4G-LTE Status, Statistics, DHCP Table, ARP Table, IPSEC Status, PPTP Status, L2TP Status, Disk Status, VoIP Status)
- **Quick Start** (Wizard Setup)
- **Configuration** (Interface Setup, Dual WAN, Advanced Setup, VoIP, Access Management, Maintenance)
- **Language**

Please see the relevant sections of this manual for detailed instructions on how to configure your router.



## 4.2 Status

In this section, you can check the router working status, including **Device Info**, **System Log**, **3G/4G-LTE Status**, **Statistics**, **DHCP Table**, **ARP Table**, **IPSEC Status**, **PPTP Status**, **L2TP Status**, **Disk Status**, and **VoIP Status**.

The screenshot shows the web interface of a Billion router. The top header includes the Billion logo, the product name "Point-to-Point Fiber Wireless-N VPN VoIP Gateway", and the slogan "Powering communications with Security". A left sidebar contains a navigation menu with options like Status, Device Info, System Log, 3G/4G-LTE Status, Statistics, DHCP Table, ARP Table, IPSEC Status, PPTP Status, L2TP Status, Disk Status, VoIP Status, Quick Start, Configuration, and Language. The main content area is titled "Status" and contains a "Device Information" section. This section is divided into several sub-sections: LAN (IPv4), WAN, and IP4. The LAN IPv4 section shows IP Address (192.168.1.254), Subnet Mask (255.255.255.0), and DHCPv4 Server (Enable). The WAN section shows Interface (EWAN), Connection Type (Dynamic IP), and Status (Connected). The IP4 section shows IP Address (172.16.1.186), Subnet Mask (255.255.255.0), Default Gateway (172.16.1.254), and DNS Server (172.16.1.254). There are buttons for "Renew IP Address" and "Release IP Address" next to the IP Address field. At the bottom right, there are "Restart" and "Logout" buttons. The footer contains the copyright notice: "Copyright © Billion Electric Co., Ltd. All rights reserved."

Device Information	
Model Name	BIPAC 9800VNX
Firmware Version	1.11
MAC Address	00:04:ED:11:22:33
LAN	
IPv4	
IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable
IPv6	
IP Address	
Prefix Length	
DHCPv6 Server	Enable Stateless
WAN	
Interface	EWAN
Connection Type	Dynamic IP
IP4	
Status	Connected
IP Address	172.16.1.186
Subnet Mask	255.255.255.0
Default Gateway	172.16.1.254
DNS Server	172.16.1.254
IPv6	

## 4.2.1 Device Info

Users will see device's basic information in this page.


### EWAN

Status 

▼ Device Information

Model Name	BIPAC 9800VNX
Firmware Version	1.11
MAC Address	00:04:ED:11:22:33
LAN	
IPv4	
IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable
IPv6	
IP Address	2000:1211:1000:3b01:204:edff:fe59:6230
Prefix Length	64
DHCPv6 Server	Enable Stateless
WAN	
Interface	EWAN ▼
Connection Type	PPPoE
PPP Connection Time	0d: 0h: 3m: 5s
IPv4	
Status	Connected
IP Address	10.40.90.101
Subnet Mask	255.255.255.255
Default Gateway	10.0.0.2
DNS Server	218.2.135.1
IPv6	
Status	Connected
IP Address	2000:db98:1000:1000:8b3a:fa69:9ce0:eb27
Prefix Length	64
Default Gateway	fe80::b8f9:bba2:f1a5:1f5d
DNS Server	2000:1000:1000:1000::ff

# SFP

Status 

▼ Device Information

Model Name	BIPAC 9800VNX
Firmware Version	1.11
MAC Address	00:04:ED:11:22:33
LAN	
IPv4	
IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable
IPv6	
IP Address	
Prefix Length	
DHCPv6 Server	Enable Stateless
WAN	
Interface	SFP <input type="button" value="v"/>
Connection Type	Dynamic IP
IPv4	
Status	Connected
IP Address	172.16.1.186 <input type="button" value="Renew IP Address"/> <input type="button" value="Release IP Address"/>
Subnet Mask	255.255.255.0
Default Gateway	172.16.1.254
DNS Server	172.16.1.254
IPv6	
Status	Not Connected
IP Address	N/A
Prefix Length	N/A
Default Gateway	N/A
DNS Server	N/A

## 3G/ 4G-LTE USB

**Status**

**Device Information**

Model Name	BIPAC 9800VNX
Firmware Version	1.11
MAC Address	00:04:ED:11:22:33

**LAN**

**IPv4**

IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable

**IPv6**

IP Address	
Prefix Length	
DHCPv6 Server	Enable Stateless


**WAN**

Interface	3G/4G-LTE
Connection Time	0d: 1h:13m:22s

**IPv4**

Status	Connected
IP Address	100.101.33.242
Subnet Mask	255.255.255.252
Default Gateway	100.101.33.241
DNS Server	168.95.1.1

**3G/4G-LTE**

Signal Strength	 -72.00dbm
Network Name	"Chunghwa Telecom"
Card IMEI	.....
Card IMSI	.....

## ■ Device Information

**Model Name:** Show model name of the router

**Firmware Version:** This is the Firmware version

**MAC Address:** This is the MAC Address

## ■ LAN

### ➤ IPv4:

**IP Address:** LAN port IPv4 address.

**Subnet Mask:** LAN port IP subnet mask.

**DHCPv4 Server:** LAN port DHCP role - Enabled, Relay or Disabled.

### ➤ IPv6:

**IP Address:** LAN port IPv6 address.

**Prefix Length:** The prefix length

**DHCPv6 Server:** The DHCP status.

## ■ WAN

**Interface:** The now used connection method, "EWAN", "SFP" and "3G/4G-LTE USB".

**Connection Type:** The protocol selected.

**PPP Connection Time:** The time totaled since PPP has been successfully connected.

### ➤ IPv4:

**Status:** The connection status, Not connected or Connected.

**IP Address:** WAN port IP address.

**Subnet Mask:** WAN port IP subnet mask.

**Default Gateway:** The IP address of the default gateway.

**DNS Server:** DNS information.

### ➤ IPv6:

**Status:** The IPv6 connection status.

**IP Address:** WAN port IPv6 address.

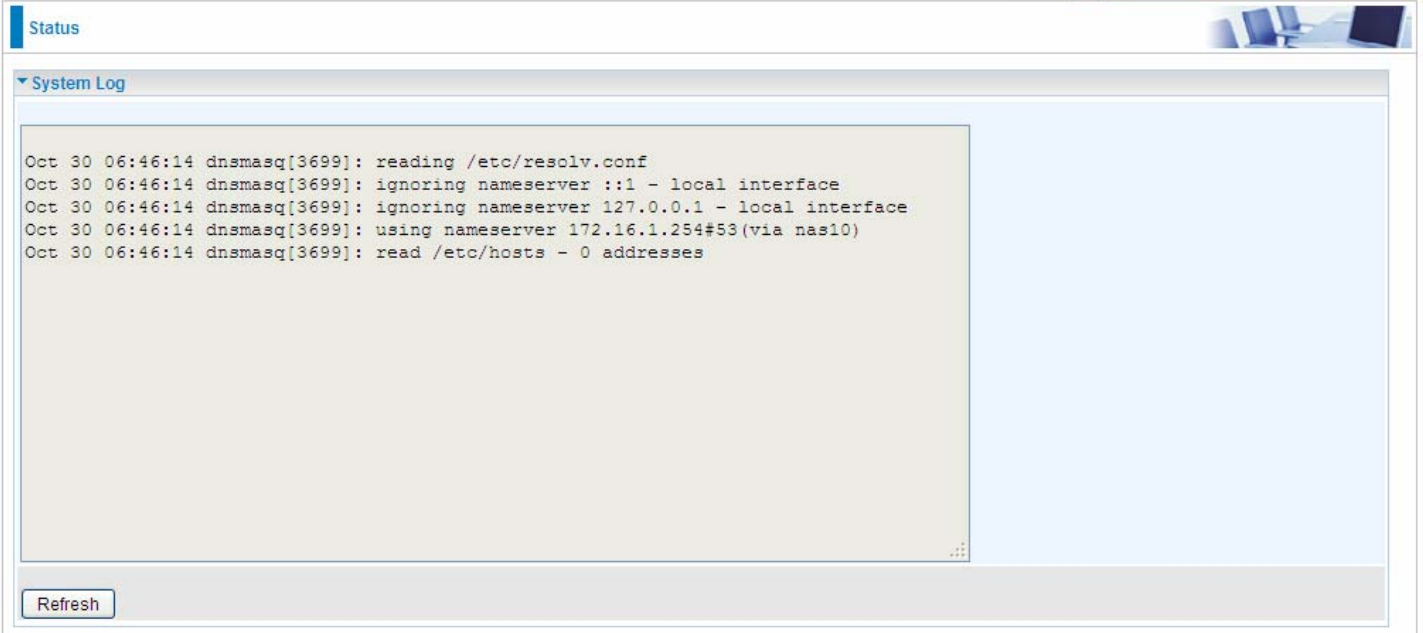
**Prefix Length:** The prefix length of IPv6 address.

**Default Gateway:** The IP address of the default gateway.

**DNS Server:** DNS information.

## 4.2.2 System Log

In system log, users can check the operations to the router and track the glitches to the router when occurred.



The screenshot shows a web interface with a 'Status' tab and a 'System Log' section. The log contains the following entries:

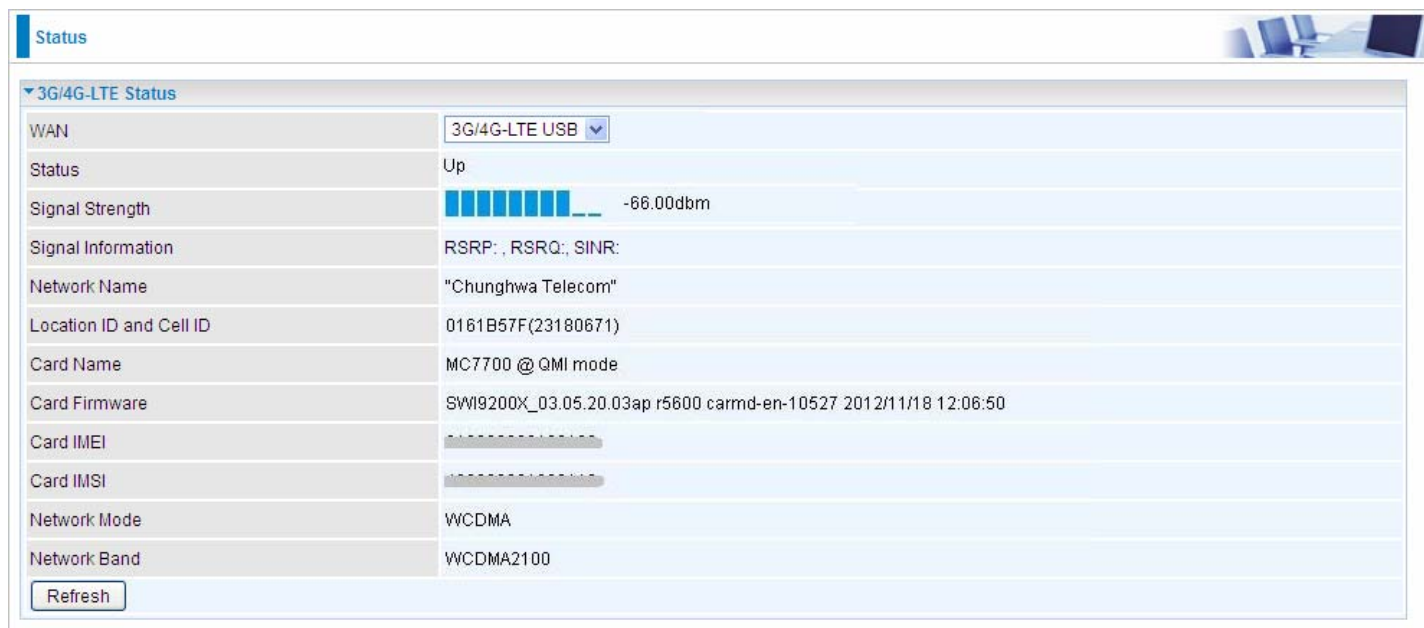
```
Oct 30 06:46:14 dnsmasq[3699]: reading /etc/resolv.conf
Oct 30 06:46:14 dnsmasq[3699]: ignoring nameserver ::1 - local interface
Oct 30 06:46:14 dnsmasq[3699]: ignoring nameserver 127.0.0.1 - local interface
Oct 30 06:46:14 dnsmasq[3699]: using nameserver 172.16.1.254#53(via nas10)
Oct 30 06:46:14 dnsmasq[3699]: read /etc/hosts - 0 addresses
```

Below the log is a 'Refresh' button.


**Refresh:** Press this button to refresh the statistics.

## 4.2.3 3G/4G-LTE Status

In this page users can check the 3G/4G-LTE connection information.



The screenshot displays the '3G/4G-LTE Status' interface. At the top, there is a 'Status' tab and a '3G/4G-LTE Status' dropdown menu. Below this, a table lists various connection parameters. The 'WAN' is set to '3G/4G-LTE USB'. The 'Status' is 'Up'. The 'Signal Strength' is represented by a bar chart and a value of -66.00dbm. The 'Signal Information' section shows 'RSRP: . RSRQ: SINR:'. The 'Network Name' is 'Chunghwa Telecom'. The 'Location ID and Cell ID' is '0161B57F(23180671)'. The 'Card Name' is 'MC7700 @ QMI mode'. The 'Card Firmware' is 'SWI9200X\_03.05.20.03ap r5600 carmd-en-10527 2012/11/18 12:06:50'. The 'Card IMEI' and 'Card IMSI' are redacted with grey bars. The 'Network Mode' is 'WCDMA' and the 'Network Band' is 'WCDMA2100'. A 'Refresh' button is located at the bottom left of the table.

WAN	3G/4G-LTE USB
Status	Up
Signal Strength	 -66.00dbm
Signal Information	RSRP: . RSRQ: SINR:
Network Name	"Chunghwa Telecom"
Location ID and Cell ID	0161B57F(23180671)
Card Name	MC7700 @ QMI mode
Card Firmware	SWI9200X_03.05.20.03ap r5600 carmd-en-10527 2012/11/18 12:06:50
Card IMEI	-----
Card IMSI	-----
Network Mode	WCDMA
Network Band	WCDMA2100

**Status:** The current status of the 3G/4G-LTE connection.

**Signal Strength:** The signal strength bar and dbm value indicates the current 3G/ 4G-LTE signal strength. On the front panel, the 3G/ 4G-LTE Signal Strength LED indicates the signal strength too.

**Signal Information:** Giving out some important LTE signal parameters like RSRP(Reference Signal Receiving Power), RSRQ(Reference Signal Receiving Quality), SINR(Signal to Interference plus Noise Ratio).

**Network Name:** The network name that the device is connected to.

**Location ID and Cell ID:** The ID of base station that the device is connected to.

**Card Name:** The name of the 3G/4G LTE module.

**Card Firmare:** The firmare of the 3G/4G-LTE module.

**Card IMEI:** The unique identification number that is used to identify the 3G/ 4G-LTE module.

**Card IMSI:** The international mobile subscriber identity used to uniquely identify the 3G/ 4G-LTE module.

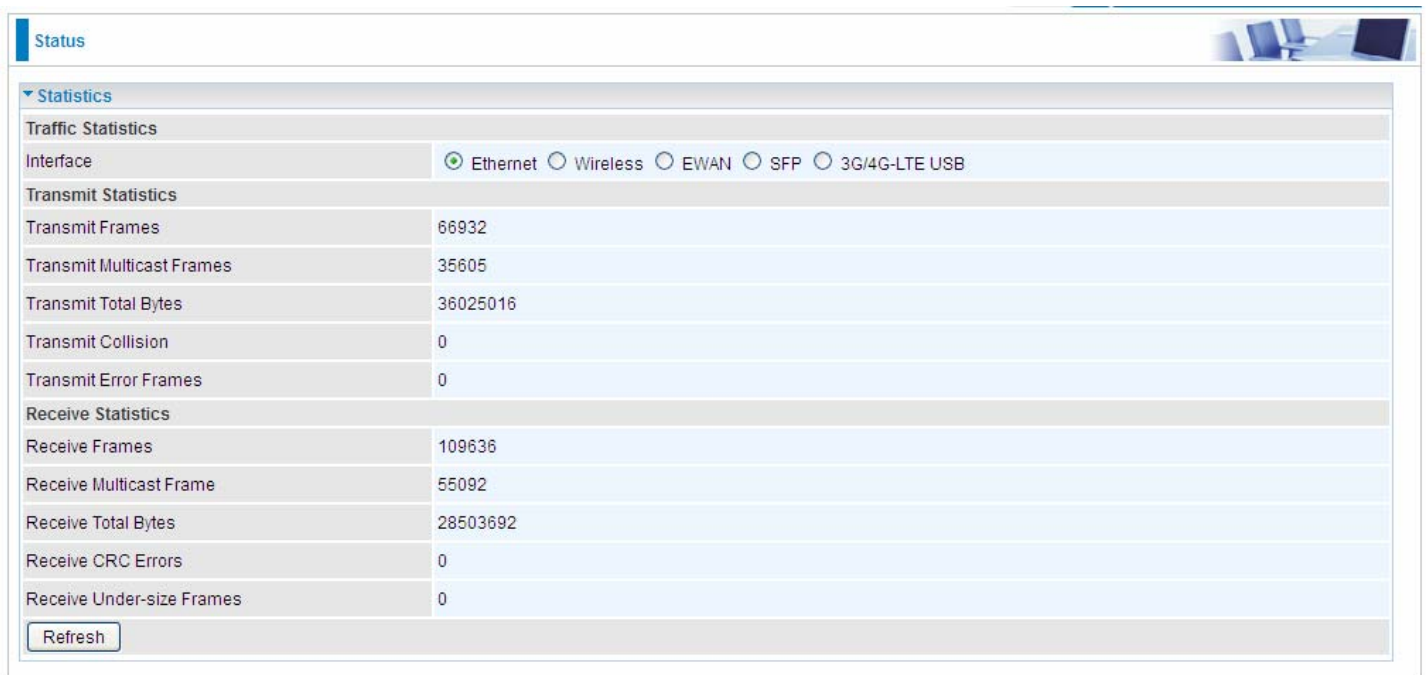
**Network Mode:** Show the using network mode.

**Network Band:** Show the using network band.

**Refresh:** Press this button to refresh the statistics.

## 4.2.4 Statistics

### ➤ Ethernet



The screenshot displays the 'Statistics' section for the Ethernet interface. It includes a 'Traffic Statistics' header and a table of statistics. The 'Interface' is set to 'Ethernet'. The statistics are categorized into 'Transmit Statistics' and 'Receive Statistics'. A 'Refresh' button is present at the bottom left of the table.

Traffic Statistics	
Interface	<input checked="" type="radio"/> Ethernet <input type="radio"/> Wireless <input type="radio"/> EWAN <input type="radio"/> SFP <input type="radio"/> 3G/4G-LTE USB
Transmit Statistics	
Transmit Frames	66932
Transmit Multicast Frames	35605
Transmit Total Bytes	36025016
Transmit Collision	0
Transmit Error Frames	0
Receive Statistics	
Receive Frames	109636
Receive Multicast Frame	55092
Receive Total Bytes	28503692
Receive CRC Errors	0
Receive Under-size Frames	0
<input type="button" value="Refresh"/>	

**Interface:** This field displays the type of port

**Transmit Frames:** This field displays the number of frames transmitted until the latest second.

**Transmit Multicast Frames:** This field displays the number of multicast frames transmitted until the latest second.

**Transmit Total Bytes:** This field displays the number of bytes transmitted until the latest second.

**Transmit Collision:** This is the number of collisions on this port.

**Transmit Error Frames:** This field displays the number of error packets on this port.

**Receive Frames:** This field displays the number of frames received until the latest second.

**Receive Multicast Frames:** This field displays the number of multicast frames received until the latest second.

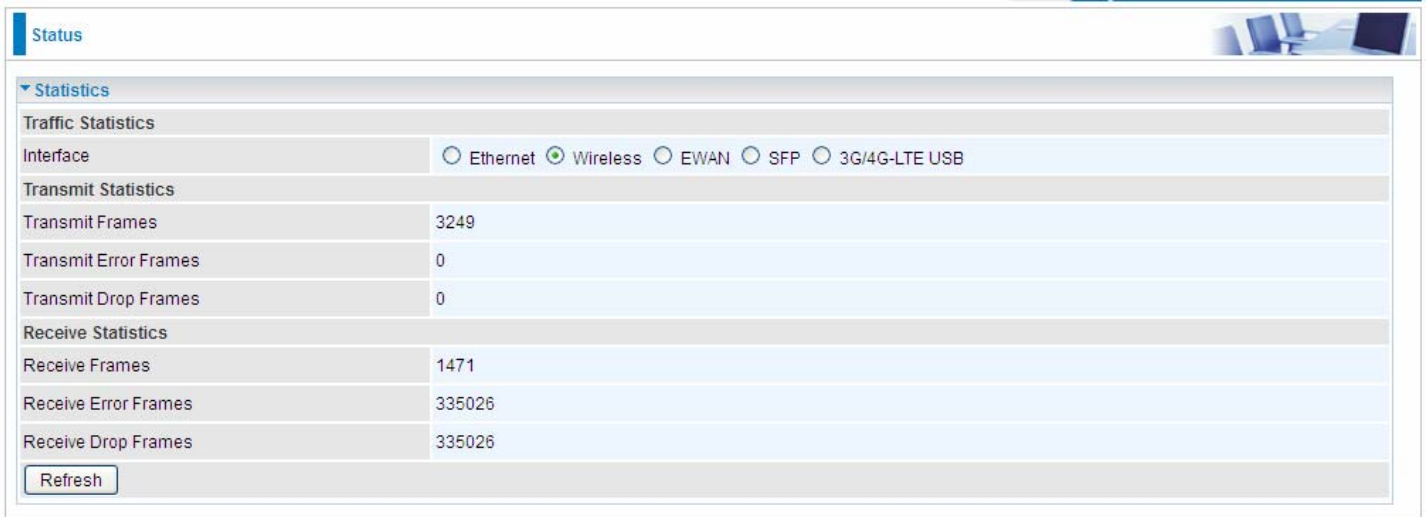
**Receive Total Bytes:** This field displays the number of bytes received until the latest second.

**Receive CRC Errors:** This field displays the number of error packets on this port.

**Receive Under-size Frames:** This field displays the number of under-size frames received until the latest second.

**Refresh:** Press this button to refresh the statistics.





The screenshot shows a web interface for network status. At the top, there is a 'Status' tab. Below it, a 'Statistics' section is expanded. Under 'Traffic Statistics', the 'Interface' is set to 'Wireless' (indicated by a checked radio button). Other options include Ethernet, EWAN, SFP, and 3G/4G-LTE USB. The 'Transmit Statistics' section shows: Transmit Frames (3249), Transmit Error Frames (0), and Transmit Drop Frames (0). The 'Receive Statistics' section shows: Receive Frames (1471), Receive Error Frames (335026), and Receive Drop Frames (335026). A 'Refresh' button is located at the bottom left of the statistics table.

Traffic Statistics	
Interface	<input type="radio"/> Ethernet <input checked="" type="radio"/> Wireless <input type="radio"/> EWAN <input type="radio"/> SFP <input type="radio"/> 3G/4G-LTE USB
Transmit Statistics	
Transmit Frames	3249
Transmit Error Frames	0
Transmit Drop Frames	0
Receive Statistics	
Receive Frames	1471
Receive Error Frames	335026
Receive Drop Frames	335026

**Transmit Frames:** This field displays the number of frames transmitted until the latest second.

**Transmit Error Frames:** This field displays the number of error frames transmitted until the latest second.

**Transmit Drop Frames:** This field displays the number of drop frames transmitted until the latest second.

**Receive Frames:** This field displays the number of frames received until the latest second.

**Receive Error Frames:** This field displays the number of error frames received until the latest second.

**Receive Drop Frames:** This field displays the number of drop frames received until the latest second.

**Refresh:** Press this button to refresh the statistics.

Status																													
▾ Statistics <table border="1"> <thead> <tr> <th colspan="2">Traffic Statistics</th> </tr> <tr> <td>Interface</td> <td> <input type="radio"/> Ethernet               <input type="radio"/> Wireless               <input checked="" type="radio"/> EWAN               <input type="radio"/> SFP               <input type="radio"/> 3G/4G-LTE USB             </td> </tr> </thead> <tbody> <tr> <th colspan="2">Transmit Statistics</th> </tr> <tr> <td>Transmit Frames</td> <td>24671</td> </tr> <tr> <td>Transmit Multicast Frames</td> <td>760</td> </tr> <tr> <td>Transmit Total Bytes</td> <td>3220301</td> </tr> <tr> <td>Transmit Collision</td> <td>0</td> </tr> <tr> <td>Transmit Error Frames</td> <td>0</td> </tr> <tr> <th colspan="2">Receive Statistics</th> </tr> <tr> <td>Receive Frames</td> <td>83803</td> </tr> <tr> <td>Receive Multicast Frame</td> <td>54854</td> </tr> <tr> <td>Receive Total Bytes</td> <td>25107546</td> </tr> <tr> <td>Receive CRC Errors</td> <td>0</td> </tr> <tr> <td>Receive Under-size Frames</td> <td>0</td> </tr> </tbody> </table>		Traffic Statistics		Interface	<input type="radio"/> Ethernet <input type="radio"/> Wireless <input checked="" type="radio"/> EWAN <input type="radio"/> SFP <input type="radio"/> 3G/4G-LTE USB	Transmit Statistics		Transmit Frames	24671	Transmit Multicast Frames	760	Transmit Total Bytes	3220301	Transmit Collision	0	Transmit Error Frames	0	Receive Statistics		Receive Frames	83803	Receive Multicast Frame	54854	Receive Total Bytes	25107546	Receive CRC Errors	0	Receive Under-size Frames	0
Traffic Statistics																													
Interface	<input type="radio"/> Ethernet <input type="radio"/> Wireless <input checked="" type="radio"/> EWAN <input type="radio"/> SFP <input type="radio"/> 3G/4G-LTE USB																												
Transmit Statistics																													
Transmit Frames	24671																												
Transmit Multicast Frames	760																												
Transmit Total Bytes	3220301																												
Transmit Collision	0																												
Transmit Error Frames	0																												
Receive Statistics																													
Receive Frames	83803																												
Receive Multicast Frame	54854																												
Receive Total Bytes	25107546																												
Receive CRC Errors	0																												
Receive Under-size Frames	0																												
<input type="button" value="Refresh"/>																													

**Transmit Frames:** This field displays the total number of frames transmitted until the latest second.

**Transmit Multicast Frames:** This field displays the total number of multicast frames transmitted till the latest second.

**Transmit Total Bytes:** This field displays the total number of bytes transmitted until the latest second.

**Transmit Collision:** This is the number of collisions on this port.

**Transmit Error Frames:** This field displays the number of error packets on this port.

**Receive Frames:** This field displays the number of frames received until the latest second.

**Receive Multicast Frames:** This field displays the number of multicast frames received until the latest second.

**Receive Total Bytes:** This field displays the number of bytes received until the latest second.

**Receive CRC Errors:** This field displays the number of error packets on this port.

**Receive Under-size Frames:** This field displays the number of under-size frames received until the latest second.

**Refresh:** Press this button to refresh the statistics.

The screenshot shows a web-based interface for monitoring SFP status. At the top, there is a 'Status' tab. Below it, a 'Statistics' section is expanded. Under 'Traffic Statistics', the 'Interface' is set to 'SFP' (indicated by a green dot). The 'Transmit Statistics' table shows: Transmit Frames (218), Transmit Multicast Frames (142), Transmit Total Bytes (46198), Transmit Collision (0), and Transmit Error Frames (0). The 'Receive Statistics' table shows: Receive Frames (6942), Receive Multicast Frame (6869), Receive Total Bytes (971479), Receive CRC Errors (0), and Receive Under-size Frames (0). A 'Refresh' button is located at the bottom left of the statistics area.

Traffic Statistics	
Interface	<input type="radio"/> Ethernet <input type="radio"/> EWAN <input checked="" type="radio"/> SFP <input type="radio"/> 3G/4G-LTE USB
Transmit Statistics	
Transmit Frames	218
Transmit Multicast Frames	142
Transmit Total Bytes	46198
Transmit Collision	0
Transmit Error Frames	0
Receive Statistics	
Receive Frames	6942
Receive Multicast Frame	6869
Receive Total Bytes	971479
Receive CRC Errors	0
Receive Under-size Frames	0

**Transmit Frames:** This field displays the total number of frames transmitted until the latest second.

**Transmit Multicast Frames:** This field displays the total number of multicast frames transmitted till the latest second.

**Transmit Total Bytes:** This field displays the total number of bytes transmitted until the latest second.

**Transmit Collision:** This is the number of collisions on this port.

**Transmit Error Frames:** This field displays the number of error packets on this port.

**Receive Frames:** This field displays the number of frames received until the latest second.

**Receive Multicast Frames:** This field displays the number of multicast frames received until the latest second.

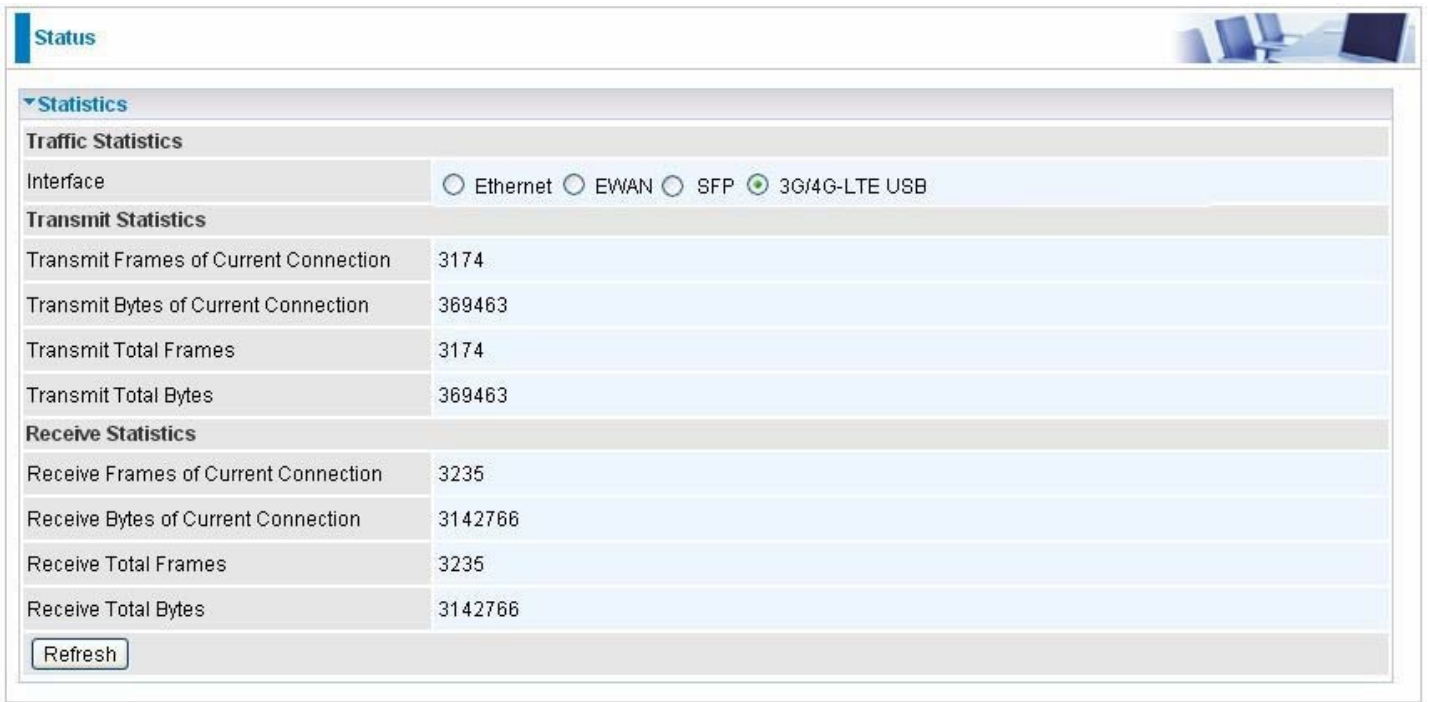
**Receive Total Bytes:** This field displays the number of bytes received until the latest second.

**Receive CRC Errors:** This field displays the number of error packets on this port.

**Receive Under-size Frames:** This field displays the number of under-size frames received until the latest second.

**Refresh:** Press this button to refresh the statistics.

➤ 3G/4G-LTE USB



The screenshot shows a web interface with a 'Status' header and a 'Statistics' section. Under 'Statistics', there is a 'Traffic Statistics' section. The 'Interface' is set to '3G/4G-LTE USB'. Below this, there are two sub-sections: 'Transmit Statistics' and 'Receive Statistics'. Each sub-section contains a table with four rows of data. A 'Refresh' button is located at the bottom left of the statistics area.

Traffic Statistics	
Interface	<input type="radio"/> Ethernet <input type="radio"/> EWAN <input type="radio"/> SFP <input checked="" type="radio"/> 3G/4G-LTE USB
Transmit Statistics	
Transmit Frames of Current Connection	3174
Transmit Bytes of Current Connection	369463
Transmit Total Frames	3174
Transmit Total Bytes	369463
Receive Statistics	
Receive Frames of Current Connection	3235
Receive Bytes of Current Connection	3142766
Receive Total Frames	3235
Receive Total Bytes	3142766

Refresh

**Transmit Frames of Current Connection:** This field displays the total number of 3G/4G LTE frames transmitted until the latest second for the current connection.

**Transmit Bytes of Current Connection:** This field shows the total bytes transmitted till the latest second for the current connection for the current connection.

**Transmit Total Frames:** The field displays the total number of frames transmitted till the latest second since system is up.

**Transmit Total Bytes:** This field displays the total number of bytes transmitted until the latest second since system is up.

**Receive Frames of Current Connection:** This field displays the number of frames received until the latest second for the current connection.

**Receive Bytes of Current Connection:** This field shows the total bytes received till the latest second for the current connection.

**Receive Total Frames:** This field displays the total number of frames received until the latest second since system is up.

**Receive Total Bytes:** This field displays the total frames received till the latest second since system is up.

**Refresh:** Press this button to refresh the statistics.

## 4.2.5 DHCP Table

DHCP table displays the devices connected to the router with clear information.



The screenshot shows a web interface with a 'Status' tab and a 'DHCP Table List' section. The table contains one entry with the following details:

#	Host Name	IP Address	MAC Address	Expire Time
1	billion-17bc5f1	192.168.1.104	18:A9:05:38:04:03	0days 23:37:51

**#:** The index identifying the connected devices.

**Host Name:** Show the hostname of the PC.

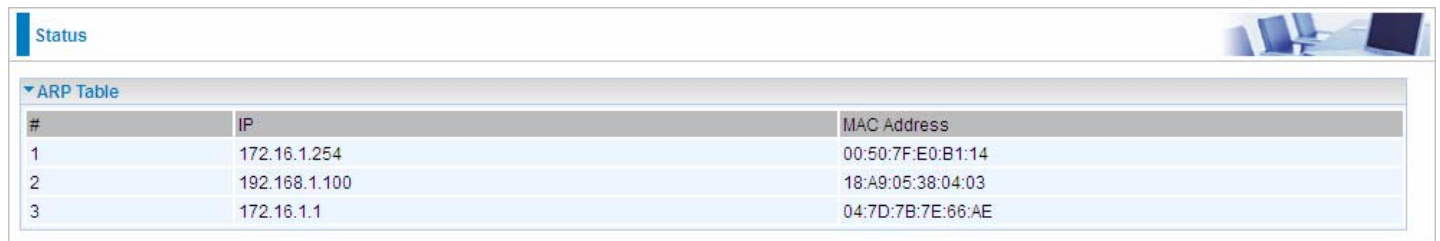
**IP Address:** The IP allocated to the device.

**MAC Address:** The MAC of the connected device.

**Expire Time:** The total remaining interval since the IP assignment to the PC.

## 4.2.6 ARP Table

This section displays the router's ARP (Address Resolution Protocol) results, which shows the mapping of Internet (IP) addresses to Ethernet (MAC) addresses.



The screenshot shows a web interface with a 'Status' tab and an 'ARP Table' section. The table contains three entries with the following details:

#	IP	MAC Address
1	172.16.1.254	00:50:7F:E0:B1:14
2	192.168.1.100	18:A9:05:38:04:03
3	172.16.1.1	04:7D:7B:7E:66:AE

### ARP table

**#:** The index marking ARP resolution results.

**IP Address:** Show the IP Address that the MAC address maps to.

**MAC Address:** Show the MAC address that is corresponded to the IP address it is mapped to.

## 4.2.7 IPSEC Status (9800VNX only)

#	Connection Name	Remote Gateway	Local Address	Remote Address	Connected	Action
0	test	10.40.92.172	192.168.1.0/24	192.168.0.0/24		<input type="button" value="Connect"/> <input type="button" value="Drop"/>

**#:** The IPsec entry index number.

**Connection Name:** User-defined IPSEC VPN connection name.

**Remote Gateway:** The IP of the remote gateway.

**Local Address:** The IP and netmask of local access range.

**Remote address:** The IP and netmask of remote access range.

**Connected:** Show the connecting status.

**Action:** Connection or Drop the connection.

## 4.2.8 PPTP Status (9800VNX only)

PPTP Client								
User	Connection Name	Active	Username	Connection Type	ServerIP	Peer Network IP	NetMask	Connected
User1	test2	No	test2	Lan to Lan	10.40.90.172	192.168.0.0	255.255.255.0	No

PPTP Server								
User	Connection Name	Active	Username	Connection Type	Assigned IP	Peer Network IP	NetMask	Connected
User1	test	Yes	test	Remote Access	192.168.1.2			Yes

### PPTP Client

**User:** Four users(sessions) for client sessions. Here shows the using user.

**Connection Name:** Show user-defined PPTP VPN connection name.

**Active:** Show if the tunnel is active for connection.

**Connection Type:** Remote Access or LAN to LAN.

**Server IP:** Show the IP of VPN Server.

**Peer Network IP:** Display the remote network and subnet mask in LAN to LAN PPTP connection.

**Netmask:** Show the netmask of peer network.

**Connected:** Show the connecting status.

### PPTP Server

**User:** Four users(sessions) for server sessions. Here shows the using user.

**Connection Name:** Show user-defined PPTP VPN connection name.

**Active:** Show if the tunnel is active for connection.

**Connection Type:** Remote Access or LAN to LAN.

**Assigned IP:** Show the IP assigned to the client.

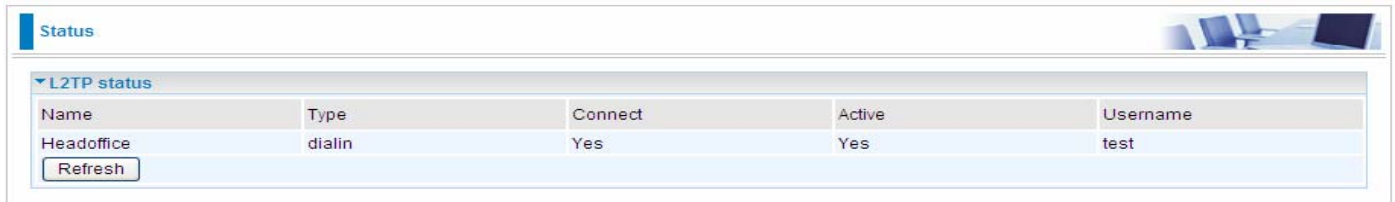
**Peer Network IP:** Display the remote network and subnet mask in LAN to LAN PPTP connection.

**Netmask:** Show the netmask of peer network.

**Connected:** Show the connecting status.

**Refresh:** Click this button to refresh the connection status.

## 4.2.9 L2TP Status (9800VNX only)



Name	Type	Connect	Active	Username
Headoffice	dialin	Yes	Yes	test

**Name:** Display the user-defined L2TP connection name.

**Type:** The VPN mode: dialin or dialout.

**Connect:** The connecting status.

**Active:** Show if the L2TP tunnel is active for connection.

**Username:** The user assigned to client (dialout use) or the user set for client to connect in (dialin use).

## 4.2.10 Disk Status



Partition	Disk Space(KB)	Free Space(KB)
usb1_1	1953988	1732288

**Partition:** Display the NAS partition.

**Disk Space(KB):** Display the total storage space of the NAS in KB unit.

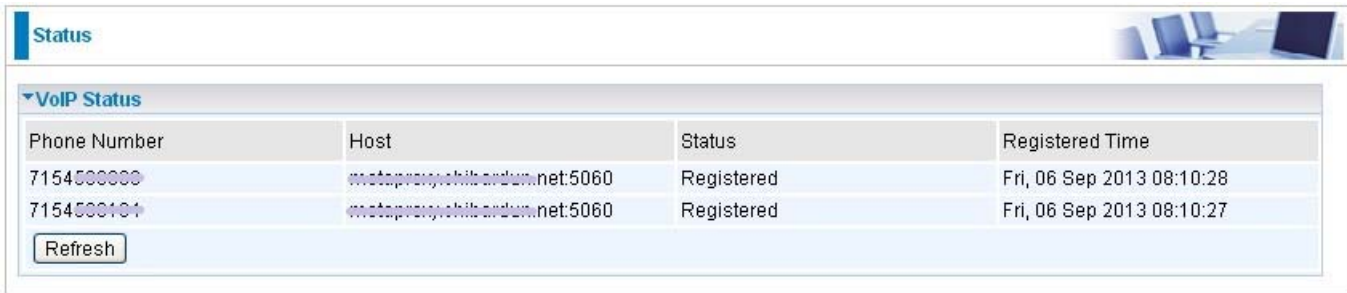
**Free Space(KB):** Display the available space in KB unit.



## 4.2.11 VoIP Status

### 4.2.11.1 VoIP Status

VoIP status give users a directive picture on the registered VoIP accounts.



The screenshot shows a web interface with a 'Status' header and a 'VoIP Status' section. Below the section title is a table with four columns: Phone Number, Host, Status, and Registered Time. There are two rows of data. A 'Refresh' button is located below the table.

Phone Number	Host	Status	Registered Time
7154500000	metaprosy.chibardun.net:5060	Registered	Fri, 06 Sep 2013 08:10:28
7154500101	metaprosy.chibardun.net:5060	Registered	Fri, 06 Sep 2013 08:10:27

Refresh

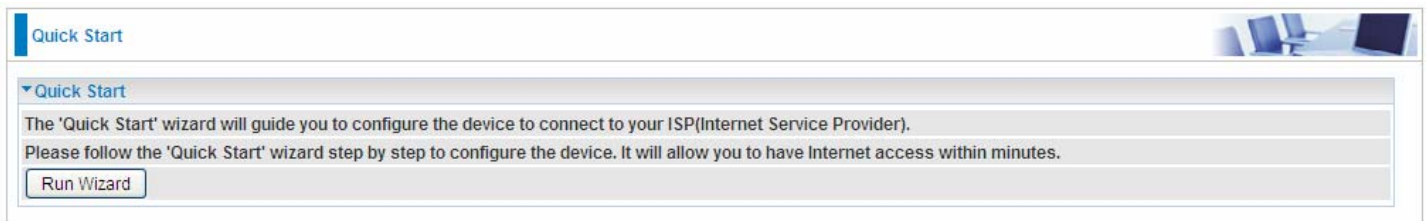
**Phone Number:** The phone number user registers and fills in the Basic page of VoIP.

**Host:** Show the IP address and port number of SIP Registrar.

**Status:** The status of the registered SIP account.

**Registered Time:** The duration the account has been successfully registered to the SIP registrar.

## 4.3 Quick Start



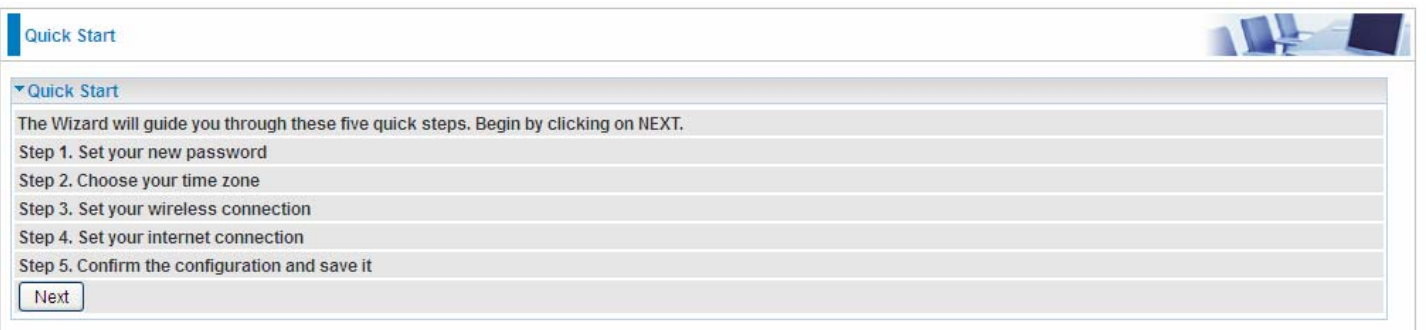
Quick Start

▼ Quick Start

The 'Quick Start' wizard will guide you to configure the device to connect to your ISP(Internet Service Provider).  
Please follow the 'Quick Start' wizard step by step to configure the device. It will allow you to have Internet access within minutes.

For detailed instructions on configuring WAN settings, see the **Interface Setup** section of this manual.

The Quick Start Wizard is a useful and easy utility to help setup the device to quickly connect to your ISP (Internet Service Provider) with only a few steps required. It will guide you step by step to configure the password, time zone, and WAN settings of your device. The Quick Start Wizard is a helpful guide for first time users to the device.



Quick Start

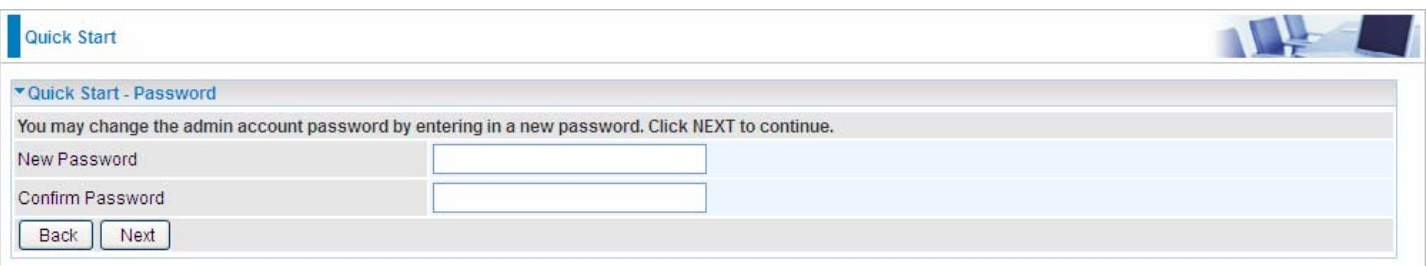
▼ Quick Start

The Wizard will guide you through these five quick steps. Begin by clicking on NEXT.

- Step 1. Set your new password
- Step 2. Choose your time zone
- Step 3. Set your wireless connection
- Step 4. Set your internet connection
- Step 5. Confirm the configuration and save it

Click **NEXT** to enter step 1.

**Step1.** Set new password of the “admin” account. The password was used to manage the web access. The default is “admin”. Once changed, please remember carefully. Click **NEXT** to continue.



Quick Start

▼ Quick Start - Password

You may change the admin account password by entering in a new password. Click NEXT to continue.

New Password

Confirm Password

**Step2:** Choose your time zone. Click **NEXT** to continue.




Quick Start

▼ Quick Start - Time Zone

Select the appropriate time zone for your location and click NEXT to continue.

Time Zone

**Step3:** Set your wireless connection. Click **NEXT** to continue.

Quick Start 

▼ Quick Start - Wireless

Configure your wireless network, authentication type and click NEXT to continue.

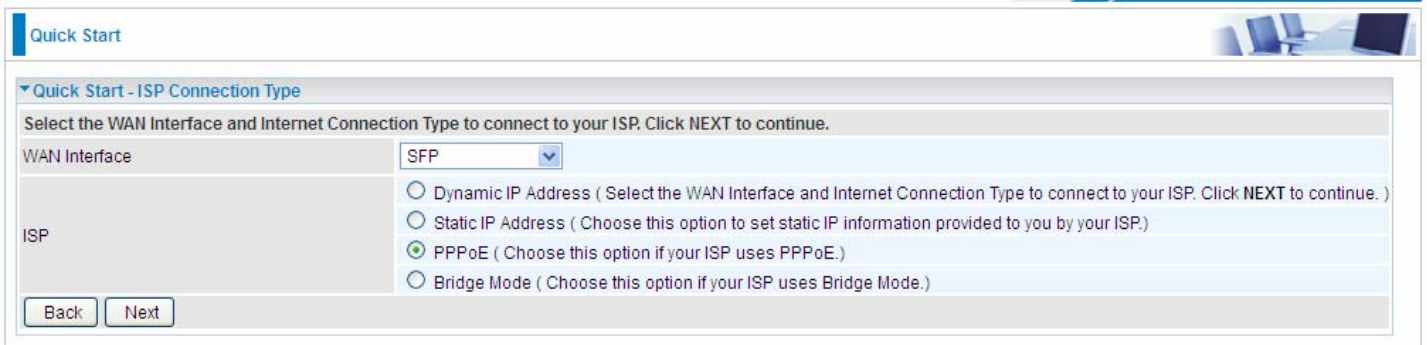
Access Point	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated
SSID	<input type="text" value="wlan-ap"/>
Broadcast SSID	<input checked="" type="radio"/> Yes <input type="radio"/> No
Channel	<input type="text" value="UNITED STATES"/> <input type="text" value="06"/>
Security Type	<input type="text" value="OPEN"/>

## Step4: Set your Internet connection

**WAN Transfer Modes:** EWAN, SFP and 3G/4G-LTE

### ➤ SFP (SFP interface for direct connection to fibre )

1). Select SFP. Refer to your ISP to choose the appropriate connection protocol. Click **NEXT** to continue.



Quick Start

Quick Start - ISP Connection Type

Select the WAN Interface and Internet Connection Type to connect to your ISP. Click NEXT to continue.

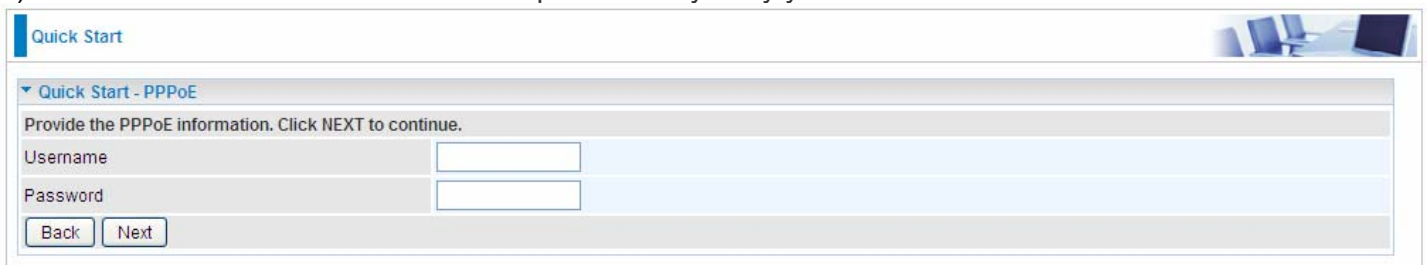
WAN Interface: SFP

ISP:

- Dynamic IP Address ( Select the WAN Interface and Internet Connection Type to connect to your ISP. Click NEXT to continue. )
- Static IP Address ( Choose this option to set static IP information provided to you by your ISP.)
- PPPoE ( Choose this option if your ISP uses PPPoE.)
- Bridge Mode ( Choose this option if your ISP uses Bridge Mode.)

Back Next

2). Enter the PPPoE account information provided to you by your ISP. Click **NEXT** to continue.



Quick Start

Quick Start - PPPoE

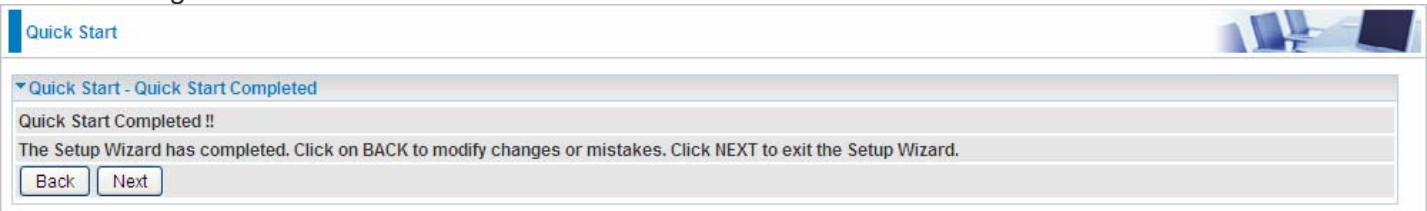
Provide the PPPoE information. Click NEXT to continue.

Username:

Password:

Back Next

3).The Setup Wizard has completed. Click on BACK to modify changes or mistakes. Click **NEXT** to save the current settings.



Quick Start

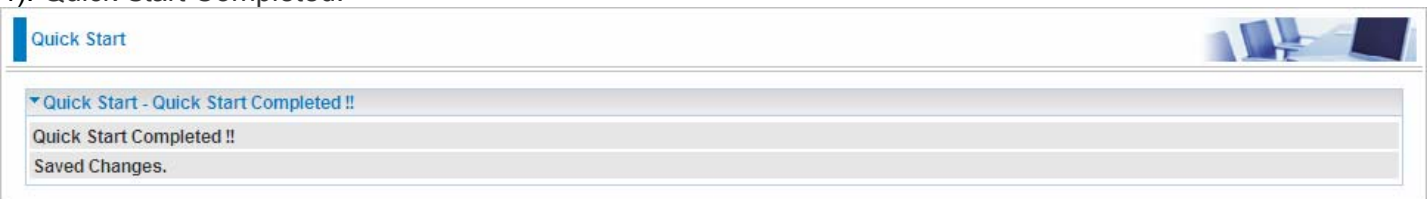
Quick Start - Quick Start Completed

Quick Start Completed !!

The Setup Wizard has completed. Click on BACK to modify changes or mistakes. Click NEXT to exit the Setup Wizard.

Back Next

4). Quick Start Completed!



Quick Start

Quick Start - Quick Start Completed !!

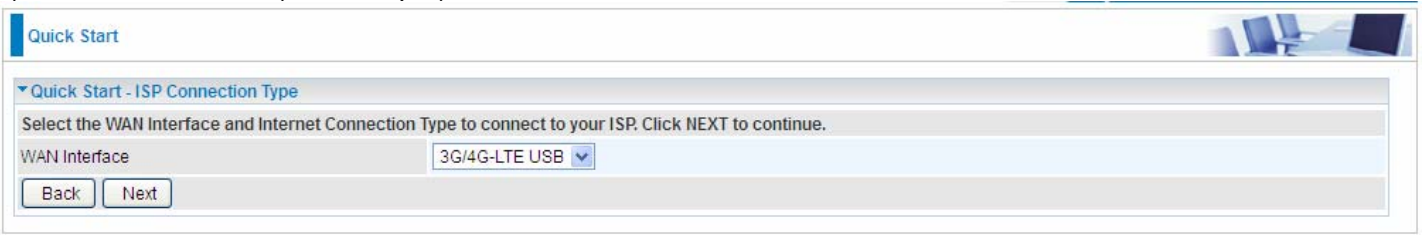
Quick Start Completed !!

Saved Changes.

Back Next

➤ **3G/4G-LTE USB**

1) Select 3G/4G-LTE (for example).



Quick Start

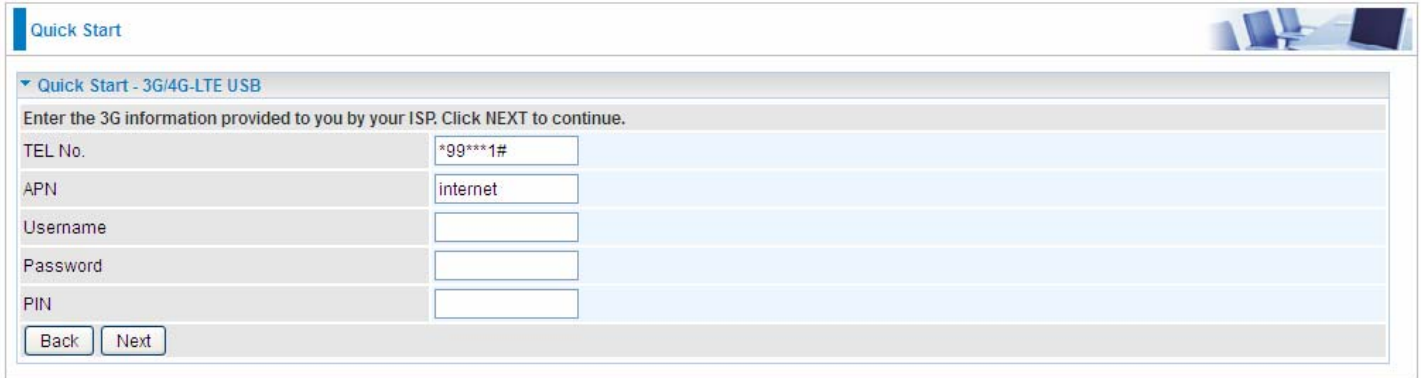
Quick Start - ISP Connection Type

Select the WAN Interface and Internet Connection Type to connect to your ISP. Click NEXT to continue.

WAN Interface: 3G/4G-LTE USB

Back Next

2). Type relevant 3G/4G-LTE parameters from your ISP.



Quick Start

Quick Start - 3G/4G-LTE USB

Enter the 3G information provided to you by your ISP. Click NEXT to continue.

TEL No.: \*99\*\*\*1#

APN: internet

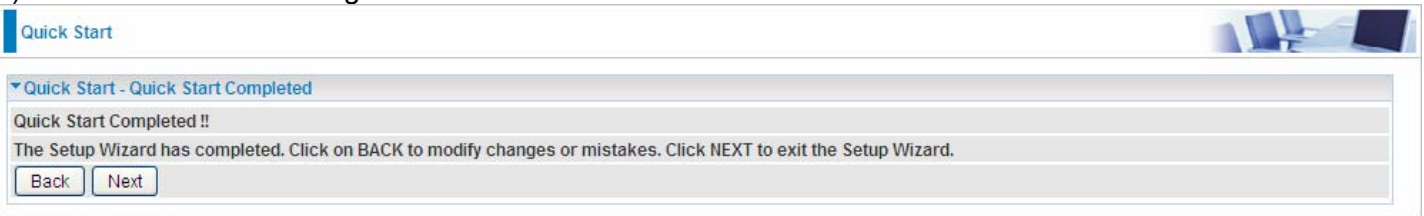
Username: [ ]

Password: [ ]

PIN: [ ]

Back Next

3). Click Next to save changes.



Quick Start

Quick Start - Quick Start Completed

Quick Start Completed !!

The Setup Wizard has completed. Click on BACK to modify changes or mistakes. Click NEXT to exit the Setup Wizard.

Back Next

4). Quick Start completed!



Quick Start

Quick Start - Quick Start Completed !!

Quick Start Completed !!

Saved Changes.

Switch to **Status > Device Info** to view the status.

**Status**

**Device Information**

Model Name	BIPAC 9800VNX
Firmware Version	1.11
MAC Address	00:04:ED:11:22:33

**LAN**

**IPv4**

IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable

**IPv6**

IP Address	
Prefix Length	
DHCPv6 Server	Enable Stateless


**WAN**

Interface	3G/4G-LTE
Connection Time	0d: 1h:13m:22s

**IPv4**

Status	Connected
IP Address	100.101.33.242
Subnet Mask	255.255.255.252
Default Gateway	100.101.33.241
DNS Server	168.95.1.1

**3G/4G-LTE**

Signal Strength	 -72.00dbm
Network Name	"Chunghwa Telecom"
Card IMEI	.....
Card IMSI	.....

➤ **EWAN**

1). Select EWAN. Refer to your ISP to choose the appropriate connection protocol. Click **NEXT** to continue.

Quick Start

Quick Start - ISP Connection Type

Select the WAN Interface and Internet Connection Type to connect to your ISP. Click NEXT to continue.

WAN Interface: EWAN

ISP:

- Dynamic IP Address ( Select the WAN Interface and Internet Connection Type to connect to your ISP. Click NEXT to continue. )
- Static IP Address ( Choose this option to set static IP information provided to you by your ISP. )
- PPPoE ( Choose this option if your ISP uses PPPoE. )
- Bridge Mode ( Choose this option if your ISP uses Bridge Mode. )

Back Next

2). Enter the PPPoE account information provided to you by your ISP. Click **NEXT** to continue.

Quick Start

Quick Start - PPPoE

Provide the PPPoE information. Click NEXT to continue.

Username: [ ]

Password: [ ]

Back Next

3). The Setup Wizard has completed. Click on **BACK** to modify changes or mistakes. Click **NEXT** to save the current settings.

Quick Start

Quick Start - Quick Start Completed

Quick Start Completed !!

The Setup Wizard has completed. Click on BACK to modify changes or mistakes. Click NEXT to exit the Setup Wizard.

Back Next

4). Quick Start Completed!

Quick Start

Quick Start - Quick Start Completed !!

Quick Start Completed !!

Saved Changes.

Switch to **Status > Device Info** to view the status.

**Status**

**Device Information**

Model Name	BIPAC 9800VNX
Firmware Version	1.11
MAC Address	00:04:ED:11:22:33
<b>LAN</b>	
<b>IPv4</b>	
IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable
<b>IPv6</b>	
IP Address	2000:1211:1000:3b01:204:edff:fe59:6230
Prefix Length	64
DHCPv6 Server	Enable Stateless
<b>WAN</b>	
Interface	EWAN
Connection Type	PPPoE
PPP Connection Time	0d: 0h: 3m: 5s
<b>IPv4</b>	
Status	Connected
IP Address	10.40.90.101
Subnet Mask	255.255.255.255
Default Gateway	10.0.0.2
DNS Server	218.2.135.1
<b>IPv6</b>	
Status	Connected
IP Address	2000:db98:1000:1000:8b3a:fa69:9ce0:eb27
Prefix Length	64
Default Gateway	fe80::b8f9:bba2:f1a5:1f5d
DNS Server	2000:1000:1000:1000::ff



## 4.4 Configuration

Click this item to access the following sub-items that configure the router: **Interface Setup**, **Dual WAN**, **Advanced Setup**, **VoIP**, **Access Management**, and **Maintenance**.

The screenshot displays the configuration web interface for a Billion router. The page title is "Point-to-Point Fiber Wireless-N VPN VoIP Gateway". The interface includes a navigation menu on the left with options: Status, Quick Start, Configuration (selected), Interface Setup, Dual WAN, Advanced Setup, VoIP, Access Management, Maintenance, and Language. The main content area shows the "Status" page with a "Device Information" section. The WAN configuration is expanded, showing the "EWAN" interface with a "Dynamic IP" connection type. The WAN IPv4 status is "Connected" with an IP address of 172.16.1.186. There are "Renew IP Address" and "Release IP Address" buttons next to the IP address. The LAN configuration is also visible, showing an IP address of 192.168.1.254 and a subnet mask of 255.255.255.0. The DHCPv4 server is enabled. The DHCPv6 server is also enabled and stateless. The footer contains the copyright notice: "Copyright © Billion Electric Co., Ltd. All rights reserved." and "Restart" and "Logout" buttons.

**BILLION** Point-to-Point Fiber Wireless-N VPN VoIP Gateway Powering communications with Security

► Status  
► Quick Start  
▼ Configuration  
► Interface Setup  
► Dual WAN  
► Advanced Setup  
► VoIP  
► Access Management  
► Maintenance  
► Language

Status

▼ Device Information

Model Name	BIPAC 9800VNX
Firmware Version	1.11
MAC Address	00:04:ED:11:22:33
LAN	
IPv4	
IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable
IPv6	
IP Address	
Prefix Length	
DHCPv6 Server	Enable Stateless
WAN	
Interface	EWAN
Connection Type	Dynamic IP
IPv4	
Status	Connected
IP Address	172.16.1.186 <input type="button" value="Renew IP Address"/> <input type="button" value="Release IP Address"/>
Subnet Mask	255.255.255.0
Default Gateway	172.16.1.254
DNS Server	172.16.1.254
IPv6	

Restart Logout

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## 4.4.1 Interface Setup

First, let us take a look at the **Interface Setup**. There are four items contained in this section, namely, **Internet**, **LAN**, **Wireless** and **Wireless MAC Filter**. Each is described in the following scenario.

The screenshot displays the configuration interface for a Billion Point-to-Point Fiber Wireless-N VPN VoIP Gateway. The page is titled "Configuration" and features a sidebar menu on the left with options: Status, Quick Start, Configuration (selected), Interface Setup (expanded), Internet (selected), LAN, Wireless, Wireless MAC Filter, Dual WAN, Advanced Setup, VoIP, Access Management, Maintenance, and Language.


The main configuration area is titled "Internet" and contains the following settings:

- WAN Interface: SFP
- Status:  Activated  Deactivated
- Link Speed:  AUTO  1G  100M
- IPv4/IPv6:  IPv4  IPv4/IPv6  IPv6
- ISP Connection Type:  Dynamic IP Address  Static IP Address  PPPoE  Bridge Mode
- 802.1q Options:  Activated  Deactivated
- 802.1q: 7 (range: 7 ~ 4094)
- PPPoE: Username: [ ] Password: [ ] Bridge Interface for PPPoE:  Activated  Deactivated
- Connection Setting: Connection:  Always On (Recommended)  Connect Manually TCP MSS Option: TCP MSS 0 bytes(0 means use default)
- IP Options: IP Common Options: Default Route:  Yes  No
- IPv4 Options: Get IP Address:  Static  Dynamic

At the bottom right of the configuration area, there are "Restart" and "Logout" buttons. The footer of the page reads "Copyright @ Billion Electric Co., Ltd. All rights reserved."

## 4.4.1.1 Internet

### ➤ SFP (direct connection to fibre)

Configuration 

▼ Internet

WAN Interface	SFP
Status	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated
Link Speed	<input checked="" type="radio"/> AUTO <input type="radio"/> 1G <input type="radio"/> 100M
IPv4/IPv6	
IP Version	<input type="radio"/> IPv4 <input checked="" type="radio"/> IPv4/IPv6 <input type="radio"/> IPv6
ISP Connection Type	
ISP	<input type="radio"/> Dynamic IP Address <input type="radio"/> Static IP Address <input checked="" type="radio"/> PPPoE <input type="radio"/> Bridge Mode
802.1q Options	
802.1q	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated
VLAN ID	7 (range: 7 ~ 4094)
PPPoE	
Username	<input type="text"/>
Password	<input type="text"/>
Bridge Interface for PPPoE	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated
Connection Setting	
Connection	<input checked="" type="radio"/> Always On (Recommended) <input type="radio"/> Connect Manually
TCP MSS Option	TCP MSS <input type="text" value="0"/> bytes(0 means use default)
IP Options	
IP Common Options	
Default Route	<input checked="" type="radio"/> Yes <input type="radio"/> No
IPv4 Options	
Get IP Address	<input type="radio"/> Static <input checked="" type="radio"/> Dynamic
Static IP Address	<input type="text" value="0.0.0.0"/>
IP Subnet Mask	<input type="text" value="0.0.0.0"/>
Gateway	<input type="text" value="0.0.0.0"/>
NAT	Enable
Dynamic Route	RIP1 Direction None
TCP MTU Option	TCP MTU <input type="text" value="0"/> bytes(0 means use default:1492)
IGMP Proxy	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
IPv6 Options	
IPv6 Address	<input type="text"/> / <input type="text"/>
Obtain IPv6 DNS	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Primary DNS	<input type="text"/>
Secondary DNS	<input type="text"/>
MLD Proxy	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

**Status:** Select whether to enable the service.

**Line Speed:** Select the exact working line speed (1G/100M) for SFP.

## ■ IPv4/IPv6

IP version: choose **IPv4**, **IPv4/IPv6**, **IPv6** based on users' environment.

Here we take IPv4/IPv6 for example, when you just choose IPv4 or IPv6, you can just get information from the following listed parameters.

## ■ ISP Connection Type:

**ISP:** Select the encapsulation type your ISP uses.

- ① **Dynamic IP:** Select this option if your ISP provides you an IP address automatically. This option is typically used for Cable services. Please enter the Dynamic IP information accordingly.
- ① **Static IP:** Select this option to set static IP information. You will need to enter in the Connection type, IP address, subnet mask, and gateway address, provided to you by your ISP. Each IP address entered in the fields must be in the appropriate IP form, which is four IP octets separated by a dot (xx.xx.xx.xx). The Router will not accept the IP address if it is not in this format.
- ① **PPPoE:** Select this option if your ISP requires you to use a PPPoE connection.
- ① **Bridge:** Select this mode if you want to use this device as an OSI layer 2 device like switch.

## ■ 802.1q Options

**802.1q:** Select whether to activate 802.1q feature. When activated, please enter the the VLAN ID.

**VLAN ID:** It is a parameter to specify the VLAN which the frame belongs. Enter the VLAN ID identification, tagged: 0-4095.

## ■ PPPoE

**Username:** Enter the user name exactly as your ISP assigned.

**Password:** Enter the password associated with the user name above.

**Bridge Interface for PPPoE:** When "Activated", the device will gain WAN IP from your ISP with the PPPoE account. But if your PC is connected to the router working as a DHCP client, in this mode, the device acts as a NAT router; while if you dial up with the account within your PC, the device will then work as a bridge forwarding the PPPoE information to the PPPoE server and send the response to your PC, thus your PC gets a WAN IP working in the internet.

## ■ Connection Setting

**Connection:**

- ① **Always On:** Click on **Always On** to establish a PPPoE session during start up and to automatically re-establish the PPPoE session when disconnected by the ISP.
- ① **Connect Manually:** Select **Connect Manually** when you don't want the connection up all the time.

**TCP MSS Option:** Enter the TCP Maximum Segment Size (MSS).

## ■ IP Options

**Default Route:** Select **Yes** to use this interface as default route interface.

## IPv4 options:

**Get IP Address:** Choose Static or Dynamic

**Static IP Address:** If Static is selected in the above field, please enter the specific IP address you get from ISP and the following IP subnet mask and gateway address.

**IP Subnet Mask:** The default is 0.0.0.0. User can change it to other such as 255.255.255.0. Type the subnet mask assigned to you by your ISP (if given).

**Gateway:** Enter the specific gateway IP address you get from ISP.

**NAT:** Select Enable if you use this router to hold a group of PCs to get access to the internet.

## Dynamic Route:

**RIP Version:** (Routing Information protocol) Select this option to specify the RIP version, including RIP-1, RIP-2.

**RIP Direction:** Select this option to specify the RIP direction.

- ① **None** is for disabling the RIP function.
- ① **Both** means the router will periodically send routing information and accept routing information then incorporate into routing table.
- ① **IN only** means the router will only accept but will not send RIP packet.
- ① **OUT only** means the router will only send but will not accept RIP packet.

**TCP MTU Option:** Maximum Transmission Unit, the maximum is 1500.

**IGMP Proxy:** IGMP (Internet Group Multicast Protocol) is a network-layer protocol used to establish membership in a Multicast group. Choose whether enable IGMP proxy.

## IPv6 options (only when choose IPv4/IPv6 or just IPv6 in IP version field above):

**IPv6 Address:** Type the WAN IPv6 address from your ISP.

**Obtain IPv6 DNS:** Choose if you want to obtain DNS automatically.

**Primary/Secondary:** if you choose Disable in the Obtain IPv6 DNS field, please type the exactly primary and secondary DNS.

**MLD Proxy:** MLD (Multicast Listener Discovery Protocol) is to IPv6 just as IGMP to IPv4. It is a Multicast Management protocol for IPv6 multicast packets.

When router's Internet configuration is finished successfully, you can go to status to get the connection information.

Status	
<b>Device Information</b>	
Model Name	BIPAC 9800VNX
Firmware Version	1.11
MAC Address	00:04:ED:11:22:33
<b>LAN</b>	
<b>IPv4</b>	
IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable
<b>IPv6</b>	
IP Address	2000:1211:1000:3b01:204:edff:fe59:6230
Prefix Length	64
DHCPv6 Server	Enable Stateless
<b>WAN</b>	
Interface	EWAN
Connection Type	PPPoE
PPP Connection Time	0d: 0h: 3m: 5s
<b>IPv4</b>	
Status	Connected
IP Address	10.40.90.101
Subnet Mask	255.255.255.255
Default Gateway	10.0.0.2
DNS Server	218.2.135.1
<b>IPv6</b>	
Status	Connected
IP Address	2000:db98:1000:1000:8b3a:fa69:9ce0:eb27
Prefix Length	64
Default Gateway	fe80::b8f9:bba2:f1a5:1f5d
DNS Server	2000:1000:1000:1000::ff



Internet

WAN Interface	EWAN
Status	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated
<b>IPv4/IPv6</b>	
IP Version	<input type="radio"/> IPv4 <input checked="" type="radio"/> IPv4/IPv6 <input type="radio"/> IPv6
<b>ISP Connection Type</b>	
ISP	<input type="radio"/> Dynamic IP Address <input type="radio"/> Static IP Address <input checked="" type="radio"/> PPPoE <input type="radio"/> Bridge Mode
<b>802.1q Options</b>	
802.1q	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated
VLAN ID	7 (range: 7 ~ 4094)
<b>PPPoE</b>	
Username	<input type="text"/>
Password	<input type="text"/>
Bridge Interface for PPPoE	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated
<b>Connection Setting</b>	
Connection	<input checked="" type="radio"/> Always On (Recommended) <input type="radio"/> Connect Manually
TCP MSS Option	TCP MSS 0 bytes(0 means use default)
<b>IP Options</b>	
<b>IP Common Options</b>	
Default Route	<input checked="" type="radio"/> Yes <input type="radio"/> No
<b>IPv4 Options</b>	
Get IP Address	<input type="radio"/> Static <input checked="" type="radio"/> Dynamic
Static IP Address	0.0.0.0
IP Subnet Mask	0.0.0.0
Gateway	0.0.0.0
NAT	Enable
Dynamic Route	RIP1 Direction None
TCP MTU Option	TCP MTU 0 bytes(0 means use default: 1492)
IGMP Proxy	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
<b>IPv6 Options</b>	
IPv6 Address	<input type="text"/> / <input type="text"/>
Obtain IPv6 DNS	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Primary DNS	<input type="text"/>
Secondary DNS	<input type="text"/>
MLD Proxy	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

Save

**Status:** Select whether to enable the service.

## ■ IPv4/IPv6

IP version: choose **IPv4**, **IPv4/IPv6**, **IPv6** based on users' environment.

Here we take IPv4/IPv6 for example, when you just choose IPv4 or IPv6, you can just get information from the following listed parameters.

## ■ ISP Connection Type:

**ISP:** Select the encapsulation type your ISP uses.

- ① **Dynamic IP:** Select this option if your ISP provides you an IP address automatically. This option is typically used for Cable services. Please enter the Dynamic IP information accordingly.
- ① **Static IP:** Select this option to set static IP information. You will need to enter in the Connection type, IP address, subnet mask, and gateway address, provided to you by your ISP. Each IP address entered in the fields must be in the appropriate IP form, which is four IP octets separated by a dot (xx.xx.xx.xx). The Router will not accept the IP address if it is not in this format.
- ① **PPPoE:** Select this option if your ISP requires you to use a PPPoE connection.
- ① **Bridge:** Select this mode if you want to use this device as an OSI layer 2 device like switch.

## ■ 802.1q Options

**802.1q:** Select whether to activate 802.1q feature. When activated, please enter the the VLAN ID.

**VLAN ID:** It is a parameter to specify the VLAN which the frame belongs. Enter the VLAN ID identification, tagged: 0-4095.

## ■ PPPoE

**Username:** Enter the user name exactly as your ISP assigned.

**Password:** Enter the password associated with the user name above.

**Bridge Interface for PPPoE:** When "Activated", the device will gain WAN IP from your ISP with the PPPoE account. But if your PC is connected to the router working as a DHCP client, in this mode, the device acts as a NAT router; while if you dial up with the account within your PC, the device will then work as a bridge forwarding the PPPoE information to the PPPoE server and send the response to your PC, thus your PC gets a WAN IP working in the internet.

## ■ Connection Setting

**Connection:**

- ① **Always On:** Click on **Always On** to establish a PPPoE session during start up and to automatically re-establish the PPPoE session when disconnected by the ISP.
- ① **Connect Manually:** Select Connect Manually when you don't want the connection up all the time.

**TCP MSS Option:** Enter the TCP Maximum Segment Size (MSS).

## ■ IP Options

**Default Route:** Select **Yes** to use this interface as default route interface.

## IPv4 options:

**Get IP Address:** Choose Static or Dynamic

**Static IP Address:** If Static is selected in the above field, please enter the specific IP address you get from ISP and the following IP subnet mask and gateway address.



**IP Subnet Mask:** The default is 0.0.0.0. User can change it to other such as 255.255.255.0. Type the subnet mask assigned to you by your ISP (if given).

**Gateway:** Enter the specific gateway IP address you get from ISP.

**NAT:** Select Enable if you use this router to hold a group of PCs to get access to the internet.

**Dynamic Route:**

**RIP Version:** (Routing Information protocol) Select this option to specify the RIP version, including RIP-1, RIP-2.

**RIP Direction:** Select this option to specify the RIP direction.

- ① **None** is for disabling the RIP function.
- ① **Both** means the router will periodically send routing information and accept routing information then incorporate into routing table.
- ① **IN only** means the router will only accept but will not send RIP packet.
- ① **OUT only** means the router will only send but will not accept RIP packet.

**TCP MTU Option:** Maximum Transmission Unit, the maximum is 1500.

**IGMP Proxy:** IGMP (Internet Group Multicast Protocol) is a network-layer protocol used to establish membership in a Multicast group. Choose whether enable IGMP proxy.

**IPv6 options** (only when choose IPv4/IPv6 or just IPv6 in IP version field above):

**IPv6 Address:** Type the WAN IPv6 address from your ISP.

**Obtain IPv6 DNS:** Choose if you want to obtain DNS automatically.

**Primary/Secondary:** if you choose Disable in the Obtain IPv6 DNS field, please type the exactly primary and secondary DNS.

**MLD Proxy:** MLD (Multicast Listener Discovery Protocol) is to IPv6 just as IGMP to IPv4. It is a Multicast Management protocol for IPv6 multicast packets.

When router's Internet configuration is finished successfully, you can go to status to get the connection information.

Status	
<b>Device Information</b>	
Model Name	BIPAC 9800VNX
Firmware Version	1.11
MAC Address	00:04:ED:11:22:33
<b>LAN</b>	
<b>IPv4</b>	
IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable
<b>IPv6</b>	
IP Address	2000:1211:1000:3b01:204:edff:fe59:6230
Prefix Length	64
DHCPv6 Server	Enable Stateless
<b>WAN</b>	
Interface	EWAN
Connection Type	PPPoE
PPP Connection Time	0d: 0h: 3m: 5s
<b>IPv4</b>	
Status	Connected
IP Address	10.40.90.101
Subnet Mask	255.255.255.255
Default Gateway	10.0.0.2
DNS Server	218.2.135.1
<b>IPv6</b>	
Status	Connected
IP Address	2000:db98:1000:1000:8b3a:fa69:9ce0:eb27
Prefix Length	64
Default Gateway	fe80::b8f9:bba2:f1a5:1f5d
DNS Server	2000:1000:1000:1000::ff

## ➤ 3G/4G-LTE USB

The BIPAC 9800VNX(L) supports 3G/4G-LTE USB (additional 3G/4G-LTE modem connected to the USB port).

Internet	
WAN Interface	3G/4G-LTE
Status	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated
Network Mode	Automatic
TEL No.	*99***1#
APN	internet
Username	user
Password	••••
PIN	
Connection	<input checked="" type="radio"/> Always On (Recommended)
Keep Alive	<input type="radio"/> Yes <input checked="" type="radio"/> No
Default Route	<input checked="" type="radio"/> Yes <input type="radio"/> No
NAT	Enable

**Status:** Choose Activated to enable the 3G connection.

**Network Mode:** There are 8 options of service standards: "Automatic", "UMTS 3G only", "GSM 2G Only", "UMTS 3G Preferred", "GSM 2G Preferred", "GSM and UMTS Only", "LTE Only", "GSM, UMTS, LTE". If you are uncertain what services are available to you, then please select Automatic.

**TEL No.:** The dial string to make a GPRS / 3G user internetworking call. It may provide by your mobile service provider.

**APN:** An APN is similar to a URL on the WWW, it is what the unit makes a GPRS / UMTS call. The service provider is able to attach anything to an APN to create a data connection, requirements for APNs varies between different service providers. Most service providers have an internet portal which they use to connect to a DHCP Server, thus giving you access to the internet i.e. some 3G operators use the APN 'internet' for their portal. The default value is "internet".

**Username/Password:** Enter the username and password provided by your service provider. The username and password are case sensitive.

**PIN:** PIN stands for Personal Identification Number. A PIN code is a numeric value used in certain systems as a password to gain access, and authenticate. In mobile phones a PIN code locks the SIM card until you enter the correct code. If you enter the PIN code incorrectly into the phone 3 times in a row, then the SIM card will be blocked and you will require a PUK code from your network/service provider.

**Connection:** Default set to Always on to keep an always-on 3G connection.

**Keep Alive:** Select Yes to keep the 3G/4G LTE connection always on.

**Default Route:** Select Yes to use this interface as default route interface.

**NAT:** Select this option to Disabled/Enable the NAT (Network Address Translation) function. Enable NAT to grant devices in LAN access to internet through the 3G gateway sharing a single internet IP.

When router's Internet configuration is finished successfully, you can go to status to get the connection information.

**Status**

**Device Information**

Model Name	BIPAC 9800VNX
Firmware Version	1.11
MAC Address	00:04:ED:11:22:33

**LAN**

**IPv4**

IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable

**IPv6**

IP Address	
Prefix Length	
DHCPv6 Server	Enable Stateless


**WAN**

Interface	3G/4G-LTE
Connection Time	0d: 1h:13m:22s

**IPv4**

Status	Connected
IP Address	100.101.33.242
Subnet Mask	255.255.255.252
Default Gateway	100.101.33.241
DNS Server	168.95.1.1

**3G/4G-LTE**

Signal Strength	 -72.00dbm
Network Name	"Chunghwa Telecom"
Card IMEI	XXXXXXXXXXXX
Card IMSI	XXXXXXXXXX

### 4.4.1.2 LAN

A Local Area Network (LAN) is a shared communication system to which many computers are attached and is limited to the immediate area, usually the same building or floor of a building.

#### IPv6

The IPv6 address composes of two parts, thus, the prefix and the interface ID.

There are two ways to dynamically configure IPv6 address on hosts. One is statefull configuration, for example using DHCPv6 (which resembles its counterpart DHCP in IPv4.) In the stateful autoconfiguration model, hosts obtain interface addresses and/or configuration information and parameters from a DHCPv6 server. The Server maintains a database that keeps track of which addresses have been assigned to which hosts.

The second way is stateless configuration. Stateless auto-configuration requires no manual configuration of hosts, minimal (if any) configuration of routers, and no additional servers. The stateless mechanism allows a host to generate its own addresses using a combination of locally available information (MAC address) and information (prefix) advertised by routers. Routers advertise prefixes that identify the subnet(s) associated with a link, while hosts generate an "interface identifier" that uniquely identifies an interface on a subnet. An address is formed by combining the two. When using stateless configuration, you needn't configure anything on the client.

The screenshot shows a network configuration page titled "Configuration". Under the "LAN" section, there are several configuration areas:

- IPv4 Parameters:** IP Address (192.168.1.254), IP Subnet Mask (255.255.255.0), Alias IP Address (0.0.0.0), Alias IP Subnet Mask (0.0.0.0), IGMP Snooping (Deactivated), Dynamic Route (RIP1, Direction: None).
- DHCPv4 Server:** DHCPv4 Server (Enabled), Start IP (192.168.1.100), IP Pool Count (20), Lease Time (86400 seconds), DNS Relay (Automatically), Primary DNS, Secondary DNS, Fixed Host (IP Address, MAC Address).
- IPv6 Parameters:** Interface Address/Prefix Length, MLD Snooping (Deactivated).
- DHCPv6 Server:** DHCPv6 Server (Enable), DHCPv6 Server Type (Stateless), Start Interface ID, End Interface ID, Lease Time, Router Advertisements (Enable).

At the bottom, there are "Save" and "Cancel" buttons, and a "Fixed Host List" table with columns for Index, IP, MAC, and Drop.

## IPv4 Parameters

**IP Address:** Enter the IP address of Router in dotted decimal notation, for example, 192.168.1.254 (factory default).

**IP Subnet Mask:** The default is 255.255.255.0. User can change it to other such as 255.255.255.128.

**Alias IP Address:** This is for local networks virtual IP interface. Specify an IP address on this virtual interface.

**Alias IP Subnet Mask:** Specify a subnet mask on this virtual interface.

**IGMP Snooping:** Select **Activated** to enable IGMP Snooping function, Without IGMP snooping, multicast traffic is treated in the same manner as broadcast traffic - that is, it is forwarded to all ports. With IGMP snooping, multicast traffic of a group is only forwarded to ports that have members of that group.

**Dynamic Route:** Select the RIP version from RIP1 or RIP2.

## DHCPv4 Server

DHCP (Dynamic Host Configuration Protocol) allows individual clients to obtain TCP/IP configuration at start-up from a server.

DHCPv4 Server	
DHCPv4 Server	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Relay
Start IP	<input type="text" value="192.168.1.100"/>
IP Pool Count	<input type="text" value="20"/>
Lease Time	<input type="text" value="86400"/> seconds (0 sets to default value of 259200)
DNS Relay	<input checked="" type="radio"/> Automatically <input type="radio"/> Manually
Primary DNS	<input type="text"/>
Secondary DNS	<input type="text"/>

**DHCPv4 Server:** If set to **Enabled**, your BIPAC 9800VNX(L) can assign IP addresses, default gateway and DNS servers to the DHCP client.

- If set to **Disabled**, the DHCP server will be disabled.
- If set to **Relay**, the BIPAC 9800VNX(L) acts as a surrogate DHCP server and relays DHCP requests and responses between the remote server and the clients. Enter the IP address of the actual, remote DHCP server in the Remote DHCP Server field in this case.
- When DHCP is used, the following items need to be set.

**Start IP:** This field specifies the first of the contiguous addresses in the IP address pool.

**IP Pool Count:** This field specifies the count of the IP address pool.

**Lease Time:** The current lease time of client.

**DNS Relay** Select Automatically obtained or Manually set (if selected. Please set the exactly information). If you set Static IP in the [ISP Connection Type](#) field, then select Manually here and set the specific DNS information.

**Primary DNS Server:** Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.

**Secondary DNS Server:** Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.

## Fixed Host


In this field, users can map the specific IP (must in the DHCP IP pool) for some specific MAC, and this information can be listed in the following table.

Fixed Host	
IP Address	<input type="text"/>
MAC Address	<input type="text"/>

**IP Address:** Enter the specific IP. For example: 192.168.1.110.

**MAC Address:** Enter the responding MAC. For example: 00:0A:F7:45:6D:ED

When added, you can see the ones listed as showed below:

Fixed Host Listing			
Index	IP	MAC	Drop
1	192.168.1.102	23:24:5B:4B:22:33	

## IPv6 parameters

IPv6 Parameters	
Interface Address/Prefix Length	<input type="text"/> / <input type="text"/>
MLD Snooping	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated
DHCPv6 Server	
DHCPv6 Server	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
DHCPv6 Server Type	<input checked="" type="radio"/> Stateless <input type="radio"/> Stateful
Start Interface ID	<input type="text"/>
End Interface ID	<input type="text"/>
Lease Time	<input type="text"/> seconds(0 sets to default value of 4800)
Router Advertisements	<input type="radio"/> Disable <input checked="" type="radio"/> Enable

**Interface Address / Prefix Length:** enter the static LAN IPv6 address, we suggest leave the field empty because when setted wrong, it will result in LAN devices not being able to access other IPv6 device through internet. Router will take the same WAN's prefix to LAN side if the field is empty.

**MLD Snooping:** Similar to IGMP Snooping, but applicable for IPv6.

## DHCPv6 Server

**DHCPv6 Server:** Check whether to enable DHCPv6 server.

**DHCPv6 Server Type:** Select Stateless or Stateful. When DHCPv6 is enabled, this parameter is available.

- **Stateless:** If selected, the PCs in LAN are configured through RA mode, thus, the PCs in LAN are configured through RA mode, to obtain the prefix message and generate an address using a combination of locally available information (MAC address) and information (prefix) advertised by routers, but they can obtain such information like DNS from DHCPv6 Server.
- **Stateful:** If selected, the PCs in LAN will be configured like in IPv4 mode, thus obtain addresses and DNS information from DHCPv6 server.

**Start interface ID:** enter the start interface ID. The IPv6 address composed of two parts, thus, the prefix and the interface ID. Interface is like the Host ID compared to IPv4.


**End interface ID:** enter the end interface ID.

**Leased Time (hour):** the leased time, similar to leased time in DHCPv4, is a time limit assigned to clients, when expires, the assigned ID will be recycled and reassigned.

**Issue Router Advertisement:** Check whether to enable issue Router Advertisement feature. It is to send Router Advertisement messages periodically. Router will multicast the v6 Prefix information (similar to v4 network number 192.168.1.0) to all LAN devices if the field is enabled. **We suggest enabling this field.**

### 4.4.1.3 Wireless

This section introduces the wireless LAN and some basic configurations. Wireless LANs can be as complex as a number of computers with wireless LAN cards communicating through access points which bridge network traffic to the wired LAN.

Configuration 

▼ Wireless

**Access Point Settings**

Access Point	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated
AP MAC Address	00:04:ED:15:07:00
Wireless Mode	802.11b+g+n
Channel	UNITED STATES 06 Current Channel : 6
Beacon Interval	100 (range: 20~1000)
RTS/CTS Threshold	2347 (range: 1500~2347)
Fragmentation Threshold	2346 (range: 256~2346, even numbers only)
DTIM Interval	1 (range: 1~255)
TX Power	100 (range:1~100)
IGMP Snooping	<input checked="" type="radio"/> Yes <input type="radio"/> No

**11n Settings**

Channel Bandwidth	40 MHz
Guard Interval	Auto
MCS	Auto

**SSID Settings**

Available SSID	1
SSID Index	<input checked="" type="radio"/> SSID1
SSID	wlan-ap
Broadcast SSID	<input checked="" type="radio"/> Yes <input type="radio"/> No
SSID Activated	Always

**WPS Settings**

Use WPS	<input checked="" type="radio"/> Yes <input type="radio"/> No
WPS State	Unconfigured
WPS Mode	<input type="radio"/> PIN code <input checked="" type="radio"/> PBC

**Security Settings**

Security Type	OPEN
---------------	------

**WDS Settings**

AP MAC Address	00:04:ED:15:07:00
WDS Mode	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated
WDS Peer MAC #1	00:00:00:00:00:00
WDS Peer MAC #2	00:00:00:00:00:00
WDS Peer MAC #3	00:00:00:00:00:00
WDS Peer MAC #4	00:00:00:00:00:00

#### ■ Access Point Settings

**Access Point:** Default setting is set to **Activated**. If you want to close the wireless interface, select **Deactivated**.

**AP MAC Address:** The MAC address of wireless AP.

**Wireless Mode:** The default setting is **802.11b+g+n** (Mixed mode). If you do not know or have both 11g and 11b devices in your network, then keep the default in **mixed mode**. From the drop-down manual, you can select **802.11g** if you have only 11g card. If you have only 11b card, then select **802.11b** and if you only have 802.11n then select **802.11n**.



**Channel:** The range of radio frequencies used by IEEE 802.11b/g/n wireless devices is called a channel. There are Regulation Domains and Channel ID in this field. The Channel ID will be different based on Regulation Domains. Select a channel from the drop-down list box.

**Beacon interval:** The Beacon Interval value indicates the frequency interval of the beacon. Enter a value between 20 and 1000. A beacon is a packet broadcast by the Router to synchronize the wireless network.

**RTS/CTS Threshold:** The RTS (Request To Send) threshold (number of bytes) for enabling RTS/CTS handshake. Data with its frame size larger than this value will perform the RTS/CTS handshake. Enter a value between 1500 and 2347.

**Fragmentation Threshold:** The threshold (number of bytes) for the fragmentation boundary for directed messages. It is the maximum data fragment size that can be sent. Enter a value between 256 and 2346, even number only.

**DTIM Interval:** This value, between 1 and 255, indicates the interval of the Delivery Traffic Indication Message (DTIM).

**TX Power:** The transmission power of the antennas, ranging from 1-100, the higher the more powerful of the transmission performance.

**IGMP Snooping:** Enable or disable the IGMP Snooping function for wireless. Without IGMP snooping, multicast traffic is treated in the same manner as broadcast traffic - that is, it is forwarded to all ports. With IGMP snooping, multicast traffic of a group is only forwarded to ports that have members of that group.”

## ■ 11n Settings

**Channel Bandwidth:** Select either **20 MHz** or **20/40 MHz** for the channel bandwidth. The wider the Channel bandwidth the better the performance will be.

**Guard Interval:** Select either **400nsec** or **800nsec** for the guard interval. The guard interval is here to ensure that data transmission do not interfere with each other. It also prevents propagation delays, echoing and reflections. The shorter the Guard Interval, the better the performance will be. We recommend users to select Auto.

**MCS:** There are options **0~15** and **AUTO** to select for the **Modulation and Coding Scheme**. We recommend users selecting **AUTO**.

## ■ SSID Settings

**Available SSID:** User can determine how many virtual SSIDs to be used. Default is 1, maximum is 4.

**SSID Index:** Select how many SSIDs you want to lay out. A total of 4 is in list. By default 4 SSIDs are in use.

**SSID:** The SSID is the unique name of a wireless access point (AP) to be distinguished from another. For security propose, change the default **wlan-ap** to a unique ID name to the AP which is already built-in to the router's wireless interface. Make sure your wireless clients have exactly the SSID as the device, in order to get connected to your network.

**Broadcast SSID:** Select **Yes** to make the SSID visible so a station can obtain the SSID through passive scanning. Select **No** to hide the SSID in so a station cannot obtain the SSID through passive scanning.

**SSID Activated:** Select the time period during which the SSID is active. Default is always which means the SSID will be active all the time without time control. See [4.4.3.11 Time Schedule](#) to set the timeslot to flexibly control when the SSID functions.

## ■ WPS Settings

WPS (Wi-Fi Protected Setup) feature is a standard protocol created by Wi-Fi Alliance. This feature greatly simplifies the steps needed to create a Wi-Fi networks for a residential or an office setting. WPS supports 2 types of configuration methods which are commonly known among consumers: **PIN Method** & **PBC Method**.

**WPS State:** Display whether the WPS is **configured** or **unconfigured**.

**WPS Mode:** Select the mode which to start WPS, choose between **PIN Code** and **PBC** (Push Button). Selecting **Pin Code** mode will require you to know the enrollee PIN code.

To future understand the two modes of configuration; please refer to the following **Wi-Fi Protected Setup**.

## Wi-Fi Protected Setup

### PIN Method: Configure AP as Registrar

1. Jot down the client's Pin (eg. 04640776).

SSID Settings	
SSID Num	1
SSID Index	<input checked="" type="radio"/> SSID1
SSID	Billion_AP
Broadcast SSID	<input checked="" type="radio"/> Yes <input type="radio"/> No
SSID Activated	Always
WPS Settings	
Use WPS	<input checked="" type="radio"/> Yes <input type="radio"/> No
WPS State	Configured
WPS Mode	<input checked="" type="radio"/> PIN code <input type="radio"/> PBC
AP PIN Code	03454435 <input type="button" value="Generate"/>
Enrollee PIN Code	04640776
WPS Progress	In progress <input type="button" value="Stop WPS"/>
Security Settings	
Security Type	Mixed WPA2/WPA-PSK
WPA Algorithms	AES
Pre-Shared Key	12345678 (8~63 characters or 64 Hex string)
Key Renewal Interval	3600 seconds (10 ~ 4194303)

2. Enter the Enrollee(Client) PIN code and then press Start WPS.

3. Launch the wireless client's WPS utility (eg. Ralink Utility). Set the Config Mode as Enrollee, press the WPS button on the top bar, select the AP (eg. Billion\_AP) from the WPS AP List column. Then press the PIN button located on the middle left of the page to run the scan.

The screenshot displays the WPS utility interface with the following components:

- Navigation Bar:** Profile, Network, Advanced, Statistics, WMM, WPS, Radio On/Off, About.
- WPS AP List:**

ID :	Billion_AP	00 04 ED 85 46 92	1
ID :	wlan-ap	00-21-85-BE-3B-2B	1
ID :	Welcome to RFINICS	00-21-27-6A-2B-7E	8
ID :	Mai-Lang	00-21-91-EE-2A-68	9
- WPS Profile List:** (Empty)
- Configuration Panel:**
  - Config Mode:** Enrollee
  - Buttons:** Rescan, Information, Pin Code (04640776), Renew, Detail, Connect, Rotate, Disconnect, Export Profile, Delete.
  - WPS Associate IE:**  WPS Associate IE
  - WPS Probe IE:**  WPS Probe IE
  - Progress:** Progress >> 0%
  - Status:** PIN - WPS Eap process failed
- Network Status:**
  - Transmit:** Link Speed >>, Throughput >> (2.736 Kbps)
  - Receive:** Link Speed >>, Throughput >> (60.120 Kbps)
  - Link Quality:** >>0%
  - Signal Strength1:** >>0%
  - Signal Strength2:** >>0%
  - Noise Strength:** >>0%
- Network Information:**
  - HT
  - BW >> n/a, SNR0 >> n/a
  - GI >> n/a, MCS >> n/a, SNR1 >> n/a
- Left Sidebar:** Status >>, Extra Info >>, Channel >>, Authentication >>, Encryption >>, Network Type >>, IP Address >>, Sub Mask >>, Default Gateway >>

4. The client's SSID and security setting will now be configured to match the SSID and security setting of the registrar (router).

The screenshot displays a network management interface with the following sections:

- Navigation Menu:** Network, Advanced, Statistics, WMM, WPS (selected), Radio On/Off, About, Help.
- WPS AP List:**

ID :	Billion_AP	00-04-ED-85-46-92	1
ID :	wlan-ap	00-21-85-BE-3B-2B	1
ID :	Welcome to RFINICS	00-21-27-6A-2B-7E	8
- WPS Profile List:** Billion\_AP
- Configuration:**
  - Buttons: PIN, PBC
  - Options:  WPS Associate IE,  WPS Probe IE
  - Progress: Progress >> 100%
  - Status: WPS status is connected successfully
- Connection Details:**
  - Status >> Billion\_AP <-> 00-04-ED-85-46-92
  - Extra Info >> Link is Up [TxPower:100%]
  - Channel >> 1 <-> 2412 MHz; central channel : 6
  - Authentication >> WPA2-PSK
  - Encryption >> AES
  - Network Type >> Infrastructure
  - IP Address >> 192.168.1.101
  - Sub Mask >> 255.255.255.0
  - Default Gateway >> 192.168.1.254
- Performance Metrics:**
  - Link Quality >> 100%
  - Signal Strength 1 >> 41%
  - Signal Strength 2 >> 44%
  - Noise Strength >> 26%
  - Transmit: Link Speed >> 108.0 Mbps, Throughput >> 0.000 Kbps
  - Receive: Link Speed >> 1.0 Mbps, Throughput >> 109.204 Kbps
- HT (High Throughput) Settings:**
  - BW >> 40
  - GI >> long
  - MCS >> 5
  - SNRO >> 30
  - SNR1 >> 20102206

## PIN Method: Configure AP as Enrollee

1. Jot down the WPS PIN (eg. 03454435). Press Start WPS.

SSID Settings	
SSID Num	1
SSID Index	<input checked="" type="radio"/> SSID1
SSID	Billion_AP
Broadcast SSID	<input checked="" type="radio"/> Yes <input type="radio"/> No
SSID Activated	Always
WPS Settings	
Use WPS	<input checked="" type="radio"/> Yes <input type="radio"/> No
WPS State	Configured
WPS Mode	<input checked="" type="radio"/> PIN code <input type="radio"/> PBC
AP PIN Code	03454435 <input type="button" value="Generate"/>
Enrollee PIN Code	<input type="text"/>
WPS Progress	In progress <input type="button" value="Stop WPS"/>
Security Settings	
Security Type	WPA2-PSK
WPA Algorithms	AES
Pre-Shared Key	12345678 (8~63 characters or 64 Hex string)
Key Renewal Interval	3600 seconds (10 ~ 4194303)

2. Launch the wireless client's WPS utility (eg. Ralink Utility). Set the Config Mode as Registrar. Enter the PIN number in the PIN Code column then choose the correct AP (eg. Billion\_AP) from the WPS AP List before pressing the PIN button to run the scan.

The screenshot displays the WPS utility interface with the following components:

- Navigation Bar:** Network, Advanced, Statistics, WMM, WPS (selected), Radio On/Off, About, Help.
- WPS AP List:**

ID	AP Name	MAC Address	Priority	Key Icon
0x0000	Billion_AP	00-04-ED-85-46-92	1	
	Welcome to RFINICS	00-21-27-6A-2B-7E	8	🔑
	Mai-Lang	00-21-91-EE-2A-68	9	🔑
- WPS Profile List:** Billion\_AP
- Configuration Panel:**
  - Buttons: PIN, PBC
  - Options:  WPS Associate IE,  WPS Probe IE
  - Progress: Progress >> 100%
  - Status: WPS status is connected successfully
- Right Panel:**
  - Buttons: Rescan, Information, Pin Code (03454435), Renew, Config Mode (Registrar), Detail, Connect, Rotate, Disconnect, Export Profile.
- Status and Performance Metrics:**
  - Status >> Billion\_AP <-> 00-04-ED-85-46-92
  - Extra Info >> Link is Up [TxPower:100%]
  - Channel >> 1 <-> 2412 MHz; central channel : 6
  - Authentication >> WPA2-PSK
  - Encryption >> AES
  - Network Type >> Infrastructure
  - IP Address >> 192.168.1.101
  - Sub Mask >> 255.255.255.0
  - Default Gateway >> 192.168.1.254
  - HT:
    - BW >> 40
    - GI >> short
    - MCS >> 7
    - SNRO >> 30
    - SNR1 >> 20102206
  - Link Quality >> 100% (Green bar)
  - Signal Strength 1 >> 24% (Red bar)
  - Signal Strength 2 >> 65% (Yellow bar)
  - Noise Strength >> 26% (Green bar)
  - Transmit:
    - Link Speed >> 150.0 Mbps
    - Throughput >> 0.000 Kbps
    - Max 1.632 Kbps (Bar chart)
  - Receive:
    - Link Speed >> 1.0 Mbps
    - Throughput >> 118.144 Kbps
    - Max 195.136 Kbps (Bar chart)

3. The router's (AP's) SSID and security setting will now be configured to match the SSID and security setting of the registrar (client).

The screenshot displays the WPS configuration interface on a router. At the top, there are navigation tabs: Network, Advanced, Statistics, WMM, WPS (selected), Radio On/Off, About, and Help. The main content area is titled 'WPS AP List' and contains a table with the following data:

ID	SSID	MAC	Priority	Key Icon
0x0000	Billion_AP	00-04-ED-85-46-92	1	
	Welcome to RFINICS	00-21-27-6A-2B-7E	8	🔑
	Mai-Lang	00-21-91-EE-2A-68	9	🔑

Below the table is the 'WPS Profile List' showing 'Billion\_AP' selected. To the right, there are control buttons: Rescan, Information, Pin Code (03454435), Config Mode (Registrar), Detail, Connect, Rotate, Disconnect, and Export Profile. At the bottom left, there are checkboxes for 'WPS Associate IE' and 'WPS Probe IE', both of which are checked. A progress bar indicates 'Progress >> 100%' and a message states 'WPS status is connected successfully'.

The bottom section provides detailed status for the 'Billion\_AP' connection:

- Status >> Billion\_AP <-> 00-04-ED-85-46-92
- Extra Info >> Link is Up [TxPower:100%]
- Channel >> 1 <-> 2412 MHz; central channel : 6
- Authentication >> WPA2-PSK
- Encryption >> AES
- Network Type >> Infrastructure
- IP Address >> 192.168.1.101
- Sub Mask >> 255.255.255.0
- Default Gateway >> 192.168.1.254

Performance metrics are shown in a bar chart format:

- Link Quality >> 100%
- Signal Strength 1 >> 24%
- Signal Strength 2 >> 65%
- Noise Strength >> 26%

Transmit and Receive statistics are also provided:

- Transmit:** Link Speed >> 150.0 Mbps, Throughput >> 0.000 Kbps
- Receive:** Link Speed >> 1.0 Mbps, Throughput >> 118.144 Kbps

4. Now to make sure that the setup is correctly done, cross check to see if the SSID and the security setting of the registrar setting match with the parameters found on both Wireless Configuration and Wireless Security Configuration page.

## PBC Method:

1. Press the PBC radio button, Then Start WPS.

SSID Settings	
SSID Num	1
SSID Index	<input checked="" type="radio"/> SSID1
SSID	Billion_AP
Broadcast SSID	<input checked="" type="radio"/> Yes <input type="radio"/> No
SSID Activated	Always
WPS Settings	
Use WPS	<input checked="" type="radio"/> Yes <input type="radio"/> No
WPS State	Configured
WPS Mode	<input type="radio"/> PIN code <input checked="" type="radio"/> PBC
Security Settings	
Security Type	WPA2-PSK
WPA Algorithms	AES
Pre-Shared Key	12345678 (8~63 characters or 64 Hex string)
Key Renewal Interval	3600 seconds (10 ~ 4194303)

2. Launch the wireless client's WPS Utility (eg. Ralink Utility). Set the Config Mode as Enrollee. Then press the WPS button and choose the correct AP (eg. Billion\_AP) from the WPS AP List section before pressing the PBC button to run the scan.



3. When the PBC button is pushed, a wireless communication will be established between your router and the PC. The client's SSID and security setting will now be configured to match the SSID and security setting of the router.

The screenshot displays the WPS configuration interface on a router. The 'WPS' tab is selected in the navigation menu. The 'WPS AP List' table shows several available profiles, with 'Billion\_AP' selected. The 'WPS Profile List' shows the details for 'Billion\_AP'. The 'PIN' and 'PBC' buttons are both checked, and the 'WPS Associate IE' and 'WPS Probe IE' options are also checked. A progress bar indicates that the connection is 100% complete. The 'WPS status' shows a successful connection to the Billion\_AP. The bottom section provides detailed connection statistics for the Billion\_AP profile, including link quality, signal strength, noise strength, and throughput for both transmit and receive directions.

ID :	WLAN AP	MAC	Priority
wlan-ap	00-04-ED-33-EF-D1	1	
ID : 0x0004	Billion_AP	00:04:ED:85:46:92	1
ID :	111111	00-0C-43-30-52-50	7
ID :	Welcome to RFINICS	00-21-27-6A-2B-7E	8

Profile Name
Billion_AP

PIN	<input checked="" type="checkbox"/> WPS Associate IE	Progress >> 100%
PBC	<input checked="" type="checkbox"/> WPS Probe IE	WPS status is connected successfully - 5200NRC

Status >> Billion_AP <-> 00-04-ED-85-46-92	Link Quality >> 100%
Extra Info >> Link is Up [TxPower:100%]	Signal Strength 1 >> 62%
Channel >> 1 <-> 2412 MHz; central channel : 6	Signal Strength 2 >> 86%
Authentication >> WPA2-PSK	Noise Strength >> 26%
Encryption >> AES	
Network Type >> Infrastructure	
IP Address >> 192.168.1.101	
Sub Mask >> 255.255.255.0	
Default Gateway >> 192.168.1.254	

HT	
BW >> 20	SNRO >> 0
GI >> short	MCS >> 7
	SNR1 >> 20102453

Transmit	
Link Speed >> 72.2 Mbps	17.744 Kbps
Throughput >> 1.008 Kbps	
Receive	
Link Speed >> 1.0 Mbps	256.300 Kbps
Throughput >> 48.172 Kbps	

## ■ Security Settings

**Security Type:** You can disable or enable wireless security for protecting wireless network. The default type of wireless security is OPEN and to allow all wireless stations to communicate with the access points without any data encryption.

To prevent unauthorized wireless stations from accessing data transmitted over the network, the router offers secure data encryption, known as WEP and WPA.

There are five alternatives to select from: WEP 64-bit, WEP 128-bit, WPA-PSK, WPA2-PSK, Mixed WPA/WPA2-PSK. If you require high security for transmissions, please select WPA-PSK, WPA2-PSK or WPA/WPA2-PSK.

### ➤ WEP

Security Settings	
Security Type	WEP 64-bit
WEP Authentication Method	Both
WEP 64-bit	For each key, please enter either (1) 5 characters, or (2) 10 characters ranging from 0~9, a, b, c, d, e, f.
<input checked="" type="radio"/> Key#1	<input type="text"/>
<input type="radio"/> Key#2	<input type="text"/>
<input type="radio"/> Key#3	<input type="text"/>
<input type="radio"/> Key#4	<input type="text"/>

**WEP Authentication Method:** WEP authentication method, there are two methods of authentication used, Open System authentication (OPENWEB) and Share Key authentication (SHAREDWEB). We suggest you select OPENWEB.

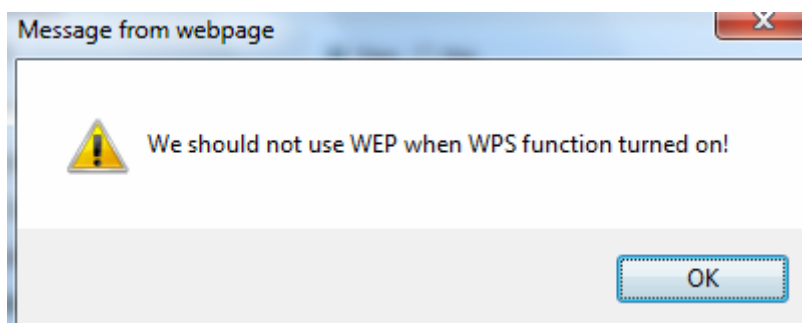
**Key 1 to Key 4:** Enter the key to encrypt wireless data. To allow encrypted data transmission, the WEP Encryption Key values on all wireless stations must be the same as the router. There are four keys for your selection. The input format is in HEX style, 5 and 13 HEX codes are required for 64-bitWEP and 128-bitWEP respectively.

If you chose **WEP 64-bit**, then enter any 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F").

If you chose **WEP 128-bit**, then enter 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F").

You must configure all four keys, but only one key can be activated at any one time. The default key is key 1.

**Note:** When you enable **WPS** function, this **WEP** function will be invalid. And if you select one of **WEP-64Bits/WEP-128Bits**, the following prompt box will appear to notice you.



➤ **WPA-PSK & WPA2-PSK**

Security Type	WPA-PSK
WPA Algorithms	AES
Pre-Shared Key	0004ED596230 (8~63 characters or 64 Hex string)
Key Renewal Interval	3600 seconds (10 ~ 4194303)

**WPA Algorithms:** TKIP (Temporal Key Integrity Protocol) or AES (Advanced Encryption System) utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers.

**Pre-Shared key:** The key for network authentication. The input format should be 8-63 ASCII characters or 64 hexadecimal characters

**Key Renewal Interval:** The time interval for changing the security key automatically between wireless client and AP.

**WDS Settings**

WDS (Wireless distributed system) is a wireless access point mode that enables wireless link and communication with other access point. It is easy to be installed, just define the peer's MAC of the connected AP.

**WDS Mode:** select Activated to enable WDS feature and Deactivated to disable this feature.

**MAC Address:** Enter the AP MAC addresses (in XX:XX:XX:XX:XX:XX format) of the peer connected AP.

WDS Settings	
WDS Mode	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated
WDS Peer MAC #1	00:00:00:00:00:00
WDS Peer MAC #2	00:00:00:00:00:00
WDS Peer MAC #3	00:00:00:00:00:00
WDS Peer MAC #4	00:00:00:00:00:00

#### 4.4.1.4 Wireless MAC Filter

The MAC filter screen allows you to configure the router to give exclusive access to up to 8 devices (Allow Association) or exclude up to 8 devices from accessing the router (Deny Association). Every Ethernet device has a unique MAC (Media Access Control) address. The MAC address is assigned at the factory and consists of six pairs of hexadecimal characters, for example, 00:AA:BB:00:00:02. You need to know the MAC address of the devices to configure this screen.

The screenshot shows the 'Configuration' page for the 'Wireless MAC Address Filter'. It includes a 'Save' button and a table for the filter listing.

Index	MAC Address	Edit	Delete
-------	-------------	------	--------

**SSID Index:** Select the targeted SSID you want the MAC filter rules to apply to.

**Active:** Select **Activated** to enable MAC address filtering.

**Action:** Define the filter action for the list of MAC addresses in the MAC address filter table.

Select **Deny** to block access to the AP, MAC addresses not listed will be allowed to access the router. Select **Allow** to permit access to the router, MAC addresses not listed will be denied access to the router.

**MAC Address:** Enter the MAC addresses (in XX:XX:XX:XX:XX:XX format) of the wireless station that are allowed or denied access to the specified in these address fields.