PLANET
Networking & Communication

User's Manual

GEPON Wi-Fi ONU

- EPN-402NV

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Federal Communication Commission Interference Statement

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

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

FCC Caution:

To assure continued compliance, for example, use only shielded interface cables when connecting to computer or peripheral devices. Any changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

Federal Communication Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm (8 inches) during normal operation.

R&TTE Compliance Statement

This equipment complies with all the requirements of DIRECTIVE 1999/5/CE OF THE EUROPEAN PARLIAMENT AND THE COUNCIL OF 9 March 1999 on radio equipment and telecommunication terminal equipment and the mutual recognition of their conformity (R&TTE).

The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) as of April 8, 2000.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

National Restrictions

This device is intended for home and office use in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

Country	Restriction	Reason/remarks
Bulgaria	None	General authorization required for outdoor use and public service
France	Outdoor use limited to 10 mW e.i.r.p. within the 2454-2483.5 MHz band	Military radio location use. Refarming of the 2.4 GHz band has been ongoing in recent years to allow the current relaxed regulation. Full implementation planned in 2012
Italy	None	If used outside of own premises, general authorization is required
Luxembourg	None	General authorization required for network and service supply (not for spectrum)
Norway	Implemented	This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund
Russian Federation	None	Only for indoor applications

Note: Please don't use the product outdoors in France.

WEEE Regulations

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Revision

User Manual of PLANET GEPON Wi-Fi ONU

Model: EPN-402NV

Rev: 1.0 (Oct., 2014)

Part No. EM-EPN-402NV_v1.0 (**2081-BA0110-000**)

CONTENTS

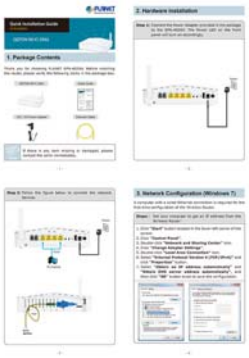
Chapter 1. Product Introduction

1.1 Package Contents

Thank you for choosing PLANET EPN-402NV. Before installing the ONU, please verify the contents inside the package box.

EPN-402NV

Quick Installation Guide



Power Adapter

12V DC, 1A
100~240V AC

Ethernet Cable

RJ45 Cable

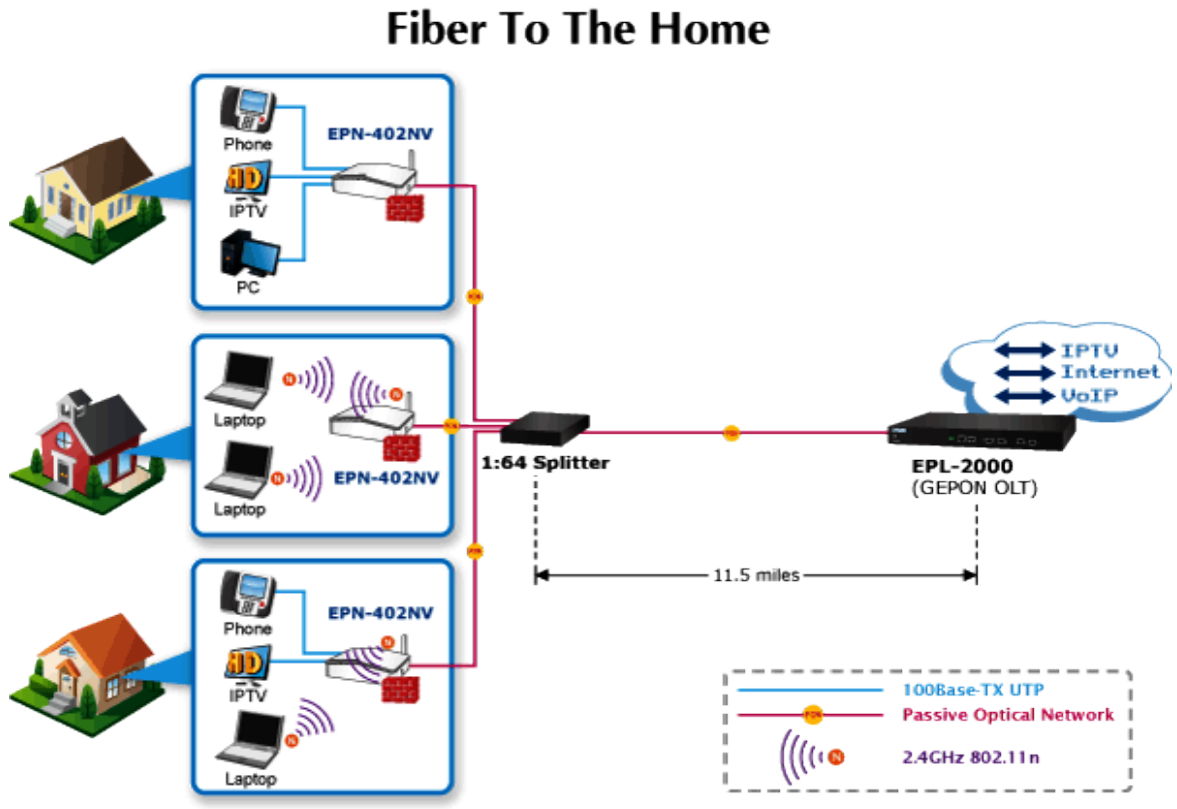
Note

If there is any item missing or damaged, please contact the seller immediately.

1.2 Product Description

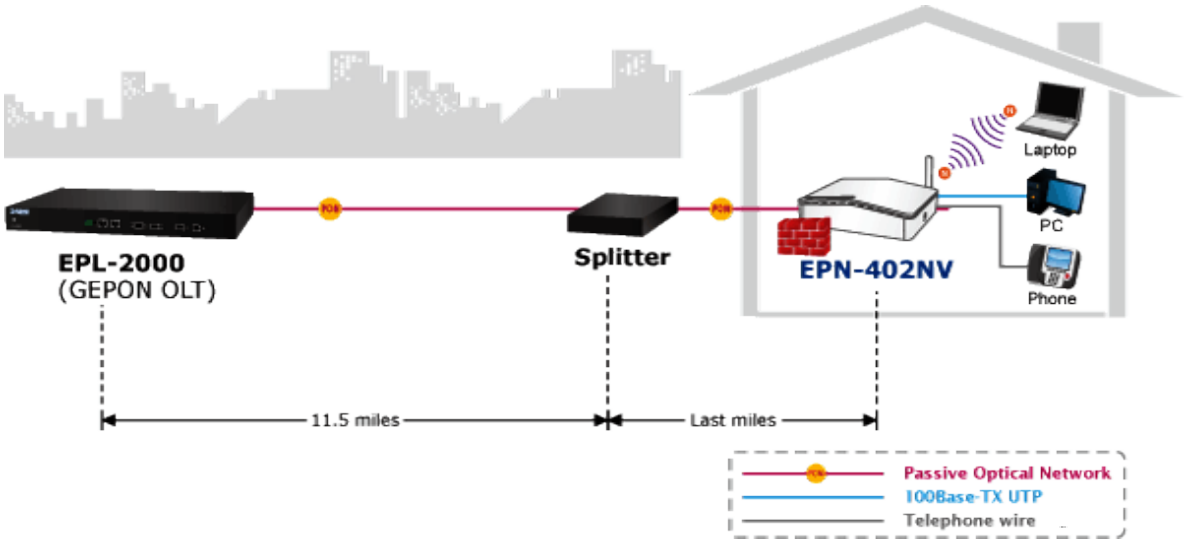
Perfectly Designed for Fiber to the Home Applications

PLANET EPN-402NV is a fiber to the home (FTTH) broadband access equipment type. With built-in 1.25Gbps GEPON fiber interface, the EPN-402NV supports different optic types for WAN and the distance can be up to 20km through the fiber connection. It can handle multiple high-throughput services such as IPTV, on-line gaming, VoIP and Internet access, and keep the bandwidth usage smoothly via its QoS features. Thus, with the advantages of high reliability and scalability, the EPN-402NV can further be applied in the network of SOHO (small office or home office) or small businesses that provide high-performance access services.



Cost-effective Network Connection Solution

With the growing network services such as HDTV, IPTV, voice over IP (VoIP) and multimedia broadband applications, the demand for broadband use has increased tremendously. The Passive Optical Network (PON) is the most promising NGN (Next Generation Networking) technology. As compared to other broadband access technologies such as xDSL and cable modem, the Passive Optical Network (PON) technology offers some competitive advantages, including a long-term life expectancy of the fiber infrastructure, lower operating costs through the reduction of “active” components, support up to 20km distance between equipment nodes, and most importantly, provide much greater bandwidth.

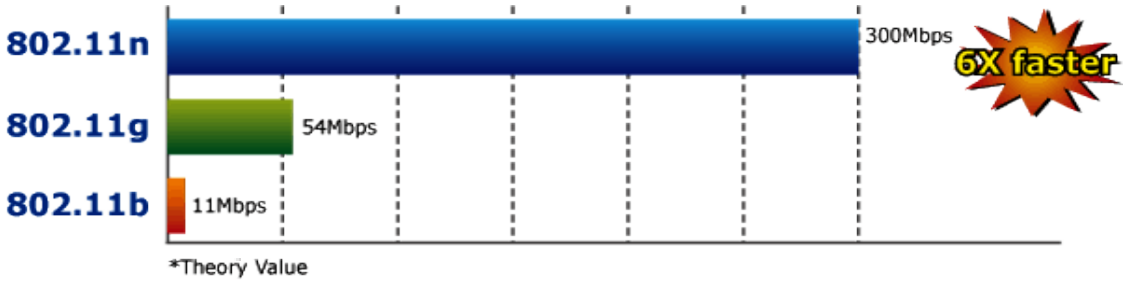


Flexibility and Extension solution

PLANET EPN-402NV provides ultra high-speed Internet connection with PLANET OLT (EPL-2000) via the new GEPON technology. The upstream and downstream transmission speed provided is up to 1.25Gbps and its maximum distance can be 20km. Through the PON technology, the EPN-402NV can receive and deliver high-speed voice, data and video services. It offers competitive advantages including a long-term life expectancy of the fiber infrastructure, lower operating costs from the reduction of “active” components, easy Installation and maintenance, and most importantly, offering a much greater and more stable bandwidth. The EPN-402NV is the perfect solution working with PLANET OLT EPL-2000 to offer benefits of cost-effectiveness, scalability and flexibility to network deployment.

High-speed 802.11n Wireless Type

With built-in IEEE 802.11b/g and 802.11n wireless network capabilities, the EPN-402NV allows any computer and wireless-enabled network device to connect to it without additional cabling. 802.11n wireless capability brings users the speed of wireless data transmission rate to as high as **300Mbps.** The radio coverage is also doubled to offer strong wireless connection even in widely spacious offices or houses.



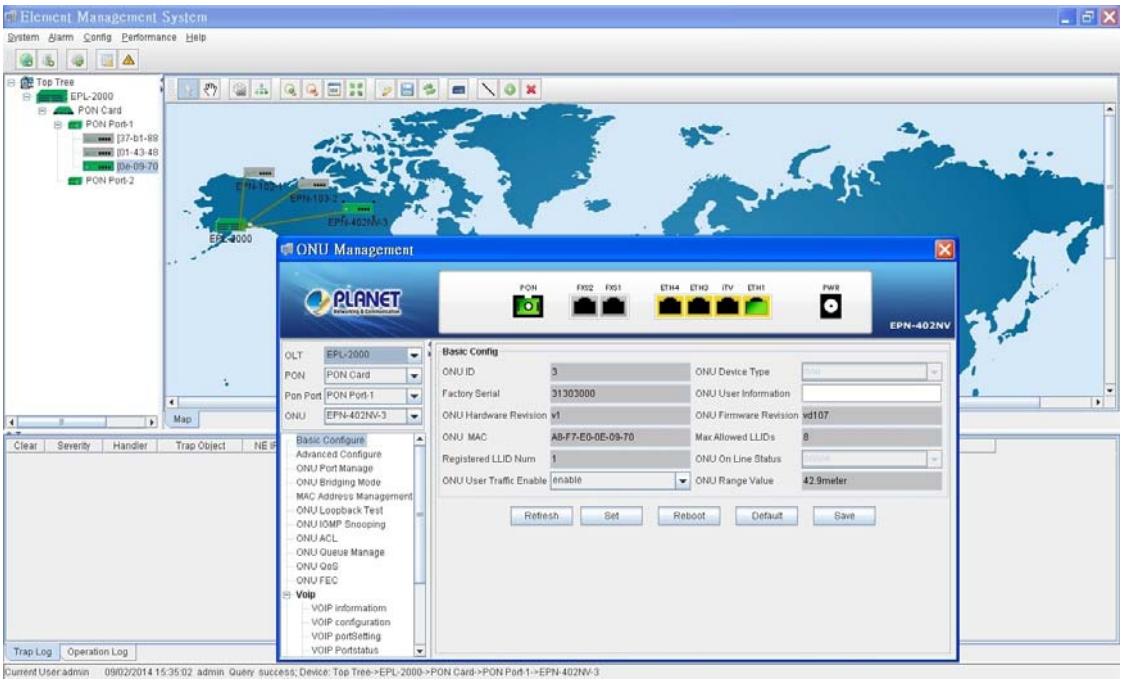
Standard Compliance with FXS Port

The EPN-402NV provides two FXS ports that can easily integrate with general voice over IP system. The EPN-402NV makes it simple for the enterprise featuring voice and data system or expanding voice system to new locations. It helps you to save money on long-distance calls; for example, the remote users can dial in

through a Unified VoIP Communication System just like an extension call but no long-distance call charge would occur.

Robust ONU Management

The EPN-402NV is designed to work with PLANET OLT EPL-2000 to provide robust FTTx applications. With the **Element Management System (EMS**) **built** in the EPL-2000, the administrators can manage and configure the facilities such as adding or removing PLANET OLTs and ONUs to or from the network architecture easily and economically. The EMS also supports many operating and monitoring functions for efficient ONU management including ONU auto-detection, auto-registration, testing link connection, binding MAC address, loopback test and filtration, bandwidth control, flow control, and multicast stream control.



1.3 Product Features

- **GEPON**
  - Supports 802.3ah CTC external OAM
  - 1 x SC type GEPON port
  - Up to 1.25Gbps upstream and downstream
  - Up to 20km
  - Supports 128-bit triple churning algorithm
  - Supports dying gasp
- **Ethernet**
  - Supports 802.1Q VLAN, QoS
  - Supports broadcast storm protection
  - Supports bandwidth control
  - Supports IGMP snooping/proxy
  - Supports IPv4/IPv6
- **VoIP**
  - Supports G.711 a/u law, G.712, G.729a code/decode
  - Supports VAD, CNG
  - Supports G.711/T.38 fax
  - Supports SIP/H.248/MGCP
- **Wireless**
  - Up to 300Mbps bandwidth
  - Compatible with 802.11b/g/n
  - Compatible with equipment working on 2.4G Hz
  - Supports WPS
- **Physical Hardware**
  - 4 x 10/100Mbps Fast Ethernet port
  - 2 x FXS port
  - 1 x Reset Button
  - 1 x Power Connector
- **Features**
  - Dynamic Bandwidth Allocation (DBA) support
  - IEEE 802.3ah compliant Forward Error Correction (FEC)
  - Enhanced IGMP feature
  - 1.5MB of integrated packet buffering
  - Supports Layer-2/3/4 classification rules
  - Supports IEEE 802.3x flow control
  - Internal Management Information Base (MIB) counters for network statistics

1.4 Product Specifications

Product		**EPN-402NV** GEPON Wi-Fi ONU
Hardware Specifications		
Transmission Speed		Downstream: 1.25 Gbps Upstream: 1.25 Gbps
Port	**PON Port**	1 x PON Port
	Ethernet Port	4 x RJ45 (10/100Base-TX)
	FXS Port	2 x RJ11 Port
	USB Port	1 x USB 2.0 Port Type A, 5V 500mA
Optic Wavelength		TX: 1270mm RX:1480mm
Optical Receive Sensitivity		-25 dBm
Dimensions (W x D x H)		190 x 137 x 48 mm
Weight		350g
Power Input		12V DC, 1A
Power Consumption		12W
EMS Utility Specifications		
ONU Feature		Supports IGMP Snooping Supports MLD Snooping Supports 802.3ah CTC external OAM Supports DBA algorithm Supports 128-bit triple churning algorithm Supports dying gasp IEEE 802.3ah compliant forward error Correction (FEC) Supports TR-069
Wireless Interface Specifications		
Standard		Compliant with IEEE 802.11b/g/n
Frequency Band		2.4~2.4835GHz
Antenna		Gain: 3 dBi internal antennas
Extended Frequency		DSSS
Modulation Type		DBPSK, DQPSK, QPSK, CCK and OFDM (BPSK/QPSK/16-QAM/ 64-QAM)
Data Transmission Rates		802.11n (40MHz):270/243/216/162/108/81/54/27Mbps 135/121.5/108/81/54/40.5/27/13.5Mbps (Dynamic) 802.11n (20MHz):130/117/104/78/52/39/26/13Mbps 65/58.5/52/39/26/19.5/13/6.5Mbps (Dynamic) 802.11g:54/48/36/24/18/12/9/6Mbps (Dynamic) 802.11b:11/5.5/2/1Mbps (Dynamic)
Channel		Europe/ ETSI: 2.412~2.472GHz (13 Channels)
Max. RF Power		16 dBm max. (EIRP)
Encryption Security		■ WEP (64/128-bit) encryption security ■ WPA-Personal / WPA2-Personal (TKIP/AES) ■ Mixed WPA / WPA2-PSK

Wireless Security	Provides wireless LAN ACL (Access Control List) filtering
	Wireless URL filtering
	Supports WPS (Wi-Fi Protected Setup)
	Enables/Disables SSID broadcast
Wireless Advanced	WMM (Wi-Fi multimedia): 802.11e wireless QoS
	Provides wireless statistics
Max. Supported Clients	128
Firewall	NAT firewall with SPI (Stateful Packet Inspection)
	Built-in NAT server supporting DMZ
	Built-in firewall with IMAC address/ port/ URL filtering
	Supports DoS protection
VoIP Protocols and Standard	
Standard	SIP/H.248/MGCP T.38 (G.711 fax pass-through)
Voice Codec	G.711 a/u law, G.712, G.729a code/decode
Voice Standard	VAD (Voice Activity Detection) CNG (Comfort Noise Generation)
Environment Specifications	
Temperature	Operating temperature: -5 ~ 55 degrees C Storage temperature: -30 ~ 60 degrees C
Humidity	Operating Humidity: 10 ~ 90% non-condensing Storage Humidity: 5 ~ 95% non-condensing
Standards Conformance	
Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3x flow control and back pressure IEEE 802.11n

Chapter 2. Hardware Installation

Please follow the instructions below to connect the EPN-402NV to the existing network devices and your computers.

2.1 Hardware Description

- **Dimensions**: 190x 137 x 48mm (L x W x H)
- **Diagram :**

Figure 2-1

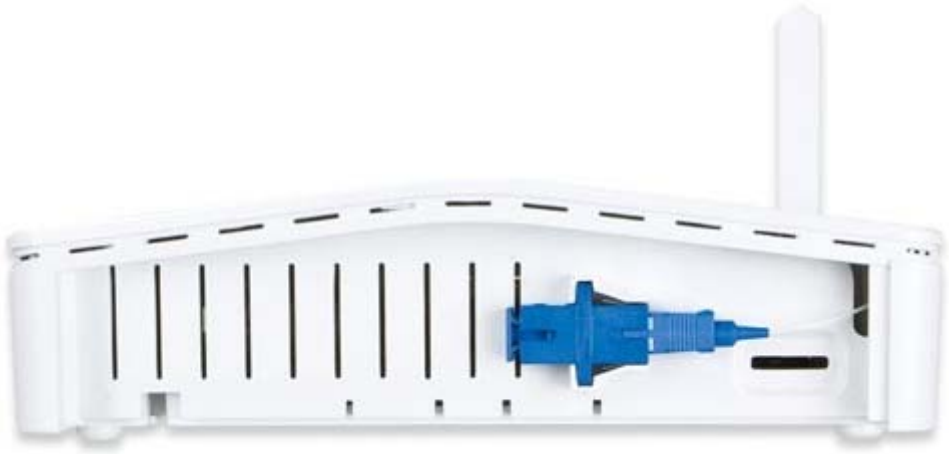


Figure 2-2

Figure 2-3

Figure 2-4

2.1.1 Front Panel

The front panel provides a simple interface monitoring the ONU. Figure 2-5, 2-6 shows the front panel of the EPN-402NV.

Front Panel

Figure 2-5 SC Type GEPON

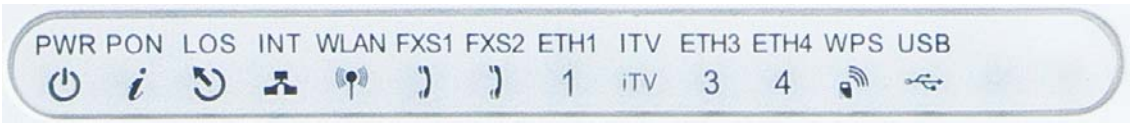


Figure 2-6 EPN-402NV Front Panel

LED (Left to Right)	COLOR	STATE	FUNCTION
PWR	**Green**	On	Device power on
		Off	Device power off
PON	**Green**	On	MPCP and OAM be active
		Flash	Registering
		Off	MPCP and OAM not founded
LOS	**Red**	Flash	Optical Power too Low
		Off	Optical Power normal
INT	**Green**	On	In ONU mode, Internet is connected, no data transmission
		Flash	Connected, no data transmission
		Off	Data is transmitting
WLAN	**Green**	On	WLAN is active
		Flash	Data is transmitting
		Off	System power off or WLAN is forbidden
FXS1 / FXS2	**Green**	On	Registered successfully to server
		Flash	Data is transmitting
		Off	Registered unsuccessfully
ETH1/iTV	**Green**	On	Linked

ETH3 / ETH4		Flash	Data is transmitting
		Off	No link
WPS	**Green**	On	Linked successfully
		Flash	Negotiating
		Off	Linked unsuccessfully
USB	**Green**	On	Linked and in master mode
		Flash	Data is transmitting
		Off	No link

2.1.2 Rear Panel

Rear Panel

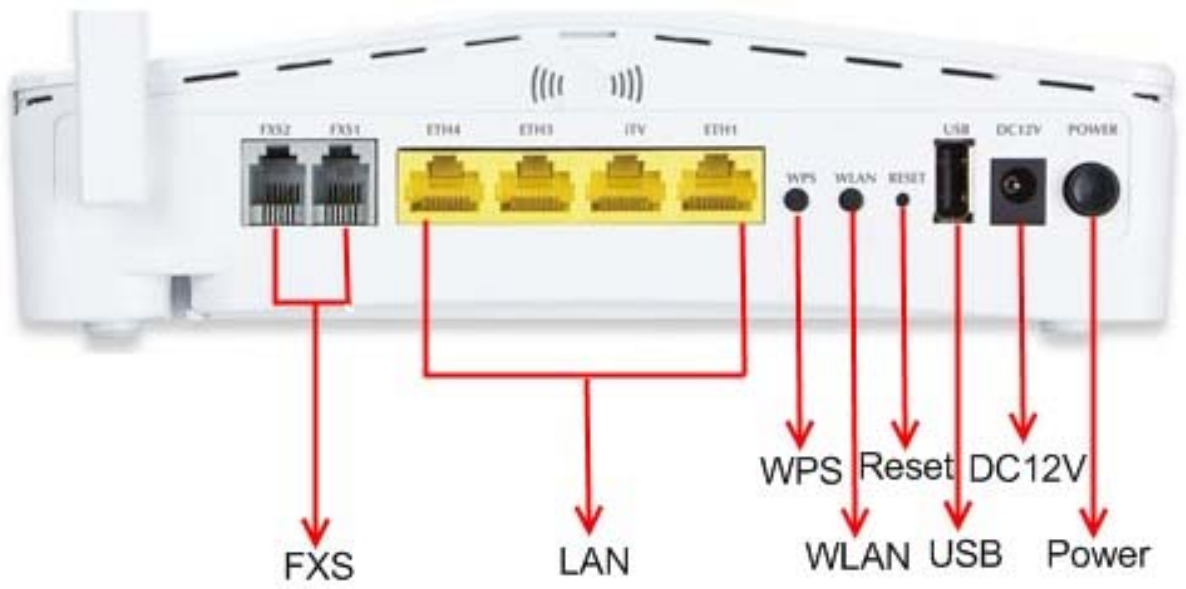


Figure 2-7 EPN-402NV Rear Panel

Object	Description
FXS1 FXS2	RJ11 FXS Connecter, connected to telephone or fax. Supply Voice Service
ETH1 **ETH3** **ETH4**	Connected to Local Area Network.
iTV	iTV Port can be connected to IPTV BOX
WPS	Press WPS Button, start to negotiate for WPS.
WLAN	Switch to open or close WLAN function.
Reset Button	Press this button and hold for 1 second for the equipment to be defaulted.
USB	USB 2.0 host port.

12V DC	Power input port.
Power	Power switch.

2.1.3 Side Panel

Figure 2-8 EPN-402NV Side Panel

Port Type	Function
Indicator LED turn on/off	Press down to turn LED on; pop up to turn LED off.

2.1.4 Bottom Side

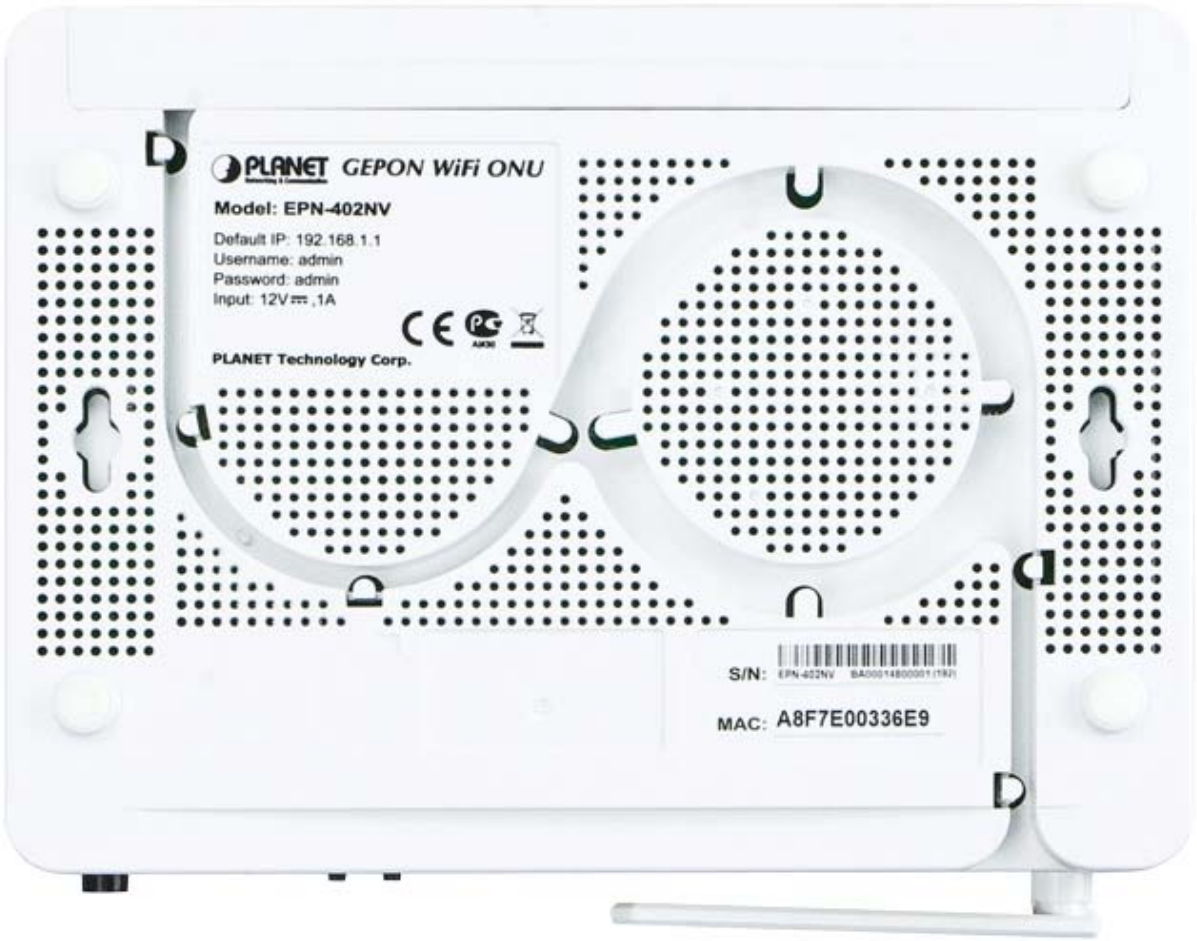


Figure 2-8 EPN-402NV Bottom Side

Chapter 3. Connecting to the Wi-Fi ONU

3.1 System Requirements

- Broadband Internet Access Service (Passive Optical Network connection)
- PCs with a working Ethernet Adapter and an Ethernet cable with RJ45 connectors
- PC subscribers use Windows 98/ME, NT4.0, 2000/XP, Windows Vista / Win 7, MAC OS 9 or later, or Linux, UNIX or other platforms compatible with **TCP/IP** protocols
- The above PC is installed with a Web browser

Note

1. The GEPON in the following instructions means PLANET EPN-402NV.
2. It is recommended to use Internet Explore 7.0 or above to access the Wi-Fi ONU.

3.2 Installing the Wi-Fi ONU

Before installing the Wi-Fi ONU, make sure your PC is connected to the Internet through the broadband service successfully at this moment. If there is any problem, please contact your local ISP. After that, please install the Wi-Fi ONU according to the following steps. Don't forget to pull out the power plug and keep your hands dry.

Step 1. Power off your PC and PLANET EPN-402NV.

Step 2. Locate an optimum location for the EPN-402NV. The best place is usually at the center of your wireless network.

Step 3. Connect the Passive Optical Network to the SC Port of the EPN-402NV with fiber cable, shown in Figure 3-1.

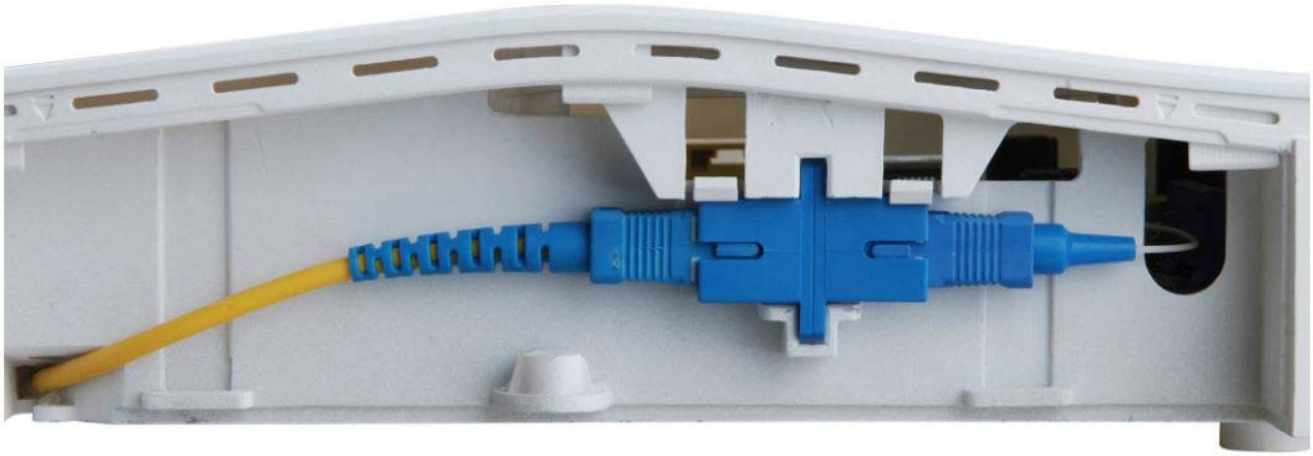


Figure 3-1

Step 4. Please fix the fiber cable on the bottom of the EPN-402NV as shown in Figure 3-2.

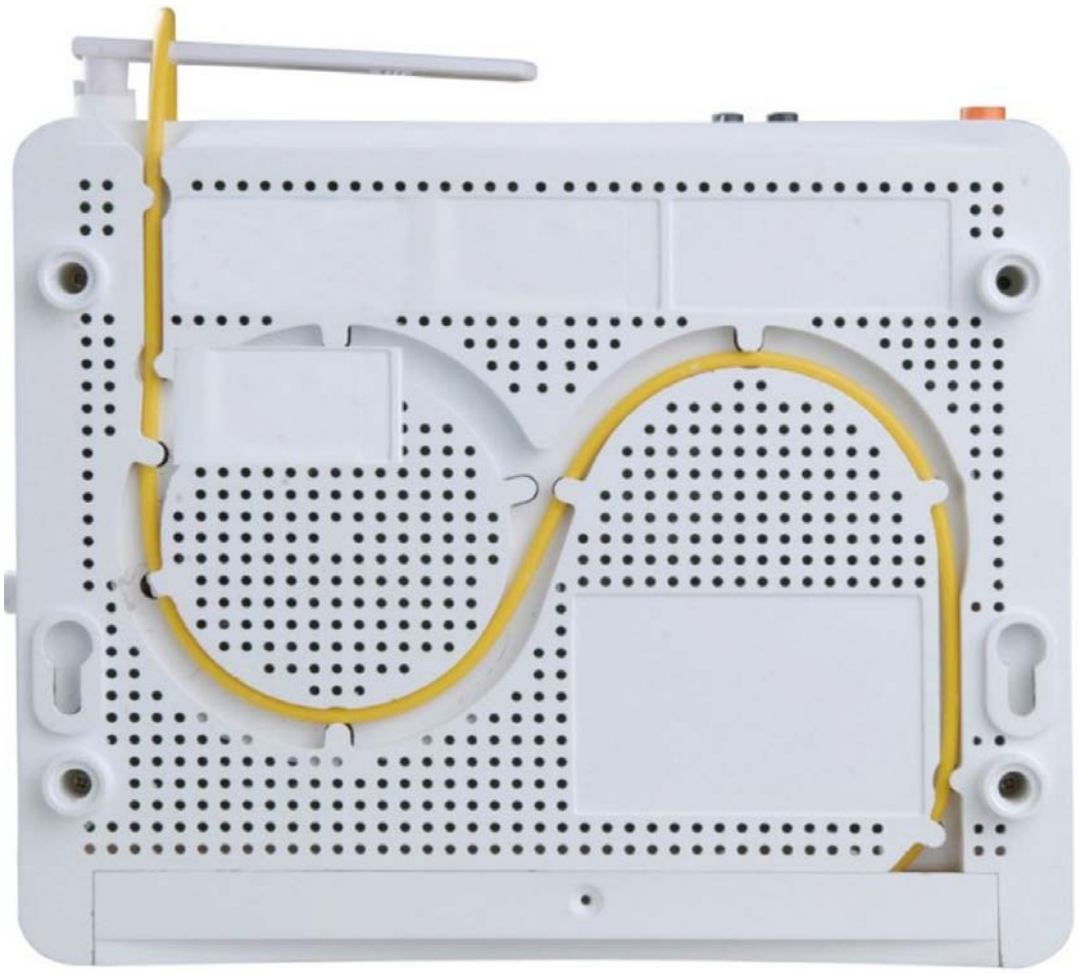


Figure 3-2

Chapter 4. Quick Installation Guide

This chapter will show you how to configure the basic functions of your Wi-Fi ONU.

A computer with wired Ethernet connection to the Wi-Fi ONU is required for the first-time configuration.

4.1 Manual Network Setup - TCP/IP Configuration

The default IP address of the Wi-Fi ONU is **192.168.1.1** and the default Subnet Mask is **255.255.255.0**. These values can be changed as you desire in the web UI of the Wi-Fi ONU. In this section, we use all the default values for description.

Whether the Wi-Fi ONU is configured via wired or wireless connection, the PC needs to be assigned an IP address first. Before you connect the local PC to the Wi-Fi ONU via wired or wireless connection, please configure the IP address for your PC in the following two ways first.

- **Obtaining an IP address automatically**
- **Configuring the IP address manually**

In the following sections, we'll introduce how to install and configure the TCP/IP correctly in **Windows 7**. And the procedures in other operating systems are similar. First, make sure your Ethernet Adapter is working, and refer to the Ethernet adapter's manual if needed.

4.1.1 Obtaining an IP Address Automatically

Summary:

1. Set up the TCP/IP Protocol in "**Obtain an IP address automatically**" mode on your PC.
2. Then the Wi-Fi ONU built-in DHCP server will assign IP address to the PC automatically.

If you are sure the DHCP server of Wi-Fi ONU is enabled (the default setting of ONU Mode), you can set up the TCP/IP Protocol in "**Obtain an IP address automatically**" mode on your PC. And then the Wi-Fi ONU built-in DHCP server will assign an IP address to the PC automatically.

1. Installing TCP/IP Component

1) On the Windows taskbar, click the **Start** button, point to **Control Panel** and then click it.

2) Under the **Network and Internet** icon, click on the **View network status and tasks.** And then click

Change adapter settings.

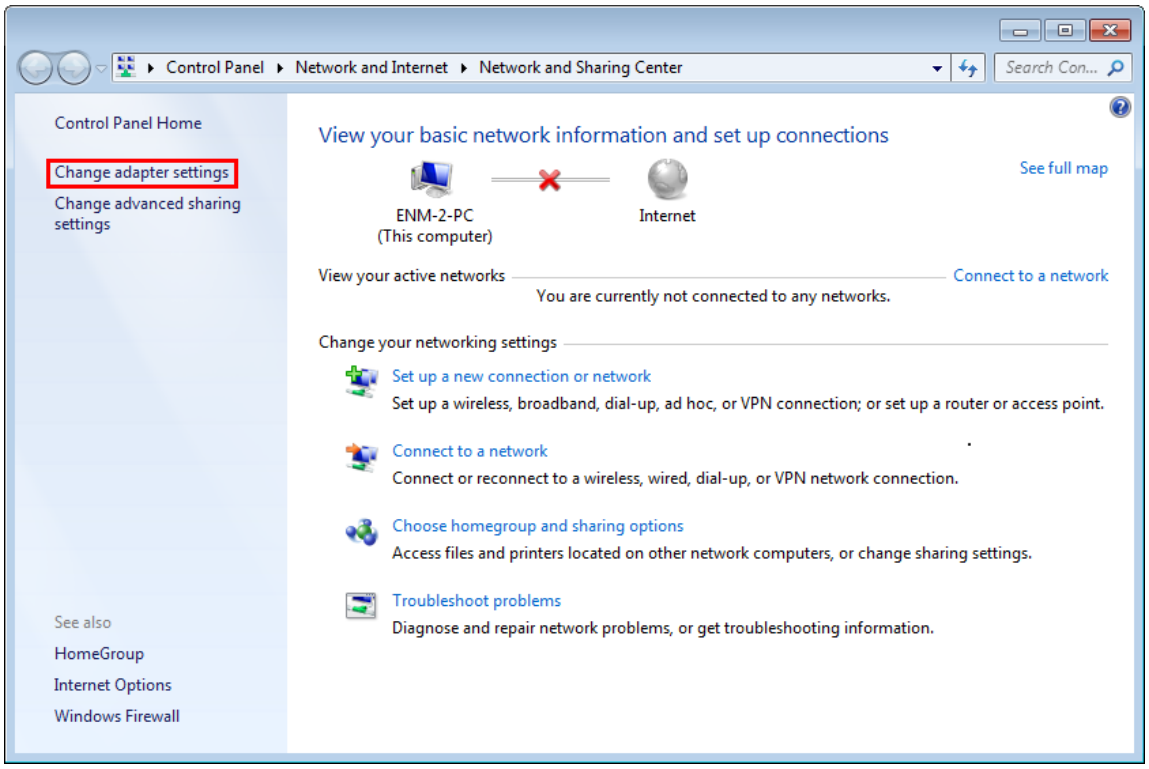


Figure 4-1 Change Adapter Settings

3) Right-click on the **Wireless Network Connection** and select **Properties** in the appearing window.

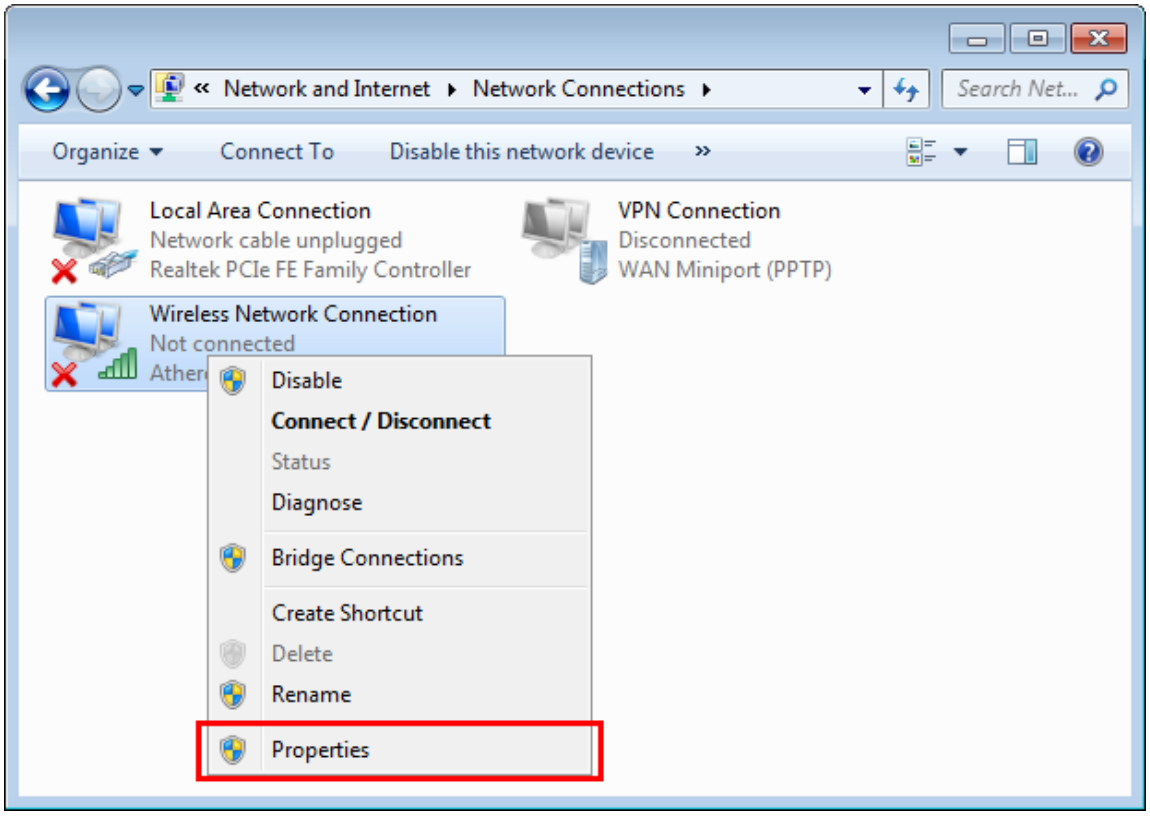


Figure 4-2 Network Connection Properties

4) In the prompt window shown below, double-click on the **Internet Protocol Version 4 (TCP/IPv4)**.

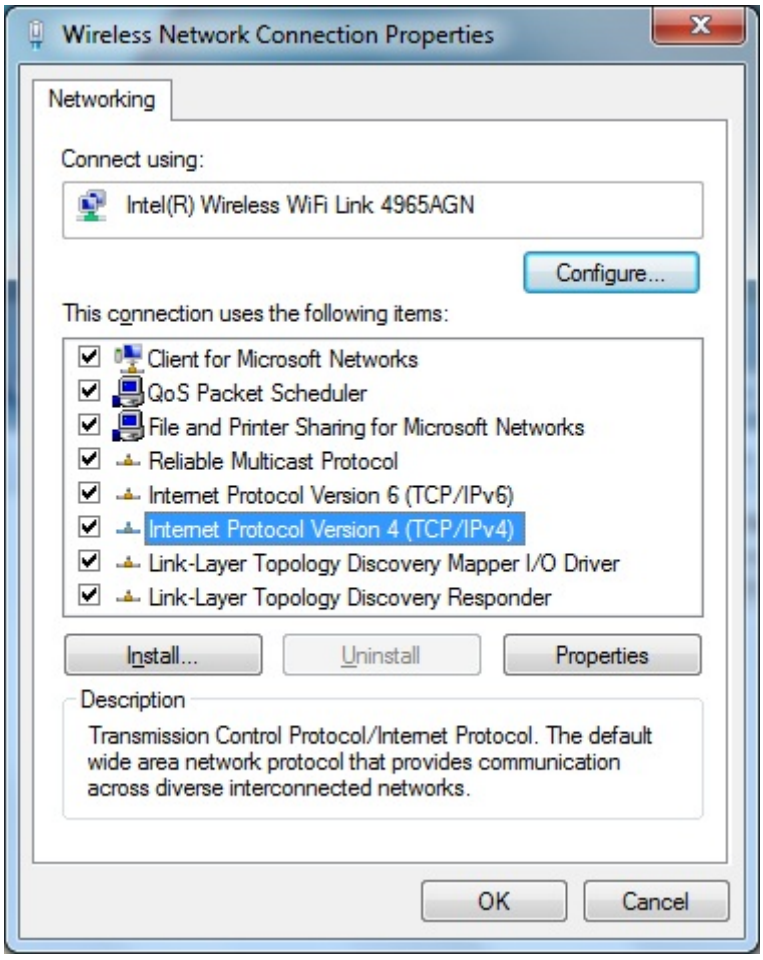


Figure 4-3 TCP/IP Setting

5) Choose **Obtain an IP address automatically**, and **Obtain DNS server address automatically** as shown in the figure below. Then click **OK** to save your settings.

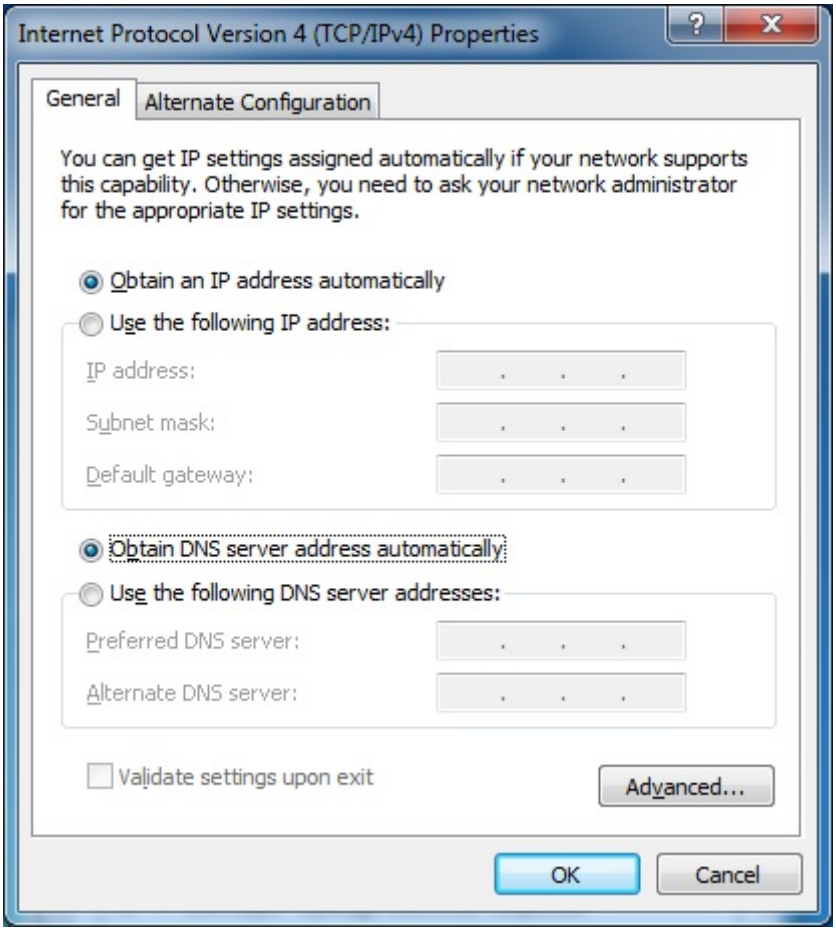


Figure 4-4 Obtain an IP Address Automatically

4.1.2 Configuring the IP Address Manually

Summary:

- Set up the TCP/IP Protocol for your PC.
- Configure the network parameters. The IP address is ***192.168.1.xxx*** ("xxx" is any number from 2 to 254), Subnet Mask is ***255.255.255.0***, and Gateway is ***192.168.1.1*** (The ONU's default IP address)

If you are sure the DHCP server of WiFi ONU is disabled, you can configure the IP address manually. The IP address of your PC should be 192.168.1.xxx (the same subnet of the IP address of the Wi-Fi ONU, and "xxx" is any number from 2 to 254), Subnet Mask is 255.255.255.0, and the Gateway is 192.168.1.1 (The default IP address of the Wi-Fi ONU)

1) Continue the settings from the last figure. Select **Use the following IP address** radio button.

2) If the LAN IP address of the Wi-Fi ONU is 192.168.1.1, enter IP address 192.168.1.x (x is from 2 to 254), and Subnet mask 255.255.255.0.

3) Enter the LAN IP address of the Wi-Fi ONU (the default IP is 192.168.1.1) into the default gateway field.

4) Select **Use the following DNS server addresses** radio button. In the preferred DNS Server field, you can enter the DNS server IP address provided by your local ISP. Then click OK to save your settings.

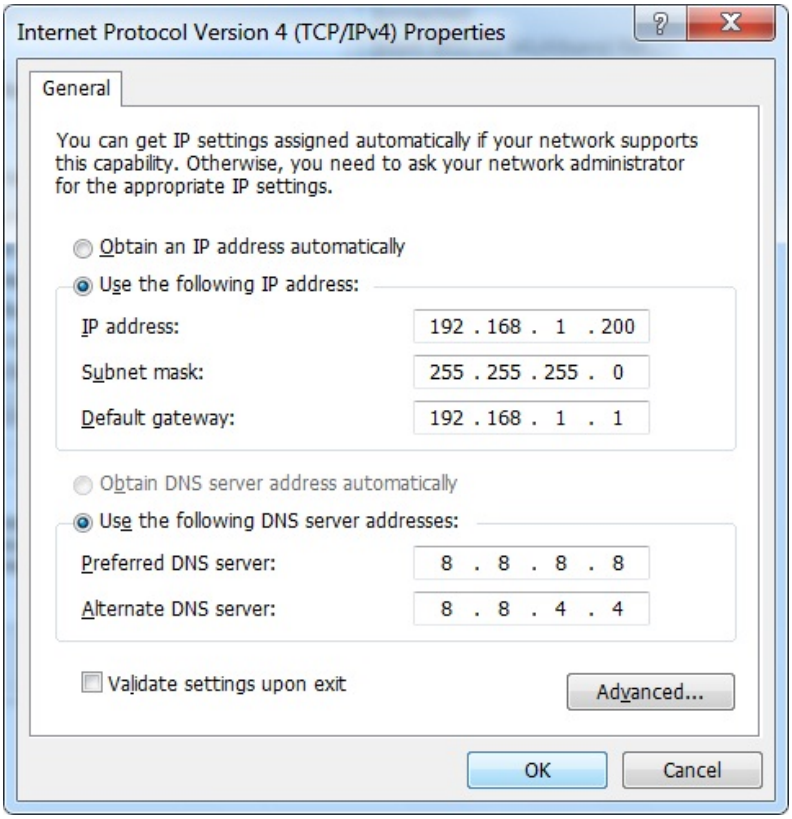


Figure 4-5 IP and DNS Server Addresses

Now, you can run the ping command in the **command prompt** to verify the network connection between your PC and the ONU. The following example is in **Windows 7** OS. Please follow the steps below:

1. Click on **Start**
2. Type "**cmd**" in the Search box.

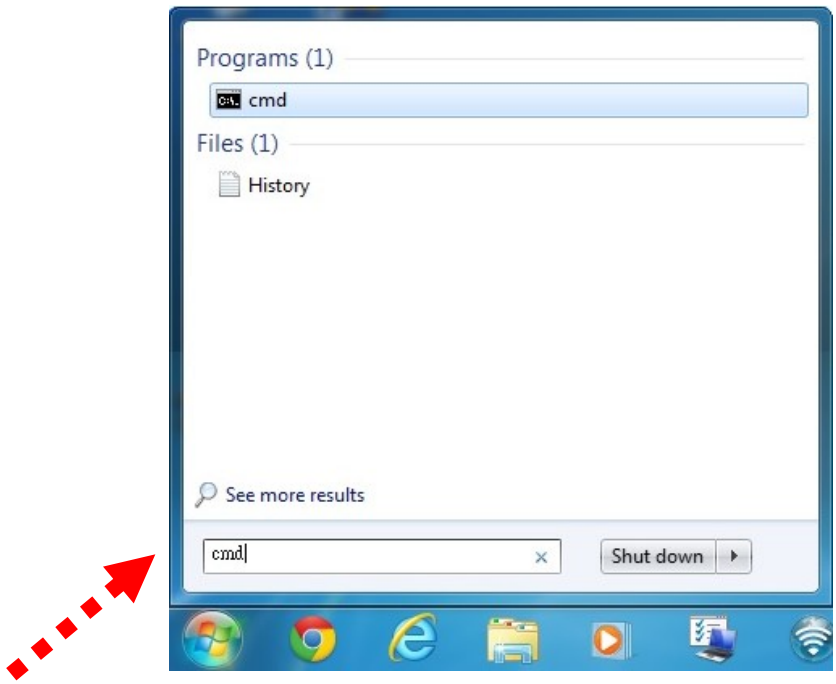


Figure 4-6

3. Open a command prompt, and type ping **192.168.1.1**, and then press **Enter**.

- If the result displayed is similar to Figure 4-7, it means the connection between your PC and the ONU has been established well.

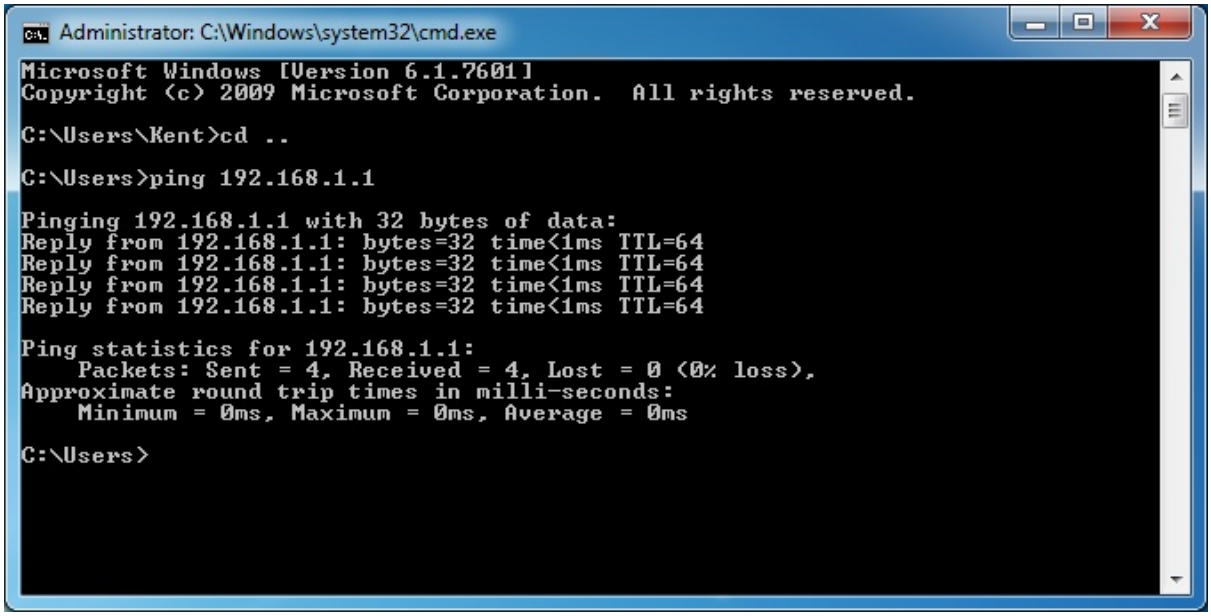


Figure 4-7 Successful Ping Command

- If the result displayed is similar to Figure 4-8, it means the connection between your PC and the ONU has failed.

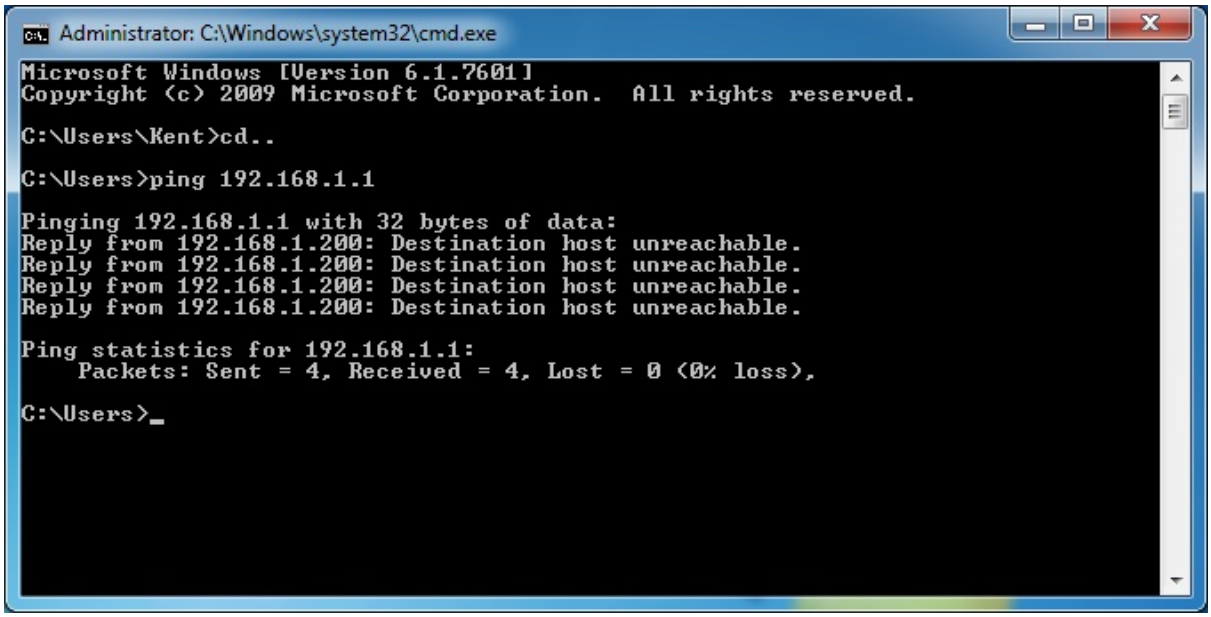


Figure 4-8 Failed Ping Command

If the address is 0.0.0.0, check your adapter installation, security settings, and the settings on your ONU. Some firewall software programs may block a DHCP request on newly installed adapters.

If the ONU's IP address is 192.168.1.1, your PC's IP address must be within the range of 192.168.1.2 ~ 192.168.1.254.

4.2 Starting Setup in the Web UI

It is easy to configure and manage the EPN-402NV with the web browser.

Step 1. To access the configuration utility, open a web-browser and enter the default IP address http://192.168.1.1 in the web address field of the browser.

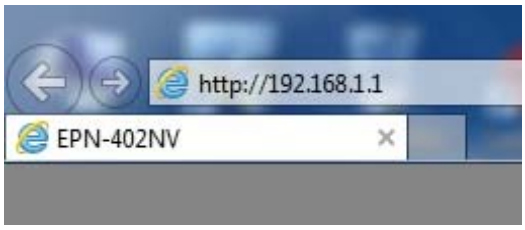


Figure 4-9 Login the ONU

After a moment, a login window will appear. Enter **admin** for the User Name and Password, both in lower case letters. Then click the **OK** button or press the **Enter** key.

Figure 4-10 Login Window

Default IP Address: **192.168.1.1**

Default User Name: **admin**

Default Password: **admin**

Note

If the above screen does not pop up, it may mean that your web browser has been set to a proxy. Go to Tools menu>Internet Options>Connections>LAN Settings in the screen that appears, cancel the Using Proxy checkbox, and click OK to finish it.

Chapter 5. Configuring the Wi-Fi ONU

This chapter delivers a detailed presentation of ONU's functions and features.

Figure 5-1 Wi-Fi ONU Functions

5.1 STATUS

5.1.1 Device Info

On this page, you can view information about the current running status of the EPN-402NV, including device identifier, hardware version, software version and PON status.

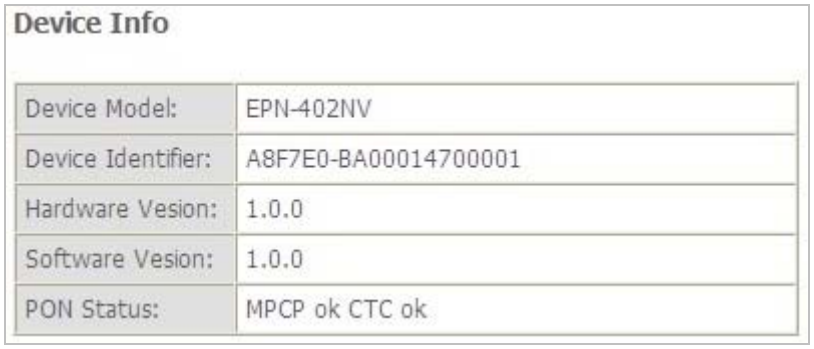


Figure 5-1-1 Device Info

The page includes the following information:

Object	Description
Device Type	The Wi-Fi ONU model.
Software Version	This is the current software the Wi-Fi ONU is using. This will change if you upgrade your ONU.
PON Status	The current mode in use.

5.1.2 WAN Info

This page shows the status of your WAN network.

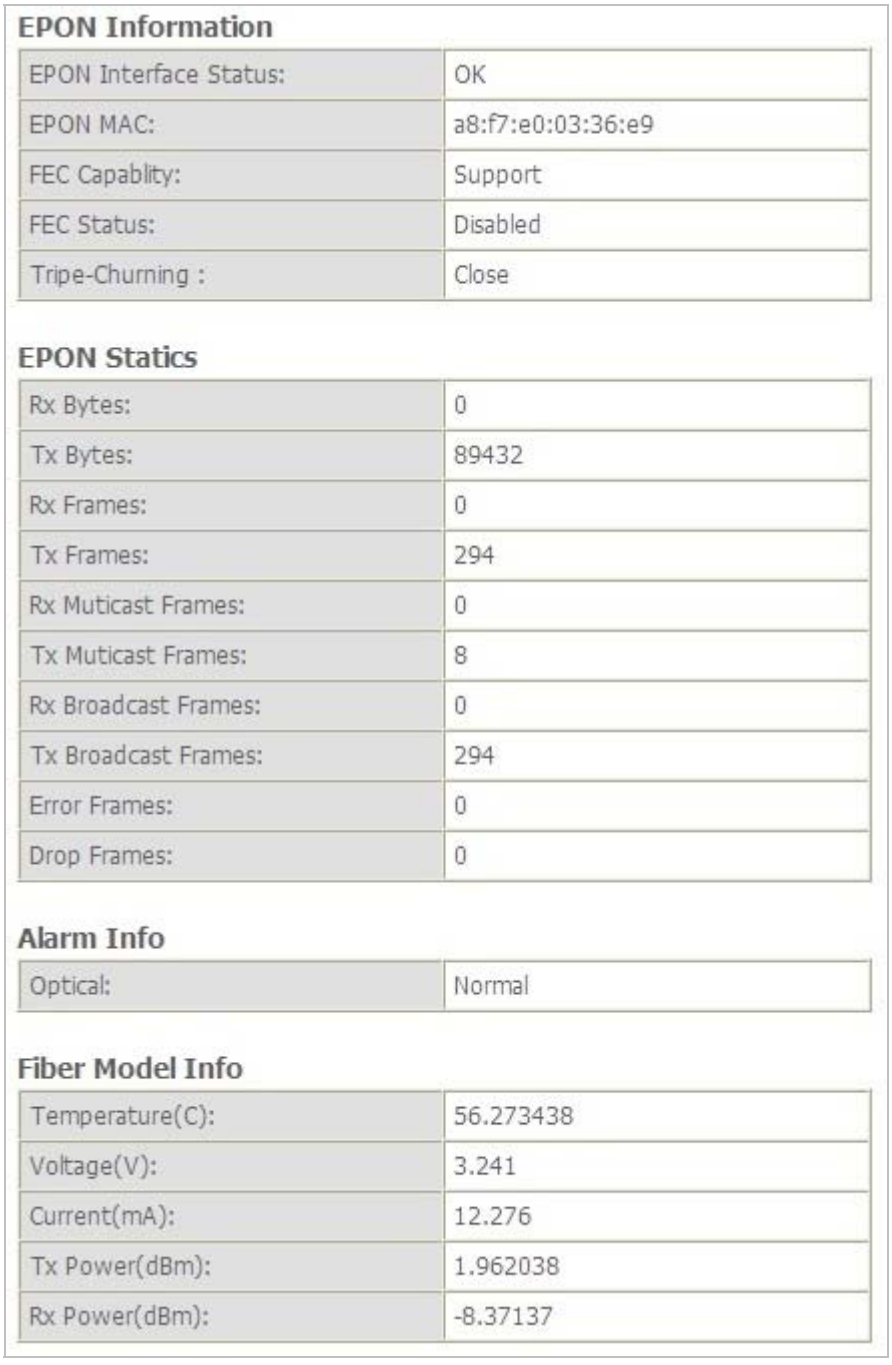
WAN Info

Interface	Description	Type	VlanMuxId	Igmp	NAT	Firewall	STATUS	DNS	Ipv4 address
epon0.1	1_TR069_R_VID_46	IPoE	46	Disable	Disable	Enable	Connecting		

WAN Info

Default Gateway	
Subnet Mask	
Primary DNS	
Secondary DNS	

Figure 5-1-2 WAN Info



EPON Information

EPON Interface Status:	OK
EPON MAC:	a8:f7:e0:03:36:e9
FEC Capablity:	Support
FEC Status:	Disabled
Tripe-Churning :	Close

EPON Statics

Rx Bytes:	0
Tx Bytes:	89432
Rx Frames:	0
Tx Frames:	294
Rx Muticast Frames:	0
Tx Muticast Frames:	8
Rx Broadcast Frames:	0
Tx Broadcast Frames:	294
Error Frames:	0
Drop Frames:	0

Alarm Info

Optical:	Normal

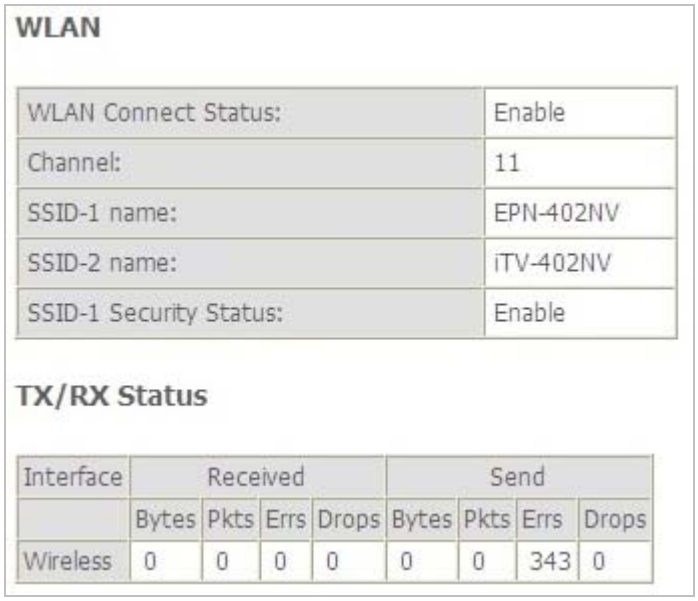
Fiber Model Info

Temperature(C):	56.273438
Voltage(V):	3.241
Current(mA):	12.276
Tx Power(dBm):	1.962038
Rx Power(dBm):	-8.37137

Figure 5-1-3 EPON information

5.1.3 Userside Info

This page shows the status of your WLAN, LAN and USB.



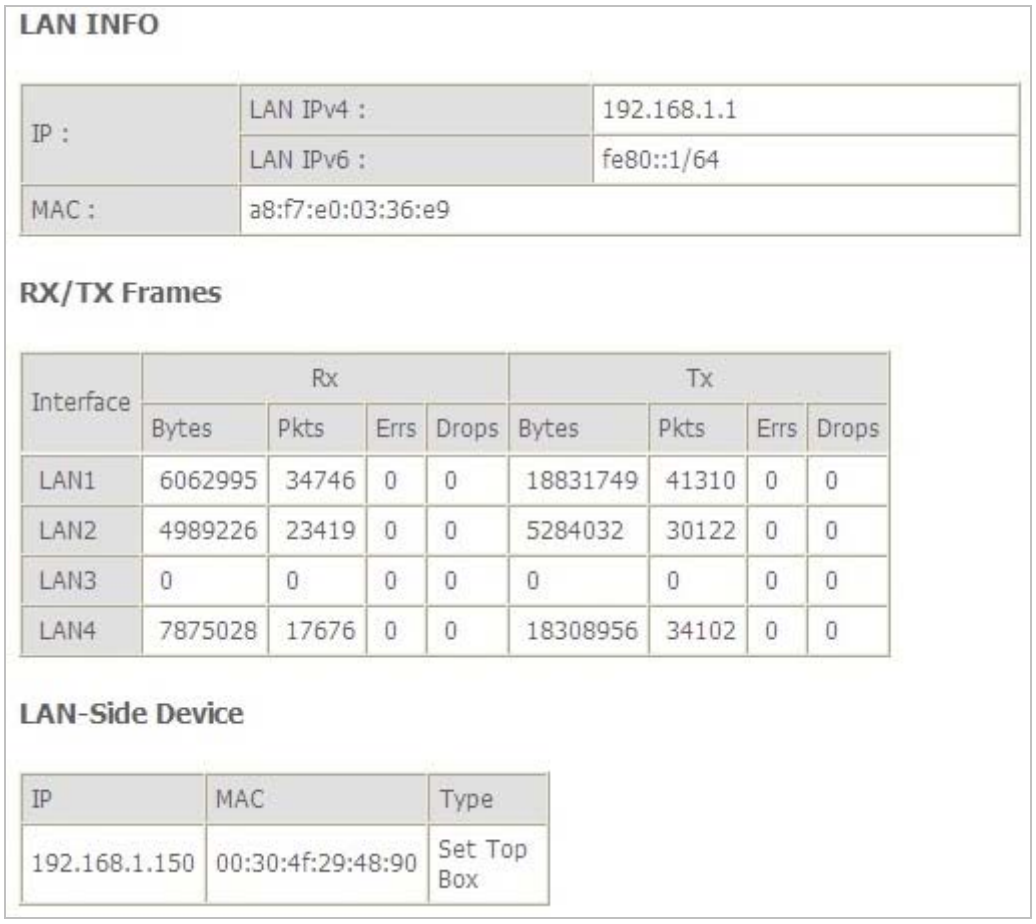
WLAN

WLAN Connect Status:	Enable
Channel:	11
SSID-1 name:	EPN-402NV
SSID-2 name:	iTV-402NV
SSID-1 Security Status:	Enable

TX/RX Status

Interface	Received				Send			
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
Wireless	0	0	0	0	0	0	343	0

Figure 5-1-4 WLAN information



LAN INFO

IP :	LAN IPv4 :	192.168.1.1
	LAN IPv6 :	fe80::1/64
MAC :	a8:f7:e0:03:36:e9	

RX/TX Frames

Interface	Rx				Tx			
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
LAN1	6062995	34746	0	0	18831749	41310	0	0
LAN2	4989226	23419	0	0	5284032	30122	0	0
LAN3	0	0	0	0	0	0	0	0
LAN4	7875028	17676	0	0	18308956	34102	0	0

LAN-Side Device

IP	MAC	Type
192.168.1.150	00:30:4f:29:48:90	Set Top Box

Figure 5-1-5 LAN information

Figure 5-1-6 USB information

5.1.4 VoIP Info

This page shows the status of your VoIP.

Figure 5-1-7 VoIP status

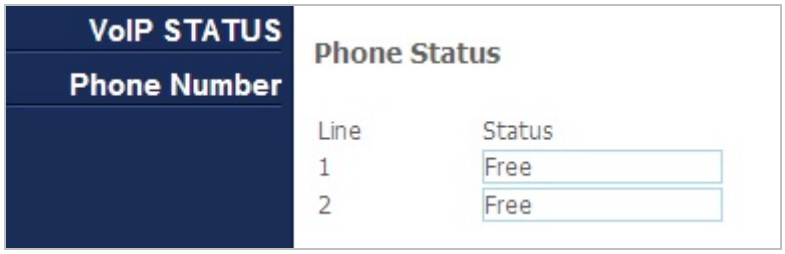


Figure 5-1-8 Phone status

5.1.5 Remote Management

This page shows the status of your WAN connection.

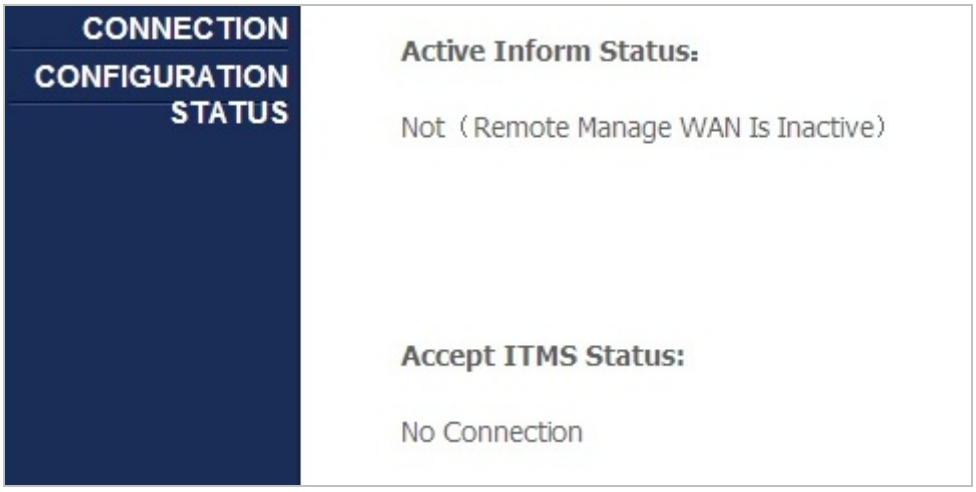


Figure 5-1-9 Connection

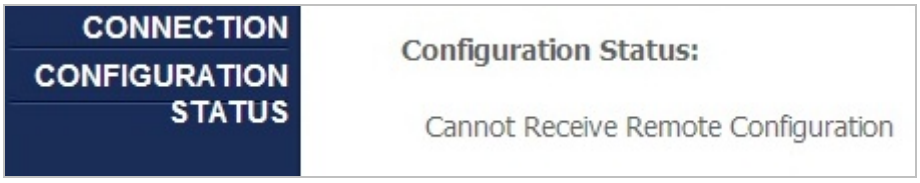


Figure 5-1-10 Configuration

5.2 NETWORK

5.2.1 WAN Setup

This page displays the information of the WAN interface for you to set up.

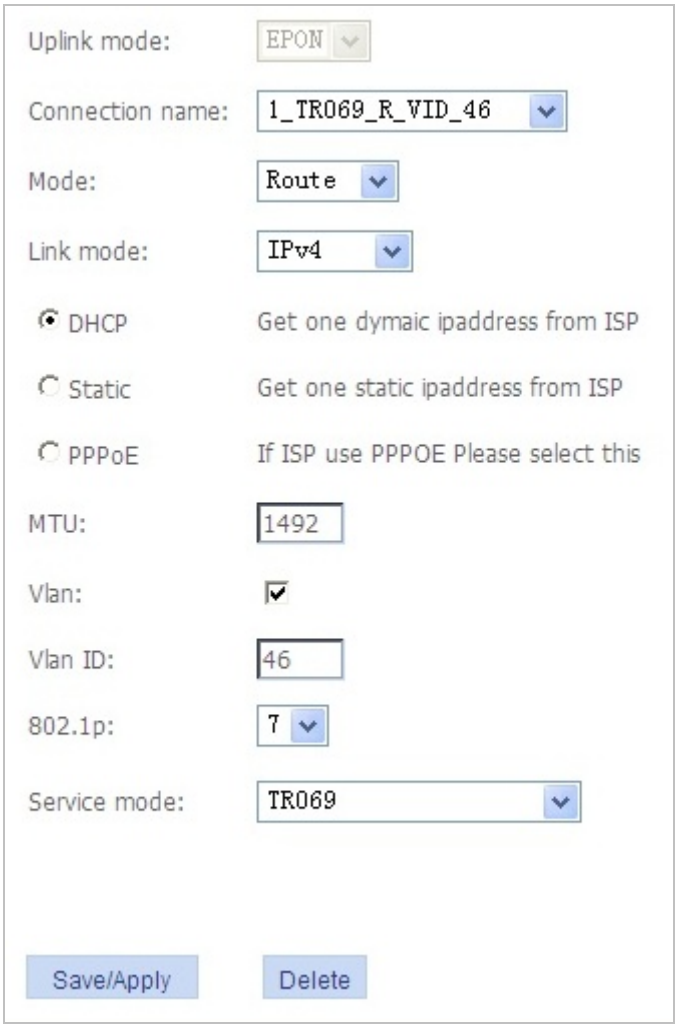


Figure 5-2-1 WAN Setup

The page includes the following fields:

Object	Description
Connection Name	The default setting is TR-069. You can add a new WAN connection.
Mode	Select **Bridge** or **Route**.
Link Mode	Select IPv4, IPv6 or IPv4/ v6.
DHCP	Select this option to let ONU obtain IP settings automatically from your ISP, if your ISP does not give you any IP information or account information. You don't need to configure any settings for this connection.

Static	If your ISP offers you static IP Internet connection type, select “Static IP" from corresponding drop-down menu and then enter IP address, subnet mask, primary DNS and secondary DNS information provided by your ISP in the corresponding fields.
PPPoE	Select PPPoE, if your ISP is using a PPPoE connection and provide you with PPPoE user name and password info.
MTU	The maximum transmission unit. You can keep it as default.
VLAN	Enable or disable VLAN function.
VLAN ID	Enter the VLAN ID from 1 to 4094.
802.1p	Select the priority levels.
Service mode	Select a different kind of service.

5.2.2 Banding Setup

This page displays the information of the Banding Setup. You can enable or disable the function.

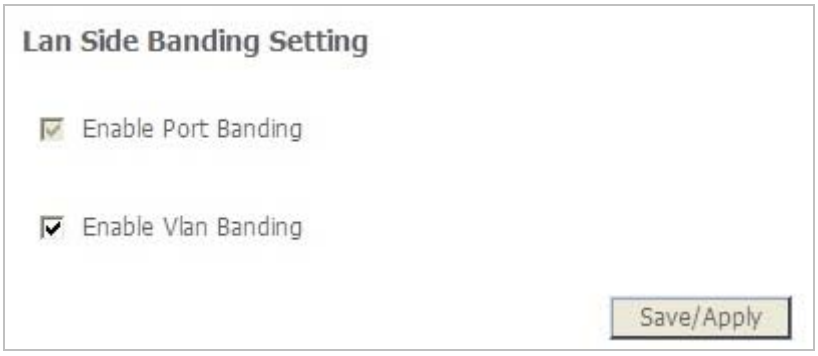


Figure 5-2-2 Banding Setup

5.2.3 LAN Setup

This page displays LAN information.

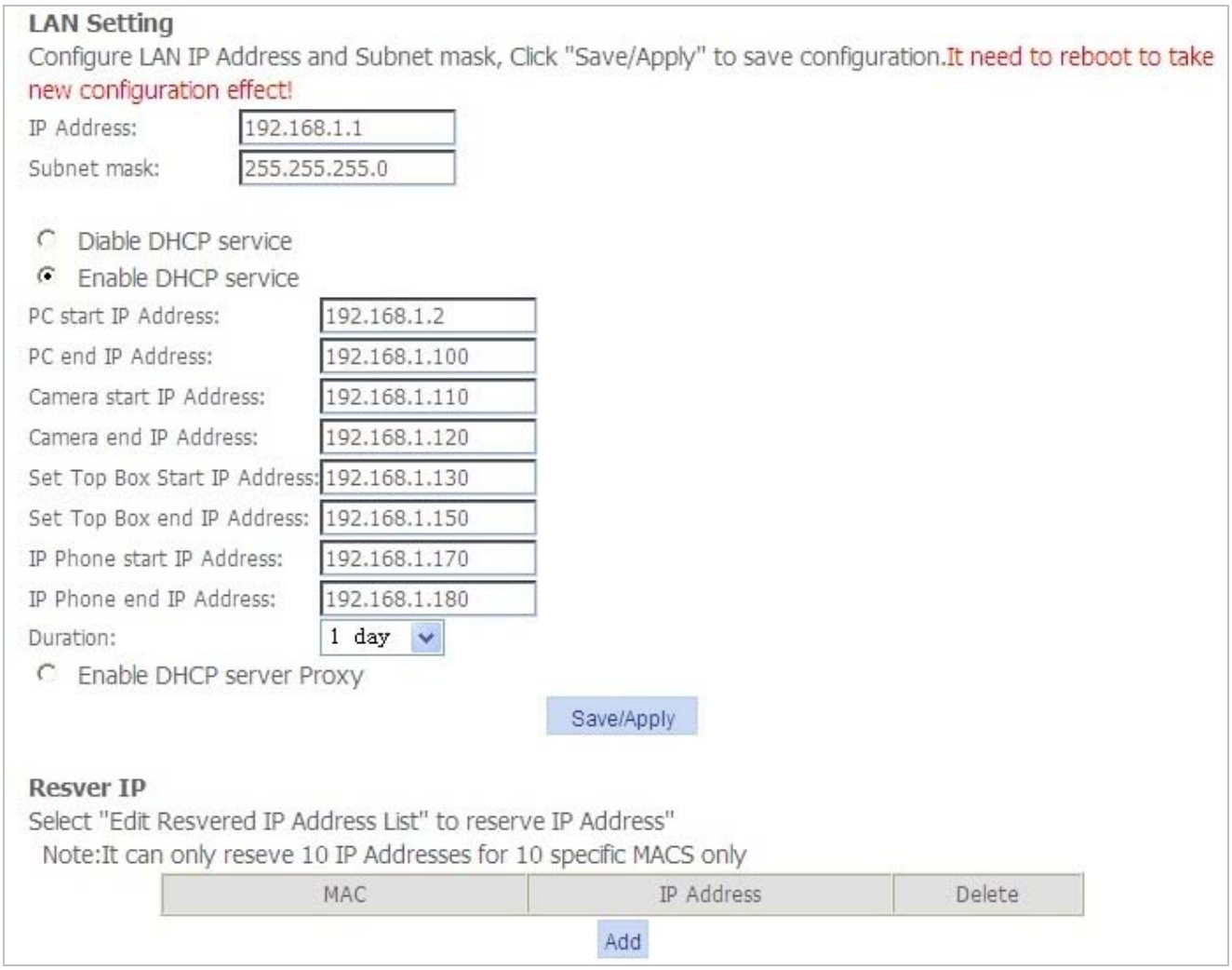


Figure 5-2-3 IPv4 Setup

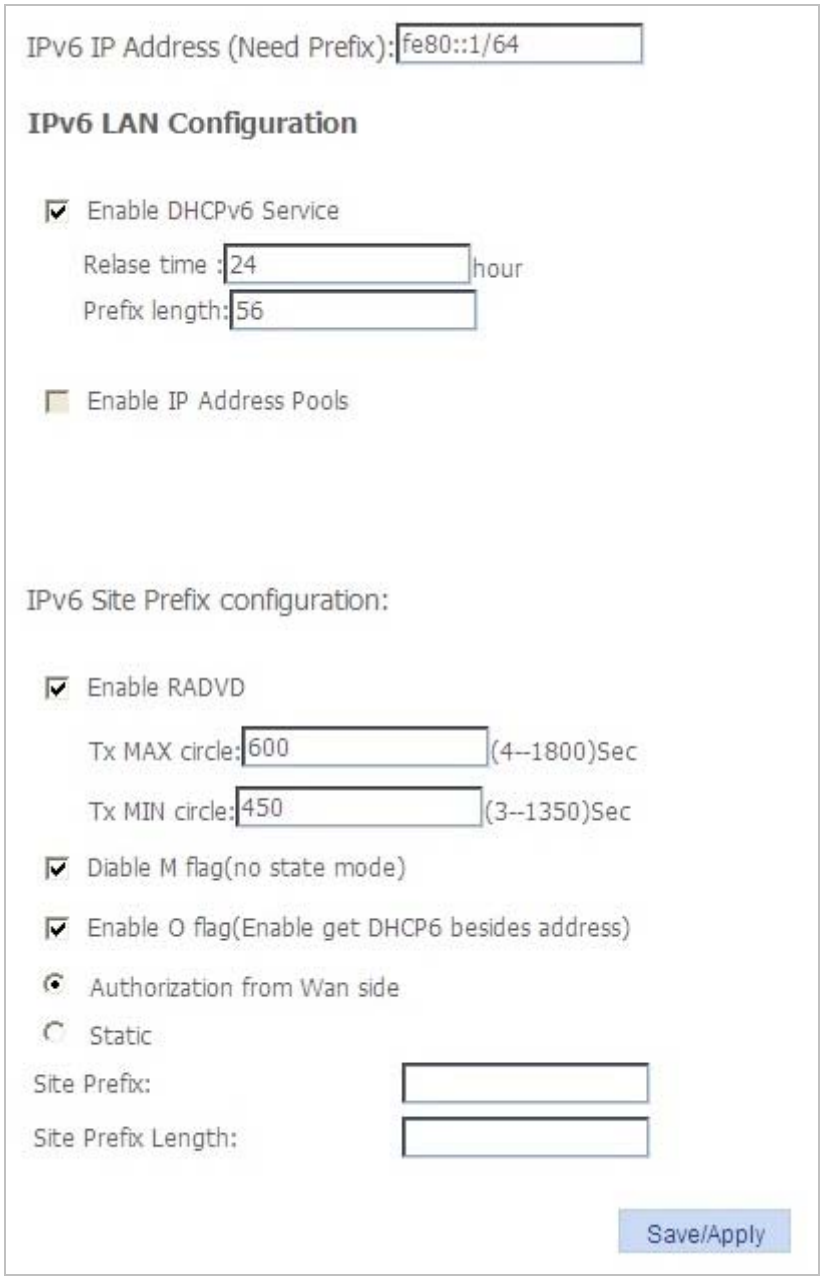


Figure 5-2-4 IPv6 Setup

5.2.4 WLAN Setup

On the coming page, you can configure the basic wireless parameters.

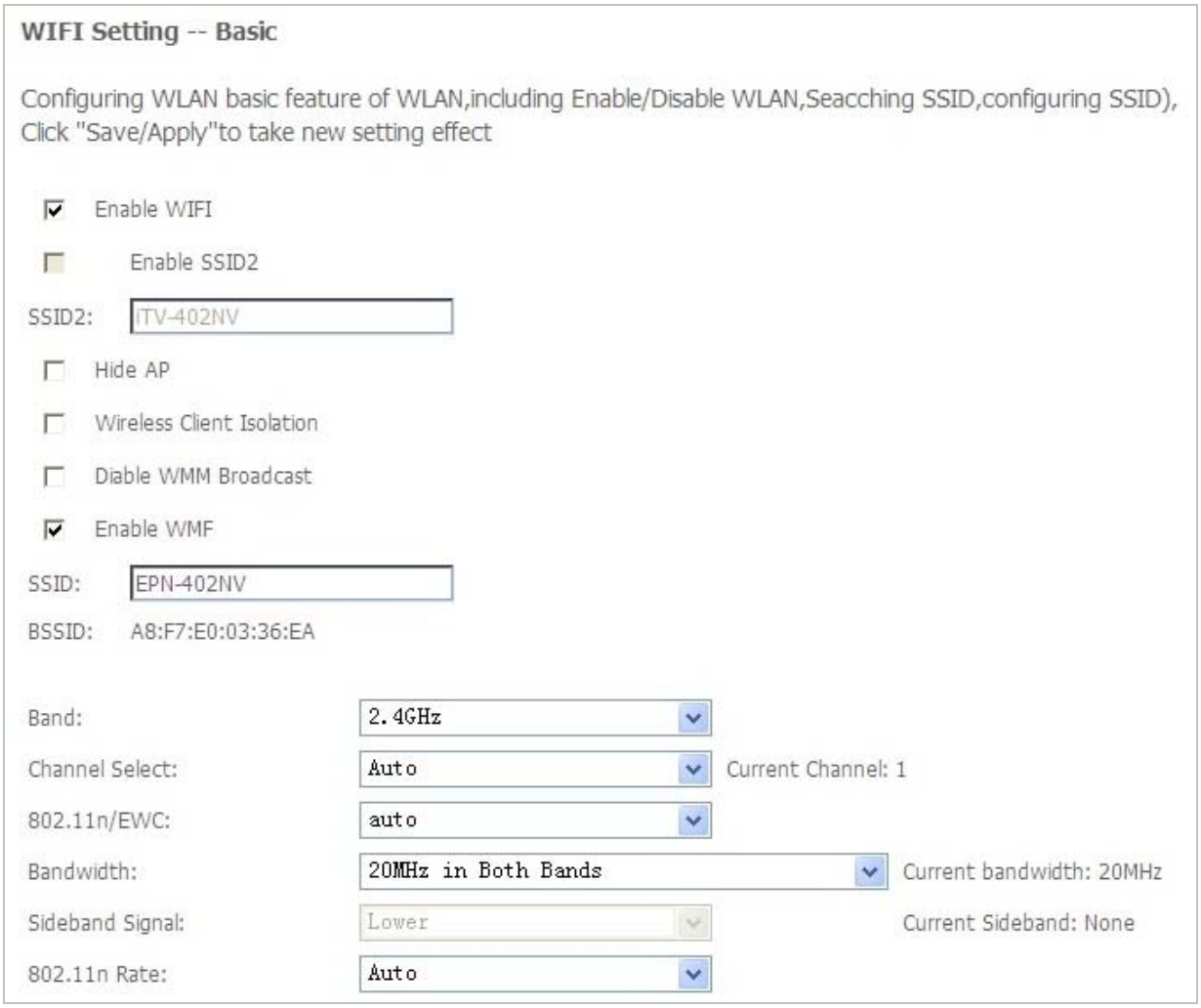


Figure 5-2-5 WLAN Setup

Object	Description
Enable Wi-Fi	You may choose to enable or disable wireless function.
Hide AP	You may choose to enable or disable SSID broadcast. When it is enabled, the ONU SSID will be broadcast in the wireless network, so that it can be scanned by wireless clients and they can join the wireless network with this SSID.
Wireless Client Isolation	Enable or disable wireless Isolation function
Disable WMM Broadcast	After enabling this option, the transmission performance of the voice and video data can be improved.
Enable WMF	After enabling this option, the transmission quality of video service such as IPTV can be improved.
SSID	Set a name (SSID) for your wireless network -- the ID of the wireless network. User can access the wireless network through it only. However, if you switch to Client Mode, this field becomes the SSID of the AP you

	want to connect with. Default: **EPN-402NV**
BSSID	Display the MAC address of the wireless interface.
Channel Select	For an optimal wireless performance, you may select the least interferential channel. It is advisable that you select an unused channel or “Auto” to let device detect and select the best possible channel for your wireless network to operate on from the drop-down list.
802.11n/EWC	Select or disable this function.
Bandwidth	Select a proper channel bandwidth to enhance wireless performance. When there are 11b/g and 11n wireless clients, please select the 802.11n mode of 20/40M frequency band.
Sideband Signal	If you select 20MHz in both Bands or 20MHz in 2.4G Band and 40MHz in 5G Band, the service of control sideband does not work. When you select 40MHz in both Bands as the bandwidth, the following page appears. Then you can select Lower or Upper as the value of sideband. As the control sideband, when you select Lower, the channel is 1~7. When you select Upper, the channel is 5~11.
802.11n Rate	Select the transmission rate for the network. The rate of data transmission should be set depending on the speed of your wireless network. You can select from a range of transmission speeds, or you can select Auto to have the ONU automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the ONU and a wireless client. The default value is **Auto**.
802.11n Protection Mode	The 802.11n standards provide a protection method so 802.11b/g and 802.11n devices can co-exist in the same network without “speaking” at the same time.
802.11n Client Support Only	Only stations that are configured in 802.11n mode can associate.
54g Rate	This enables Broadcom 54G Wireless Chipset to be more compatible with other IEEE802.11b, IEEE802.11g based devices.
Muti Rate	To set the wireless transmission power for multicast applications
XPress™ Technology	Broadcom's standards-based frame-bursting technology is to improve 802.11 wireless LAN performance. If the WMM (Quality of Service) is enabled, the XPress™ Technology option can also be enabled.
TX Power	To set the Wireless Transmission power for the wireless router.
WMM(Wi-Fi Media)	To enable Wi-Fi Multimedia.

WMM QoS	Enable or disable QoS features.
WMM APSD	To enable the Power Saving mode in Wi-Fi Multimedia.

Click "**Advanced**" to configure wireless security policies.

Figure 5-2-6 WLAN Security Setup

Object	Description
SSID	To choose the appropriate SSID that you configured.
Authentication Mode	Select the security mode from the dropdown list. There are 5 options in the Security Mode dropdown list: ■ **OPEN** ■ **SHARE** ■ **WPA-PSK** ■ **WPA2-PSK** ■ **Mixed WPA2/WPA-PSK**

■ **Open Mode**

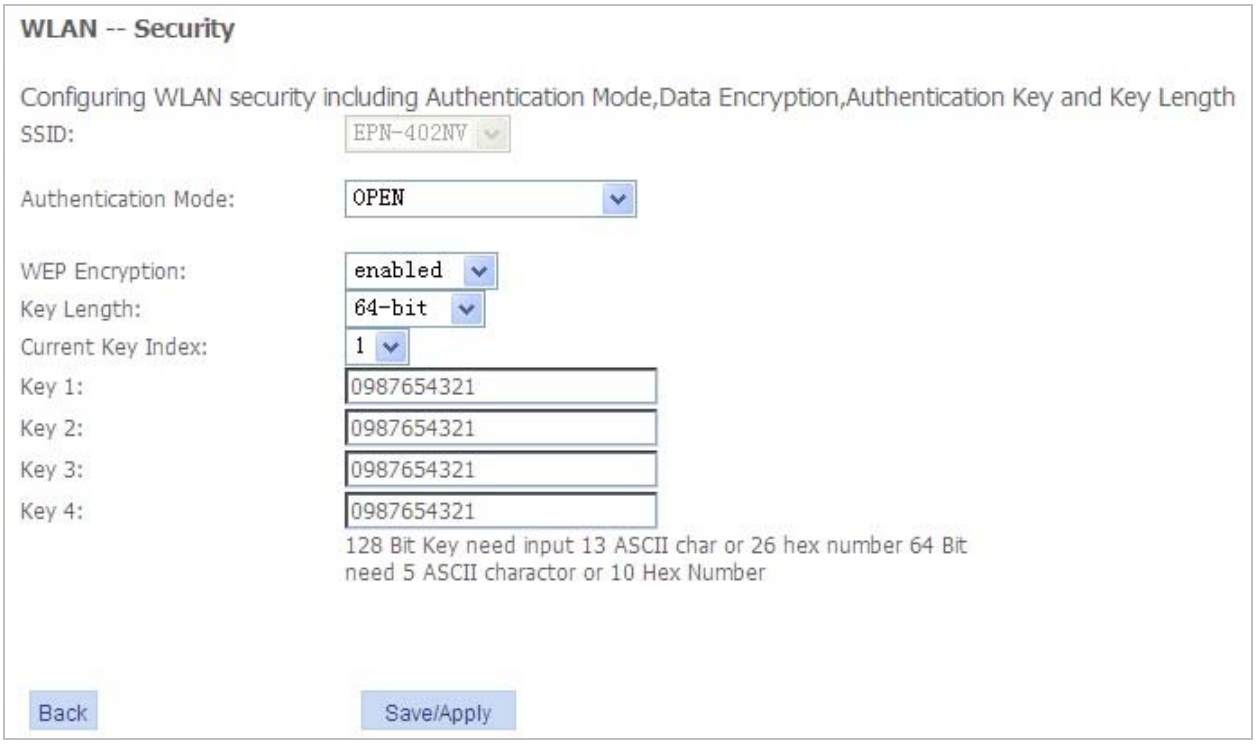


Figure 5-2-7 WLAN Security OPEN mode

Object	Description
SSID	Select an SSID for configuring the security settings.
Authentication Mode	Select the Open mode.
WEP Encryption	Enable or disable WEP encryption. After enabling this function, you can set the encryption strength, current network key, and network keys.
Key Length	You can set 64-bit or 128-bit key.
Current Key Index	The current key that you use.
Key1/2/3/4	Set the network key. If it is 128-bit key, you need to enter 13 ASCII characters or 26 hexadecimal digits. For the 64-bit key, you need to enter 5 ASCII characters or 10 hexadecimal digits.

- **Shared Mode**

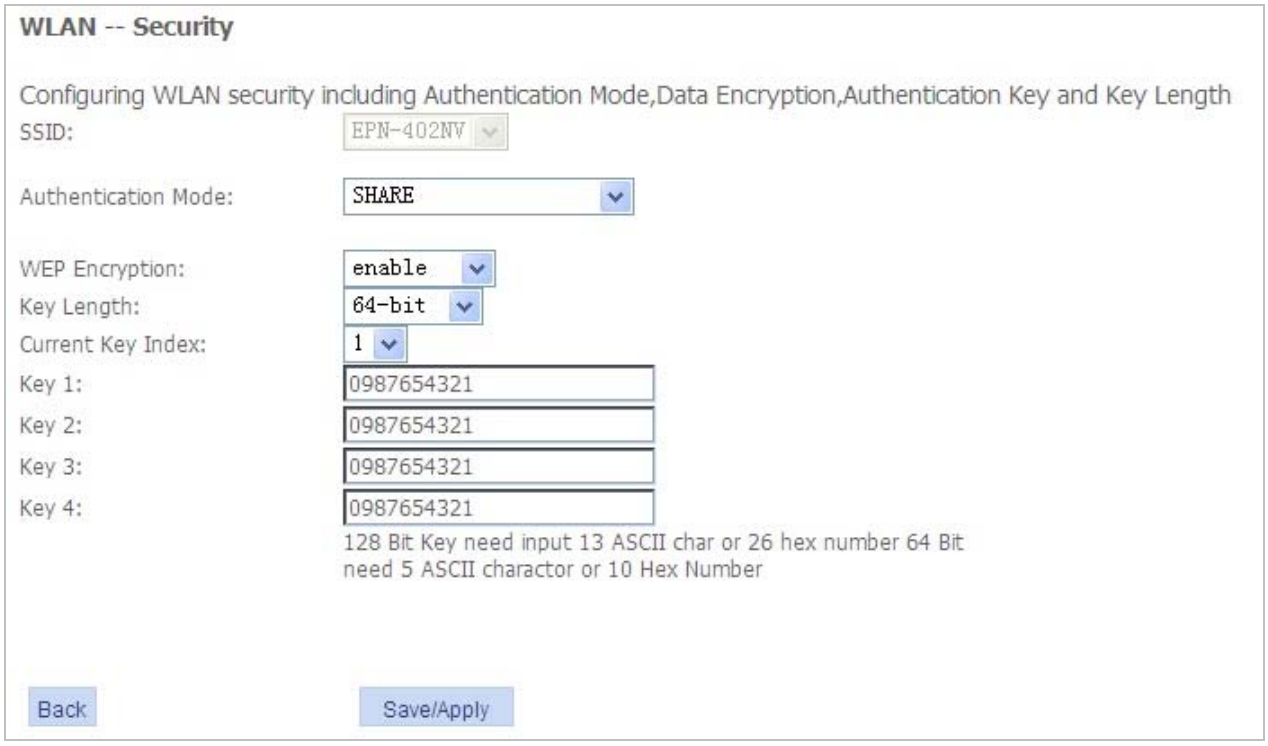


Figure 5-2-8 WLAN Security Shared Mode

For the parameters' description of shared mode, please refer to the **Open Mode**.

- **WPA Mode**

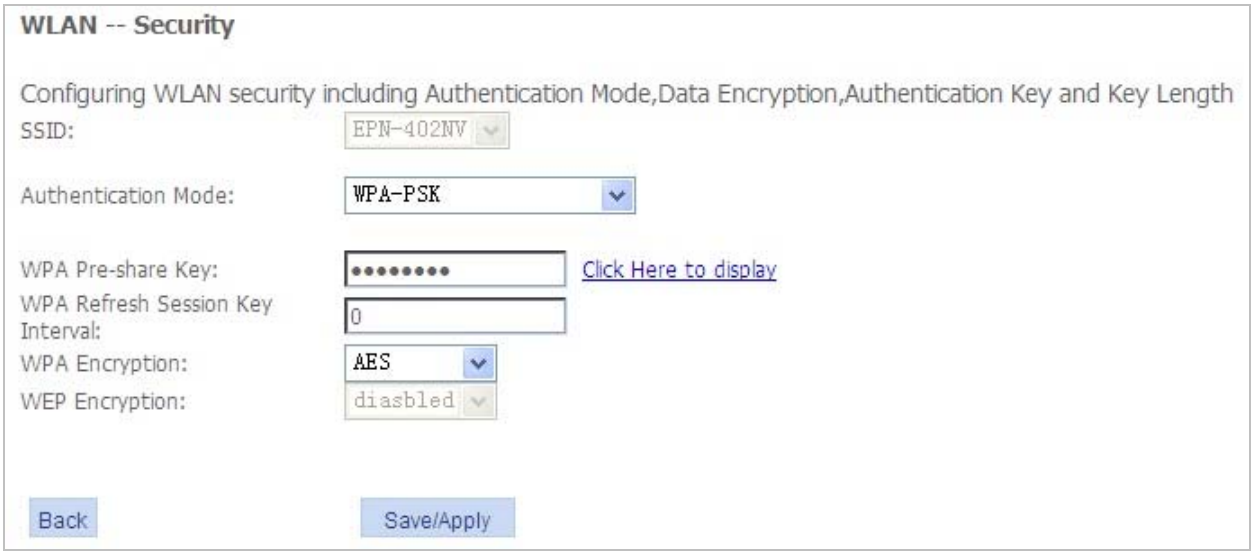


Figure 5-2-9 WLAN Security WPA Mode

Object	Description
Select SSID	Select an SSID for configuring the security settings.

Authentication Mode	Select the WPA-PSK mode.
WPA Pre-share Key	The key for WPA encryption. Click the "**Click Here to display"** button to display the current key. The default key is 12345678.
WPA Refresh Session key Interval	Setting the interval for refresh session key.
WPA Encryption	You may select AES, or TKIP+AES.

- **WPA2 Mode**

Figure 5-2-10 WLAN Security WPA2 Mode

For the parameters' description of WPA2 mode, please refer to the **WPA Mode**.

- **Mixed WPA2/WPA-PSK Mode**

Figure 5-2-11 WLAN Security WPA2/WPA-PSK Mode

For the parameters' description of WPA2/WPA-PSK mode, please refer to the **WPA Mode**.

5.2.5 Remote Management

On the coming page, you can configure the parameters for remote management of the ONU through TR069.

- **TR069**

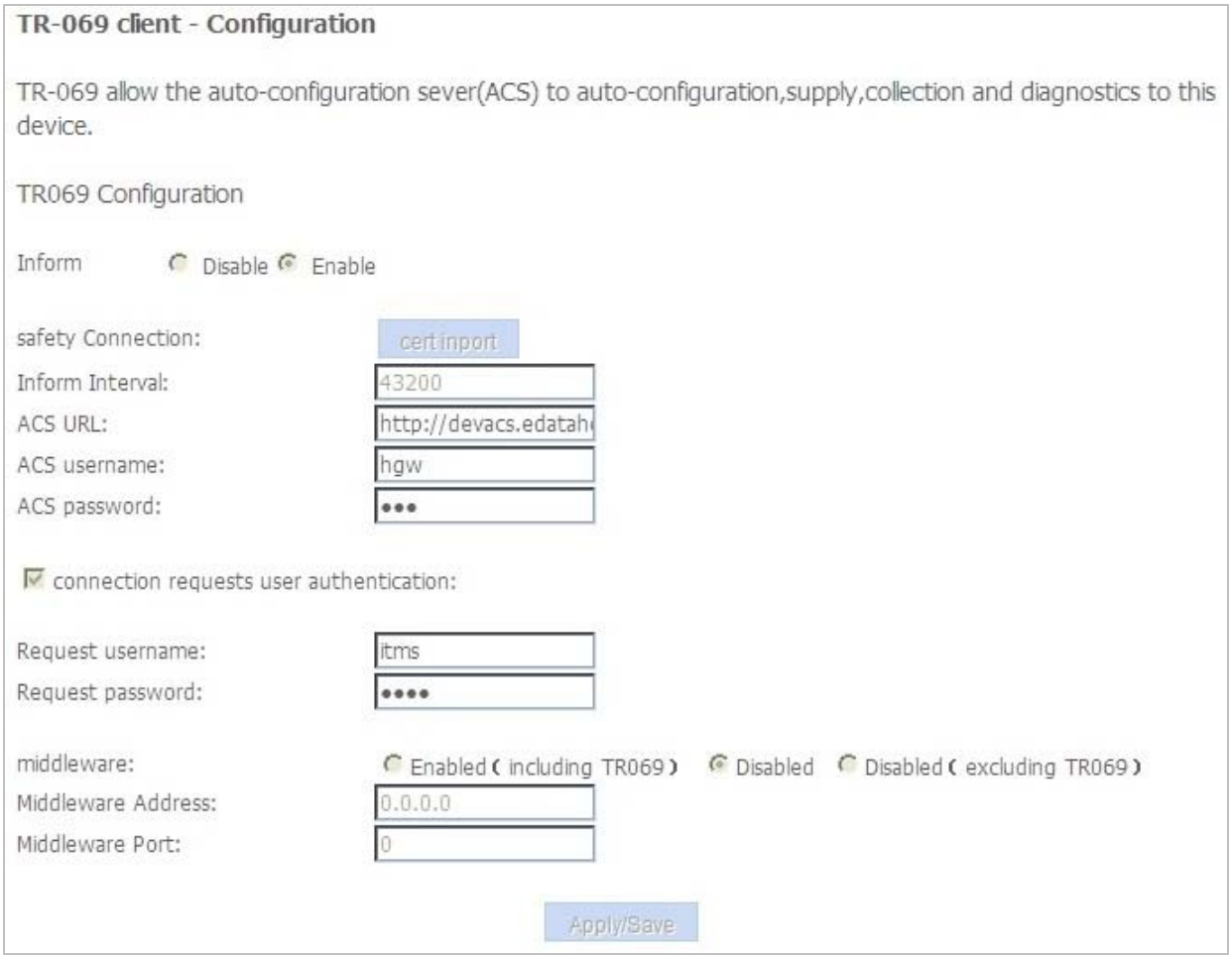


Figure 5-2-12 TR069

The page includes the following fields:

Object	Description
Inform	To Enable or Disable TR069
Safety Connection	To import the license for the ITMS Server
Inform Interval	The time interval to send a notification (seconds)
ACS URL	The TR069 ACS Server address
ACS username	The User Name for the Remote Management Server
ACS password	The password for the associated User Name
Connection requests user authentication	To enable or disable User Authentication for the Remote Management Server
Request username	The Authentication ID for the Remote Management Server
Request password	The password for the Authentication ID

Middleware	To enable or disable the middleware ■ Enabled (including TR069): To enable middleware with TR069 functionalities ■ Disabled: Check the box to disable middleware ■ Disabled (excluding TR069): To enable middleware without TR069 functionalities
Middleware Address	The remote server address for the Middleware
Middleware Port	To set the port number for the Middleware server

■ **OLT AUTH**

To authorize the GEPON OLT with LOID, this function can prevent your Internet connection from being illegally connected by other unknown users. It is available only if your GEPON OLT supports LOID authorization.

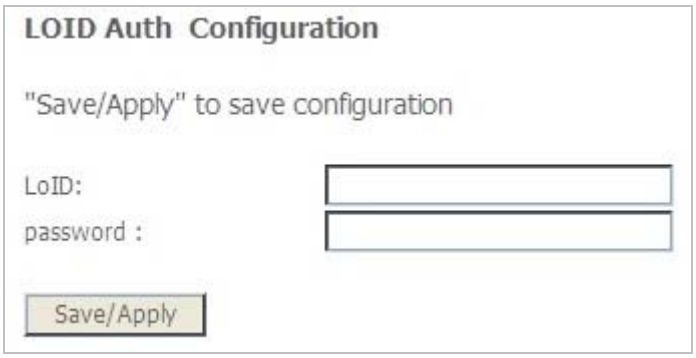


Figure 5-2-13 OLT AUTH

The page includes the following fields:

Object	Description
LOID	The Authorization LOID (The length must be within 24 digits)
Password	The password for the associated LOID

5.2.6 QoS

■ **QoS**

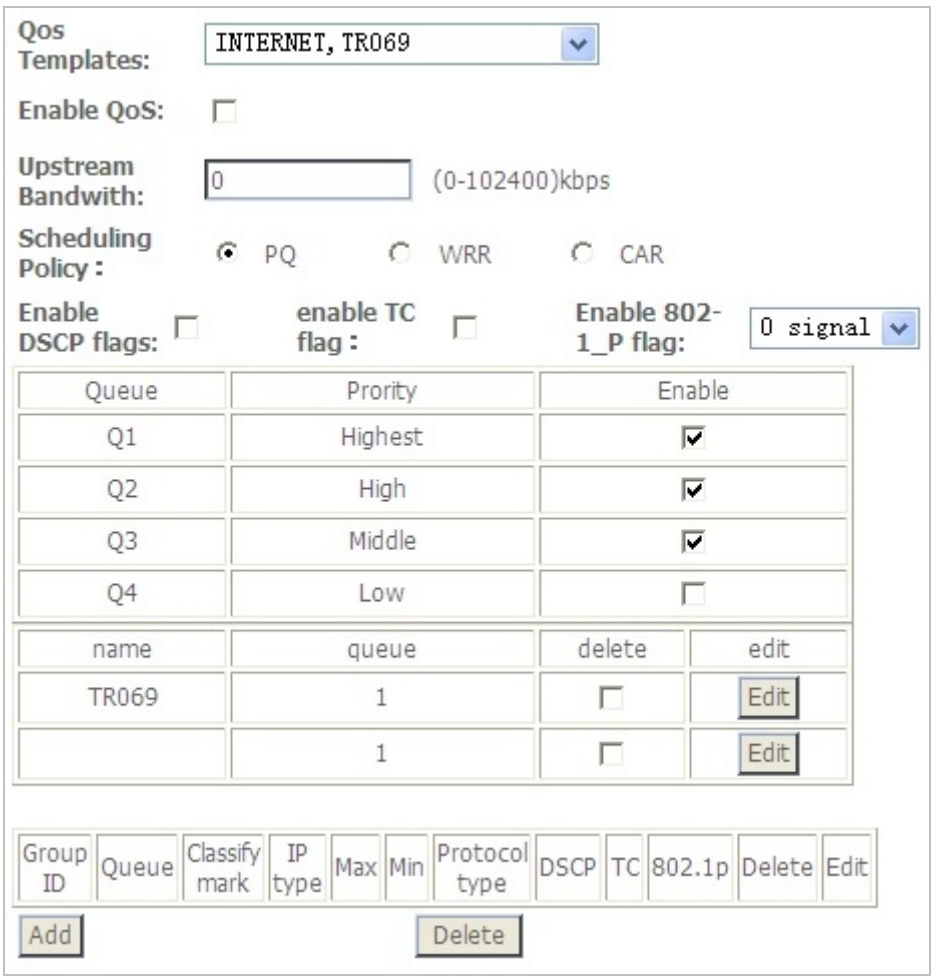


Figure 5-2-14 QoS

The page includes the following fields:

Object	Description
QoS Templates	To choose the available templates or to customize the template to determine what services to enable the QoS for. ■ **Internet, TR069** – To enable QoS for Internet Data and TR069 service ■ **Internet, TR069, VoIP** – To enable QoS for Internet Data, TR069 and VoIP services ■ **Internet, TR069, IPTV** – To enable QoS for Internet Data, TR069 and IPTV services ■ **Internet, TR069, VoIP, IPTV** – To enable QoS for Internet Data, TR069, VoIP and IPTV services ■ **Manual templates** – To customize the template to determine the services to enable QoS
Enable QoS	Check the box to enable QoS

Upstream Bandwidth	To set the uploading bandwidth for the customized QoS template
Scheduling Policy	To determine the alternative QoS mode. You can choose to use QoS PQ, QoS WRR or QoS CAR mode.
Enable DSCP Flag	To enable the DSCP (Differentiated Services Code Point) flag for QoS
Enable TC Flag	To enable the TC (Traffic Categories) flag for QoS
Enable 802.1_P Flag	To enable IEEE802.1P flag for QoS
Q1	To enable the highest QoS level
Q2	To enable a high QoS level
Q3	To enable a medium QoS level
Q4	To enable a low QoS level

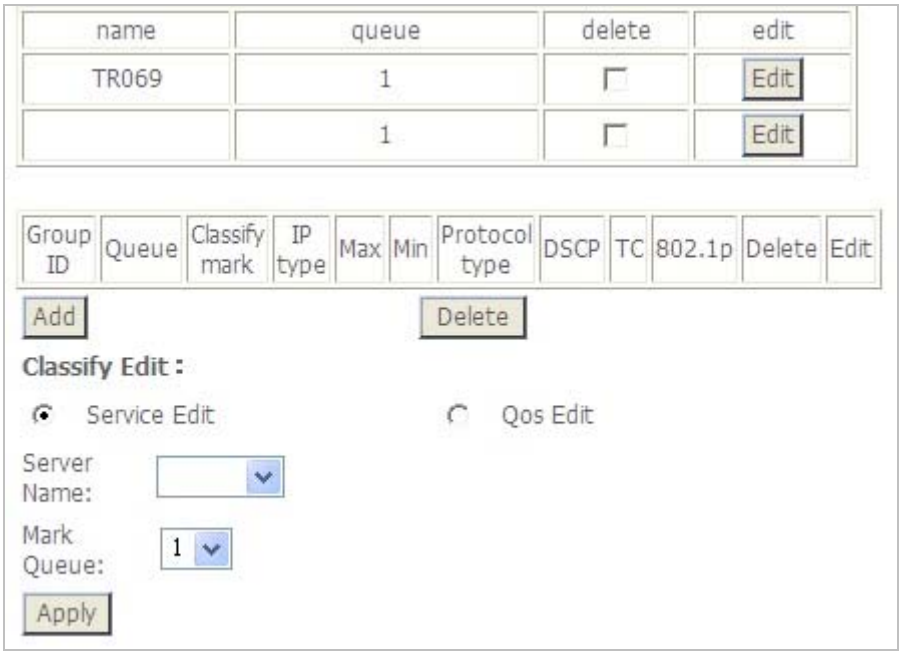


Figure 5-2-14 QoS

Figure 5-2-15 QoS

The page includes the following fields:

Object	Description
Name	The Service Name that you want to enable QoS for, e.g, VoIP, TR069
Queue	The QoS queue for the service specified
Delete	Remove the service from the QoS template
Edit	To edit the service that you want to enable for QoS
Add	Click this button to edit Service Classification and edit Flow Classification.
Delete	Click this button to delete the configured QoS service and flow classification template
Server Name	The service that you want to enable QoS for; you can set either VoIP or TR069 service
Mark Queue	The QOS level that you want to enable for the configured service

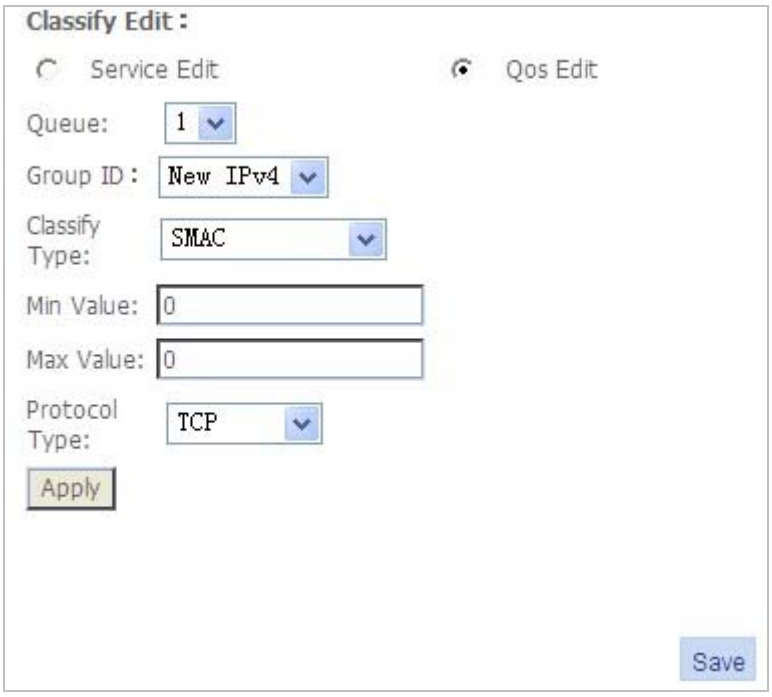


Figure 5-2-16 QoS

The page includes the following fields:

Object	Description
Name	The Service Name that you want to enable QoS for, e.g, VoIP, TR069
Queue	The QoS queue for the service specified
Delete	Remove the service from the QoS template
Edit	To edit the service that you want to enable for QoS
Add	Click this button to edit Service Classification and edit Flow Classification.
Delete	Click this button to delete the configured QoS service and flow classification template
Server Name	The service that you want to enable QoS for; you can set either VoIP or TR069 service
Mark Queue	The QoS level that you want to enable for the configured service

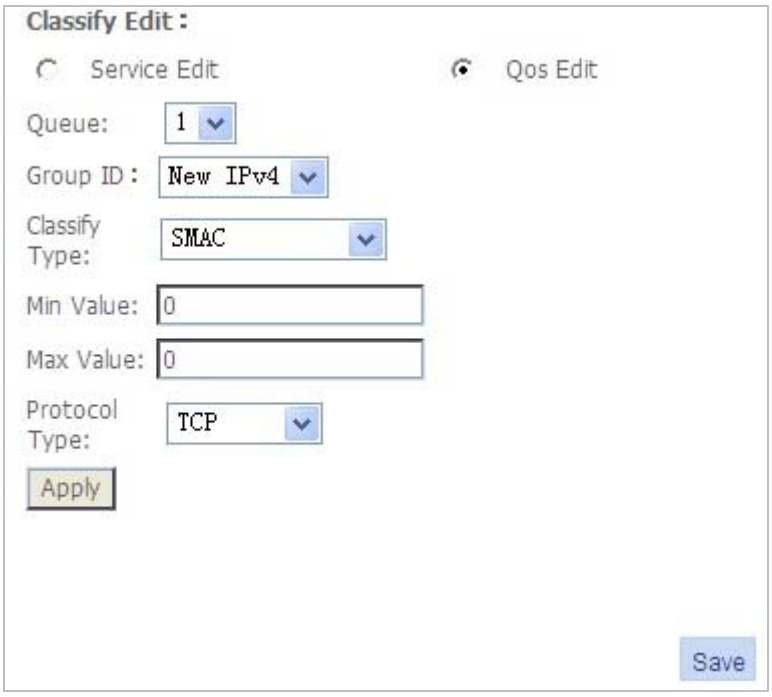


Figure 5-2-17 QoS

The page includes the following fields:

Object	Description
Queue	To set the priority for the flow classification that you enabled. ■ 1 is the highest QoS level ■ 2 is the high QoS level ■ 3 is the medium QoS level ■ 4 is the low QoS level
Group ID	To set the IPV4 or IPV6 version for the flow classification.
Classify Type	To set a different service or interface for flow classification ■ **SMAC:** To set flow classification for SMAC service ■ **DMAC:** To set flow classification for DMAC Service ■ **802.1P:** To set based flow classification for IEEE802.1P service ■ **DIP:** To set flow classification for DIP service ■ **SPORT:** To set flow classification for SPORT service ■ **DPORT:** To set flow classification for DPORT service ■ **TOS:** To set flow classification for TOS service ■ **DSCP:** To set flow classification for DSCP service ■ **WAN Interface:** To set flow classification for WAN interface ■ **LAN Interface:** To set flow classification for LAN interface
Min Value	The minimum QoS level for the enabled Service

Max Value	The maximum QoS level for the enabled Service
Protocol Type	To determine which protocol to enable QoS

■ **FLOW CACHE**

Figure 5-2-18 Flow Cache

The page includes the following fields:

Object	Description
Enable Flow Cache	Check the box for 'Enable Flowcache' to enable Cache for the transmission flow

5.2.7 SNTP

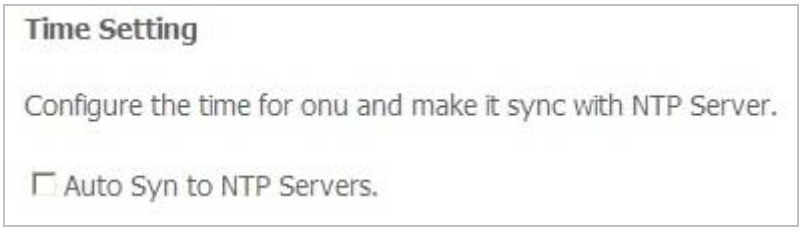


Figure 5-2-19 SNTP

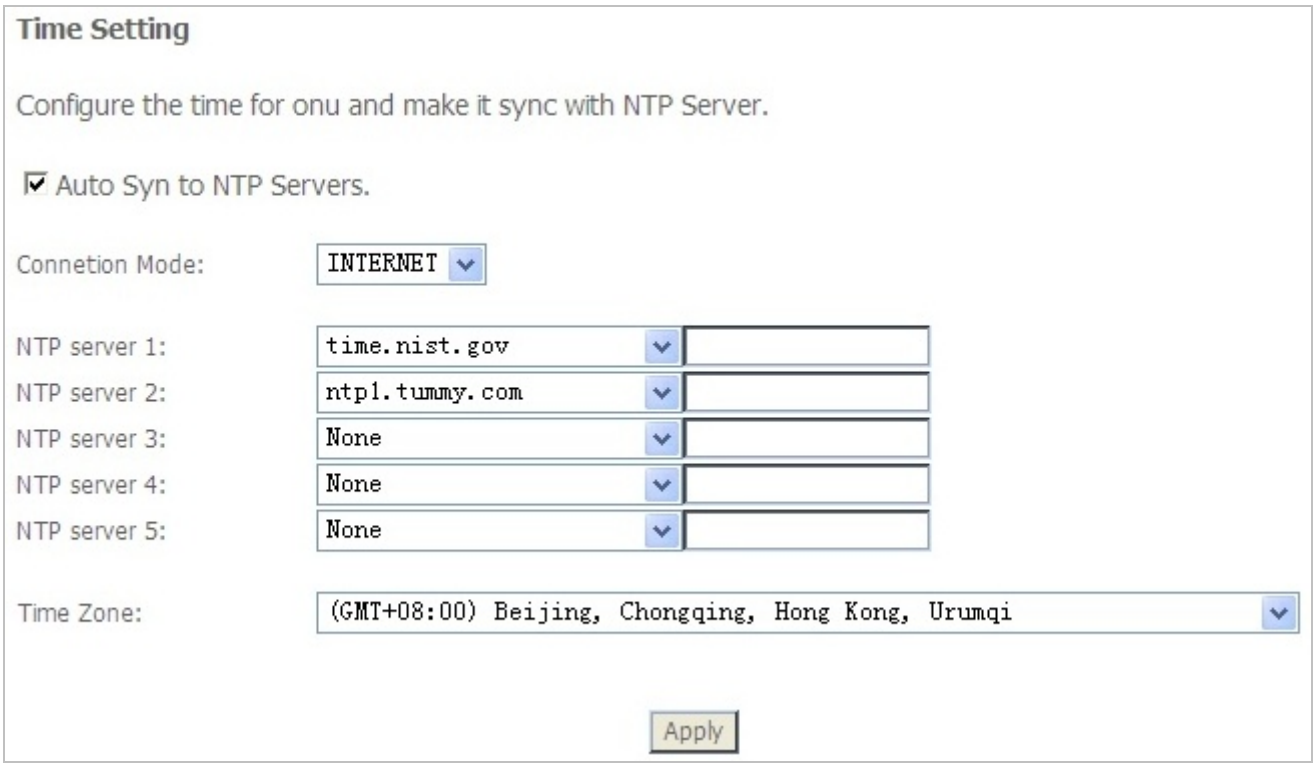


Figure 5-2-20 SNTP

The page includes the following fields:

Object	Description
Auto Syn to NTP Servers	Check the box to automatically sync with the available NTP time servers
Connection Mode	To determine the way to connect to NTP servers.
Time Server	Select the available NTP servers for your NTP Server
Time Zone	To choose the appropriate Time Zone for your EPN-402NV

5.2.8 Route Setup

- **Static Route**

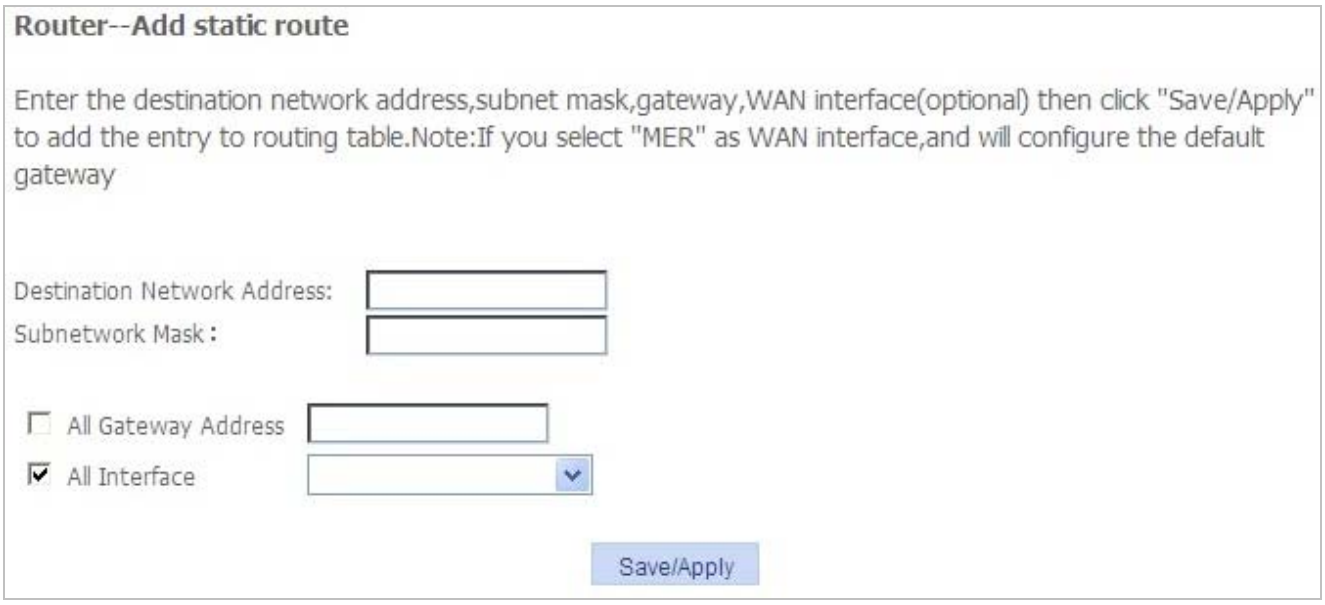


Figure 5-2-21 Static Route

The page includes the following fields:

Object	Description
Destination Network Address	The destination address that you want to add a route for
Subnet Work Mask	The Subnet Mask for your Destination Routing address
All Gateway Address	The Gateway IP Address for your destination routing address
All Interfaces	To determine which interface to enable the Static Route for

- **Dynamic Route**

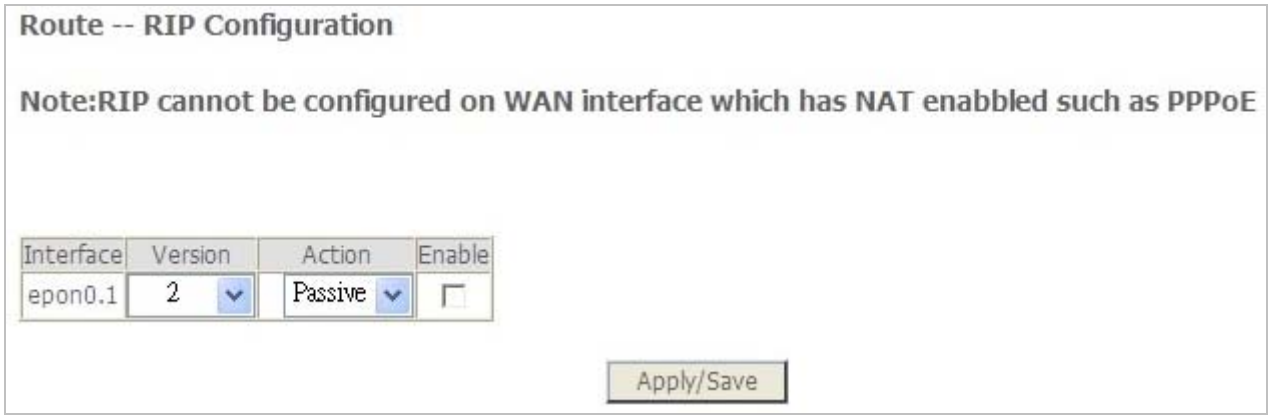


Figure 5-2-22 Dynamic Route

The page includes the following fields:

Object	Description
Interface	The LAN interface of your EPN-402NV
Version	To determine which RIP Version for the Dynamic Routing
Enable	To enable or disable dynamic routing for the LAN interface

- **IPv6 Static Route**

Figure 5-2-23 IPv6 Static Route

The page includes the following fields:

Object	Description
Add	Click 'Add' to add an IPV6 Static Route for your EPN-402NV
Destination IPv6 Address	Input the destination IPV6 address that you want to add a Static Route for
Subnet Prefix Length	To determine the length for your IPV6 Subnet Prefix
IPv6 Gateway Address	Input the Gateway IP address for your destination IPV6 address
Interface	To determine which WAN interface to be associated with the Static IPV6 Route
Metric	To determine the Metric for your IPV6 Static Route (Value in

	between 0-4261412864)

5.3 SECURITY

5.3.1 WAN Access Setup

On this page, you can enable or disable URLs to pass through the WAN interface.

Figure 5-3-1 WAN Access Setup

The page includes the following fields:

Object	Description
URL Filter	Check the box on '**Enable**' to enable URL filter; check the box on '**Disable**' to disable URL Filter
URL Classification	■ **Blacklist:** Check the box on 'Blacklist' and click the '**Add**' button to specify a URL in blacklist ■ **Whitelist** : Check the box on '**Whitelist**' and click the '**Add**' button to specify a URL in whitelist

Figure 5-3-2 URL Filter

The page includes the following fields:

Object	Description
URL	The URL address that you want to allow access with
Port Number	The port number that you want to enable for the whitelist URL

5.3.2 Firewall

On this page, you can set the firewall level for the multiple services that pass through the EPN-402NV.

- **Security Level**

Figure 5-3-3 Security Level

- **Attack Protection**

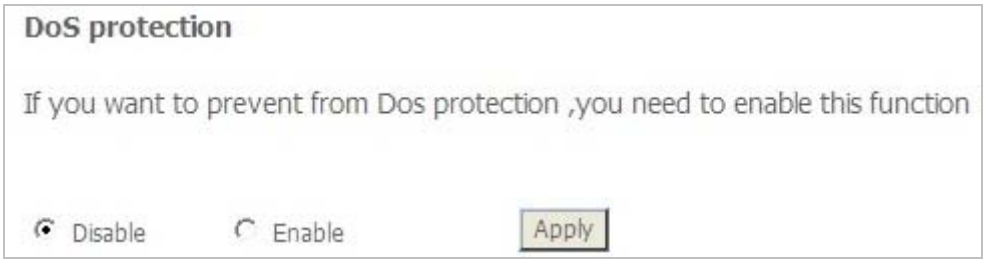


Figure 5-3-4 Attack Protection

The page includes the following fields:

Object	Description
Disable	To disable protection for DOS attack
Enable	To enable protection for DOS attack

5.3.3 MAC Filter

On this page, you can create a firewall filter based on a specific MAC Address.

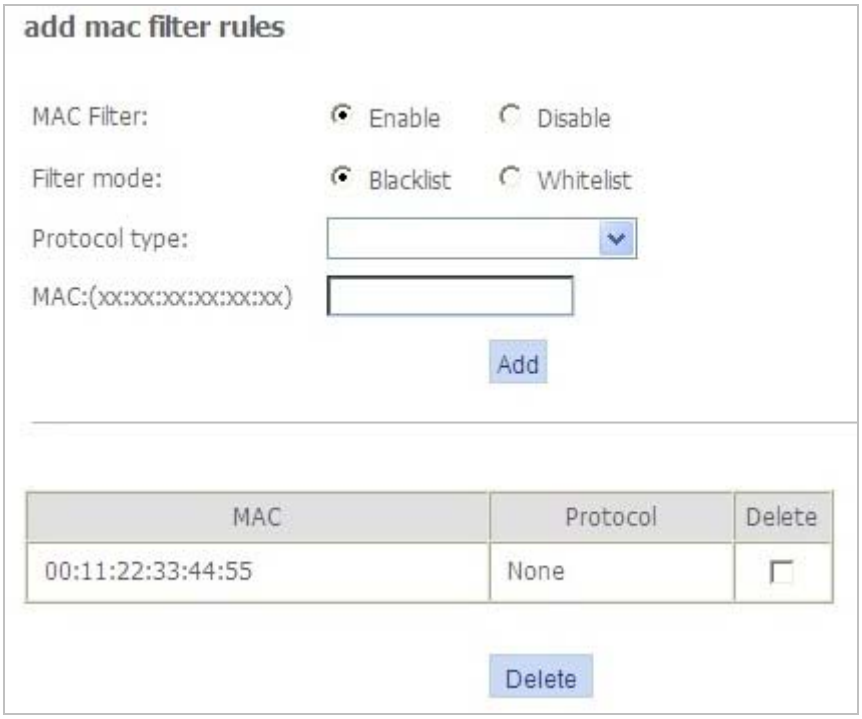


Figure 5-3-5 MAC Filter

The page includes the following fields:

Object	Description
MAC Filter	Enable or Disable to create a filter based on MAC address
Filter Mode	■ **Blacklist**: Enable banning a specific MAC Address ■ **Whiltelist:** Enable allowing a specific MAC Address
Protocol Type	To determine which service to be allowed or denied with the appointed MAC address
MAC	The MAC address that you want to add the MAC Address filter for
Add	Click the 'Add' button to add a MAC Address filter
Delete	Click the 'Delete' button to delete a MAC Address filter that you created

5.3.4 IP Filter

On this page, you can create a firewall filter based on a specific port.

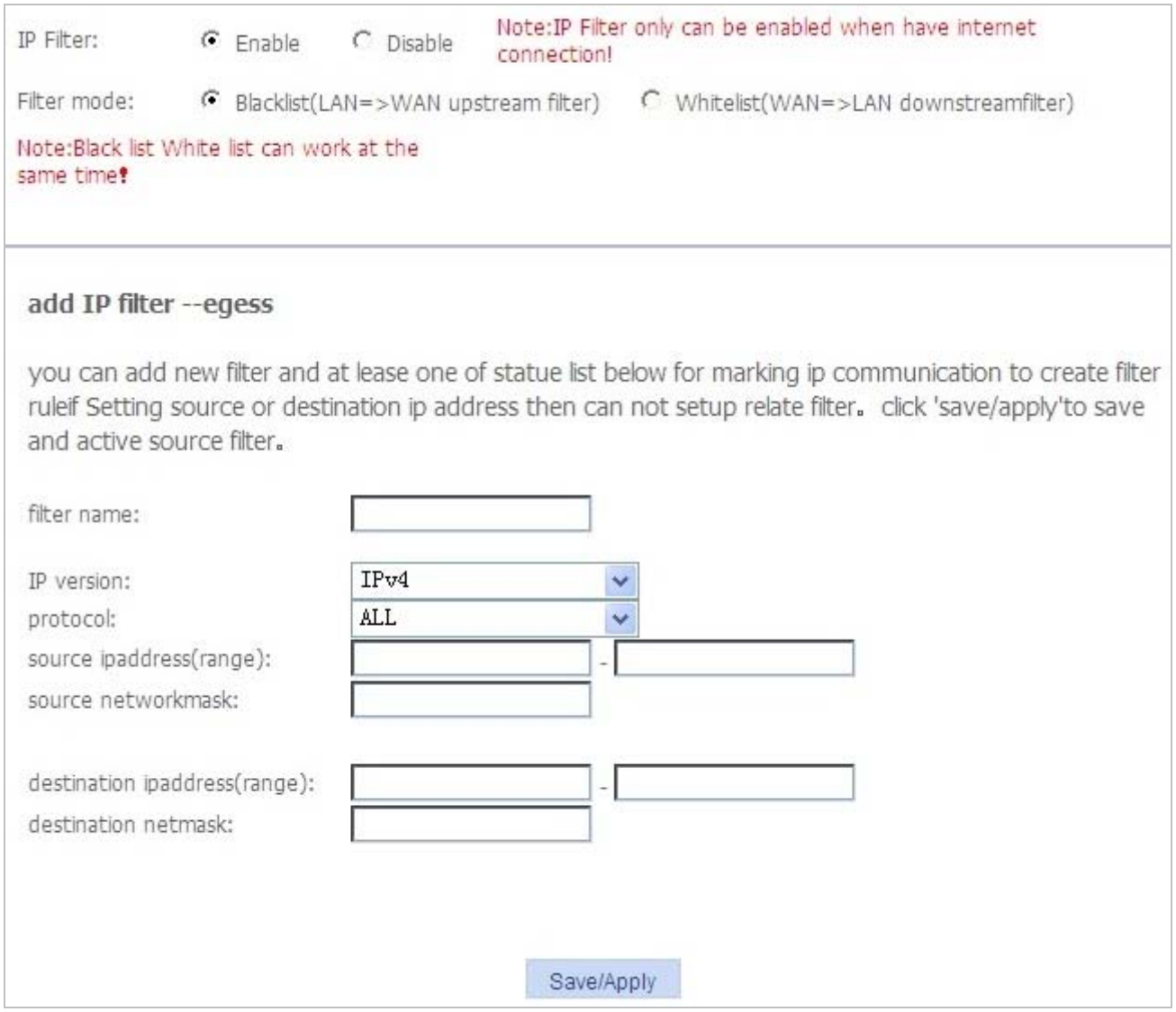


Figure 5-3-6 IP Filter

The page includes the following fields:

Object	Description
IP Filter	Enable or disable the IP filter
Filter Mode	■ **Blacklist**: To disable the specified port to pass through LAN to WAN ■ **Whiltelist:** To enable the specified port to pass through WAN to LAN
Filter Name	To specify a name for the filter
IP Version	To determine either IPV4 or IPV6 version for the filter
Protocol	To determine which protocol to be allowed or denied
Source IP Address (range)	The IP address range that you want to allow or deny, e.g, 192.168.1.2 – 192.168.1.254

Source Network Mask	The subnet mask for the IP range that you specified
Destination IP Address (range)	The Destination IP or host that you want to allow or deny for the filter
Destination Network Mask	The Subnet Mask for the Destination IP or host that you allowed or denied

5.4 APPLICATION

5.4.1 DDNS Setup

On this page, you can create a Dynamic DNS for your EPN-402NV.

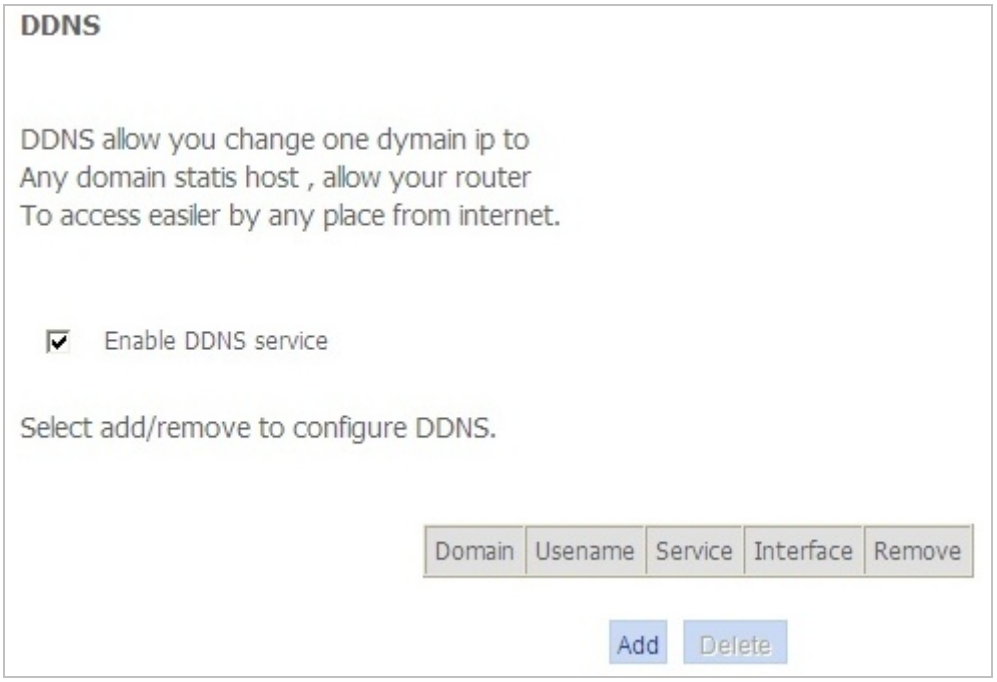


Figure 5-4-1 DDNS

Figure 5-4-2 Add DDNS

The page includes the following fields:

Object	Description
DDNS provider	To determine the DDNS service provider
Domain	The URL/Host name for your DDNS service provider
Interface	To determine which WAN connection to be applied with DDNS service
Username	The user name of your DDNS
Password	The password of your DDNS

5.4.2 Advanced NAT

- **ALG SETUP**

Figure 5-4-3 ALG

The page includes the following fields:

Object	Description
Enable H.323	Check the box to enable H.323 ALG
Enable RTSP	Check the box to enable RTSP ALG
Enable IPSEC	Check the box to enable IPSEC
Enable SIP	Check the box to enable SIP
Enable L2TP	Check the box to enable L2TP
Enable FTP	Check the box to enable FTP

■ DMZ SETUP

Figure 5-4-4 DMZ

The page includes the following fields:

Object	Description
Enable DMZ Host	Check the box to enable DMZ
DMZ Host IP Address	The LAN IP address that you want to enable with DMZ

■ VIRTUAL HOST

Figure 5-4-5 Virtual Server

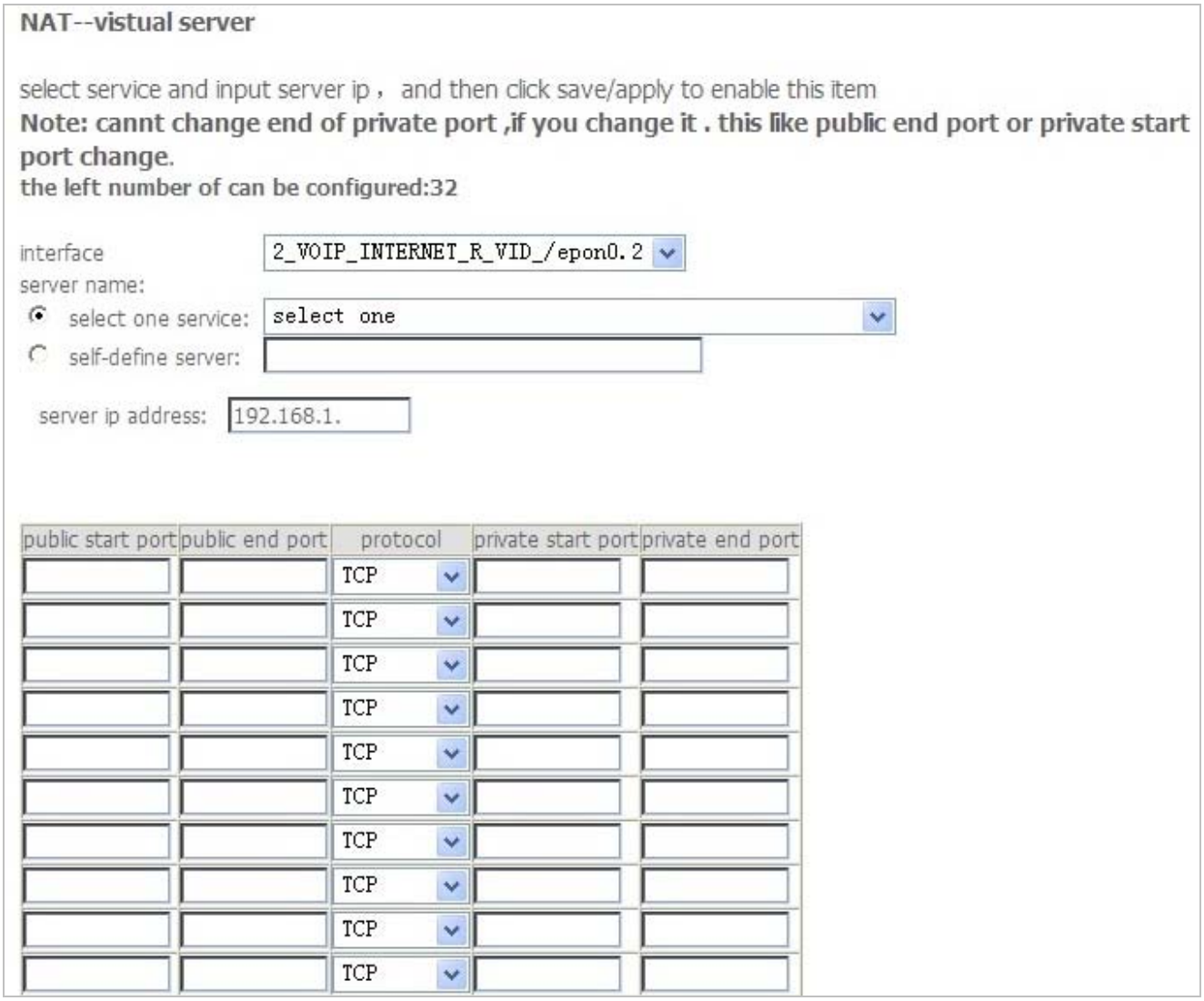


Figure 5-4-6 Add Virtual Server

The page includes the following fields:

Object	Description
Add	Click 'Add' to add a virtual host server
Delete	Click 'Delete' to remove a Virtual Host Server
Interface	The WAN interface that you want to enable with Virtual Host Server service
Server Name	Select the services that you want to enable with Virtual Host Server service
Server IP Address	The LAN IP address that you want to enable for Virtual Host Server
Public Start Port	The outbound start port of your Virtual Host Server
Public End Port	The outbound end port of your Virtual Host Server

Private Start Port	The inbound start port of your Virtual Host Server
Private End Port	The inbound end port of your Virtual Host Server

5.4.3 UPnP Setup

On this page you can enable or disable UPNP.

Figure 5-4-7 UPnP

5.4.4 VoIP

- **Basic**

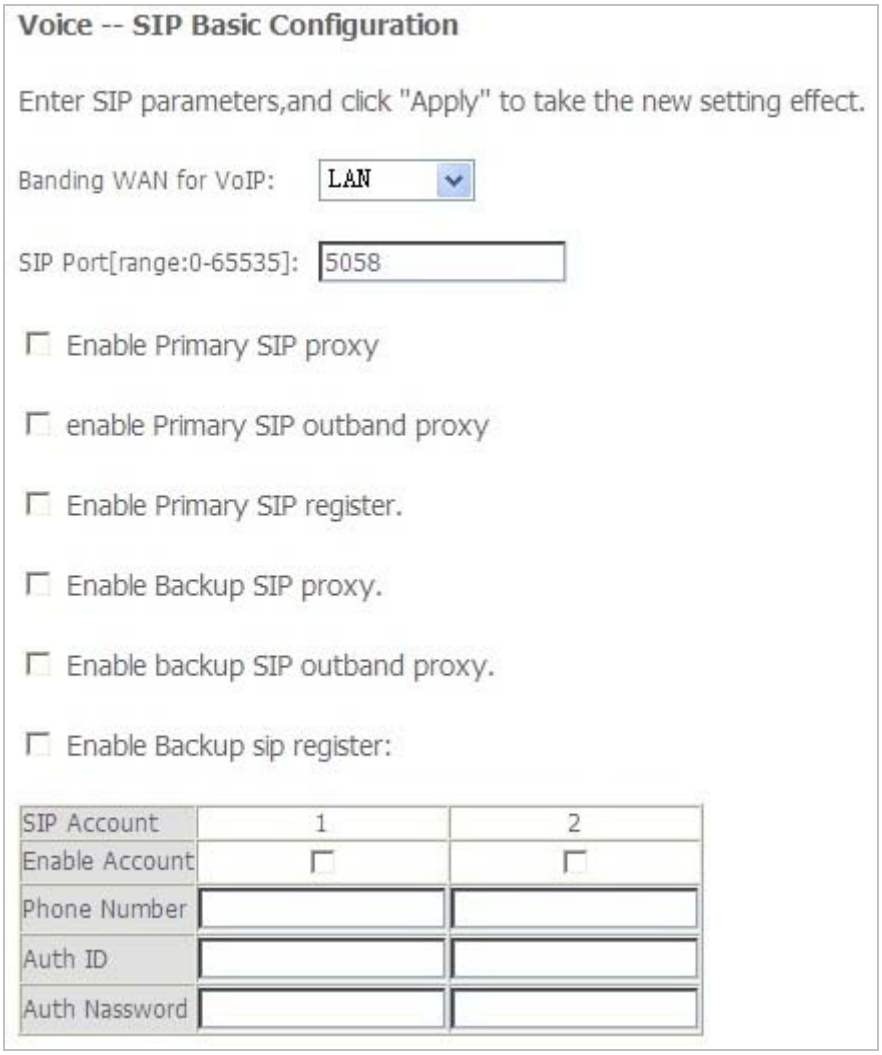


Figure 5-4-8 VoIP Basic

The page includes the following fields:

Object	Description
Banding WAN for VoIP	Check the box to select the WAN connection interface for your VoIP service
SIP Port	To input the port number for SIP, generally default SIP port is 5058
Enable Primary SIP Proxy	Check the box to enable register to a SIP Server
Enable Primary SIP Outbound Proxy	The primary SIP Server address can be Host name or IP address
Enable Primary SIP Register	The primary SIP port by default is 5060
Enable Backup SIP Proxy	Check the box to enable register to a backup SIP Server

Enable Backup SIP Outbound Proxy	The backup SIP Server address can be Host name or IP address
Enable Backup SIP Register	The backup SIP port by default is 5060

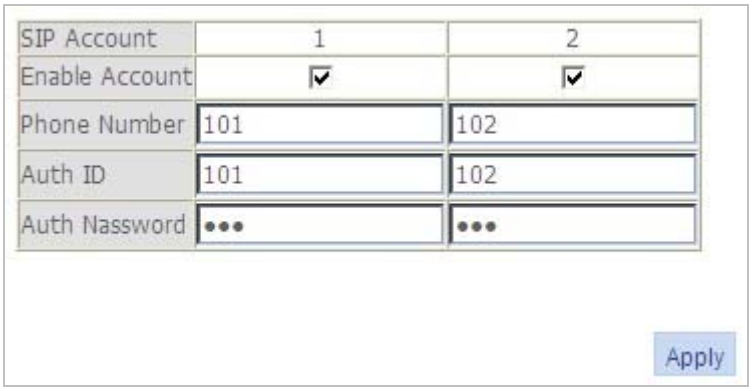


Figure 5-4-8 VoIP Account

The page includes the following fields:

Object	Description
SIP Account	There are two SIP accounts able to be registered with EPN-402NV simultaneously
Enable Account	Check the boxes to enable the associated SIP 1 and SIP 2 accounts
Phone Number	The SIP user name
Auth ID	The ID for your SIP account
Auth Password	The password for your SIP account

- **Digital Map**

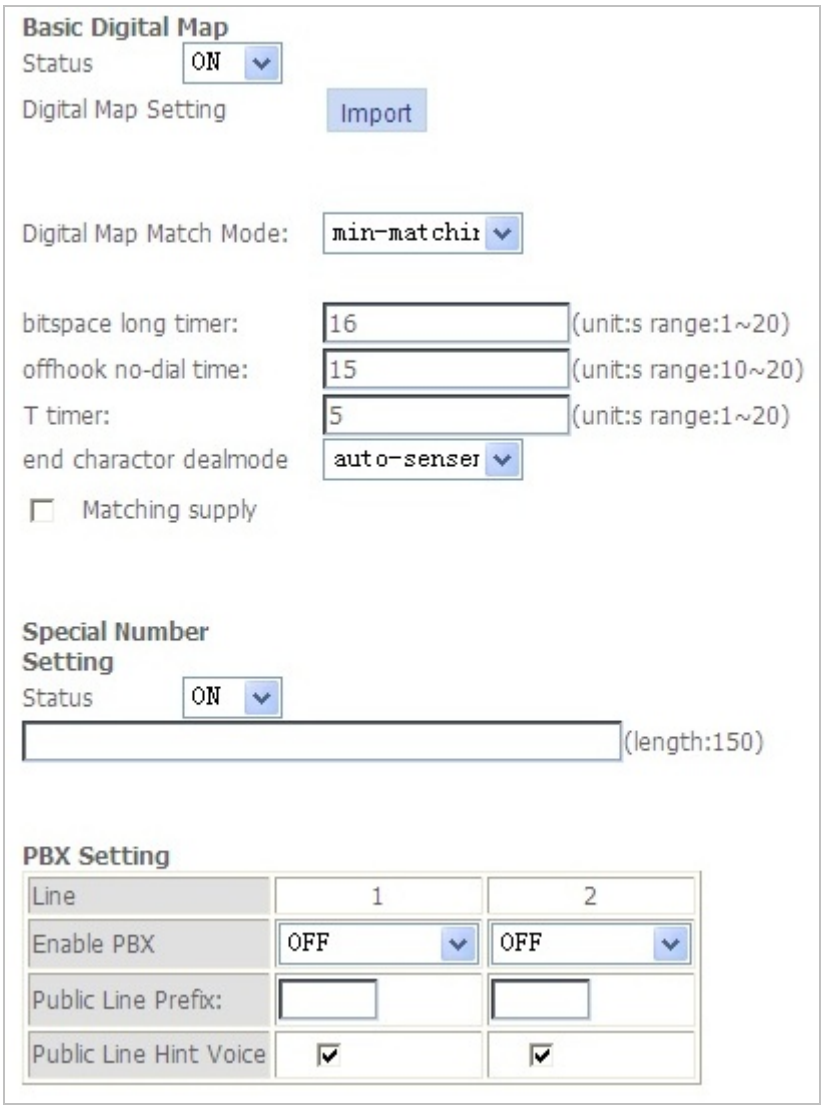


Figure 5-4-9 Digital Map

The page includes the following fields:

Object	Description
Status	Enable Standard Digital Map/Dial plans for VoIP service
Digital Map Match Mode	The matching mode of the specified dialing plans
Bit Space Long Timer	Specify the max timer time
Off Hook No-dial Time	Specify the time of not dialing after you pick up the phone
T Timer	Specify the T-timer time
End Character Deal Mode	To select the stop character processing mode

Matching Supply	Match with the specified number
Status	Enable hotline number

- **Voice Media**

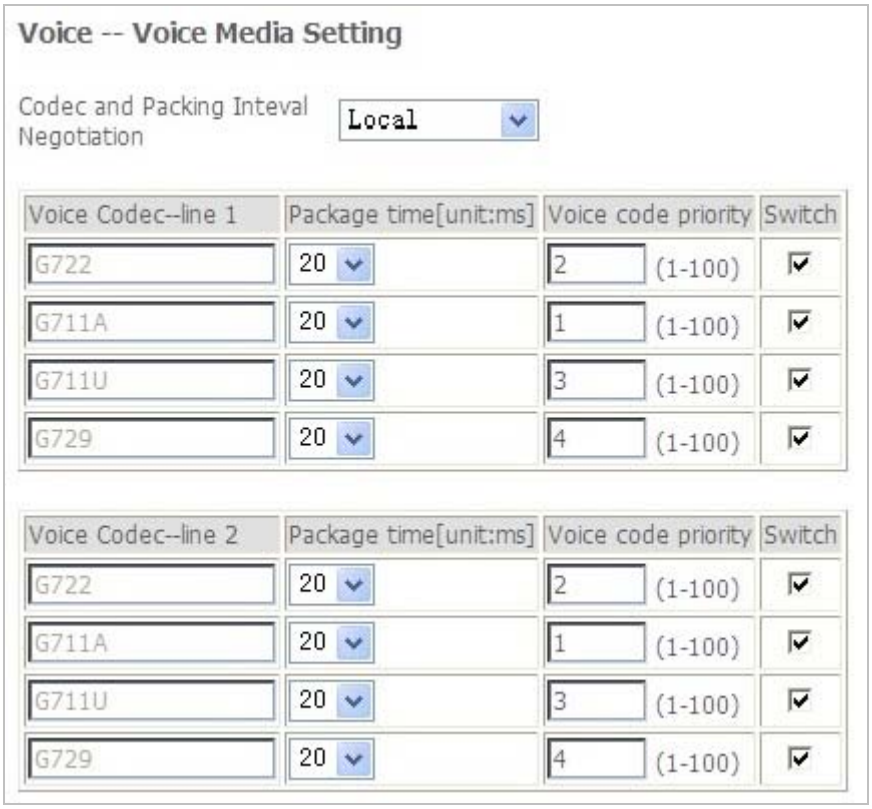


Figure 5-4-10 Voice Media

The page includes the following fields:

Object	Description
Status	Enable Standard Digital Map/Dial plans for VoIP service
Digital Map Match Mode	The matching mode of the specified dialing plans
Bit Space Long Timer	Specify the max. timer time
Off Hook No-dial Time	Specify the time of not dialing after you pick up the phone
T timer	Specify the T-timer time
End character deal mode	To select the stop character processing mode
Matching supply	Match with the specified number

Status	Enable hotline number

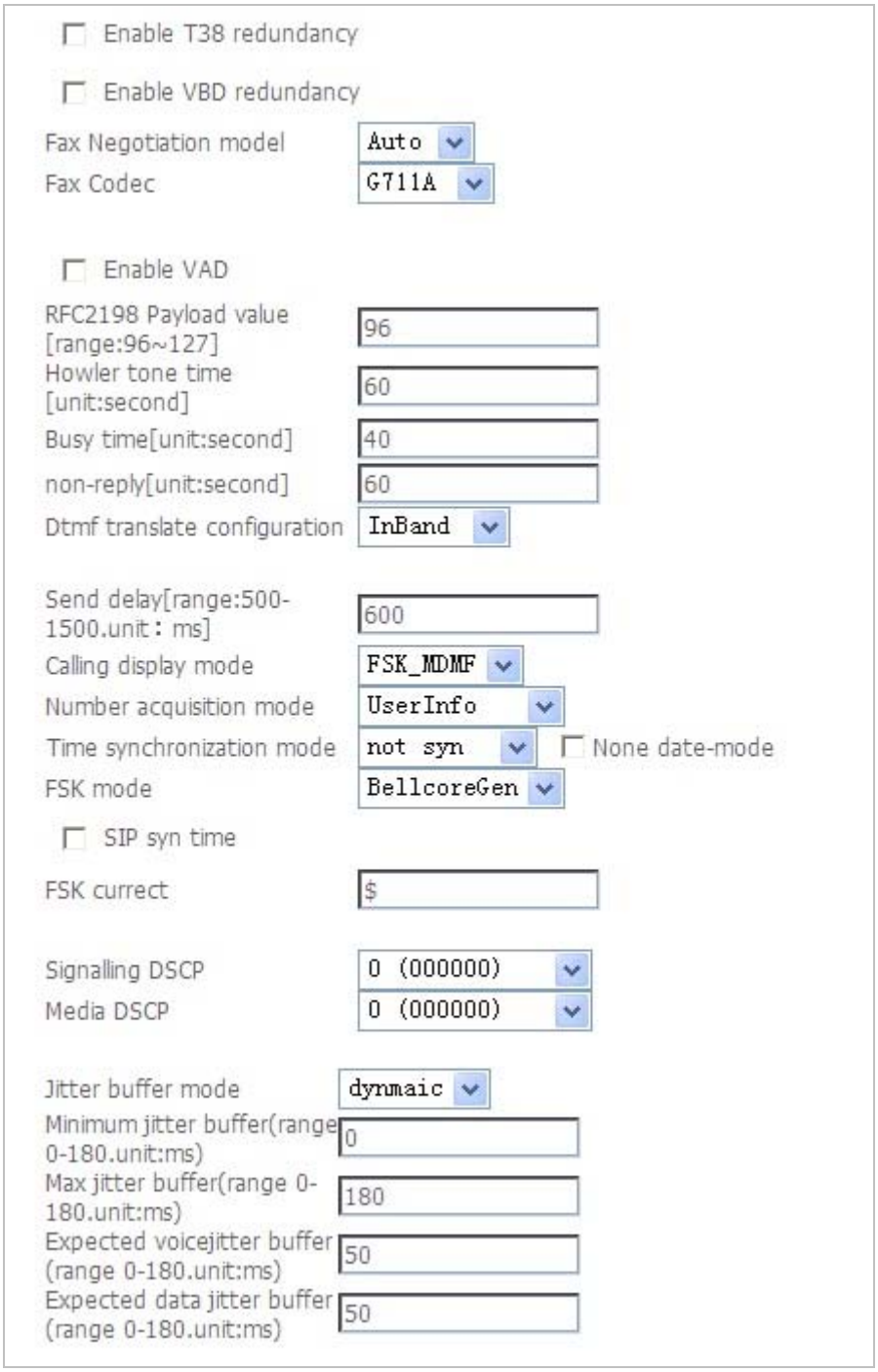


Figure 5-4-11 Voice Media

The page includes the following fields:

Object	Description
Enable T38 Redundancy	Check the box to enable T.38 fax redundancy
Enable VBD	Check the box to enable VBD (Voice Band Data) redundancy

Redundancy	
Fax Negotiation Mode	Set the fax session mode
Fax Codec	Set the codec for fax
Enable T38 Fax	Enable T.38 fax
Enable G711 Fax	Enable fax with G.711 codec
Enable VAD	Check the box to enable VAD (Voice Activation Detection)
CNG Mode	Select the CNG mode
RFC2198 Payload Value	Set the value of RFC2198 payload, ranging from 96 to 127
Howler Tone Time	Set the urging tone time
Busy Time	Set the busy tone time
Non-reply	Set the no answer tone time
DTMF Translate Configuration	Set the DTMF mode of VoIP
Send Delay	Set the Caller ID sending delay time
Calling Display Mode	Set the Caller ID mode
Signaling DSCP	The QoS value of SIP signaling
Media DSCP	The QoS value for SIP media
Jitter Buffer Mode	Set the Voice Jitter buffer mood
Minimum Jitter Buffer	Set the minimum value of Voice Tendencies Jitter buffer
Maximum Jitter Buffer	Set the maximum value of Voice Tendencies Jitter buffer
Expected Voice Jitter Buffer	Set the value of Voice Static Jitter buffer
Expected Data Jitter Buffer	Set the value of Transparent Voice Static Jitter buffer
Fixed Payment Number	Set the PSTN telephone number
RTP Port Range	Set the range of RTP port
Enable Reversed Polarity	Check the box to enable Reverse Polarity for SIP account 1 and 2

Echo Suppression Set	Check the box to enable Echo Suppression settings for SIP account 1 and 2
Receiving Gain	Set the Receiving Gain value for Echo Suppression
Transmission Gain	Set the Sending Gain value for Echo Suppression
Bat Minimum Time	Set the minimum Hook Time
Bat Maximum Time	Set the maximum Hook Time

- **SIP**

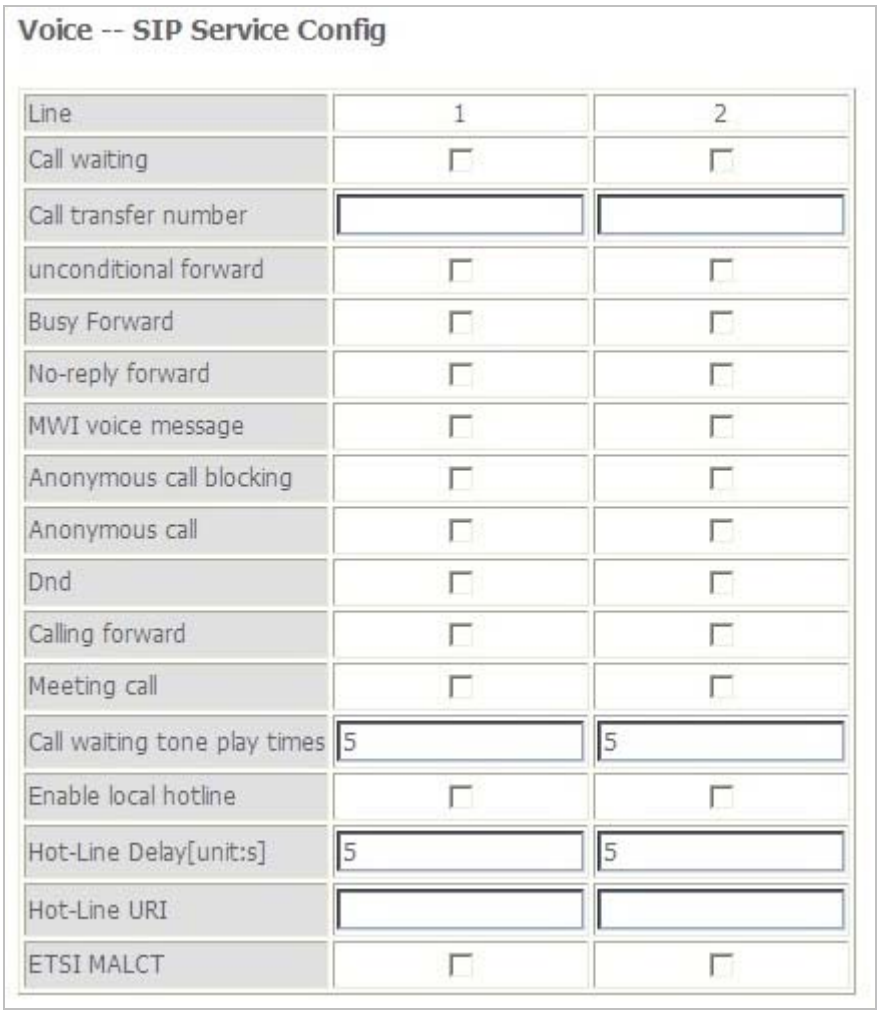


Figure 5-4-12 SIP Configuration

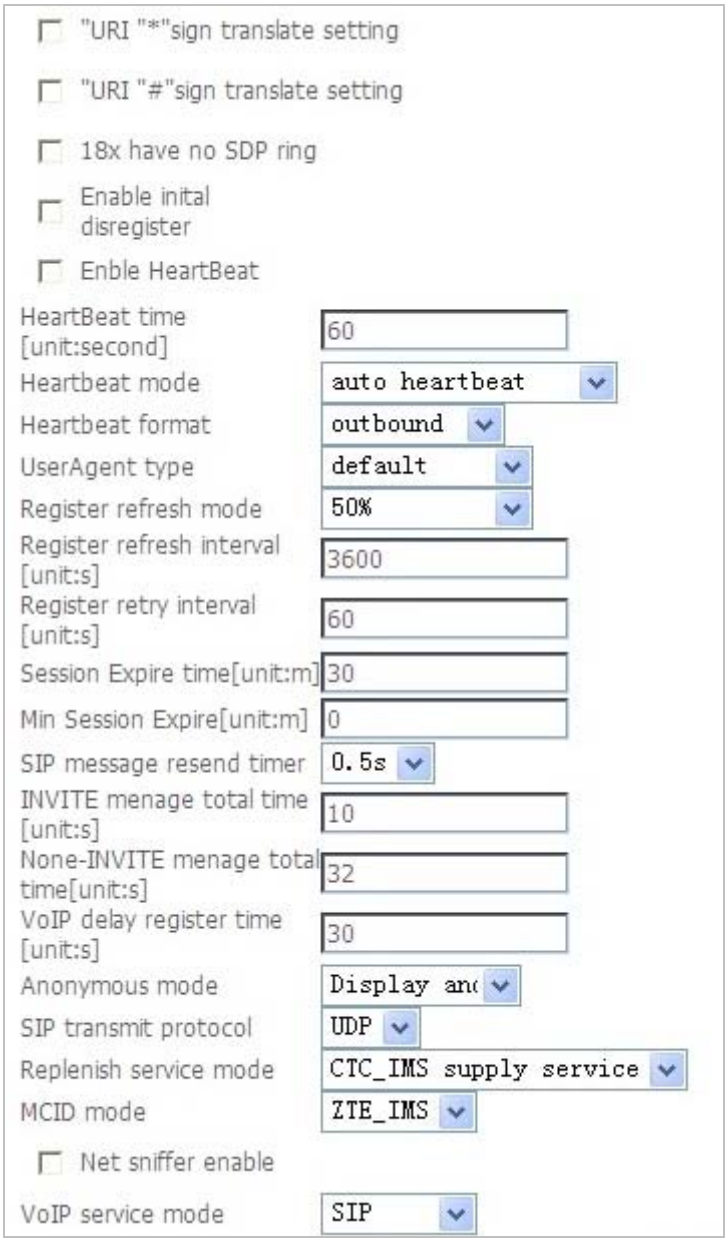


Figure 5-4-13 SIP Configuration

The page includes the following fields:

Object	Description
"URL" "*" Sign Translate Setting	Check the box to enable URL and '*' Escape setting
"URL" "#" Sign Translate Setting	Check the box to enable URL and '#' Escape setting
18x has no SDP Ring	Check the box to disable SDP in 18x ring process
Enable Initial Deregister	Check the box to enable SIP initial cancellation
Enable Heartbeat	Check the box to enable SIP Heartbeat Switch

Heartbeat Time	Set the SIP Heartbeat Switch time interval
Heartbeat Mode	Set the SIP heartbeat mode
Heartbeat Format	Set SIP heartbeat switch in different authentication modes
User Agent Type	Set the SIP agent type
Register Refresh Mode	Set the SIP registration Refresh mode
Register Refresh Interval	Set the SIP registration Update time interval
Register Retry Interval	Set the SIP registration re-try time interval
Session Expire Time	Set the SIP session expiration time
Min. Session Expire	Set the minimum SIP Session Expiration Time
SIP Message Resend Timer	Set the SIP message re-transit initial time
Invite Message Total Time	Set the SIP Invite Message re-transit time
Non-Invite Message Total Time	Set the SIP non-invite message re-transit time
VoIP Delay Register Time	Set the SIP registration delay time
Anonymous Mode	Set the SIP Anonymous mode
SIP Transmit Protocol	Set SIP protocol through UDP or TCP
Replenish Service Mode	Set the Supplementary service mode
MCID Mode	Set the Malicious Call Identification mode
Net Sniffer Enable	Check the box to enable Network detection
VoIP Service Mode	Set VoIP protocol

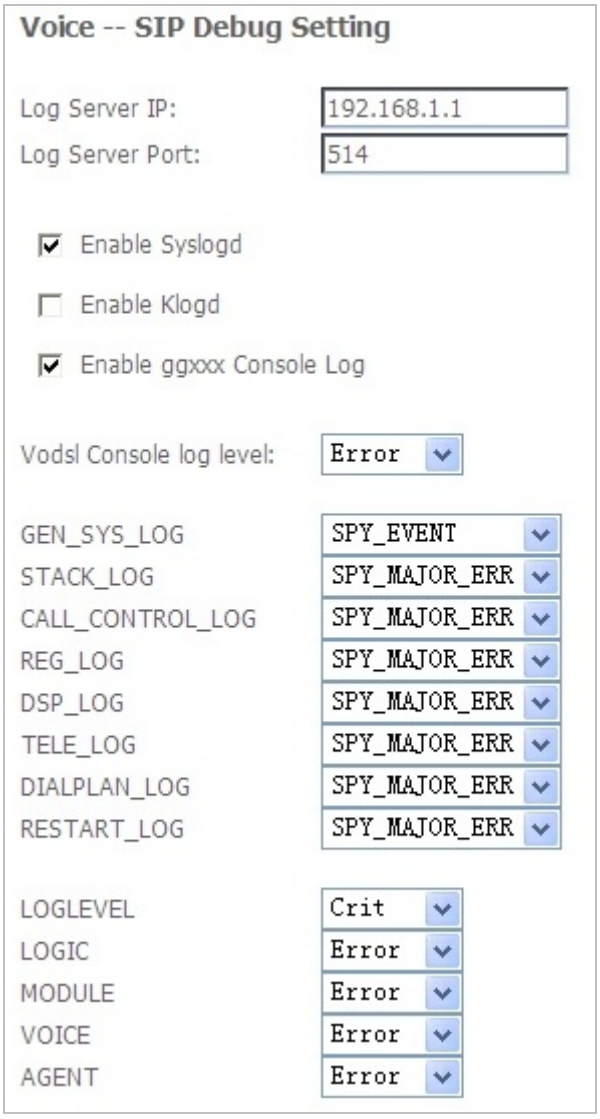
- **IMS Service**

On this page you can configure the Voice IMS Parameters. This is a feature available with IMS server configurations. (Not specified).

Figure 5-4-14 IMS Service

- **Debug**

On this page you can debug the VoIP SIP configurations.



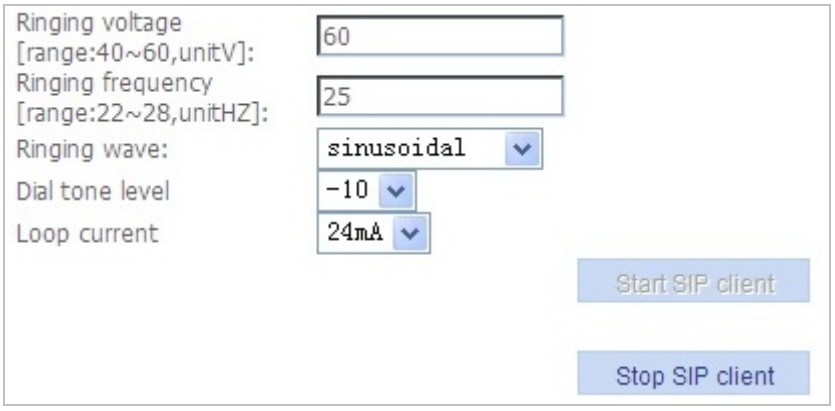


Figure 5-4-15 Debug

The page includes the following fields:

Object	Description
Log Server IP	The Server Address that you want to store your SIP Syslog

Log Server Port	The port number of your SIP Syslog server
Enable Syslog	Check the box to enable SIP Syslog
Enable Klog	Check the box to enable SIP Klog
Vodsl Console Log Level	Set the Vodsl console level of your SIP Syslog
GEN_SYS_LOG	To determine the general system log level
STACK_LOG	To determine the STACK Log level
CALL_CONTROL_LOG	To determine the Call Control Log level
REG_LOG	To determine the Registration Log level
DSP_LOG	To determine the Voice DSP log level
TELE_LOG	To determine the telecommunication logo level
DIALPLAN_LOG	To determine the Dialplan_LOG level
RESTART_LOG	To determine the Rebooting Log level
LOGLEVEL	To set the log level of your SIP Syslog
LOGIC	To set different SIP Syslog type of SIP logic
MODULE	To set different SIP Syslog type of SIP module
VOICE	To set different SIP Syslog type of SIP Voice
AGENT	To set different SIP Syslog type of SIP Agent
Ringing Voltage	To set the ringing voltage level of your SIP Syslog
Ringing Frequency	To set the ringing frequency of your SIP Syslog
Ringing Wave	To set the ringing waveform of your SIP Syslog
Start SIP Client	Enable SIP client starting to report syslog
Stop SIP Client	Stop SIP client reporting SIP Syslog

5.4.5 IGMP

- **IGMP Snooping**

Check the box to enable IGMP Snooping of your Wi-Fi ONU.

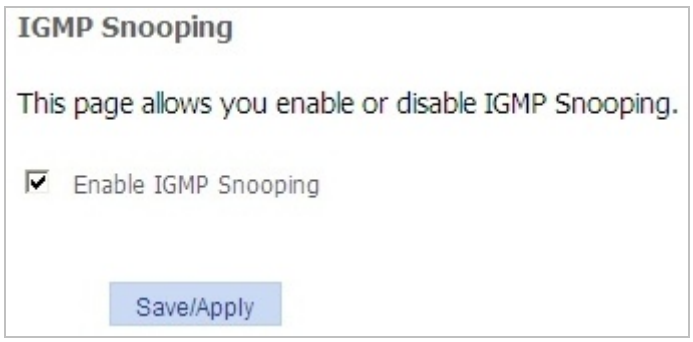


Figure 5-4-16 IGMP Snooping

- **IGMP Proxy**

On this page, you can enable IGMP pass-through a specific WAN interface.

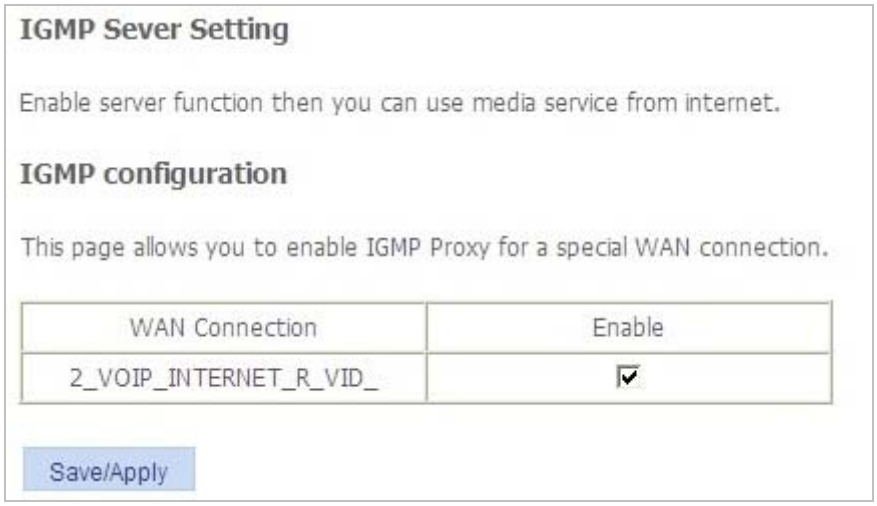


Figure 5-4-17 IGMP proxy

The page includes the following fields:

Object	Description
WAN Connection	The WAN interface that you will enable for the IGMP Server
Enable	Check the box to enable IGMP Server

5.4.6 MLD Setup

- **MLD Snooping**

This page allows you to enable or disable MLD Snooping function.

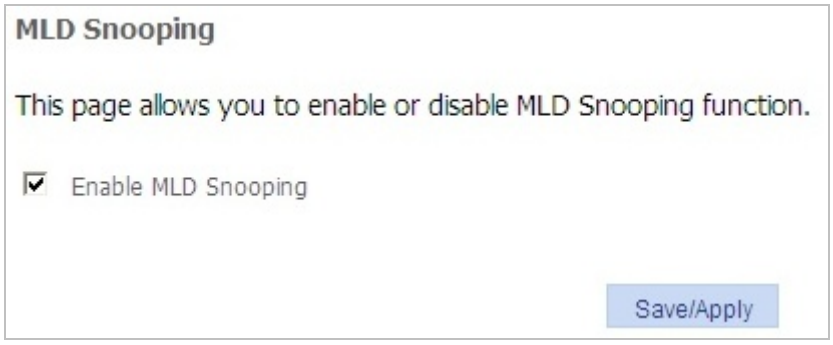


Figure 5-4-18 MLD Snooping

- **MLD Proxy**

On this page you can enable MLD Proxy for a special WAN connection.

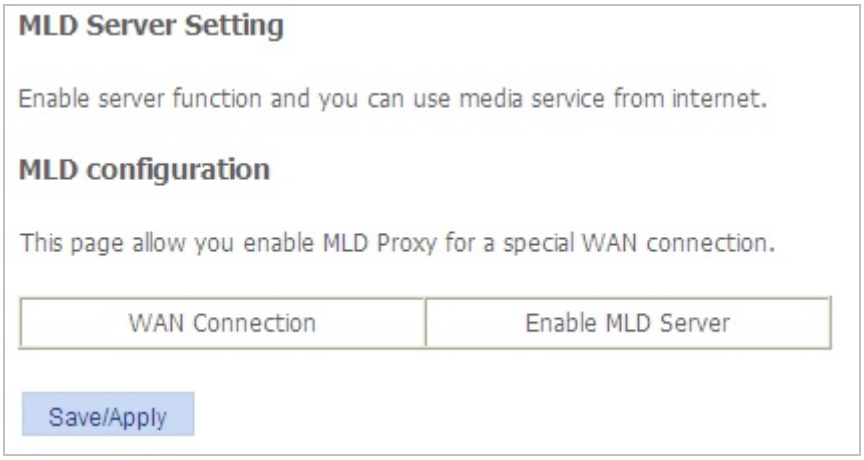


Figure 5-4-19 MLD Proxy

The page includes the following fields:

Object	Description
WAN Connection	The WAN interface that you will enable for the MLD Server
Enable MLD Server	Check the box to enable MLD Server

5.4.7 Daily Application

- **Family Storage**

On this page you can download files, music, and video from internet to the family storage USB device even you are not at home.

Figure 5-4-20 Family Storage

The page includes the following fields:

Object	Description
Download File Storage	Specify the downloading directory of your USB Storage device
Username	Your remote FTP user name
Password	The password for your remote FTP server
Port	The port number specified for your remote FTP Server
Remote URL	The URL that you download from
Download	Click the 'Download' button to start downloading files to your USB storage device.

- **IPTV**

On this page, you can configure a specific Multicast VLAN for your IPTV application.

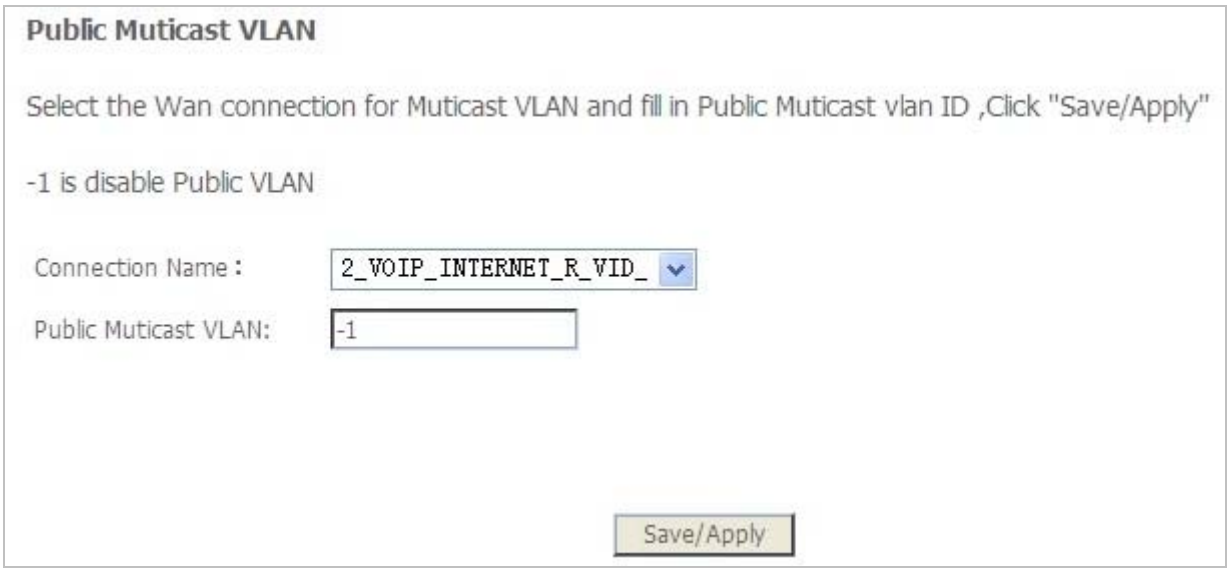


Figure 5-4-21 IPTV

The page includes the following fields:

Object	Description
Connection Name	The WAN interface for your IPTV Application
Public Multicast VLAN	Specify the VLAN ID for your public Multicast streaming

5.5 MANAGEMENT

5.5.1 User Management

On this page you can set up the User Account password for your EPN-402NV. By default, the password for user account is ‘admin’. You can modify this password.

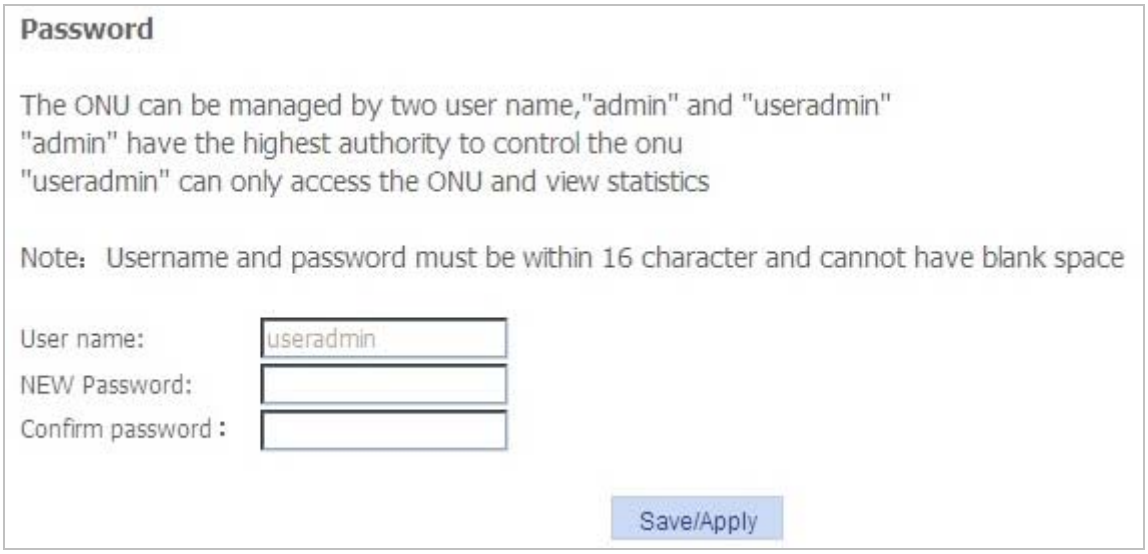


Figure 5-5-1 Password

The page includes the following fields:

Object	Description
User Name	The original user name, by default, it’s ‘admin’
New Password	The new password that you want to apply to your ONU
Confirm Password	Re-enter the new password

5.5.2 Device Management

- **Device Reboot**

On this page, you can reboot the Wi-Fi ONU by pressing the Reboot button.

Figure 5-5-2 Reboot

- **USB Backup**

On this page you can back up the configuration file to your USB Storage device.

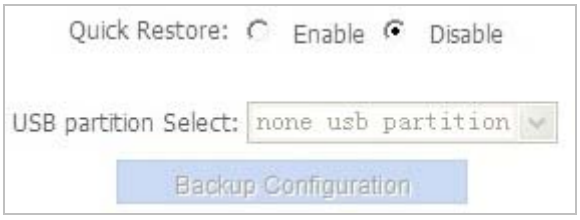


Figure 5-5-3 USB Backup

- **Reset ONU**

On this page, you can click the button to reset the ONU to factory default setting.

Figure 5-5-4 Reset to Default

5.5.3 Log Management

- **LOG LEVEL**

On this page, you can manage the log of your EPN-402NV.

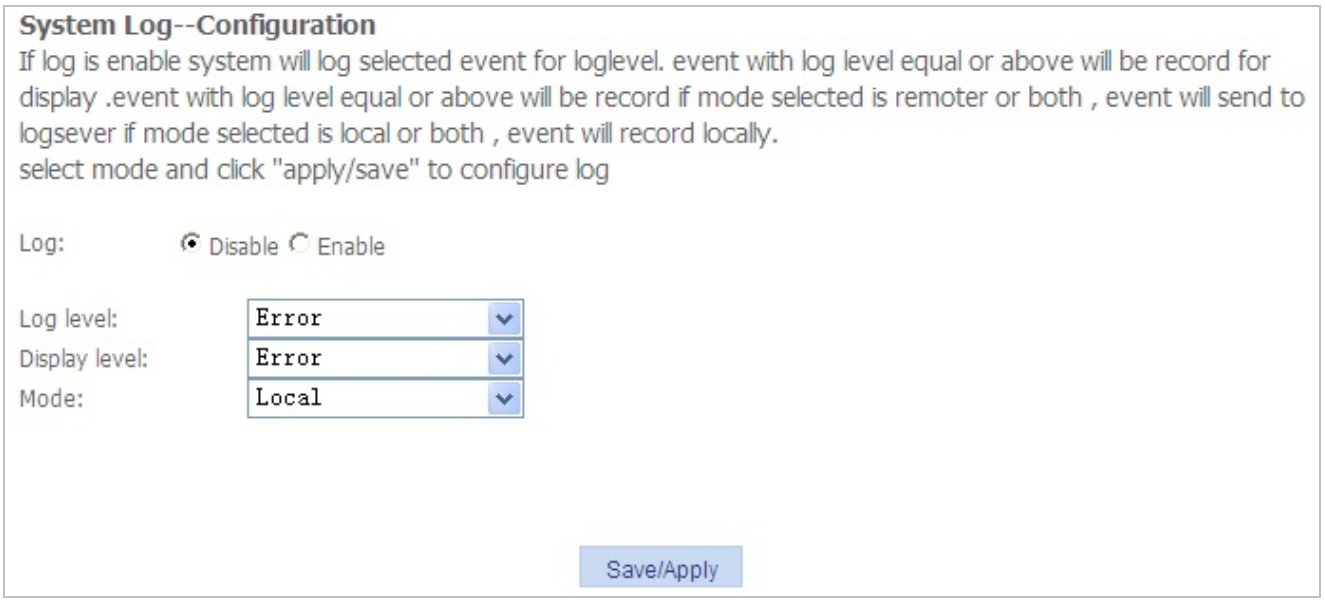


Figure 5-5-5 Log Level

The page includes the following fields:

Object	Description
Log	Check the box to enable or disable Log for your EPN-402NV
Log Level	To determine which type of log to be recorded in the log file
Display Level	To determine which type of log to be displayed in the log file
Mode	To determine either to enable local or remote logs
Server IP	The Server that you will store the logs
Server UDP Port	The port number for the Server which you will store up the logs

■ **LOG**

On this page, you can check or manage logs of your EPN-402NV.

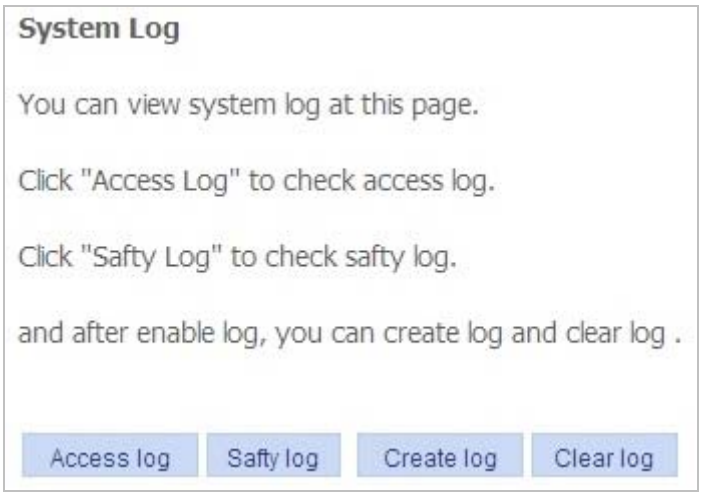


Figure 5-5-6 Log

The page includes the following fields:

Object	Description
Access Log	Click the ‘Access Log’ button to view the access logs of your Wi-Fi ONU
Safety Log	Click the ‘ Safety Log’ button to view the Security logs of your Wi-Fi ONU
Create Log	Click the ‘Create log’ button to compose a new log file.
Clear Log	Click the ‘Clear log’ button to clear all access logs and security logs of your Wi-Fi ONU

■ **Maintenance**

This function is for TR-069 management; it’s for manually provisioning new configurations/data to the remote ACS server.

Figure 5-5-7 Maintenance

5.6 DIAGNOSIS

5.6.1 Line Diagnosis

On this page, you can to view the connection status of your LAN and WLAN interfaces. Click the '**Retesting'** button to refresh the page

Figure 5-6-1 Line Diagnosis

5.6.2 Ping Test

On this page you can diagnose the Internet connections.

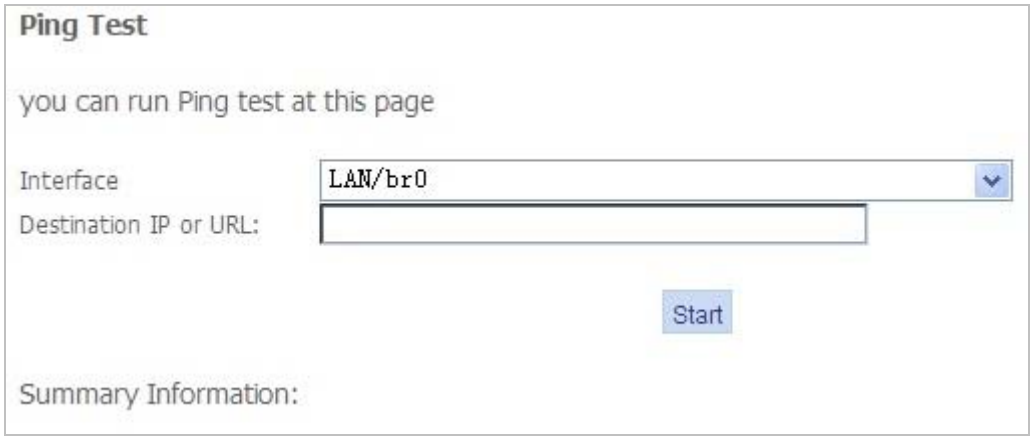


Figure 5-6-2 Ping Test

The page includes the following fields:

Object	Description
Interface	Choose one of the internet connection to run Ping Tests
Destination IP or	Enter the IP address or the Host Name that you want to Ping

URL	
Start	Click the 'Start' button to start ping the destination IP or URL

5.6.3 Tracert Diagnosis

On this page you can trace the route table for the destination IP address or Host.

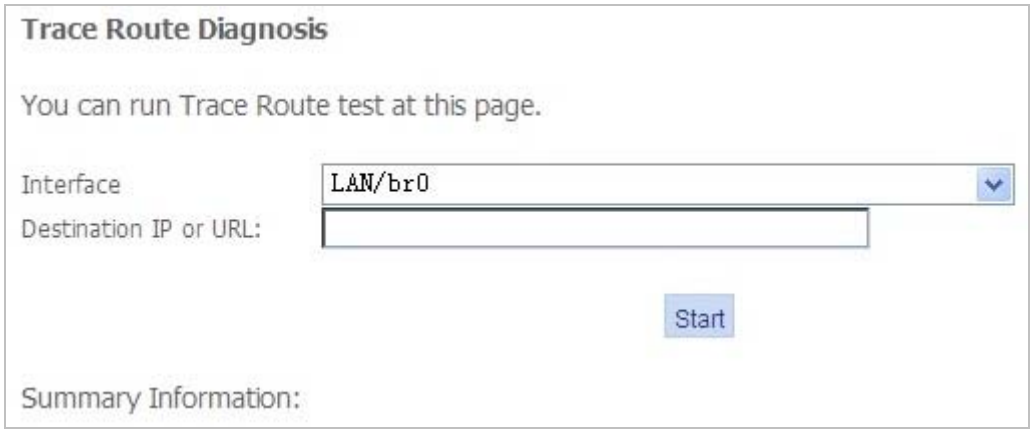


Figure 5-6-3 Trace Route

The page includes the following fields:

Object	Description
Interface	Choose one of the internet connection to run Trace Route
Destination IP or URL	Enter the IP address or the Host Name that you want to trace route with
Start	Click the 'Start' button to start ping the destination IP or URL

5.6.4 Inform Manual

Inform manual is a function for reporting failures or logs to the ACS server. On this page you can diagnose the inform report function of the EPN-402NV.

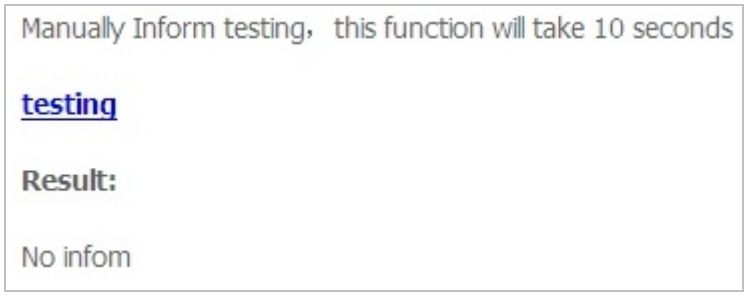


Figure 5-6-4 Inform Manual

Click the 'Testing' button to manually send message to a remote TR069 ACS Server.

5.7 HELP

You can view the help information of this device on this page.

Figure 5-7-1 Help

Chapter 6. Quick Connection to a Wireless Network

6.1 Windows XP (Wireless Zero Configuration)

Step 1: Right-click on the **wireless network icon** displayed in the system tray

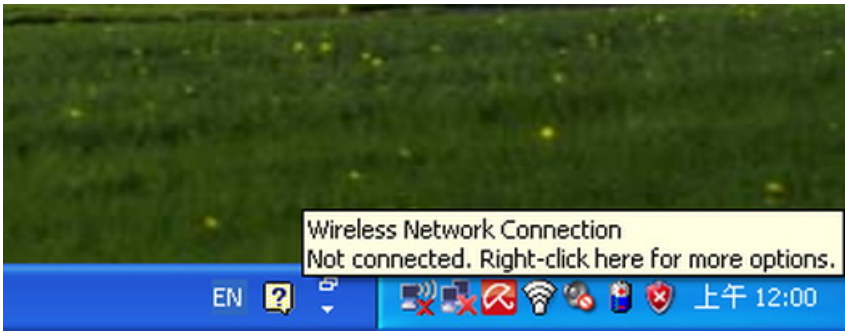


Figure 6-1

Step 2: Select [**View Available Wireless Networks**]

Step 3: Highlight and select the wireless network (SSID) to connect

(1) Select SSID (Take PLANET for example)

(2) Click the [**Connect**] button

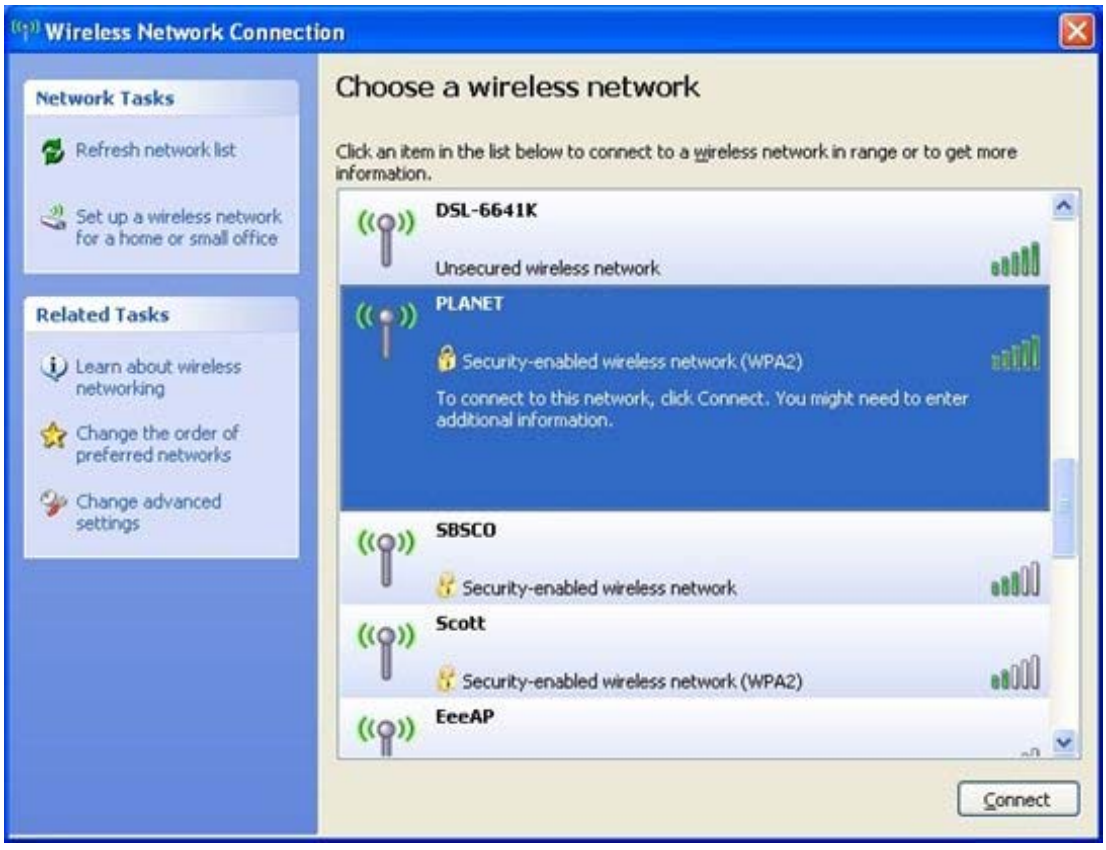


Figure 6-2 Wireless Network Connection

Step 4: Enter the encryption key of the Wi-Fi ONU

(1) The Wireless Network Connection box will appear

(2) Enter the encryption key that is configured in section 5.7.3

(3) Click the [Connect] button

Figure 6-3

Step 5: Check if "**Connected**" is displayed

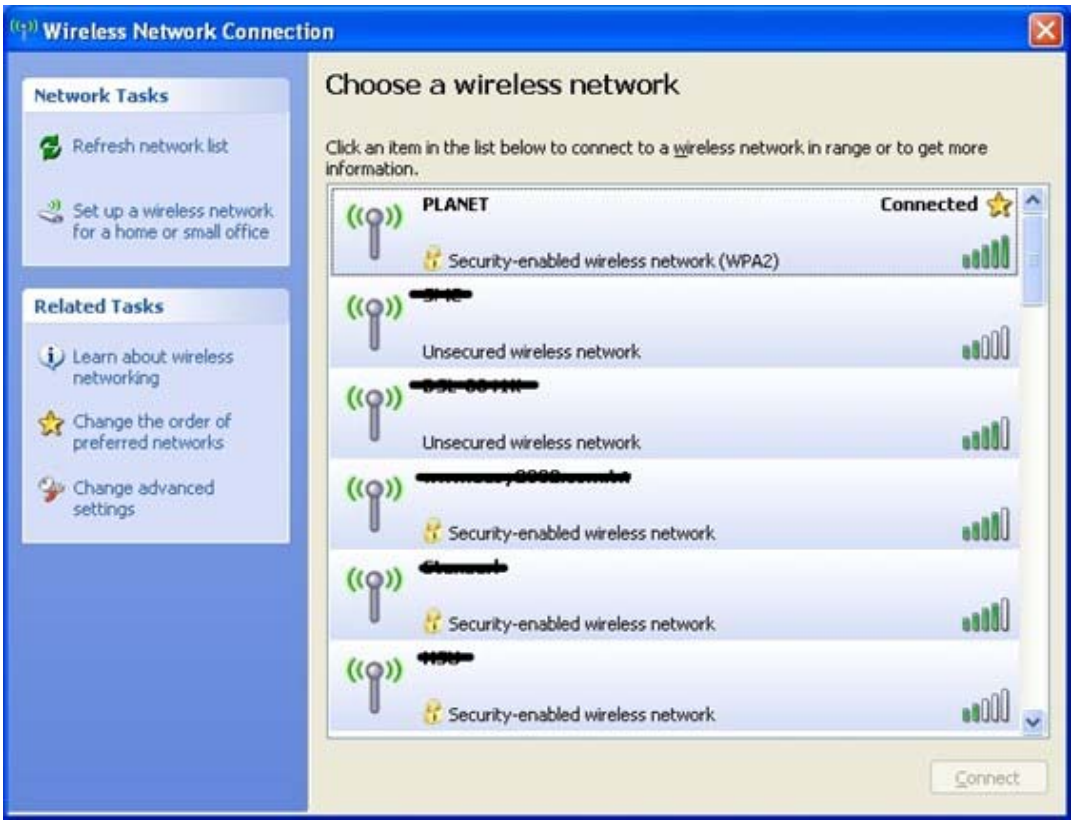


Figure 6-4

Note

Some laptops are equipped with a "Wireless ON/OFF" switch for the internal wireless LAN. Make sure the hardware wireless switch is switched to "ON" position.

6.2 Windows 7 (WLAN AutoConfig)

WLAN AutoConfig service is built-in in Windows 7 that can be used to detect and connect to wireless network. This built-in wireless network connection tool is similar to wireless zero configuration tool in Windows XP.

Step 1: Right-click on the **network icon** displayed in the system tray

Figure 6-5

Step 2: Highlight and select the wireless network (SSID) to connect

(1) Select SSID (Take default_2.4G for example)

(2) Click the [**Connect**] button

Figure 6-6

Note

If you will be connecting to this Wi-Fi ONU in the future, check [**Connect automatically**].

Step 4: Enter the **encryption key** of the Wi-Fi ONU

(1) **Connect to a Network** box will appear

(2) Enter the encryption key that is configured in section 5.7.3

(3) Click the [OK] button

Figure 6-7 Connect to a Network

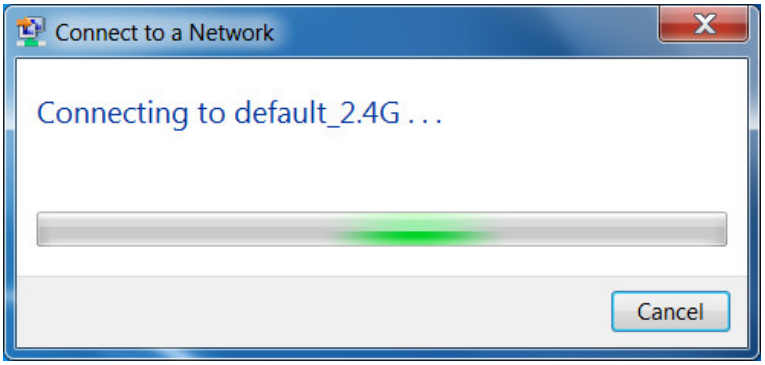


Figure 6-8 Connecting

Step 5: Check if "**Connected**" is displayed

Figure 6-9

6.3 Mac OS X 10.x

Step 1: Right-click on the **network icon** displayed in the system tray

The AirPort Network Connection menu will appear

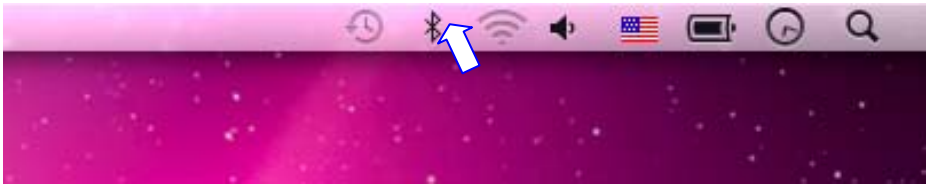


Figure 6-10

Step 2: Highlight and select the wireless network (SSID) to connect

(1) Select and SSID (Take PLANET for example)

(2) Double-click on the selected SSID

Figure 6-11

Step 4: Enter the **encryption key** of the Wi-Fi ONU

(1) Enter the encryption key that is configured in section 5.7.3

(2) Click the [OK] button

Figure 6-12

Note

If you want to connect this Wi-Fi ONU in the future, check [**Remember this network**].

Step 5: Check if the AirPort is connected to the selected wireless network.

If “Yes”, then there will be a “check” symbol in the front of the SSID.

Figure 6-13

6.4 iPhone / iPod Touch / iPad

Step 1: Tap the [**Settings**] icon displayed in the home screen

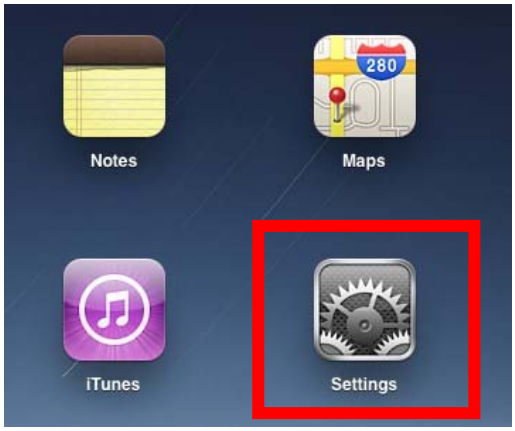


Figure 6-14

Step 2: Check Wi-Fi setting and select the available wireless network

(1) Tap [**General**] \ [**Network**]

(2) Tap [**Wi-Fi**]

If this is the first time to connect to the Wi-Fi ONU, it should show “Not Connected”.

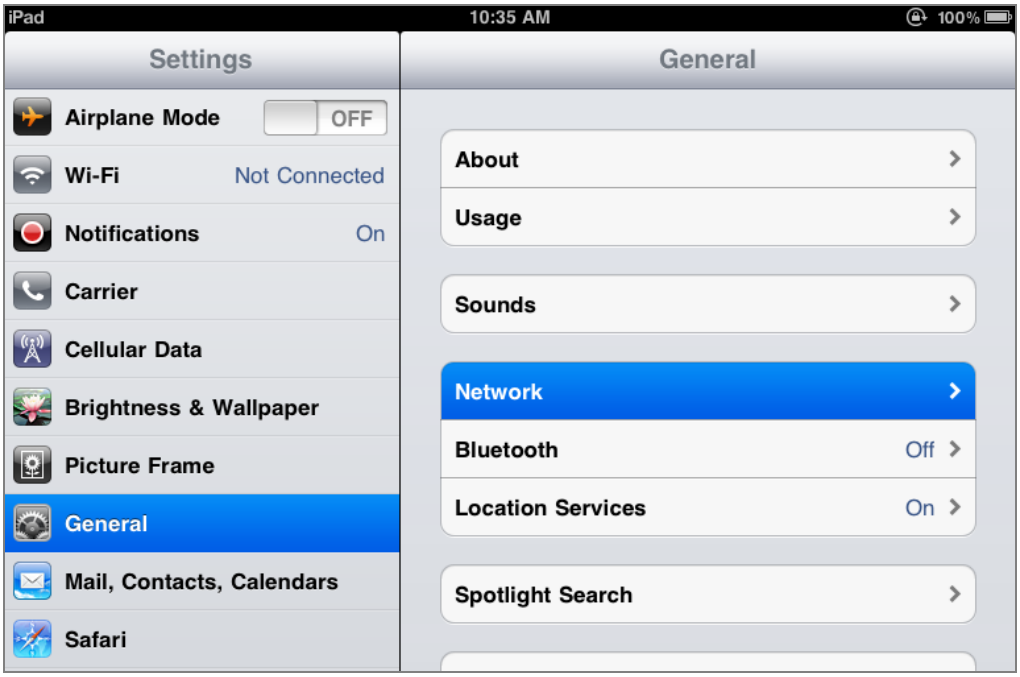


Figure 6-15

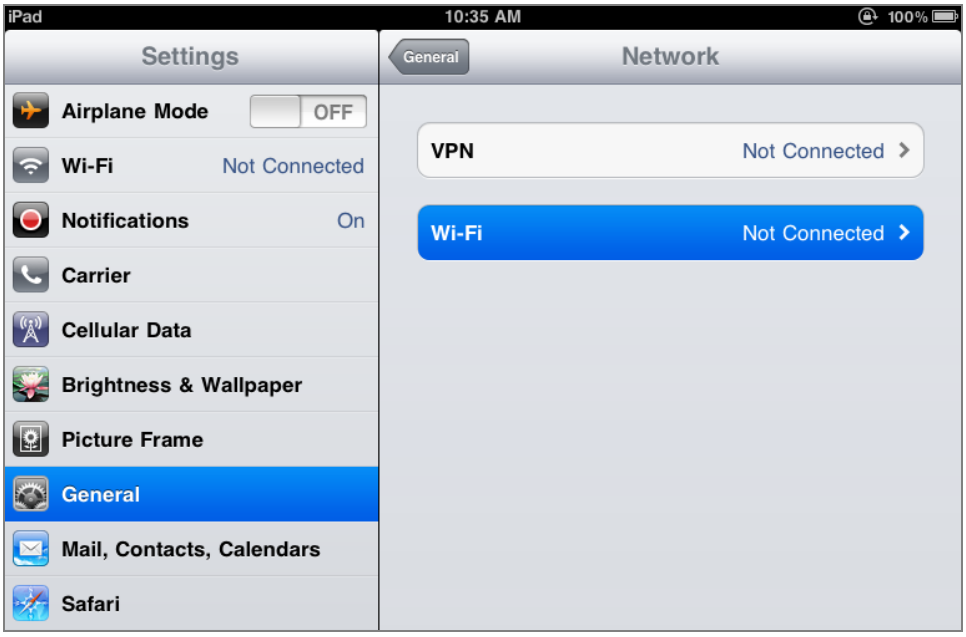


Figure 6-16

Step 3: Tap the target wireless network (SSID) in "**Choose a Network…**"

(1) Turn on Wi-Fi by tapping "**Wi-Fi**"

(2) Select SSID (Take PLANET for example)

Figure 6-17

Step 4: Enter the **encryption key** of the Wi-Fi ONU

(1) The password input screen will be displayed

(2) Enter the encryption key that is configured in section 5.7.3

(3) Tap the [**Join**] button

Figure 6-18

Step 5: Check if the iDevice is connected to the selected wireless network.

If “Yes”, then there will be a “check” symbol in the front of the SSID.

Figure 6-19

Appendix A: Specifications

Product		**EPN-402NV** GEPON Wi-Fi ONU
Hardware Specifications		
Transmission Speed		Downstream: 1.25 Gbps Upstream: 1.25 Gbps
Port	**PON Port**	1 x PON Port
	Ethernet Port	4 x RJ45 (10/100BASE-TX)
	FXS Port	2 x RJ11 Port
	USB Port	1 x USB 2.0 Port Type A, 5V 500mA
Optic Wavelength		TX: 1270mm RX:1480mm
Optical Receive Sensitivity		-25 dBm
Dimensions (W x D x H)		190 x 137 x 48 mm
Weight		350g
Power Input		12V DC, 1A
Power Consumption		12W
EMS Utility Specifications		
ONU Feature		Supports IGMP snooping Supports MLD snooping Supports 802.3ah CTC external OAM Supports DBA algorithm Supports 128-bit triple churning algorithm Supports dying gasp IEEE 802.3ah compliant forward error Correction (FEC) Supports TR-069
Wireless Interface Specifications		
Standard		Compliant with IEEE 802.11b/g/n
Frequency Band		2.4~2.4835GHz
Antenna		Gain: 3 dBi internal antennas
Extended Frequency		DSSS
Modulation Type		DBPSK, DQPSK, QPSK, CCK and OFDM (BPSK/QPSK/16-QAM/ 64-QAM)
Data Transmission Rates		802.11n (40MHz):270/243/216/162/108/81/54/27Mbps 135/121.5/108/81/54/40.5/27/13.5Mbps (Dynamic) 802.11n (20MHz):130/117/104/78/52/39/26/13Mbps 65/58.5/52/39/26/19.5/13/6.5Mbps (Dynamic) 802.11g:54/48/36/24/18/12/9/6Mbps (Dynamic) 802.11b:11/5.5/2/1Mbps (Dynamic)
Channel		Europe/ ETSI: 2.412~2.472GHz (13 Channels)
Max. RF Power		16 dBm max. (EIRP)

Encryption Security	■ WEP (64/128-bit) encryption security ■ WPA-Personal / WPA2-Personal (TKIP/AES) ■ Mixed WPA / WPA2-PSK
Wireless Security	Provides wireless LAN ACL (Access Control List) filtering
	Wireless URL filtering
	Supports WPS (Wi-Fi Protected Setup)
	Enables/Disables SSID broadcast
Wireless Advanced	WMM (Wi-Fi multimedia): 802.11e wireless QoS
	Provides wireless statistics
Max. Supported Clients	128
Firewall	NAT firewall with SPI (Stateful Packet Inspection)
	Built-in NAT server supporting DMZ
	Built-in firewall with IMAC address/ port/ URL filtering
	Supports DoS protection
VoIP Protocols and Standard	
Standard	SIP/H.248/MGCP T.38 (G.711 fax pass-through)
Voice Codec	G.711 a/u law, G.712, G.729a code/decode
Voice Standard	VAD (Voice Activity Detection) CNG (Comfort Noise Generation)
Environment Specifications	
Temperature	Operating temperature: -5 ~ 55 degrees C Storage temperature: -30 ~ 60 degrees C
Humidity	Operating Humidity: 10 ~ 90% non-condensing Storage Humidity: 5 ~ 95% non-condensing
Standards Conformance	
Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3x flow control and back pressure IEEE 802.11n

Appendix B: Glossary

- **802.11n** - 802.11n builds upon previous 802.11 standards by adding MIMO (multiple-input multiple-output). MIMO uses multiple transmitter and receiver antennas to allow for increased data throughput via spatial multiplexing and increased range by exploiting the spatial diversity, perhaps through coding schemes like Alamouti coding. The Enhanced Wireless Consortium (EWC) [3] was formed to help accelerate the IEEE 802.11n development process and promote a technology specification for interoperability of next-generation wireless local area networking (WLAN) products.
- **802.11b** - The 802.11b standard specifies a wireless networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4GHz, and WEP encryption for security. 802.11b networks are also referred to as Wi-Fi networks.
- **802.11g** - specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology, using OFDM modulation and operating in the unlicensed radio spectrum at 2.4GHz, and backward compatibility with IEEE 802.11b devices, and WEP encryption for security.
- **DDNS** (**D**ynamic **D**omain **N**ame **S**ystem) **-** The capability of assigning a fixed host and domain name to a dynamic Internet IP Address.
- **DHCP** (**D**ynamic **H**ost **C**onfiguration **P**rotocol) **-** A protocol that automatically configure the TCP/IP parameters for the all the PC(s) that are connected to a DHCP server.
- **DMZ** (**Dem**ilitarized **Z**one) **-** A Demilitarized Zone allows one local host to be exposed to the Internet for a special-purpose service such as Internet gaming or videoconferencing.
- **DNS** (**D**omain **N**ame **S**ystem) **-** An Internet Service that translates the names of websites into IP addresses.
- **Domain Name -** A descriptive name for an address or group of addresses on the Internet.
- **DSL** (**D**igital **S**ubscriber **L**ine) **-** A technology that allows data to be sent or received over existing traditional phone lines.
- **ISP** (**I**nternet **S**ervice **P**rovider) **-** A company that provides access to the Internet.
- **MTU** (**Maximum Transmission Unit**) **-** The size in bytes of the largest packet that can be transmitted.
- **NAT** (**N**etwork **A**ddress **T**ranslation) **-** NAT technology translates IP addresses of a local area network to a different IP address for the Internet.
- **PPPoE** (**P**oint to **P**oint **P**rotocol **o**ver **E**thernet) **-** PPPoE is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.
- **SSID -** A **S**ervice **S**et **Id**entification is a thirty-two character (maximum) alphanumeric key identifying a

wireless local area network. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID. This is typically the configuration parameter for a wireless PC card. It corresponds to the ESSID in the wireless Access Point and to the wireless network name.

- **WEP** (**W**ired **E**quivalent **P**rivacy) **-** A data privacy mechanism based on a 64-bit or 128-bit or 152-bit shared key algorithm, as described in the IEEE 802.11 standard.
- **Wi-Fi -** A trade name for the 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see http://www.wi-fi.net), an industry standards group promoting interoperability among 802.11b devices.
- **WLAN** (**W**ireless **L**ocal **A**rea **N**etwork) **-** A group of computers and associated devices communicate with each other wirelessly, which network serving users are limited in a local area.

EC Declaration of Conformity

English	Hereby, **PLANET Technology Corporation,** declares that this **802.11ac Wireless Broadband ONU** is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.	**Lietuviškai**	Šiuo **PLANET Technology Corporation,**, skelbia, kad **802.11ac Wireless Broadband ONU** tenkina visus svarbiausius 1999/5/EC direktyvos reikalavimus ir kitas svarbias nuostatas.
Česky	Společnost **PLANET Technology Corporation,** tímto prohlašuje, že tato **802.11ac Wireless Broadband ONU** splňuje základní požadavky a další příslušná ustanovení směrnice 1999/5/EC.	**Magyar**	A gyártó **PLANET Technology Corporation**, kijelenti, hogy ez a **802.11ac Wireless Broadband ONU** megfelel az 1999/5/EK irányelv alapkövetelményeinek és a kapcsolódó rendelkezéseknek.
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Eestikeeles	Käesolevaga kinnitab **PLANET Technology Corporation,** et see **802.11ac Wireless Broadband ONU** vastab Euroopa Nõukogu direktiivi 1999/5/EC põhinõuetele ja muudele olulistele tingimustele.	**Polski**	Niniejszym firma **PLANET Technology Corporation,** oświadcza, że **802.11ac Wireless Broadband ONU** spełnia wszystkie istotne wymogi i klauzule zawarte w dokumencie „Directive 1999/5/EC”.
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Español	Por medio de la presente, **PLANET Technology Corporation,** declara que **802.11ac Wireless Broadband ONU** cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE	**Slovensky**	Výrobca **PLANET Technology Corporation,** týmto deklaruje, že táto **802.11ac Wireless Broadband ONU** je v súlade so základnými požiadavkami a ďalšími relevantnými predpismi smernice 1999/5/EC.
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