User Manual

ADSL2+ Modem/Wireless Router with VoIP Gateway

Model:LX360

Contents

1 Introduction

The DSL Router, an ADSL2+ integrated access device (IAD), is an advanced all-in-one gateway, incorporating VoIP, USB storage, Ethernet switch, and wireless home networking access point, complied with the IEEE802.11b/g standards. It can provide high access performance applications for individual users, SOHOs, small enterprises, and so on.

Network and Router management is done through the web-based management interface that can be accessed through the local Ethernet using any web browser. You may also enable remote management to enable configuration of the Router via the WAN interface.

1.1 Application

- Home gateway
- SOHOs
- Small enterprises
- Voice over IP (VoIP)
- TV over IP (IPTV)
- Higher data rate broadband sharing
- Shared broadband internet access
- Audio and video streaming and transfer
- PC file and application sharing

1.2 Environment Requirements

- Operating temperature: 0ºC~40ºC (32ºF to 104ºF)
- Storage temperature: -10ºC~55ºC (14ºF to 131ºF)
- Operating humidity: 10%~95%, non-condensing
- Storage humidity: 5%~95%, non-condensing
- Power adapter input: 100V~240V AC, 50/60Hz
- Power adapter output: 12V DC, 2A

1.3 System Requirements

Recommended system requirements are as follows:

- Pentium 233 MHZ or above
- Memory: 64 Mbps or above
- 10M Base-T Ethernet or above
- Windows 9x, Windows 2000, Windows XP, Windows ME, Windows NT
- Ethernet network interface card

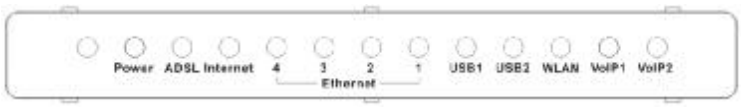
1.4 Safety Cautions

Follow the announcements below to protect the device from risks and damage caused by fire and electric power.

- Use volume labels to mark the type of power.
- Use the power adapter that is packed within the device package.
- Pay attention to the power load of the outlet or prolonged lines. An overburden power outlet or damaged lines and plugs may cause electric shock or fire accident. Check the power cords regularly. If you find any damage, replace it at once.
- Proper space left for heat radiation is necessary to avoid any damage caused by overheating to the device. The holes are designed for heat radiation to ensure that the device works normally. Do not cover these heat radiant holes.
- Do not put this device close to a place where a heat source exits or high temperature occurs. Avoid the device from direct sunshine.
- Do not put this device close to a place where is over damp or watery. Do not spill any fluid on this device.
- Do not connect this device to any PC or electronic product, unless our customer engineer or your broadband provider instructs you to do this, because any wrong connection may cause any power or fire risk.
- Do not place this device on an unstable surface or support.

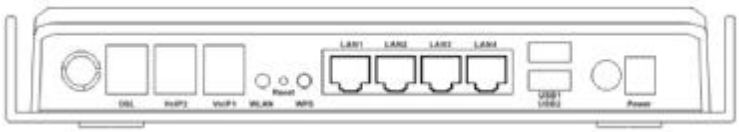
1.5 LED Status Description

1.5.1 Front Panel



Indicator	Status	Description
Power	Off	Power not supplied.
	On	Power supplied.
ADSL	Quick blink	DSL line is training.
	On	DSL line is connected.
	Off	DSL line is disconnected.
Internet	Off	No connection.
	Blink	DSL traffic is flowing.
	On	The users can access the Internet.
Ethernet4/3/2/1	Off	No Ethernet signal is detected.
	Blink	The user data is passing through Ethernet port.
	On	Ethernet interface is ready to work
USB1/2	Off	No USB device is detected.
	Blink	The user data is passing through USB port.
	On	The USB interface is ready to work.
WLAN	Off	No radio signal is detected.
	Blink	The user data is passing through WLAN port.
	On	WLAN interface is ready to work.
VoIP1/2	Off	VoIP phone is not registered.
	Blink	Phone is off-hook.
	On	VoIP phone is registered.

1.5.2 Rear Panel



Interface	Des ription

	Wireless antenna.
DSL	RJ-11 port, using the telephone line to connect the modem with the ADSL cable or splitter.
VoIP1/2	Connect to phone for VoIP application.
WLAN	Enable or disable the WLAN. Press the button for to enable the WLAN.
Reset	To restore the factory default, keep the device powered on and push a long needle into the hole. Press down the button and then release.
WPS	Enable or disable the WPS. Press the button to enable the WPS.
LAN1/2/3/4	RJ-45 port, connect the modem to a PC or other network device.
USB1/2	USB host port, connect to another USB device to supply some value-added application.
	Power switch.
Power	Power supplied port, plug in for power adapter that the power input is 12V DC, 2 A.

2 Hardware Installation

2.1 Choosing the Best Location for Wireless Operation

= Keep the numbers of walls and ceilings to the minimum:

The signal emitted from wireless LAN devices can penetrate through ceilings and walls. However, each wall or ceiling can reduce the range of wireless LAN devices from 1 ~ 30 miters. Position your wireless devices so that the number of walls or ceilings obstructing the signal path is minimized.

= Consider the direct line between access points and workstations:

A wall that is 0.5 meters thick, at a 45-degree angle appears to be almost 1 meter thick. At a 2-degree angle, it appears over 14 meters thick. Be careful to position access points and client adapters so the signal can travel straight through (90º angle) a wall or ceiling for better reception.

= Building materials make difference:

Buildings constructed using metal framing or doors can reduce effective range of the device. If possible, position wireless devices so that their signals can pass through drywall or open doorways. Avoid positioning them in the way that their signal must pass through metallic materials. Poured concrete walls are reinforced with steel while cinderblock walls generally have little or no structural steel.

= Position the antenna for best reception:

Play around with the antenna position to see if signal strength improves. Some adapters or access points allow you to judge the strength of the signal.

= Keep your product away (at least 1~2 meters) from electrical devices:

= Keep wireless devices away from electrical devices that generate RF noise such as microwave ovens, monitors, electric motors, etc.

2.2 Connecting the ADSL Router

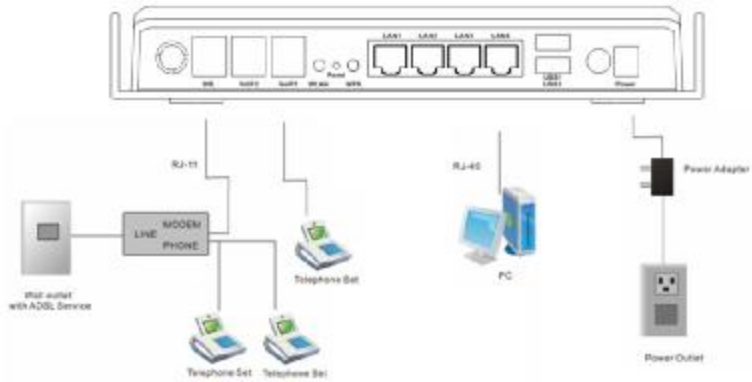
= See the following figure. Connect the DSL port of the DSL Router with a telephone cable.

= Connect the LAN port of the DSL Router to the network card of the PC via an Ethernet cable.

= Connect the VoIP port of the DSL Router to the phone.

= Plug one end of the power adapter to the wall outlet and connect the other end to the PWR port of the DSL Router.

The following figure displays the connection of the DSL Router, PC, and telephones.



3 Introduction to Web Configuration

3.1 Logging In to the Modem

Step 1 Open a Web browser on your computer.

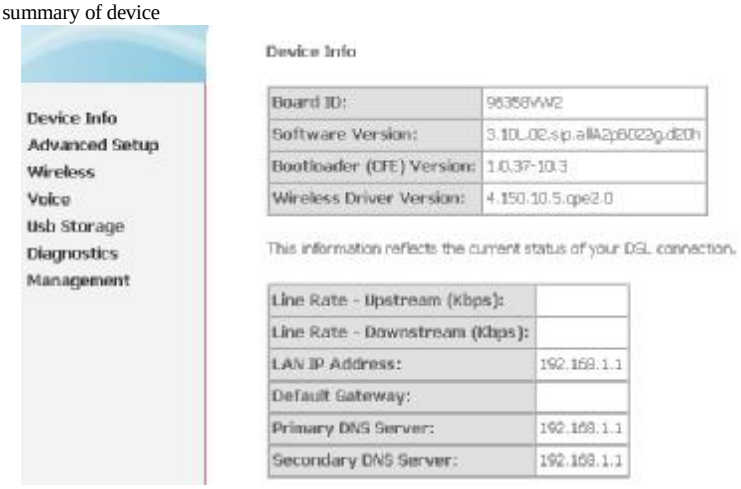
Step 2 Enter **http://192.168.1.1** (DSL router default IP address) in the address bar. The login page appears.

Step 3 Enter a user name and the password. The default username and password of the super user are **admin** and **admin**. The username and password of the common user are **user** and **user**. You need not enter the username and password again if you select the option **Remember my password**. It is recommended to change these default values after logging in to the DSL router for the first time.

Step 4 Click **OK** to log in or click **Cancel** to exit the login page.

3.2 Summary of Device Information

After logging in to the DSL router, the home page appears. In this page, you can view the summary of device

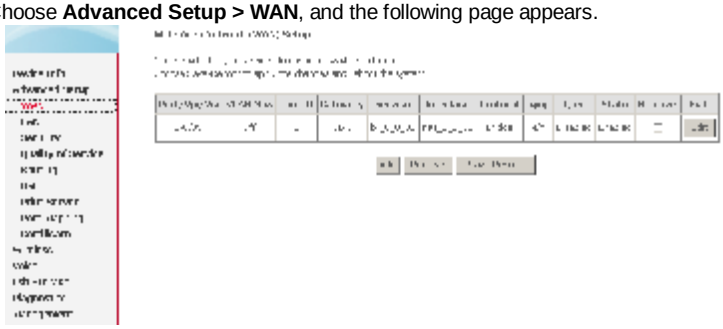


= **Default Gateway**: In the bridging mode there is no gateway. In other modes, it is the address of the uplink equipment, for example, PPPoE/PPPoA.

= **DNS Server**: In the PPPoE / PPPoA mode, it is obtained from the uplink equipment. In the bridging mode, there is no DNS Server address and you can manually enter the information.

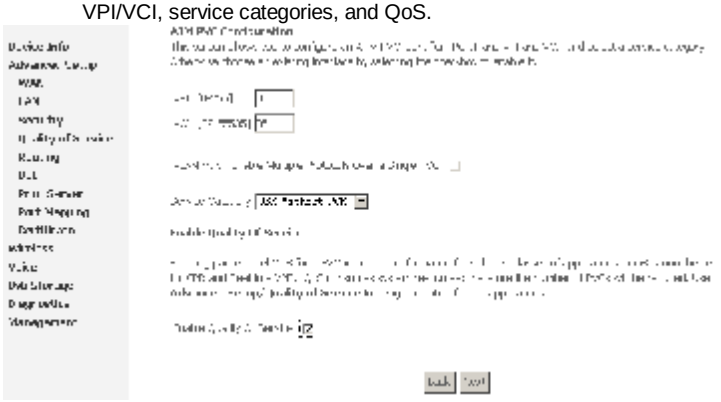
3.3 Advanced Setup

Choose **Advanced Setup > WAN**, and the following page appears.



3.3.1 Configuring PPPoE

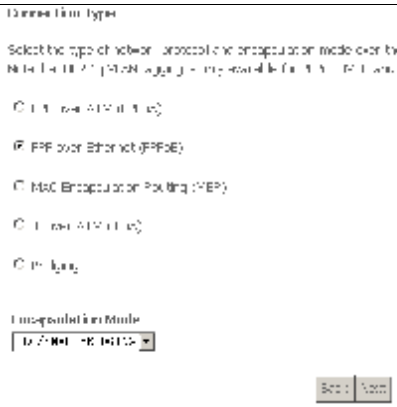
Step 1 Click **Add** and the following page appears. In this page, you can modify VPI/VCI, service categories, and QoS.



- **VPI**: Virtual path between two points in an ATM network. Its valid value range is from 0 to 255.
- **VCI**: Virtual channel between two points in an ATM network. Its valid value range is from 32 to 65535 (1 to 31 are reserved for known protocols).
- **Service Category**: UBR Without PCR/UBR With PCR/CBR/Non Realtime VBR/Realtime VBR.
- **Enable Quality Of Service**: Enable or disable QoS.

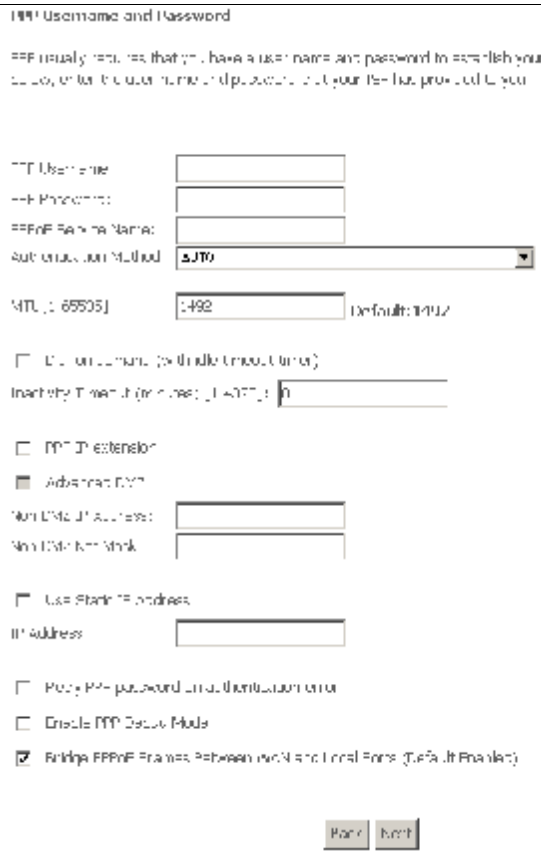
After proper modifications, click **Next** and the following page appears.

Step 2 In this page, you can modify the Internet connection type and encapsulation type.



Change the connection type of PVC 0/35 to PPP over Ethernet (PPPoE) and set the Encapsulation Mode to LLC/SNAP-BRIDGING (according to the uplink equipment). Click **Next** and the following page appears.

Step 3 In this page, you can modify the PPP user name, PPP password, authentication method.



- = **PPP Username:** The correct user name that your ISP provides to you.
- = **PPP Password:** The correct password that your ISP provides to you.
- = **PPPoE Service Name:** If your ISP provides it to you, please enter it. If not, do not enter any information.
- = **Authentication Method:** The value can be AUTO, PAP, CHAP, or MSCHAP. Usually, you can select AUTO.
- = **Dial on demand (with idle timeout timer):** If this function is enabled, you need to enter the idle timeout time. Within the preset minutes, if the modem does not detect the flow of the user continuously, the modem automatically

stops the PPPoE connection. Once it detects the flow (like access to a webpage), the modem restarts the PPPoE dialup.

If this function is disabled, the modem performs PPPoE dial-up all the time. The PPPoE connnection does not stop, unless the modem is powered off and DSLAM or uplink equipment is abnormal.

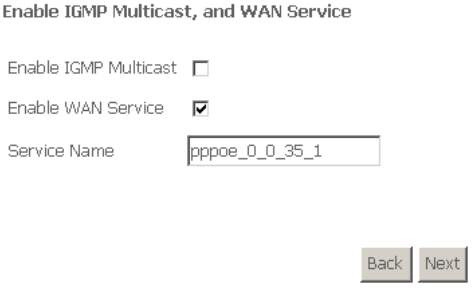
- **PPP IP extension:** If this function is enabled, the WAN IP address obtained by the modem through built-in dial-up can be directly assigned to the PC being attached to the modem (at this time, the modem connects to only one PC). From the aspect of the PC user, the PC dials up to obtain an IP addres. But actually, the dial-up is done by the modem.

If this function is disabled, the modem itself obtains the WAN IP address.

- **Advanced DMZ:** This is the virtual server configuration option. The DMZ host feature allows one local computer to be exposed to the Internet. In this way, other computers can easily access the DMZ host, the DMZ host is not protected by the firewall, and may be vulnerable to attack. This may also put other computers in the home network at risk. When designating a DMZ host, you must consider the security implications and protect it if necessary. To set up a DMZ host, you should enable the **PPP IP extension** first.
- **Non DMZ IP Address:** The DMZ host IP address. You can modify it.
- **Non DMZ Net Mask:** The DMZ host subnet mask. It is build upon the DMZ host IP address.
- **Use Static IP Address:** If this function is disabled, the modem obtains an IP address assigned by an uplink equipment such as BAS, through PPPoE dial-up.If this function is enabled, the modem uses this IP address as the WAN IP address.

After entering the PPP user name and password, click **Next** and the following page appears.

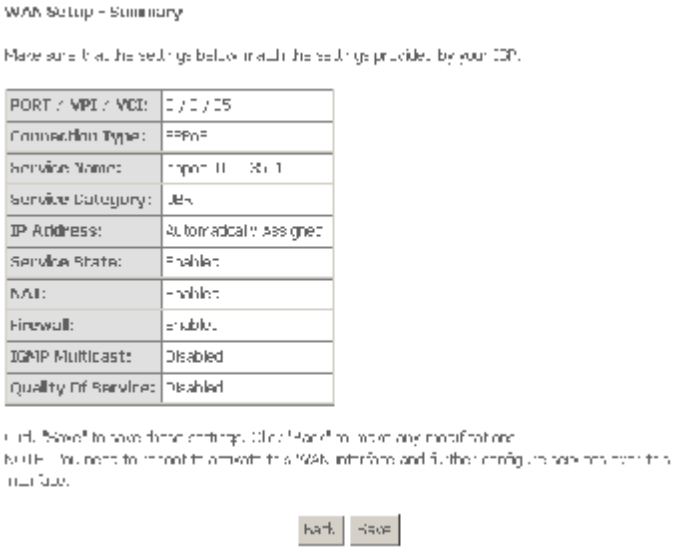
In this page, you can modify the service name, and enable or disable the IGMP multicast and WAN service.



= **Enable IGMP Multicast**: IGMP proxy. For example, if you wish that the PPPoE mode supports IPTV, enable this function.

= **Enable WAN Service**: Enable it, unless you do not want to active the PVC.

Click **Nex**t, and the following page appears. This page shows all the configuration. You can view the default values of NAT enable and Firewall enable.



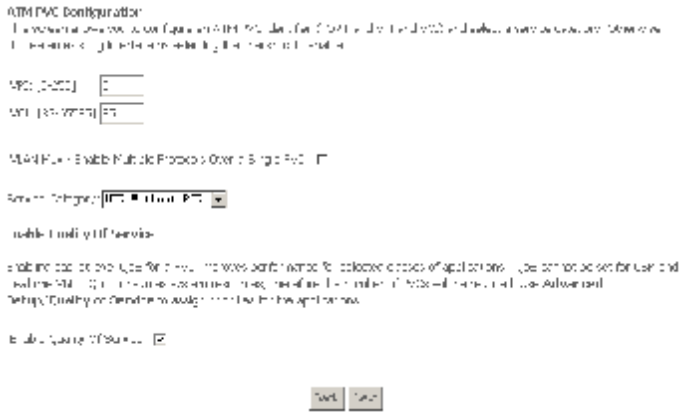
To save the settings, click **Save**. To make any modifications, click **Back**. After you click **Save**, the following page appears.

Note: You need to reboot the modem to activate this WAN interface and further configure services in this interface.

3.3.2 Bridge Configuration

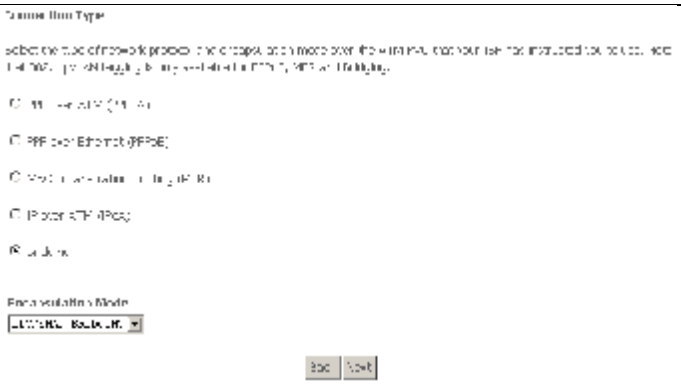
This section describes the procedure for adding PVC 0/35 (Bridge mode).

Click **Add,** and the following page appears. In this page, you can modify VPI/VCIs, service categories, and QoS.



In this example, PVC 0/35 is to be modified and the default values of service category remain. In actual applications, you can modify them as required.

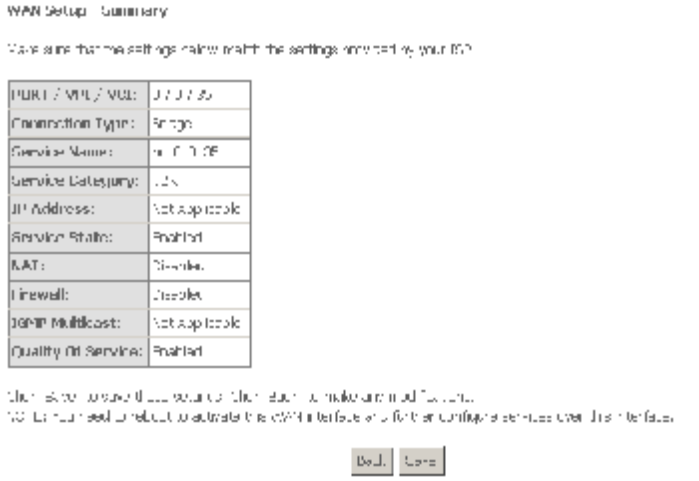
After proper modifications, click **Next** and the following page appears. In this page, you can modify the Internet connection type and encapsulation type.



Click **Next** and the following page appears. In this page, you can modify the service name.

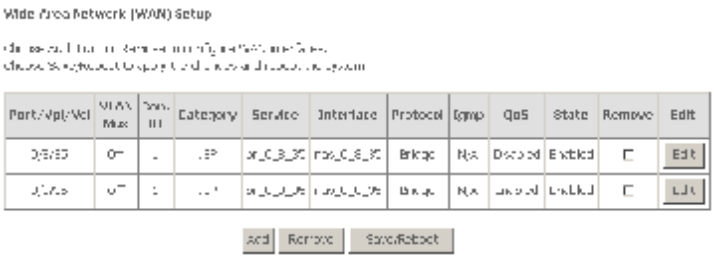
= **Enable Bridge Service:** Enable it, unless you do not want to active the PVC.

Click **Next** and the following page appears. This page shows all the configuration.



To save the settings, click **Save**. To make any modifications, click **Back**. After you click **Save**, the following page appears.

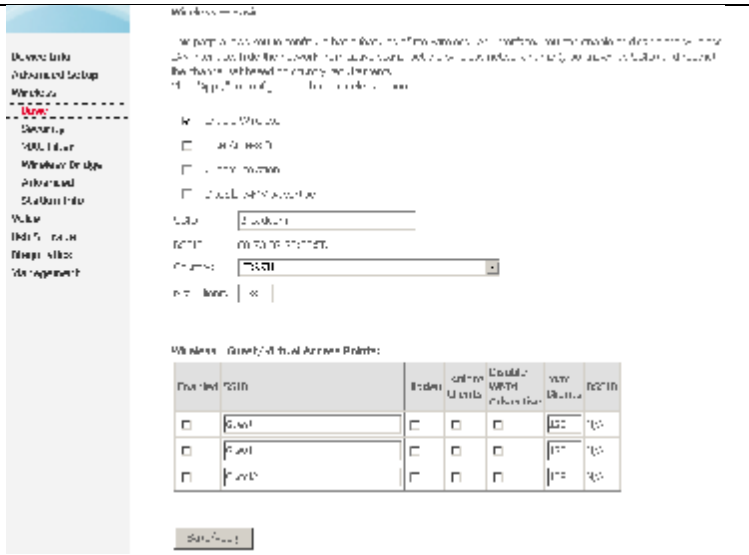
Note: You need to reboot the modem to activate this WAN interface and further configure services in this interface.



3.4 Wireless

3.4.1 Wireless – Basic

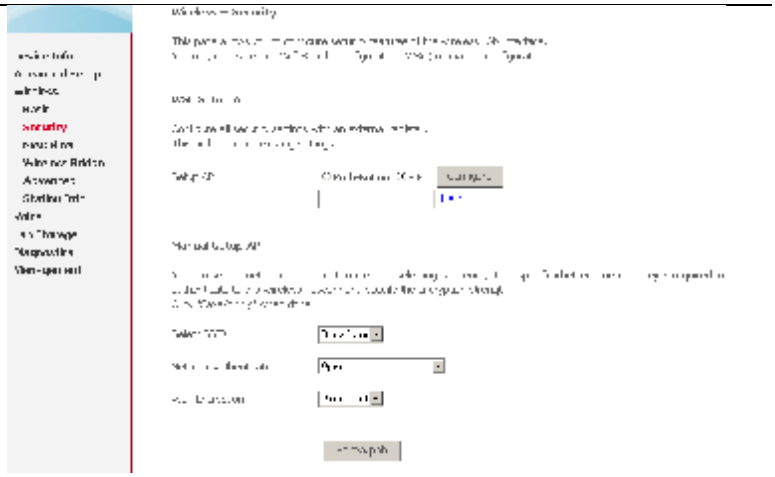
Choose **Wireless** > **Basic**, and the following page appears.



- **Enable Wireless**: If you want to make wireless be available, you have to check this box first. Otherwise, the Hide Access Point SSID, Country, Enable Wireless Guest Network, and Guest SSID box will not be displayed.
- **Hide Access Point**: Check this box if you want to hide any access point for your router, so a station cannot obtain the SSID through passive scanning.
- **SSID**: The SSID (Service Set Identification) is the unique name shared among all devices in a wireless network. The SSID must be identical for all devices in the wireless network.
- **Country**: The channel will adjust according to nations to adapt to frequency provision of each nation.
- **Guest SSID**: The SSID (Service Set Identification) is the unique name shared among all devices in a guest wireless network. The SSID must be identical for all devices in the guest wireless network.

3.4.2 Wireless – Security

Choose **Wireless** > **Security**, and the following page appears.

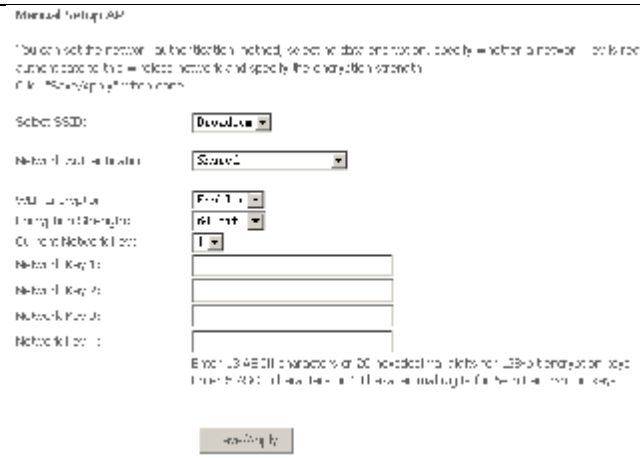


In this page, the data is not encrypted when it is transferred from the device to the client station. This is the default option.

- **Select SSID**: Select the wireless LAN of SSID to configure security features.
- **Network Authentication**: Select the authentication mode for the selected wireless LAN of SSID to be open. That is no WEP encryption, so the **WEP Encryption** is disabled.

64-bit WEP

If you select the “Shared” as the Network Authentication, you can select **64-bit** or **128-bit** as the Encryption Strength. In the following figure, select **64-bit** as an example.



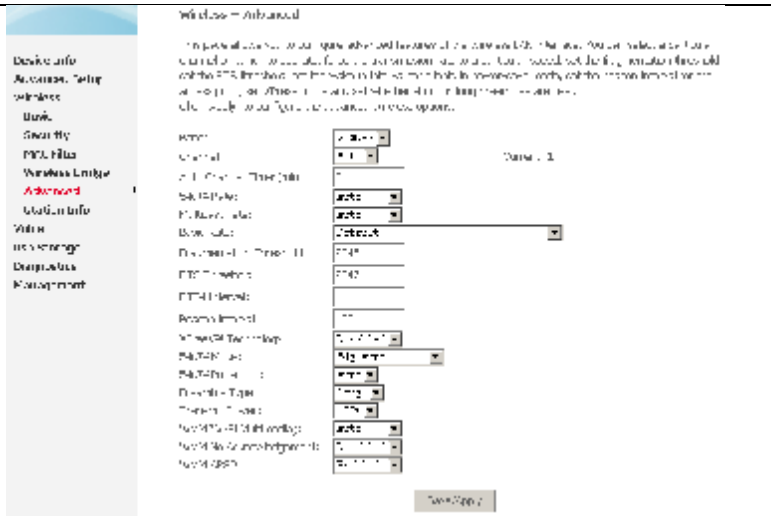
- = **Network Authentication**: Select the authentication mode for the selected wireless LAN of SSID to be open or shared.
- = **WEP Encryption**: Enable WEP Encryption.
- = **Encryption Strength**: Select the desired Data Security level to be 64-bit.
- = **Current Network Key**: Select one of network key that you set on the Key boxes as default one.
- = **Network Key 1 to 4**: Enter 5 ASCII characters or 10 hexadecimal digits for 64-bit encryption keys to fill out WEP keys box. The system allows you to type in 4 kinds of the WEP key.

The authentication modes are as follows: 802.1X, WPA, WPA-PSK,WPA2, WPA2 –PSK, Mixed WPA2/WPA, Mixed WPA2/WPA –PSK.

After proper configuration, click **Save/Apply** to save the wireless security options and make the modification effect.

3.4.3 Wireless – Advanced

Choose **Wireless** > **Advanced**, and the following page appears. This page allows you to configure advanced features of the wireless LAN interface. You can select a particular channel on which to operate, force the transmission rate to a particular speed, set the fragmentation threshold, set the RTS threshold, set the wakeup interval for clients in power-save mode, set the beacon interval for the access point, set XPress mode and set whether short or long preambles are used.



= **Band:** Select 802.11b/g using wireless frequency band range. The radio frequency remains at 2.437 GHz.

= **Channel:** Fill in the appropriate channel to correspond with your network settings. The default value is **Auto**. All devices in your wireless network must use the same channel in order to work correctly. This router supports auto channeling functionality.

= **Auto Channel Timer(min):** Specifies the timer of auto channelling.

= **54g™ 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 Router automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Router and a wireless client. The default value is **Auto**.

= **Multicast Rate:** Select the multicast 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 Router automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Router and a wireless client. The default value is **Auto**.

= **Basic Rate:** Select the basic transmission rate ability for the AP.

= **Fragmentation Threshold:** Packets that are larger than this threshold are fragmented into multiple packets. Try to increase the fragmentation threshold

if you encounter high packet error rates. Do not set the threshold too low, since this can result in reduced networking performance.

= **RTS Threshold:** This value should remain at its default setting of 2347.Should you encounter inconsistent data flow, only minor reductions are recommended. Should you encounter inconsistent data flow, only minor reduction of the default value, 2347, is recommended. If a network packet is smaller than the preset RTS threshold size, the RTS/CTS mechanism will not be enabled. The Router sends Request to Send (RTS) frames to a particular receiving station and negotiates the sending of a data frame. After receiving an RTS, the wireless station responds with a Clear to Send (CTS) frame to acknowledge the right to begin transmission. The RTS Threshold value should remain at its default value of 2347.

= **DTIM Interval:** Enter a value between 1 and 255 for the Delivery Traffic Indication Message (DTIM.) A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages.

= **Beacon Interval:** A beacon is a packet of information that is sent from a connected device to all other devices where it announces its availability and readiness. A beacon interval is a period of time (sent with the beacon) before sending the beacon again. The beacon interval may be adjusted in milliseconds (ms). Default (100) is recommended.

= **XPress™ Technology:** Select **Enabled** or **Disabled**. This is a special accelerating technology for IEEE802.11g. The defaule is **Disabled**.

= **54g™ Mode**: Compatible with IEEE 802.11b, IEEE 802.11g. Select a Standards from the drop-down list box. Its default setting is 54g Auto. The drop-down list box includes below mode:

- **802.11b Only**: Only stations that are configured in 802.11b mode can associate. If you select it, the rate of transmission only has selected values: 1 Mbps, 2 Mbps, 5.5 Mbps, and 11 Mbps. For other selections, the rate of transmission has lots of selected values: 1 Mbps, 2 Mbps, 5.5 Mbps, 6 Mbps, 9 Mbps, 11 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps.
- **54g LRS**: This is a special compatibility mode for 802.11b/g and is in fact designed for older types of b-clients. Use this mode if you are experiencing problems with wireless clients that connect to the Gawv5.4U4-A3 Access Point. If you select it, the preamble type will be disabled, which cannot be set.
- **54g Auto**: Only stations that are configured in 802.11b/g mode can associate.
- **54g Perfomance**: Only stations that are configured in 802.11g mode can associate. It is the same as 54g LRS, if you select it, the preamble type will be disabled, which cannot be set.

- **54g™ Protection**: The 802.11g standards provide a protection method so 802.11g and 802.11b devices can co-exist in the same network without "speaking" at the same time. Do not disable 54g Protection if there is a possibility that a 802.11b device may need to use your wireless network. In Auto Mode, the wireless device will use RTS/CTS to improve 802.11g performance in mixed 802.11g/802.11b networks. Turn protection off to maximize 802.11g throughput under most conditions.
- **Preamble Type**: Preambles are a sequence of binary bits that help the receivers synchronize and ready for receipt of a data transmission. Some older wireless systems like 802.11b implementation use shorter preambles. If you are having difficulty connecting to an older 802.11b device, try using a short preamble. You can select short preamble only if the 54g mode is set to 802.11b.
- **Transmit Power:** Adjust the transmission range here. This tool can be helpful for security purposes if you wish to limit the transmission range.
- **WMM(Wi-Fi Multimedia)**: Select whether WMM is enable or disabled. Before you disable WMM, you should understand that all QoS queues or traffic classes relate to wireless do not take effects.
- **WMM No Acknowledgement:** Select whether ACK in WMM packet. By default, the Ack Policy for each access category is set to Disable, meaning that an acknowledge packet is returned for every packet received. This provides a more reliable transmission but increases traffic load, which decreases performance. To disable the acknowledgement can be useful for voice, for example, where speed of transmission is important and packet loss is tolerable to a certain degree.
- **WMM APSD**: APSD is short for automatic power save delivery, Selecting enable makes it have very low power consumption. WMM Power Save is an improvement to the 802.11e amendment adding advanced power management functionality to WMM.

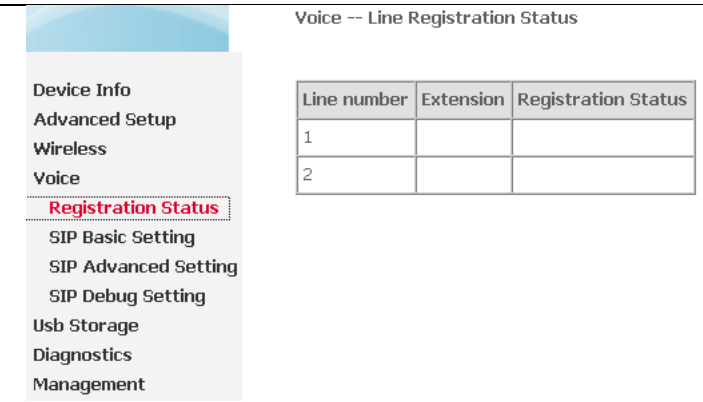
Click **Save/Apply** to configure the advanced wireless options and make the changes take effect.

3.5 Voice

The VoIP page does not contains **Save/Apply** button, but you can save your configurations by clicking **Stop SIP clien**t or **Start SIP clien**t. Both of the actions can save the configurations. If you want to start the VoIP service, click **Start SIP clien**t. If you want to stop the VoIP service, click **Stop SIP clien**t.

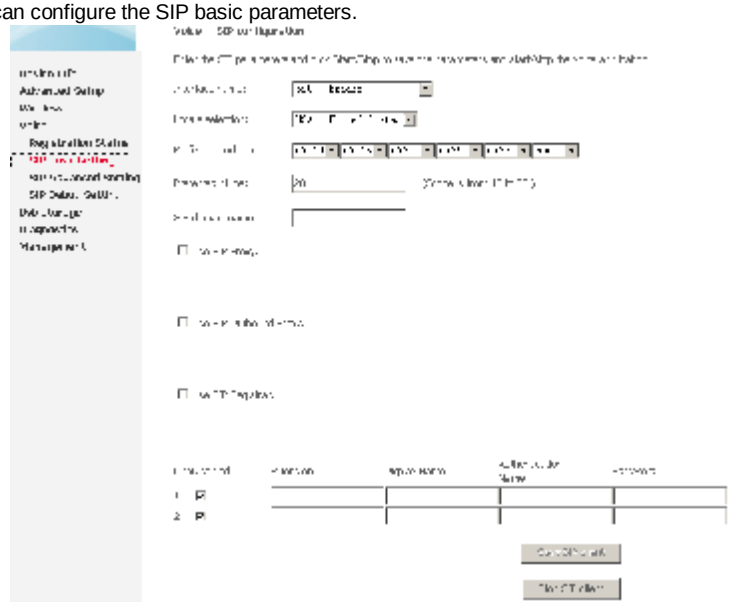
3.5.1 Registration Status

Choose **Voice > Registration Status**, the following page appears. In this page, you can view the status of Voice line registration.



3.5.2 SIP Basic Setting

Choose **Voice > SIP Basic Setting**, the following page appears. In this page, you can configure the SIP basic parameters.



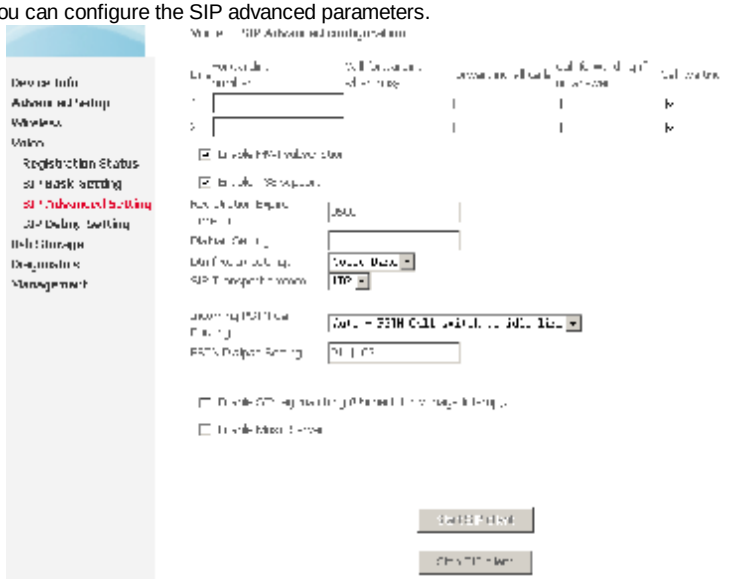
= **Interface name**: This item provides for you to choose the way which VoIP of the DSL router connects to SIP Proxy.

- **Locale selection**: This item provides for you to choose country where your locale in. The different country use different standards used by DSL router VoIP module, such as ring tone standard. Locale selection default value is USA.
- **Preferred code list:** This item provides for you to specify the priority of codec, and the priority of codec declined from up to down. Codecs define the method of relaying voice data. Different codecs have different characteristics, such as data compression and voice quality. For Example, G.723 is a codec that uses compression, so it is good for use where bandwidth is limited but its voice quality is not as good compared to other codecs such as the G.711.If you specify none of the codecs, using the default value, the DSL ROUTER choose the codec automatically.
- **SIP domain name**: The IAD SIP domain name of UA. If the SIP UA has no domain name, let it be blank and the IAD can use the IP address of VoIP WAN interface.
- **Use SIP Proxy**: Select the check box if your DSL router uses a SIP proxy. SIP proxy allows other parties to call DSL router through it.
- **Use SIP Outbound Proxy**: Some network service providers require the use of an outbound proxy. This is an additional proxy, through which all outgoing calls are directed. In some cases, the outbound proxy is placed alongside the firewall and is the only way to let SIP traffic pass from the internal network to the Internet.
- **Use SIP Registrar**: Select this option to register with the proxy. You can register your USER ID on the SIP Registrar. SIP Registrar works with SIP Proxy, allowing other parties to call DSL ROUTER through it.
- **LineDisabled**: Line number is a telephone port in the Router to which you can connect a standard (POTS) telephone. If you check this option, and the line corresponding you checked is disable. You can not use it to initiate or accept any call.
- **Extension:** This is VoIP user ID of telephone, used for identification to initiate and accept calls.
- **Display Name:** A free text description which is displayed to remote parties as your caller ID.
- **Authentication Name:** The login name used for authentication with the SIP proxy.
- **Password:** The password used for authentication with the SIP proxy.

Note: Click **Start SIP client** or **Stop SIP client** to save the configurations.

3.5.3 SIP Advanced Setting

Choose **Voice > SIP Advanced Setting**, the following page appears. In this page, you can configure the SIP advanced parameters.



- **Forwarding number**: Set the number to forward a call. This number can also be set through dialing '*74<NUM>#' on the phone key pad.
- **Call forwarding when busy**: Enable **Call forwarding when busy**. When this box is checked, incoming calls are forwarded to an appointed number (see Forwarding number) when the specific line is busy. It has the same effect as dialing ***72** on the phone pad.
- **Forwarding all calls**: Enable **Forwarding all calls**. When this box is checked, incoming calls are forwarded to an appointed number (see Forwarding number) unconditionally. Dialing ***73** can also accomplish this service.
- **Call forwarding if no answer**: Enable **Call forwarding if no answer**. When this box is checked, incoming calls are forwarded to an appointed number when it is not answered in 18s. Dialing ***71** can also accomplish this service.

= **Call waiting**: If call waiting is enabled on a line (see feature codes on the below), and you hear the call waiting tone during a call, press flash to answer the second call. The first call is automatically placed on hold. To switch between calls, press flash again.
  - Check the feature “Call waiting” to enable this function
  - Dial ‘*61’ can also enable Call waiting and dial ‘*60’ can also disable Call waiting
  - Call forward feature settings (Busy or All) takes priority over the call waiting feature
  - Call waiting feature is ignored on new incoming calls if there is already a call on hold or in conference
= **Enable MWI subscription**: MWI stands for message waiting indicator. When set this enabled, the Router sends a SIP SUBSCRIBE message to proxy, asking for a notification when its voicemail status changes. When its status do changes, the proxy sends a NOTIFY message to gateway, causing a MWI tone streamed to the handset of the user.
= **Enable T38 support**: Checking this box enables T38 support. When doing a fax transmission on the Router, after fax tone been detected, fax transmission switches to T38 mode.
= **Registration Expire Timeout**: It is the interval the Router initiates a new registration since last one. It is also known as ‘registration assurance timer’. The gateway uses this mechanism to keep its binding record updated.
= **Dialpan Setting**: Set the VoIP dial plan. If user-dialed number matches it, the number is processed by the Router immediately.
= **Dtmf Relay setting**: Set DTMF transmit method, which can be following values:
  - **SIP Info**: Use SIP INFO message to transmit DTMF digits.
  - **RFC2833:** Use RTP packet to encapsulate DTMF events, as specified in RFC 2833.
  - **Voice Band:** DTMF events are mixed with user voice in RTP packet.
= **SIP Transport protocol**: Select the transport protocol to use for SIP signaling. Note that SIP proxy and registrar need to support the protocol you choose.
= **Incoming PSTN Call Routing**: Select the way incoming PSTN calls to be routed. It has following items:

- **Auto - PSTN Call switch to idle line**: The Router automatically selects the idle line for incoming PSTN call.
- **Line1 - PSTN Call switch to Line1**: PSTN call is routed to line 1. If it is busy, PSTN call fails.
- **Line2 - PSTN Call switch to Line2**: PSTN call is routed to line 2.
- **VoIP - PSTN Call switch to VoIP call:** PSTN call can be routed to VoIP extension, which is filled in '**PSTN Call Routing Data**'.

= **PSTN Dialpan Setting**: Set the PSTN dial plan. If user-dialed number matches it fully, the number can be processed by DSL router immediately and make PSTN call.

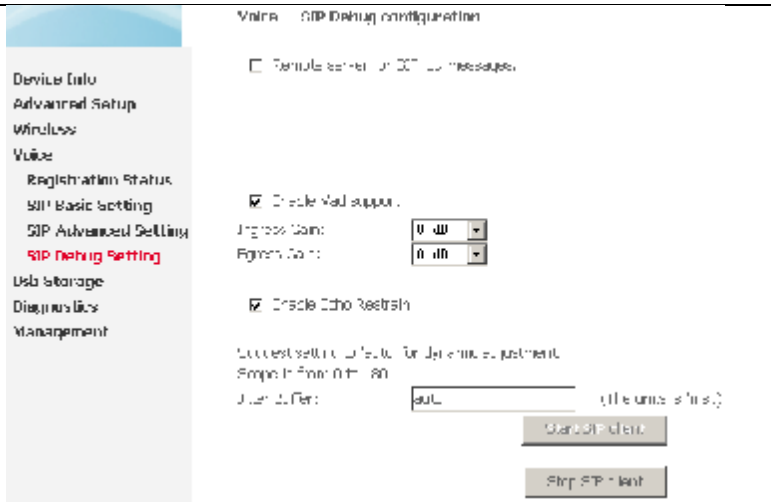
= **Enable SIP tag matching (Uncheck for Vonage Interop)**: Enable the checking of the 'to' tag in SIP message. Enabling this feature may impose more strictly checking on SIP messages. If you place the Router in a Vonage network, using the Vonage server, make sure to uncheck it.

= **Enable Music Server**: When set enabled, the holding party acts like a coordinator, and triggers the music server to stream music to the hold party. This is done by sending an INVITE without SDP to music server, and acknowledging response of the server with an ACK message containing the SDP of the hold party. Music server then streams music to hold party.

Note: Click **Start SIP client** or **Stop SIP client** to save the configurations.

3.5.4 SIP Debug Setting

Choose **Voice > SIP Debug Setting**, the following page appears.



= **Remote server for SIP log message:** For SIP Debugging. Set one IP address and one port. The SIP message (both send and receive) of IAD send to the setting host.

= **Enable Vad support:** Configure voice activity detection (VAD) and comfort noise generator (CNG).

= **Ingress Gain:** Set receiving gain.

= **Egress Gain:** Set transmitting gain.

= **Enable Echo Restrain:** Set echo canceller.

= **Jitter Buffer:** Set gain of jitter buffer. You can set a static buffer or select Auto. Auto means adaptive buffer.

Note: Click **Start SIP client** or **Stop SIP client** to save the configurations.

3.5.5 VoIP Functionality

This section describes how to use the functionality of the Router. Some features involve 2 or 3 parties. In that case, note that all 3 parties have to be successfully registered.

3.5.5.1 Registering

Before using any VoIP functionality, the Router must register itself to a registrar. the Router also has to be configured with a proxy, which relays VoIP signaling to next

hop. In fact, many implementations integrate these two into one server, so in many case registrar and proxy refer to the same IP.

(1) Select the right interface to use for registering, depending on where Proxy/Registrar resides. If use WAN link, make sure it is already up.
(2) Fill **SIP domain name** with the IP address or the domain name of the SIP proxy. Note if we use domain name, it must be resolvable to the IP address of the proxy.
(3) Select the **Use SIP Registrar** check box and enter the right value in the **IP/Port** field.
(4) Fill the extension information: **Extension**, **Display Name**, **Authentication Name** and **Password**. **Authentication Name** and **Password** must be pre-configured in registrar database.
(5) Click **Stop SIP client** (if VoIP application has been started already), then **Start SIP client** to make above settings take effect.
(6) VoIP LED should be on, indicating that SIP client is successfully registered.

3.5.5.2 Placing a call

This section depicts how to place a basic VoIP call.

(1) Pick up the handset on the phone.
(2) Now you hear the dial-tone. Dial the extension of remote party
(3) To end the dialing, wait for digit-timeout, or just press # immediately.
(4) After remote party answers the call, you are in voice connection.

3.5.5.3 Anonymous call

Anonymous call does not send the caller ID to remote party. This is useful if you don't want others know whom you are.

(1) Pick up the handset on the phone.
(2) Dial ***83** to enable anonymous call.
(3) Hook on the handset, and dial another extension as you like. Now your caller ID information is blocked.
(4) To enable caller ID transmission again, dial ***84** on the key pad.

3.5.5.4 Do Not Disturb (DND)

If DND enabled, all incoming calls will be rejected. DND is useful if you do not want others to bother you.

(1) Pick up the handset on the phone.
(2) Dial ***86** to enable DND function
(3) Hook on the phone. Now your phone rejects all incoming calls.
(4) To disable DND, press ***87** on the key pad.

3.5.5.5 Redial

For outgoing calls, DSL Router remembers the number you dial. Next time when you want to dial that person, the Router provides you the redial functionality.

(1) To re-dial the latest dialed person, press ***68** on the key pad.
(2) Now you have made the call, as if you just dialed the whole number.

3.5.5.6 Call Return

For incoming calls, the Router remembers the number of calling party.

(1) To return a call, press ***69**.
(2) Now you have made the call as if you have dialed the whole number

3.5.5.7 Call Hold

Call hold enable you put a call to a pending state, and pick it in future.

(1) Assuming you are in a voice connection, you can press **FLASH** to hold current call.
(2) Now you can call another party, or press **FLASH** again to return to first call.

3.5.5.8 Call Waiting

Enabling call waiting allows third party to call in when you are in a voice connection.

(1) Pick up the phone attached to the Router.
(2) Press ***61** to enable call waiting function.
(3) Assuming that you are in a voice connection, when another call comes in, the Router streams a call waiting tone to your phone, indicating another call is available.
(4) Press **FLASH** switches to this call and the initial call puts to hold automatically.
(5) Press **FLASH** for several times switches between these two calls back and forth.
(6) Pressing ***60** disables call waiting function.

3.5.5.9 Blind Transfer

Bind transfer transfers the current call to a third party blindly, regardless of whether the transfer is successfully.

(1) Assume that you have already been in a voice connection.
(2) Press **FLASH** to hold the first party.
(3) Dial a third party.
(4) Before the third party answers the call, hook on your phone.
(5) Now the first party takes over the call and is in connection with the third party.

3.5.5.10 Consultative Transfer

Consultative transfer lets the third party answer the transferred call, and then hook on the transferring party. It is gentler than blind transfer.

(1) Assume you have already been in a voice connection with a first party.
(2) Press **FLASH** to hold the first party.
(3) Dial a third party.
(4) After the third party answers the call, hook on your phone.
(5) Now the first party takes over the call and is in connection with the third party.

3.5.5.11 Call Forwarding No Answer

If this feature enabled, incoming calls are forwarded to third party when you doesn't answer them. It involves two steps: setting the forwarding number and enable the feature.

(1) Dial ***74<NUM>#** to set forwarding number, where **NUM** is the number of the party whom the call is forwarded to.
(2) Dial ***71** to enable call forwarding no answer. That is, when our phone doesn't answer incoming call, this call will be forwarded.
(3) Press ***70** disables call forwarding no answer.

3.5.5.12 Call Forwarding Busy

If this feature enabled, incoming calls are forwarded to third party when you busy. It involves two steps: setting the forwarding number and enable the feature.

(1) Dial ***74<NUM>#** to set forwarding number, where **NUM** is the number of the party whom the call is forwarded to. Note that if we have already set forwarding number before, this step can be omitted.

(2) Press ***72** to enable call forwarding busy. That is, when our phone gets busy, this call will be forwarded.
(3) Press ***70** disables call forwarding busy.

3.5.5.13 Call Forwarding All

If this feature enabled, incoming calls will be forwarded to third party without any reason. It involves two steps: setting the forwarding number and enable the feature.

(1) Dial ***74<NUM>#** to set forwarding number, where **NUM** is the number of the party whom the call is forwarded to. Note if we have already set forwarding number before, this step can be omitted.
(2) Press ***73** to enable call forwarding all. That is, all incoming alls will be forwarded to the third party.
(3) Press ***75** disables call forwarding all, but lets call forwarding no answer and call forwarding busy unchanged.
(4) Press ***70** disables all call forwarding function.

3.5.5.14 3-Way Conference

3-way conference enables you to invite a third party to a call, and every person in the conference is able to hear others' voice.

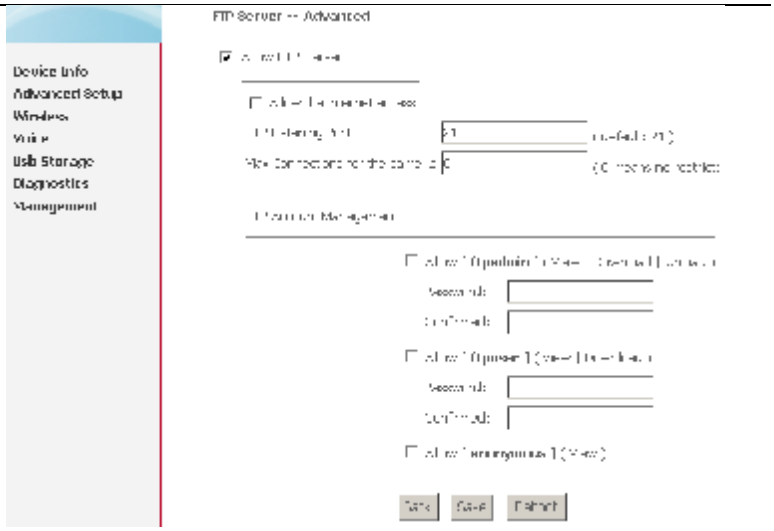
(1) Assume you are in connection with a first party.
(2) Press **FALSH** to put the first party on hold.
(3) Dial a third party.
(4) After the third party answers the call, press **FALSH** again to invite the first party.
(5) Now all three parties are in a 3-way conference.

3.6 USB Storage

Choose **USB Storage**, the following page appears.

- **Local Path**: When you insert the USB storage, it shows the USB storage information, and you can select which storage to store.
- **Username**: The account name which is set in the Configuration Web page of the Remote URL.
- **Password**: The password which is set in the Configuration Web page of the Remote URL.
- **Port**: The port which is set in the Configuration Web page of the Remote URL.
- **Remote URL**: It is the remote FTP address where you are going to download files. When we download files, we store it to Local Path.

Click **Server Config,** the following page appears. In this page, you can configure the FTP server.



= **Allow FTP Server**: If you allow users to access the FTP sever, please select this checkbox.

= **Allow the internet access**: If you allow the users of internet to access the FTP sever, please select this checkbox. Then configure the FTP listening port and maximum connections for the same IP.

= **FTP Account Management**

- **ftpadmin**: If you allow the user of administrator to access the FTP sever, please select this checkbox. The user of administrator can view, download and upload the FTP file. Then configure the password.
- **ftpuser**: If you allow the common user to access the FTP sever, please select this checkbox. The common user can view and download the FTP file. Then configure the password.
- **anonymous:** If you allow the anonymous user to access the FTP sever, please select this checkbox. The anonymous user can view FTP file.

Note: After setting, you need to reboot the router to take the configuration effect.

3.7 Management

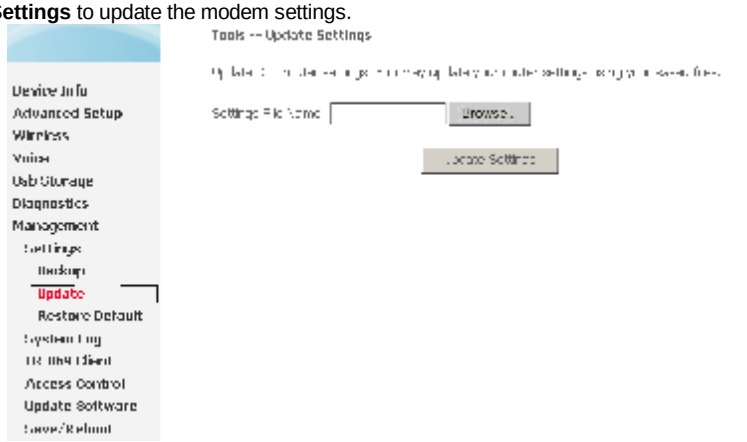
3.7.1 Settings

3.7.1.1 Settings Backup

Choose **Management** > **Settings** > **Backup** to back up the DSL router configuration.

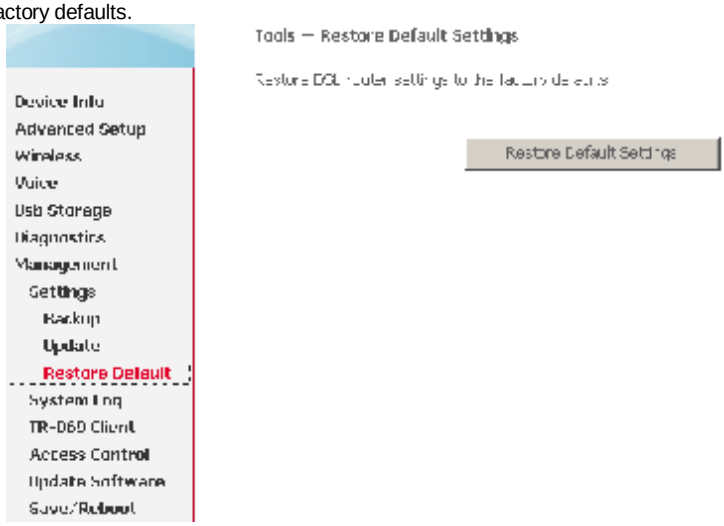
3.7.1.2 Settings Update

Choose **Management** > **Settings** > **Update**, the following page appears. Click **Browse** and select the correct update configure settings file. Then, click **Update Settings** to update the modem settings.



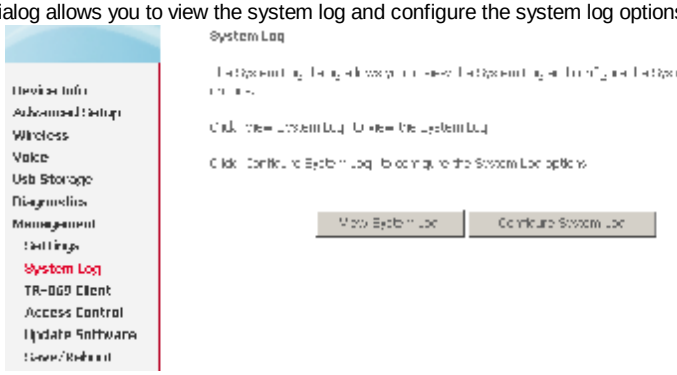
3.7.1.3 Settings Restore Default

Choose **Management** > **Settings** > **Restore Default**, the following page appears. In this page, Click **Restore Default Settings** to restore DSL router settings to the factory defaults.

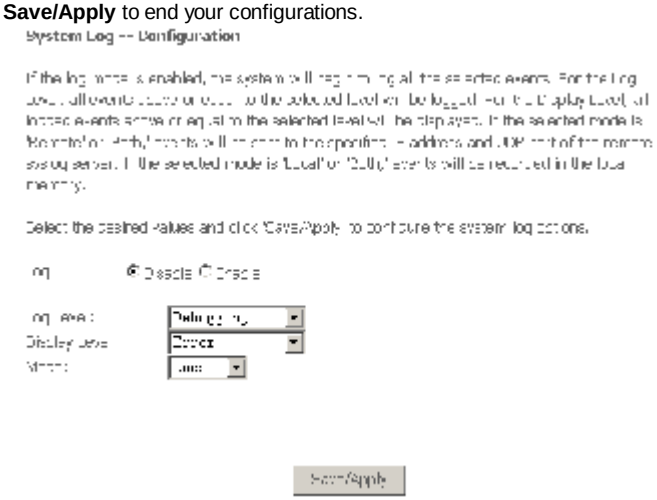


3.7.2 System Log

Choose **Management** > **System Log**, the following page appears. The system log dialog allows you to view the system log and configure the system log options.

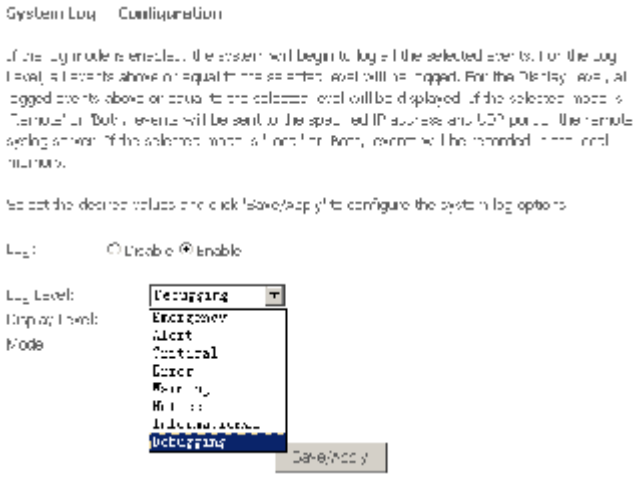


Click **Configure System Log** to show the following page. You can enable or disable the system log and then select the log level, display level and mode, and click **Save/Apply** to end your configurations.

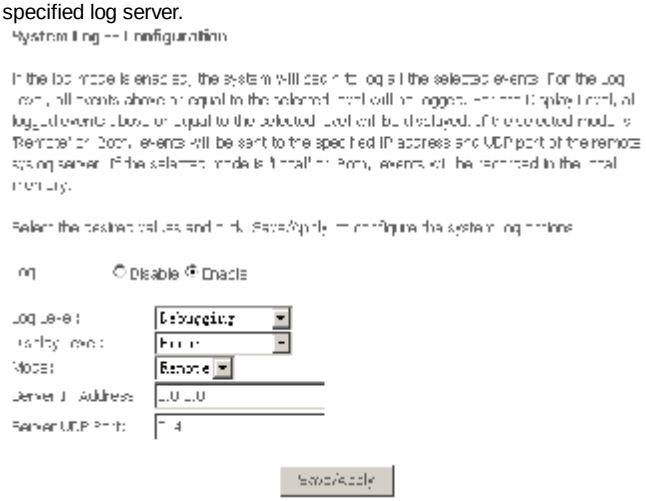


Both the log level and display level have eight choices. The default log level is **Debugging** and the default display level is **Error**.

The mode options are **Local**, **Remote**, and **Both**. The default is **Local**.

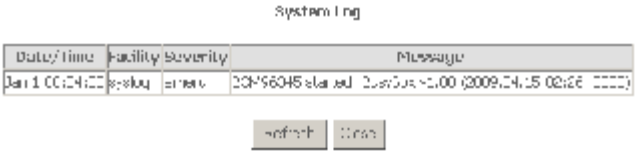


If you select **Remote** or **Both**, all events are transmitted to the specified UDP port of the specified log server.



After operations under **Configure System Log**, click **View System Log** to query the system logs. In this example, the **View System Log** is the default.

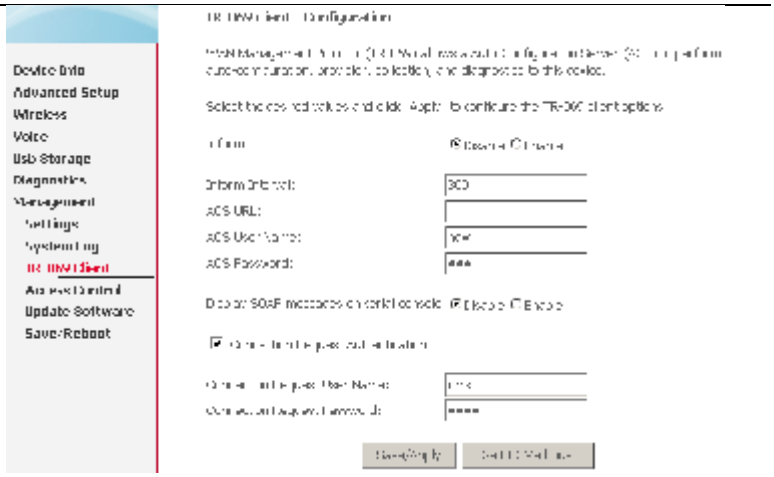
Note: The log and display of the system events are above the set level. If you intend to record all information, you need to set the levels as Debugging.



Click **Refresh** to refresh the system event logs or click **Close** to exit from this interface.

3.7.3 TR-069 Client

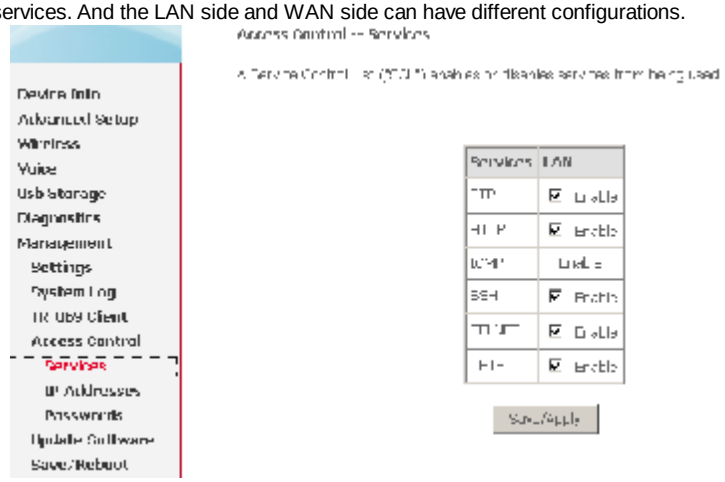
Choose **Management** > **TR-069 Client**, the following page appears. Select the desired values and click **Save/Apply** to configure the TR-069 client options.



3.7.4 Access Control

3.7.4.1 Access Control – Services

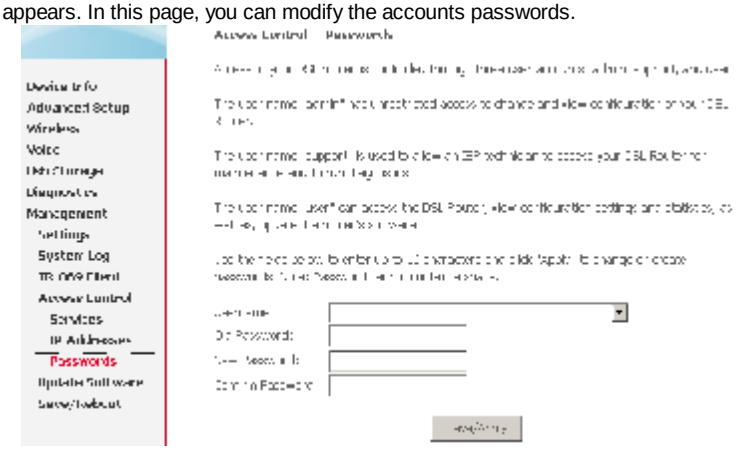
Choose **Management** > **Access Control** > **Services**, the following page appears. In this page, you can enable or disable FTP, HTTP, ICMP, SSH, TELNET and TFTP services. And the LAN side and WAN side can have different configurations.



Note: If the connection is PPPoE PVC, you can view the information of WAN side.

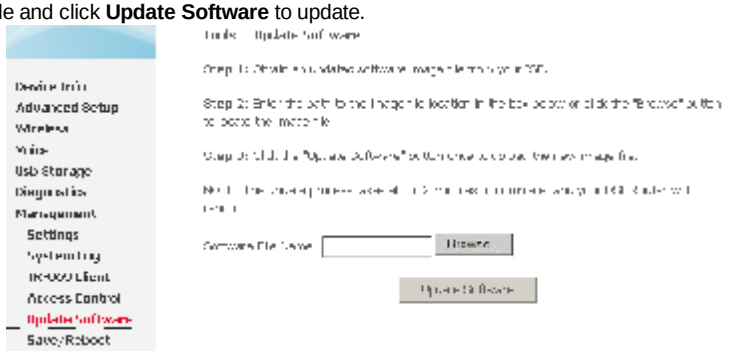
3.7.4.2 Access Control – Passwords

Choose **Management** > **Access Control** > **Passwords,** the following page appears. In this page, you can modify the accounts passwords.



3.7.5 Update Software

Choose **Management** > **Update Software,** the following page appears. In this page, you can update the modem Software. Click **Browse** to find the right version file and click **Update Software** to update.



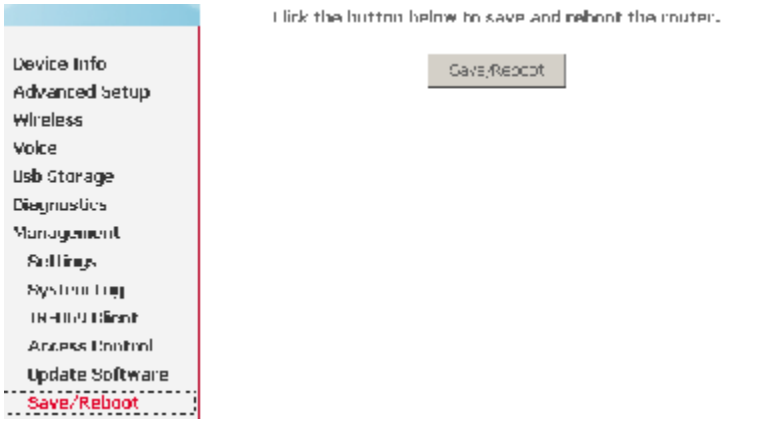
Note: Do not turn off your modem during firmware updates. When the update is finished, the modem reboots automatically. Do not turn off your modem either

before the reboot is over. You must guarantee the update software is right and accurate. It is strictly forbidden to use other software for updates.

After update software, it is suggested to restore the modem to the factory defaults and configure it again.

3.7.6 Save/Reboot

Choose **Management** > **Save/Reboot,** the following page appears. In this page, you can click **Save/Reboot** to save and reboot the router.



4 Q&A

(1) **Q**: Why all LED indicators are off?

A:

- Check the connection between the power adaptor and the power socket.
- Check the power switch is on or not.

(2) **Q**: Why LAN LED is not lighting?

A:

- Check the connection between the ADSL modem and your computer, hub, or switch.
- Check the running status of your PC, hub, or switch, and ensure that they are working normally.

(3) **Q**: Why ADSL LED is not lighting?

A: Check the connection between the ADSL "DSL" port and the wall jack.

(4) **Q**: Why cannot visit Internet with ADSL LED is on?

A: Ensure that the following information is correctly entered.

- VPI/VCI
- Username/password.

(5) **Q**: Why cannot open the Modem Web configuration page?

A: Follow below steps to check the communication between the computer and modem.

- Choose **Start** > **Run** from the desktop, and ping ***192.168.1.1*** (the IP address of the modem).
- If the modem cannot be reached, please check following configuration:
  - Type of the network cable
  - Connection between the modem and computer
  - TCP/IP configuration of you computer

(6) **Q**: How to load the default setting after incorrect configuration?

A:

- To restore the factory default, keep the device powered on and push a needle into the hole. Press down the button about one second and then release.

- The default IP address and subnet mask of the modem are *192.168.1.1* and *255.255.255.0* respectively.
- User/password of super user: **admin**/**admin**
- User/password of common user: **user**/**user**

FCC Information

This equipment complies with CFR 47, Part 15.19 of the FCC rules. Operation of the equipment is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received; including interference that may cause undesired operation.

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

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

Federal Communications Commission (FCC) Requirements, Part 15

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

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

---Reorient or relocate the receiving antenna.

---Increase the separation between the equipment and receiver.

---Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

---Consult the dealer or an experienced radio/TV technician for help.

Regulatory information / Disclaimers

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications (including the antennas) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, or the substitution of the connecting cables and equipment other than manufacturer specified. It is the responsibility of the user to correct any interference caused by such unauthorized modification, substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government

CAUTION: To maintain compliance with FCC's RF exposure guidelines, this equipment should be installed and operated with minimum distance 20cm between the radiator and your body. Use on the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

MPE Statement (Safety Information)

Your device contains a low power transmitter. When device is transmitted it sends out Radio Frequency (RF) signal.

Safety Information

In order to maintain compliance with the FCC RF exposure guidelines, this equipment should be installed and operated with minimum distance 20cm between the radiator and your body. Use only with supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.