D-Link®

Version 1.0 | 06/04/2010

User Manual

ADSL2+ Modem

DSL-520B

Table of Contents

General Information

The D-Link DSL-520B is an ADSL2+ modem that offers the convenience of Ethernet connections. This user manual provides a simple and easy-to-understand format to install and configure your modem.

Package Contents

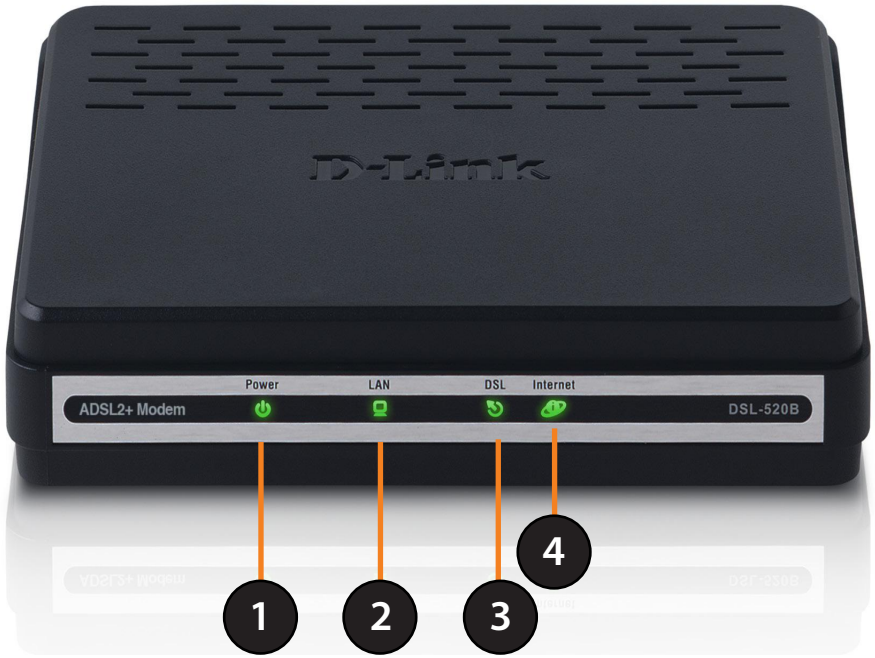
- ADSL2+ Modem
- 12VDC, 500mA DC CEC-compliant switching power adapter
- RJ-11 telephone cable
- RJ-45 Ethernet cable
- Quick Install Guide
- Installation CD-ROM

Note: *Using a power supply with a different voltage rating than the one included with the DSL-520B will cause damage and void the warranty for this product.*

Important Safety Instructions

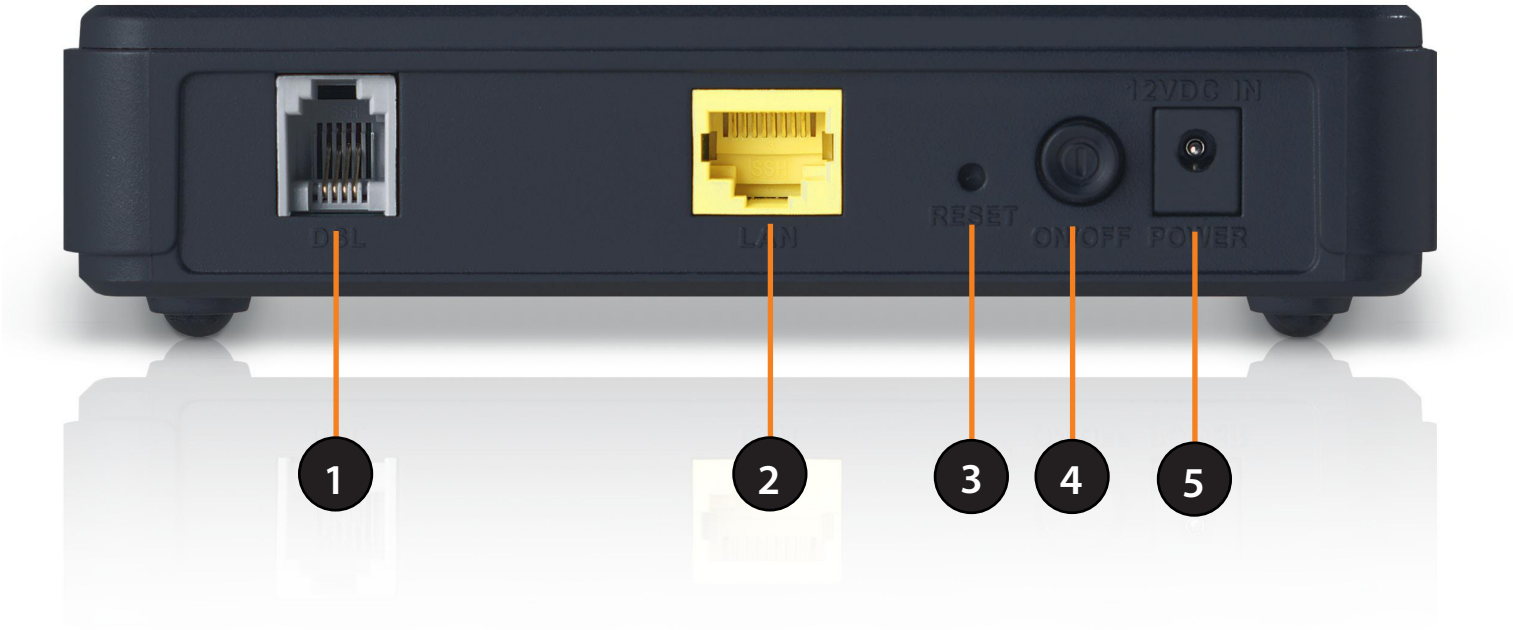
- Place your modem on a flat surface close to the cables in a location with sufficient ventilation.
- To prevent overheating, do not obstruct the ventilation openings of this equipment.
- Plug this equipment into a surge protector to reduce the risk of damage from power surges and lightning strikes.
- Operate this equipment only from an electrical outlet with the correct power source as indicated on the adapter.
- Do not open the cover of this equipment. Opening the cover will void any warranties on the equipment.
- Unplug equipment first before cleaning. A damp cloth can be used to clean the equipment. Do not use liquid/aerosol cleaners or magnetic/static cleaning devices.
- To reduce the risk of fire, use only No. 26 AWG (or larger diameter/smaller AWG) RJ-11 telephone cable.

Front Panel View



1	**Power LED**	• A solid green light indicates the unit is powered on. • A red light indicates a malfunction.
2	**LAN LED**	• A solid light indicates a connection to an Ethernet-enabled computer. This LED blinks during data transmission.
3	**DSL LED**	• A solid light indicates the DSL is synchronized • A flashing LED indicates the modem is attempting to synchronize with the DSL provider.
4	**Internet LED**	• A solid green light indicates that the modem has an IP address and is connected to the Internet. • A red light indicates that the modem does not have an IP address or authentication has failed • No light indicates that an ADSL connection is not present or the modem is in bridge mode.

Rear Panel View



1	**DSL Line**	• Connect to an active telephone line (RJ-11).
2	**LAN Port**	• Connect Ethernet devices such as computers, switches, and hubs.
3	**Reset**	• Pressing the Reset button for 5 seconds restores the modem to its original factory default settings.
4	**ON/OFF**	• Press this button to turn the unit ON or OFF.
5	**Power Receptor**	• Receptor for the supplied power adapter.

Installing the Modem

Connect the ADSL and Telephone Lines

- Connect an RJ-11 cable between the wall phone jack and the DSL port on the rear panel of the modem.

Connect the PC to the Modem

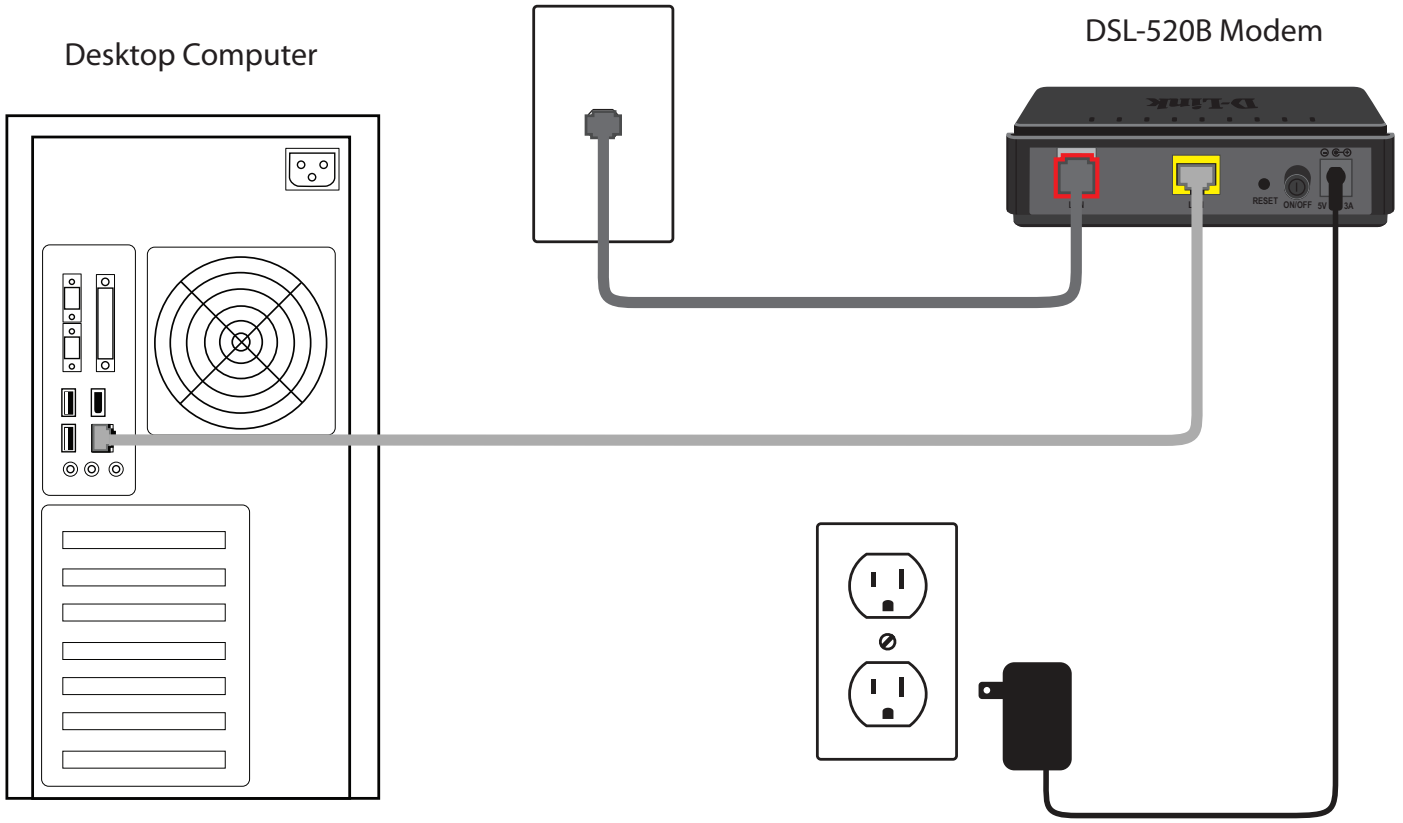
- To use the Ethernet connection, connect the Ethernet cable from the computer directly to the modem. Connect one end of the Ethernet cable to the port labeled LAN on the back of the modem and attach the other end to the Ethernet port of your computer.

- If your LAN has more than one computer, you can attach one end of an Ethernet cable to a hub or a switch and the other to the Ethernet port (labeled LAN) on the modem. Note that either a crossover or straight-through Ethernet cable can be used. The modem automatically recognizes the type of connection that is required.

Connect the Power Adapter

- Complete the process by connecting the supplied 12V, 500mA power adapter to the POWER connector on the back of the device and plug the adapter into a wall outlet or power strip. Then turn on and boot up your PC and any LAN devices, such as hubs or switches, and any computers connected to them.

Installation Diagram



Configuring Your Computer

Prior to accessing the modem through the LAN or USB port, note the following necessary configurations:

- Your PC's TCP/IP address: 192.168.1.x (where "x" is any number between 2 and 254)
- The modem's default IP address: 192.168.1.1
- Subnet mask: 255.255.255.0

Below are the procedures for configuring your computer. Follow the instructions for the operating system that you are using.

Windows® XP

1. In the Windows taskbar, click on the **Start** button then go to **Control Panel** and then click **Network Connections**.

2. In the **Network Connections** window, right-click on the **Local Area Connection** icon and click on **Properties**.

3. Listed in the **Local Area Connection** window are the installed network components. Make sure the box for Internet Protocol (TCP/IP) is checked and then click on **Properties**.

4. In the Internet Protocol (TCP/IP) Properties dialog box, click on the radio buttons labeled **Obtain an IP address automatically and Obtain DNS server address automatically**.

5. Click on **OK** twice to save your changes and then close the Control Panel.

Mac

These are instructions for configuring your Mac OS X operating system

1. In the Mac OS X Dock, click on the **System Preferences** icon.
2. Under **Internet & Network**, click **Network**. In the **Show** menu, select **Built-in Ethernet** or Ethernet (Depending on your Mac OS version.)
3. Click the **TCP/IP** tab.
4. In the Configure menu, select **Using DHCP**.
5. Click **Apply** Now and Save if your computer prompts you to save changes.

Log in to the Modem

This section will explain how to log in to your modem using the following steps:

1. Launch your web browser.

2. Enter the URL http://192.168.1.1 in the address bar and press **Enter**.

A login screen like the one below will be displayed after you connect to the user interface.

Note: Use **admin/admin** as a default for username and password.

- The admin account can perform all functions (username / password: **admin / admin**).

Note: *Passwords can be changed at any time.*

3. Enter your user name and password, and then click **OK** to display the user interface.

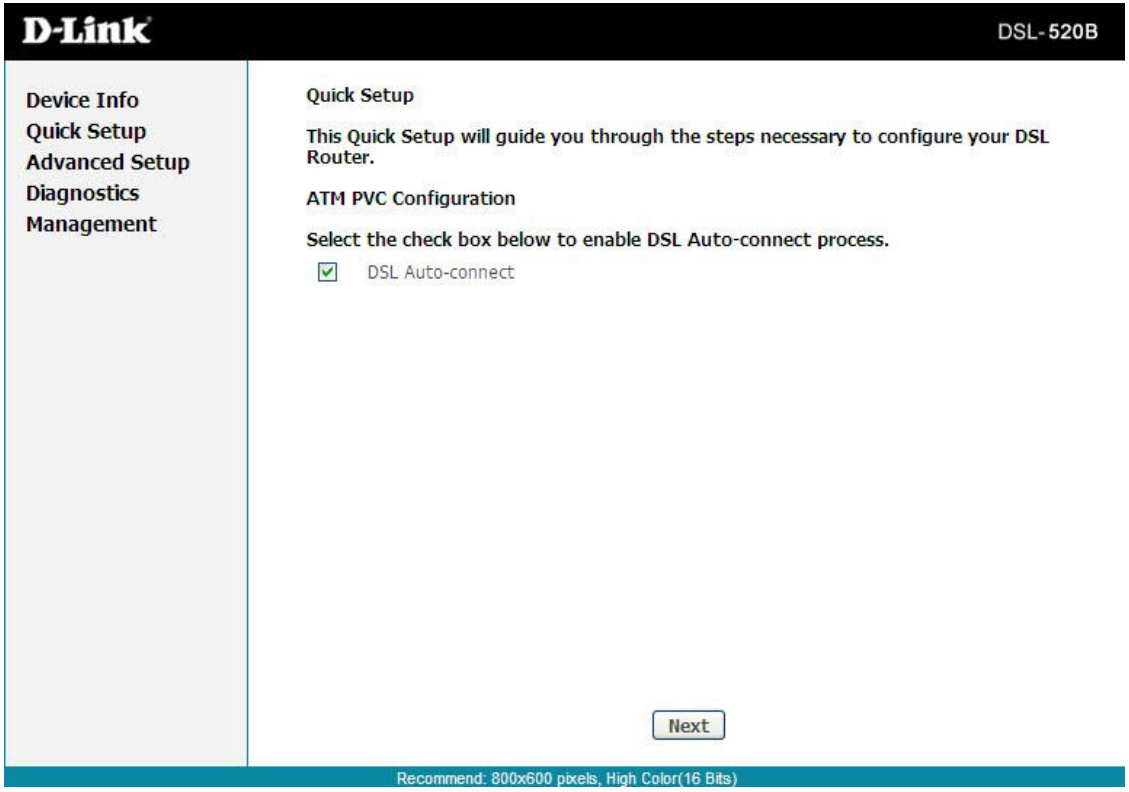
Note: *This manual has been prepared using the admin user name.*

Quick Setup

Quick Setup will be the first page you see when you log in to the router. Verify the box is checked next to DSL Auto-connect. Please prepare your account information provided by your Internet Service Provider (ISP).

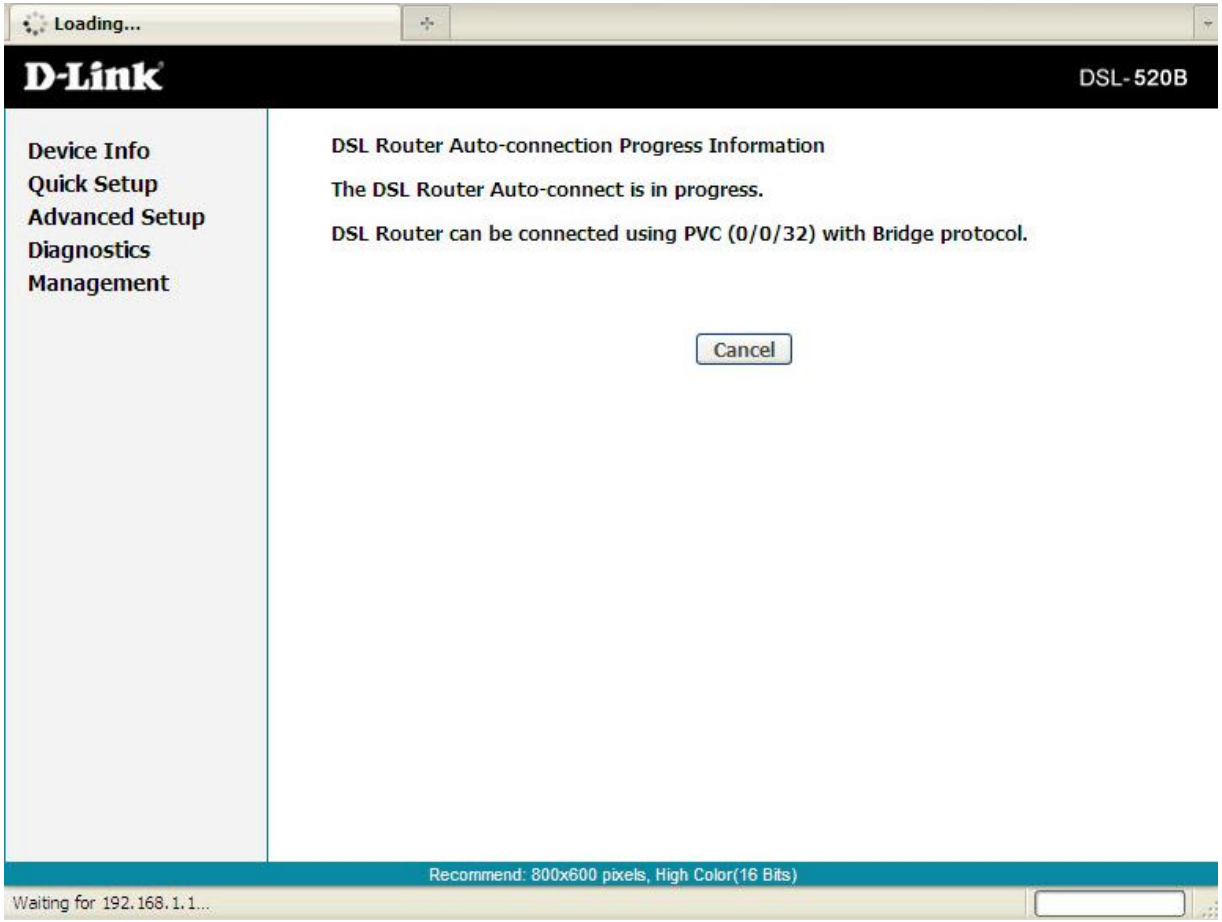
Click **Next** to begin setup.

Note: Quick Setup will allow you to configure a PPPoE connection. For more information on PPPoE and other connection types, please see the Advanced Setup section in this user manual.



The router will automatically perform a PVC scan in order to detect your DSL connection.

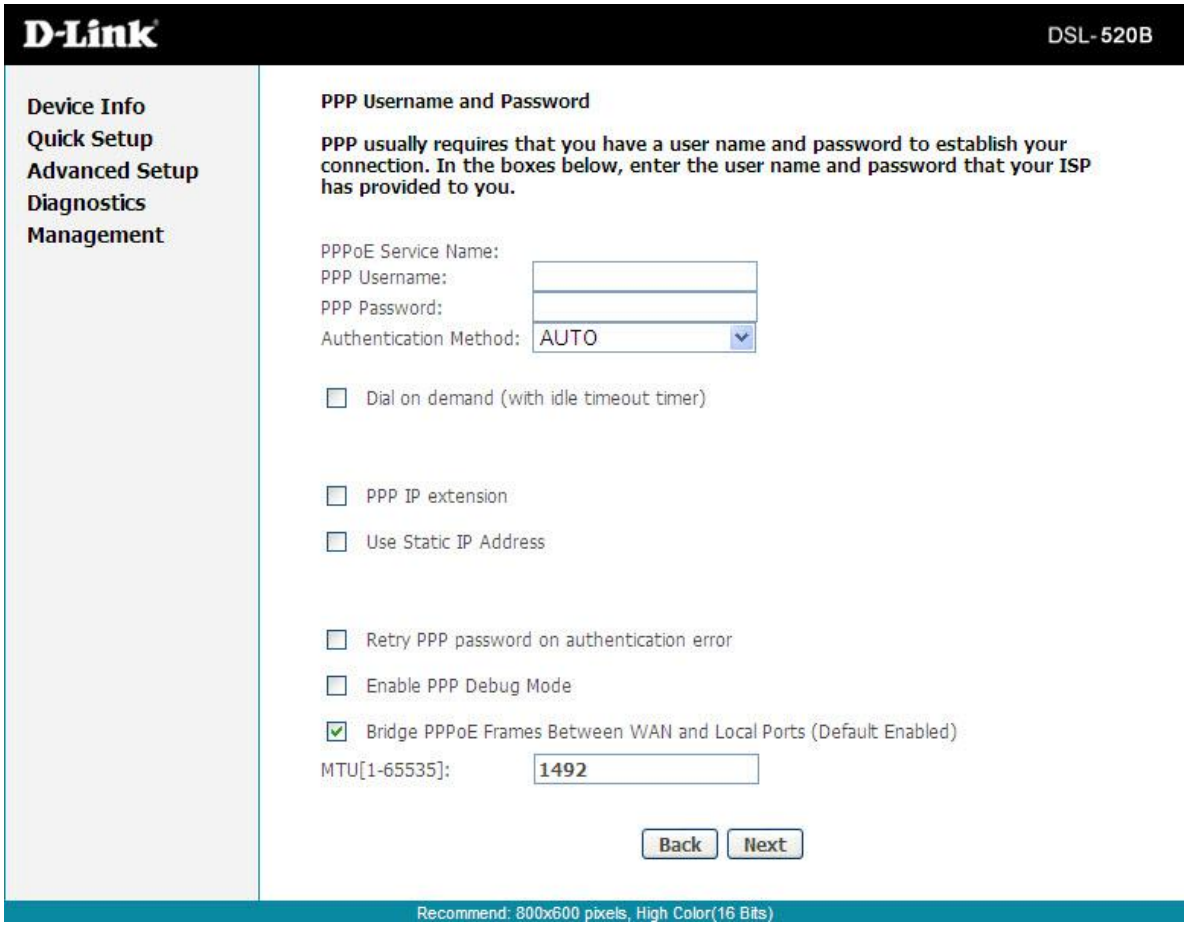
If the scan is unsuccessful, you must manually enter account settings. For these settings, please refer to your account information provided by your ISP.



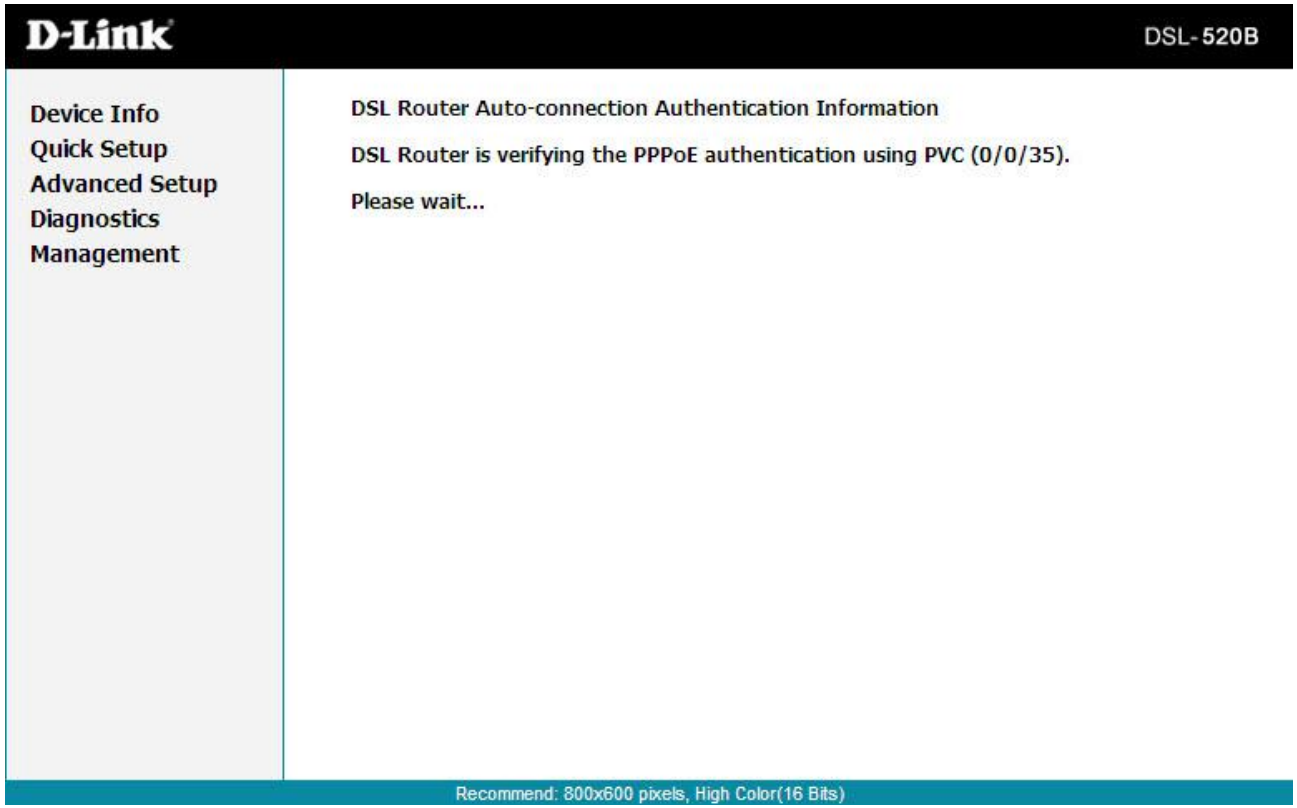
When the PVC scan is complete, you will be prompted to enter your username and password as provided by your ISP.

Advanced users can configure optional settings on this page.

Click **Next** to continue setup.

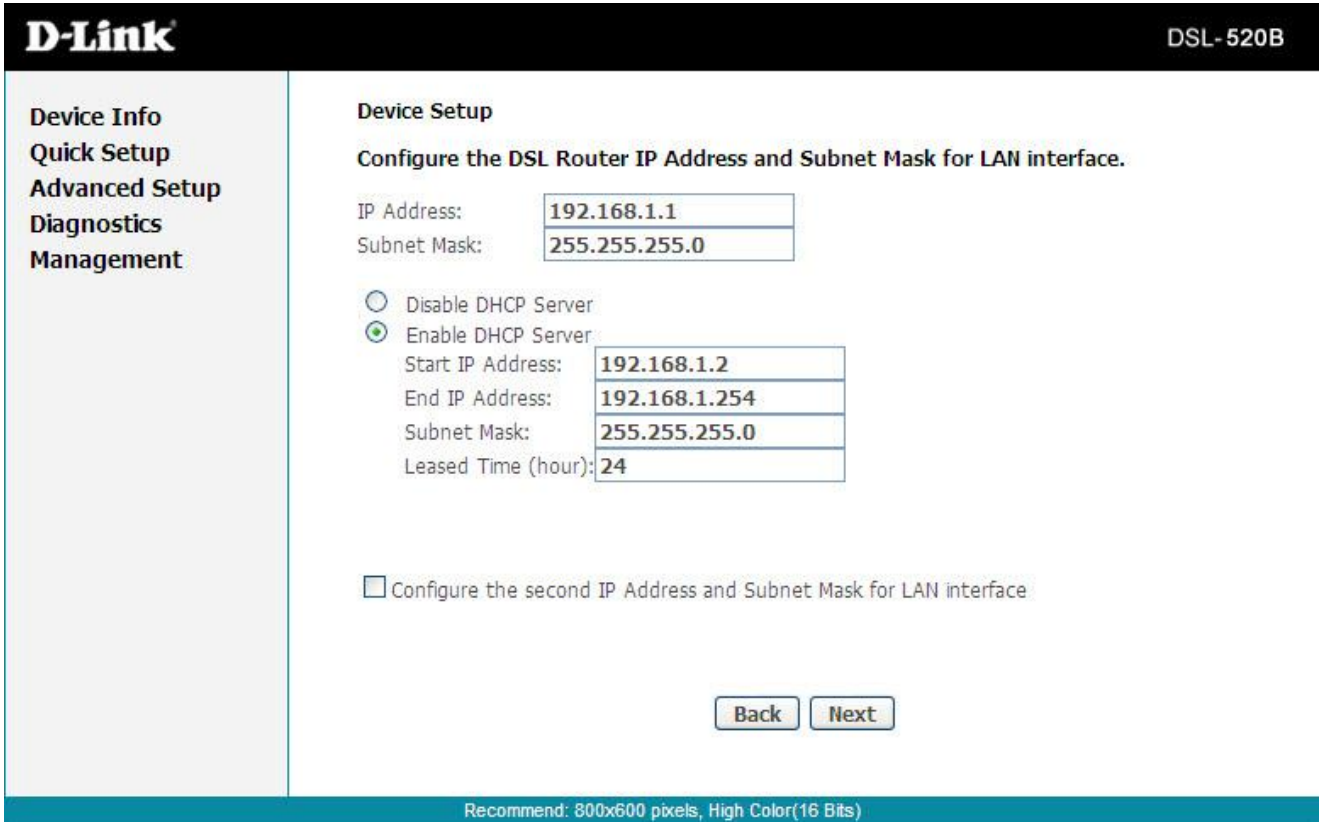


The router will automatically verify your username and password.

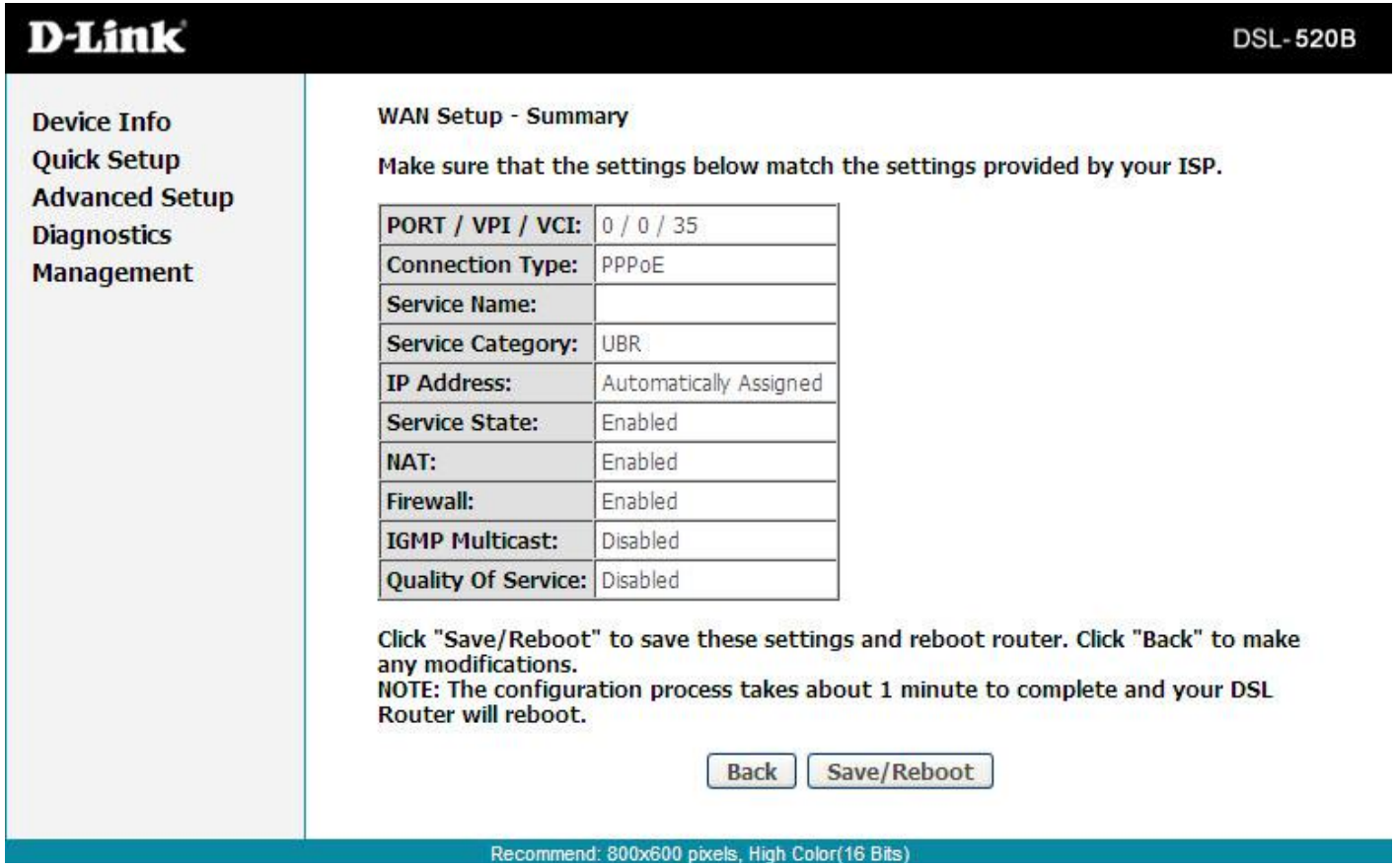


This page allows you to adjust the Local Area Network settings. No changes are required on this page.

Click **Next** to continue.



Verify your settings are correct and click Save/Reboot. The router will save your settings and reboot itself. Please do not unplug any cables during this process.

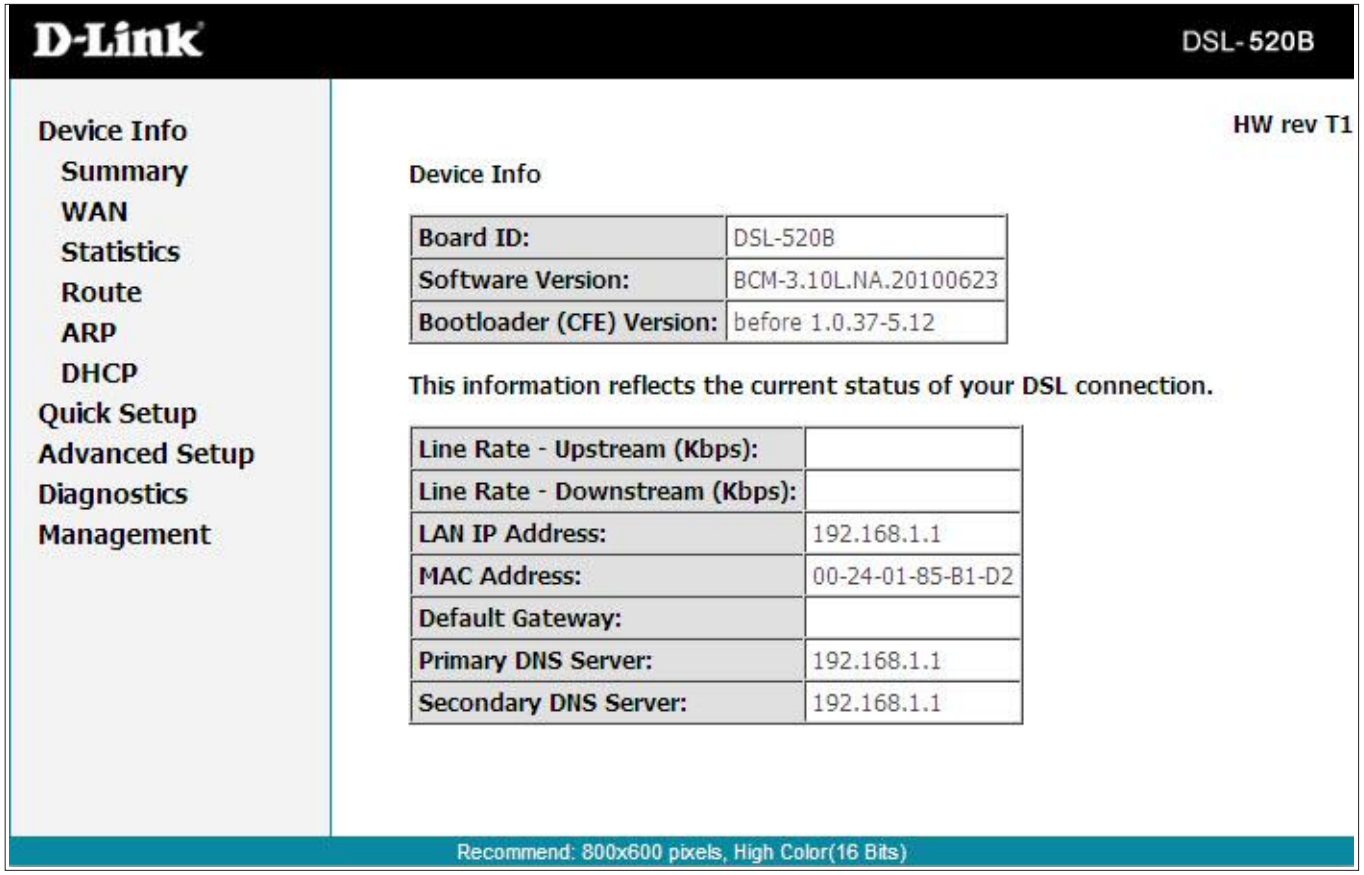


Device Info

The Device Info page shows details of the modem such as the version of the software, bootloader, LAN IP address, etc. It also displays the current status of your DSL connection.

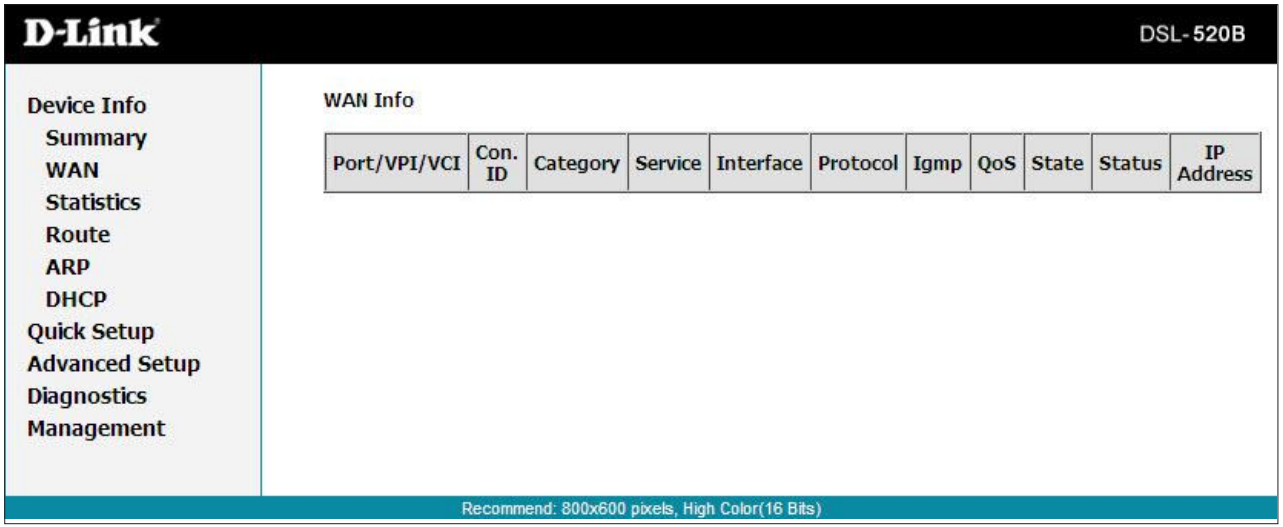
Summary

A summary of your device's information is provided in this section. The information will reflect your DSL's connection status.



WAN

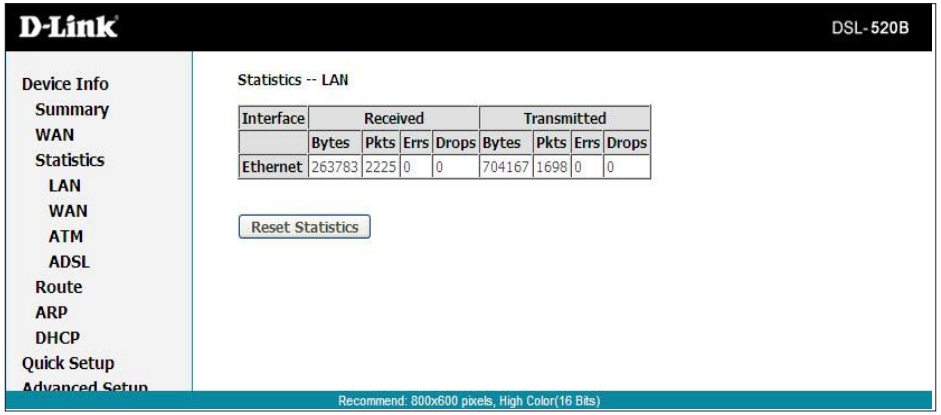
The WAN Info screen displays WAN connections previously set up in the Home section. There is an extra "Status" column used for connection status information, displaying either ADSL Link Down or ADSL Link Up.



Statistics

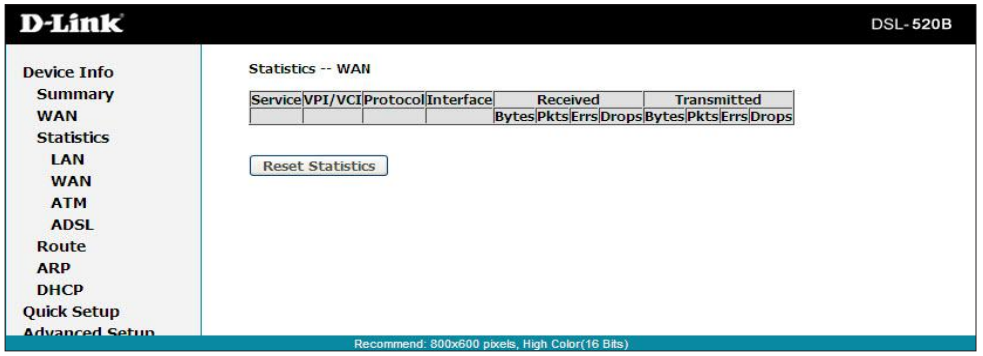
LAN

The LAN section shows received and transmitted packet information for the Ethernet interface. Click on **Reset Statistics** to renew the information.



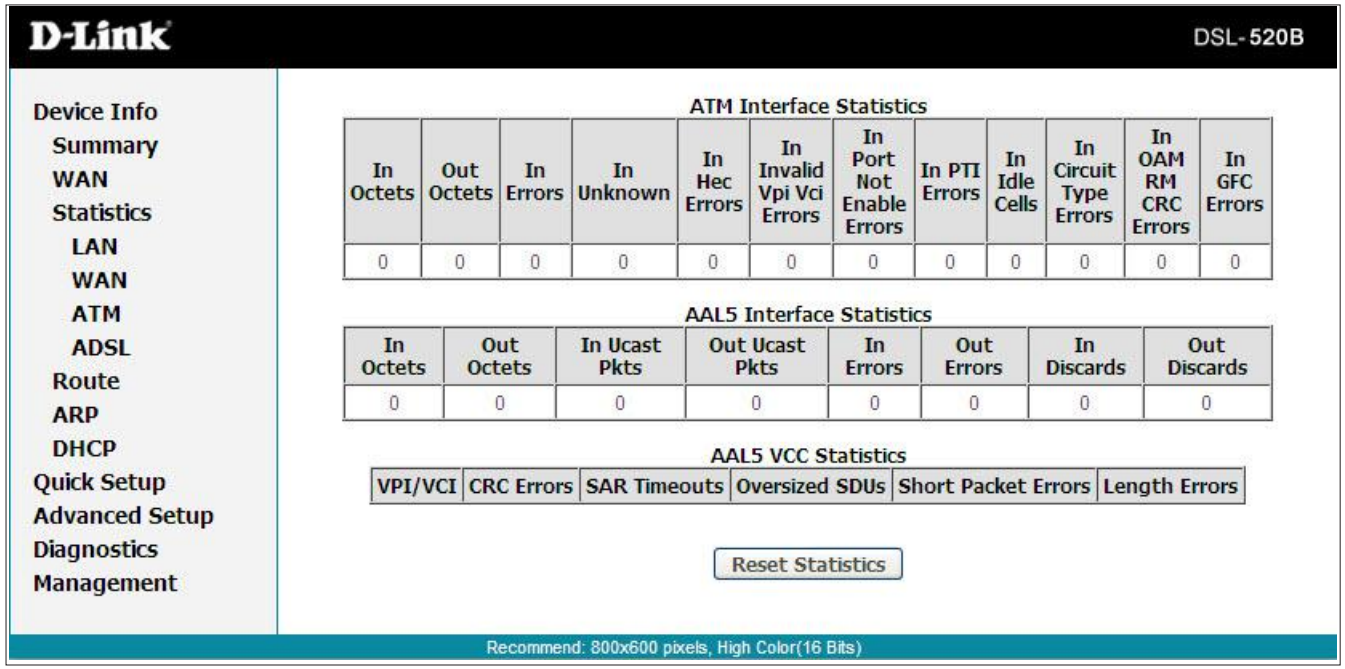
WAN

The WAN section shows received and transmitted packet information for the WAN connections that you have set up. Click on **Reset Statistics** to renew the information.



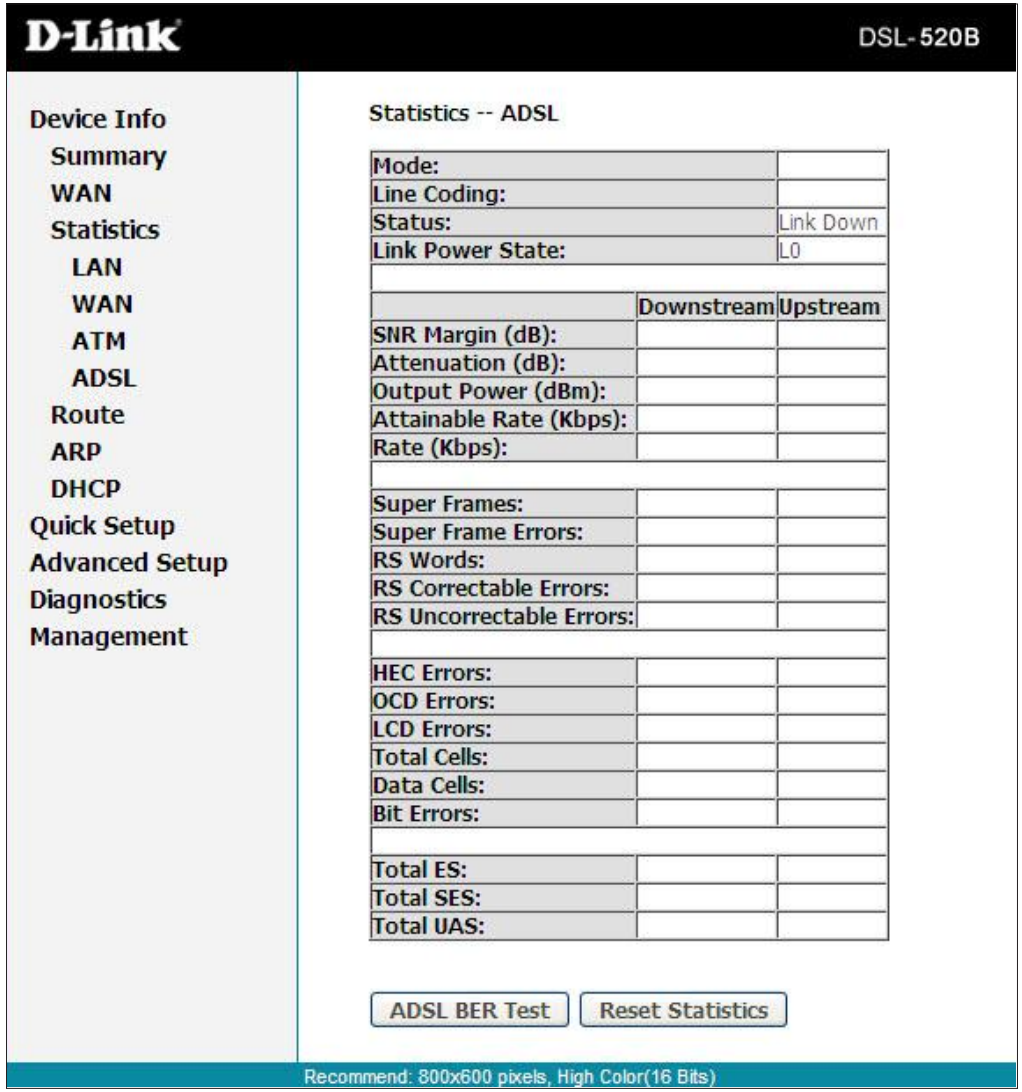
ATM

The ATM section displays statistical values for your ATM interface as well as for AAL5 and AAL5 VCC. Click on **Reset Statistics** to reset the values.



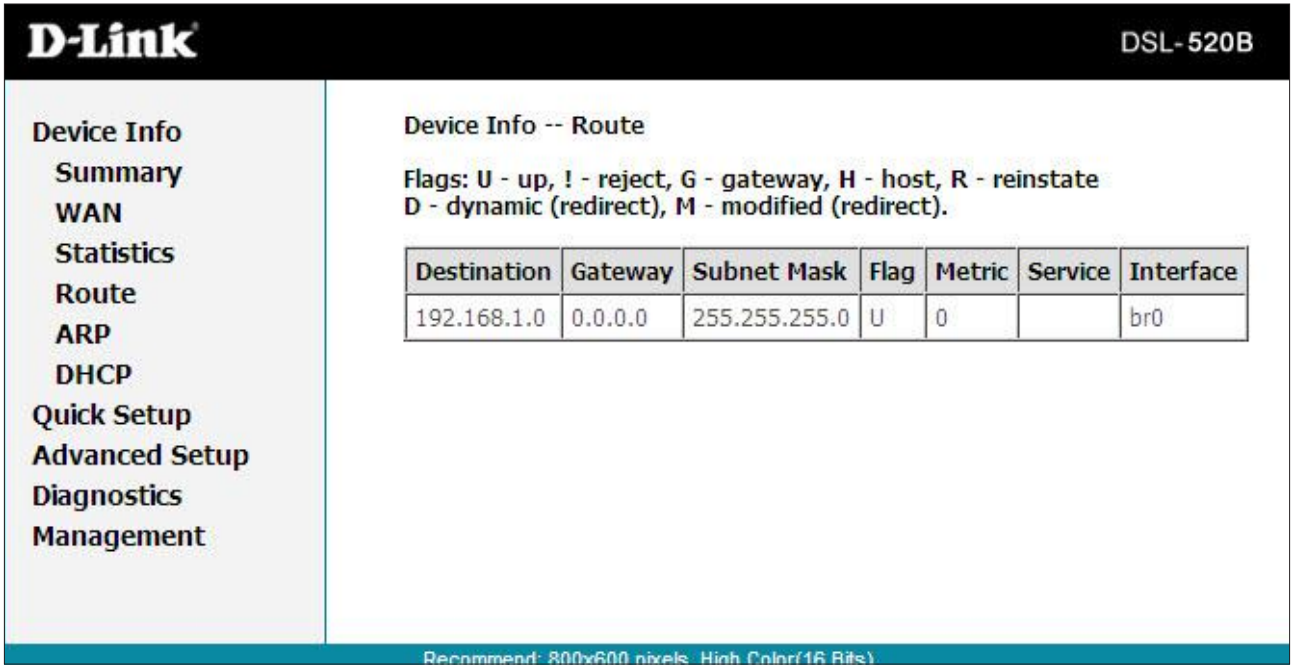
ADSL

Information contained in the ADSL screen is useful for troubleshooting and diagnosing connection problems.



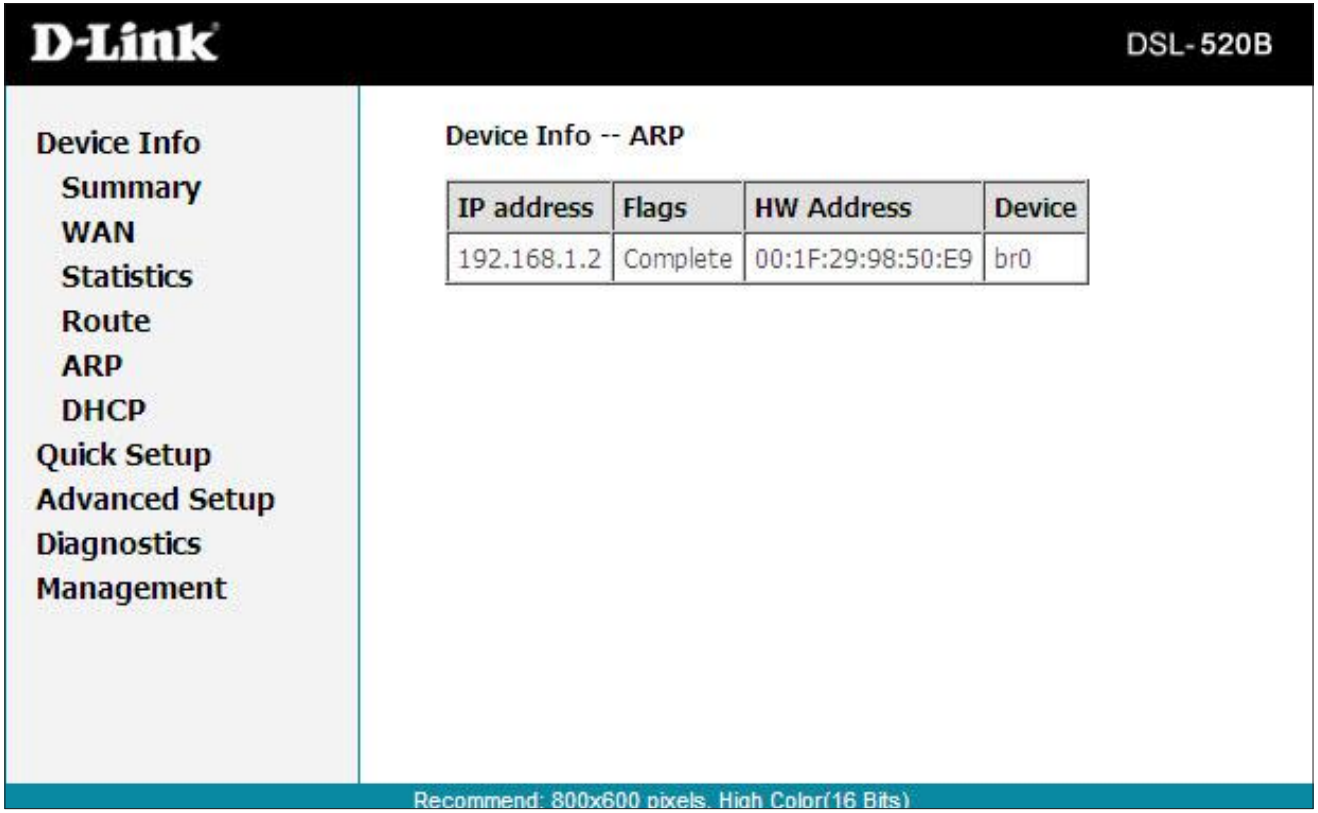
Route

The Route Info section displays route information showing the IP addresses of the destination, gateway, and subnet mask as well as other route information.



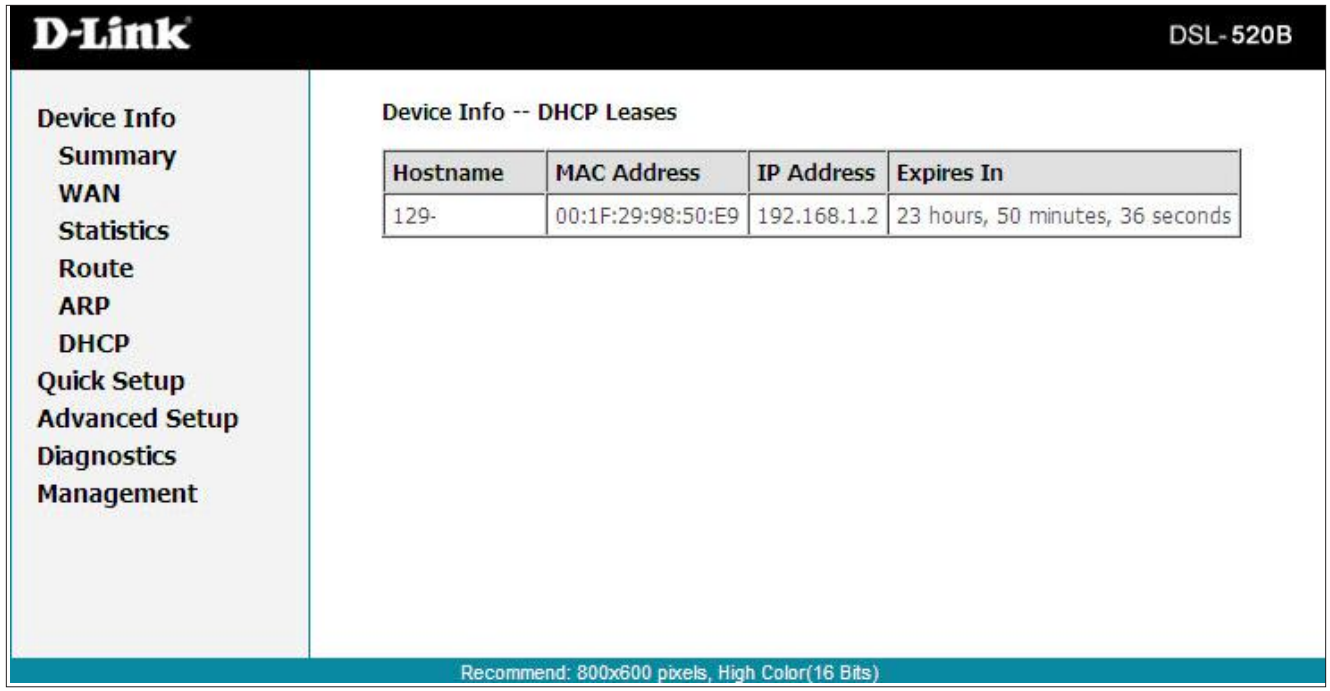
ARP

This section allows you to query the MAC and IP address information of the equipment attached to the modem.



DHCP

The DHCP server is enabled by default for the router's Ethernet LAN interface. DHCP service will supply IP settings to computers configured to automatically obtain IP settings that are connected to the router though the Ethernet port. When the router is used for DHCP it becomes the default gateway for DHCP client connected to it. Keep in mind that if you change the IP address of the router, you must change the range of IP addresses in the pool used for DHCP on the LAN.



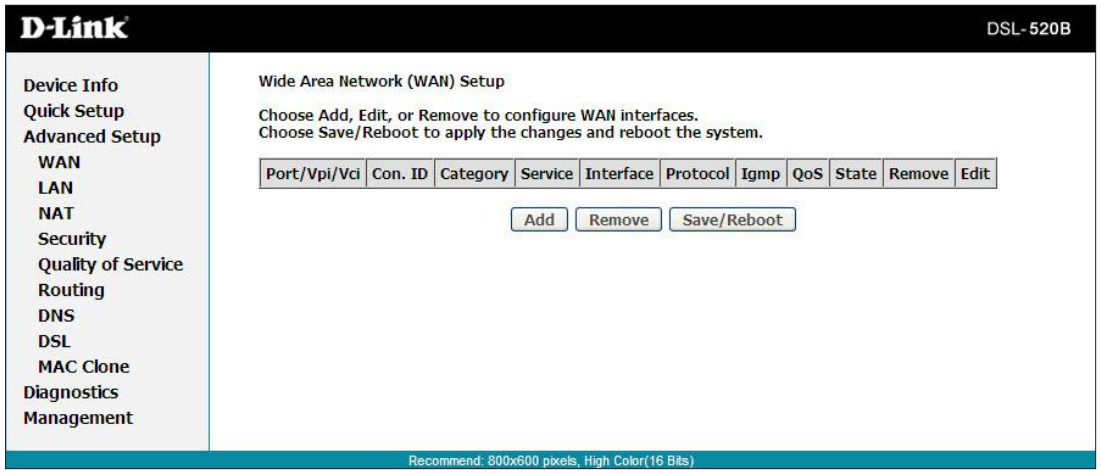
Advanced Setup

This section of the setup is an advanced version of the quick setup. If you want to make specific configurations to your modem such as creating a SNMP, etc., consider going through this advanced setup for a more comprehensive configuration.

WAN

Configure the DSL settings as provided by your ISP.

Click the **Add** button if you want to add a new connection for the WAN interface and to proceed to the ATM PVC Configuration screen on the following page. The ATM PVC Configuration screen allows you to configure an ATM PVC identifier (VPI and VCI) and select a service category.



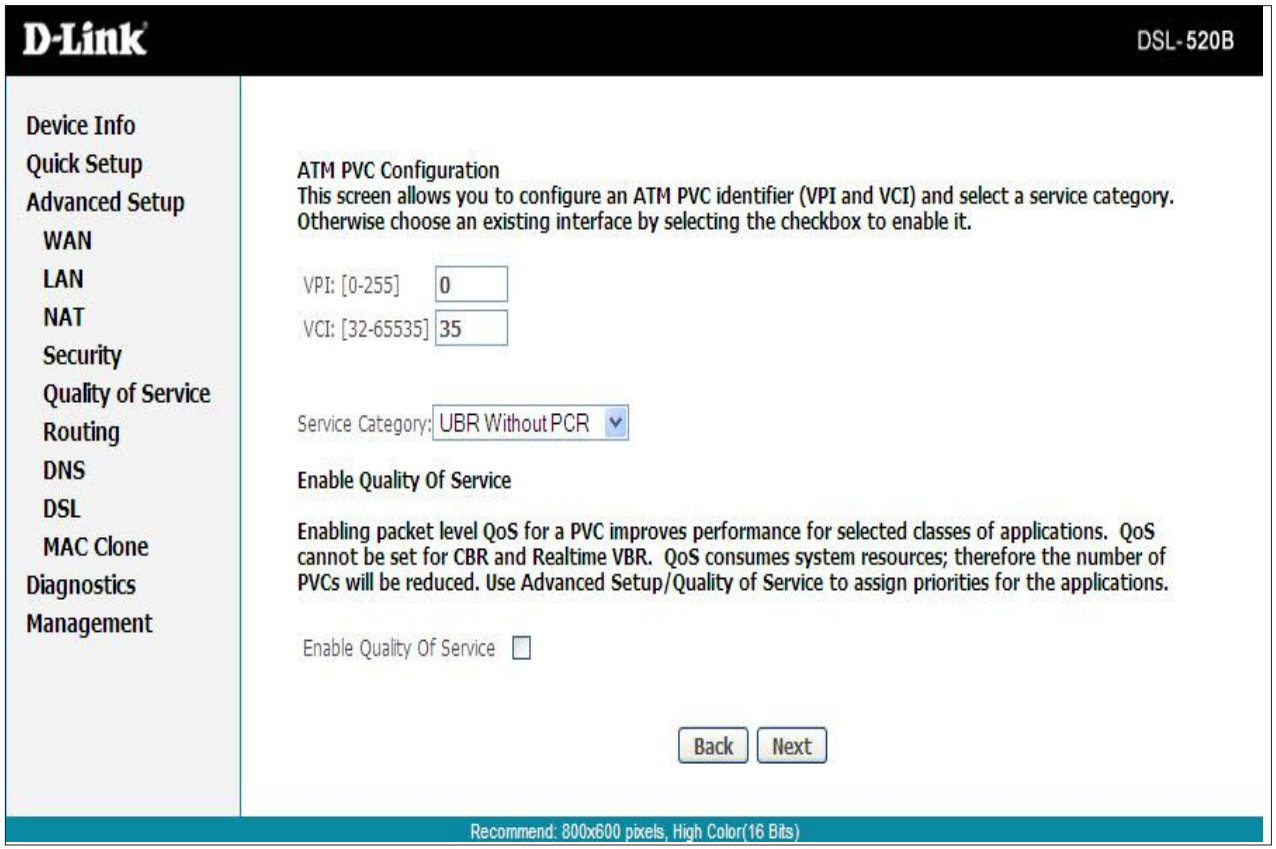
ATM PVC Configuration

VPI/VCI: These values are required for all DSL connection types and are provided by your ISP.

Service Category: Use the default setting unless otherwise instructed by your ISP.

Enable QoS: Use the default setting unless otherwise instructed by your ISP. For more information about QoS, see the Quality of Service section in this user manual.

Click **Next**



Connection Type

This screen shows the types of network protocols and encapsulation modes that can be configured.

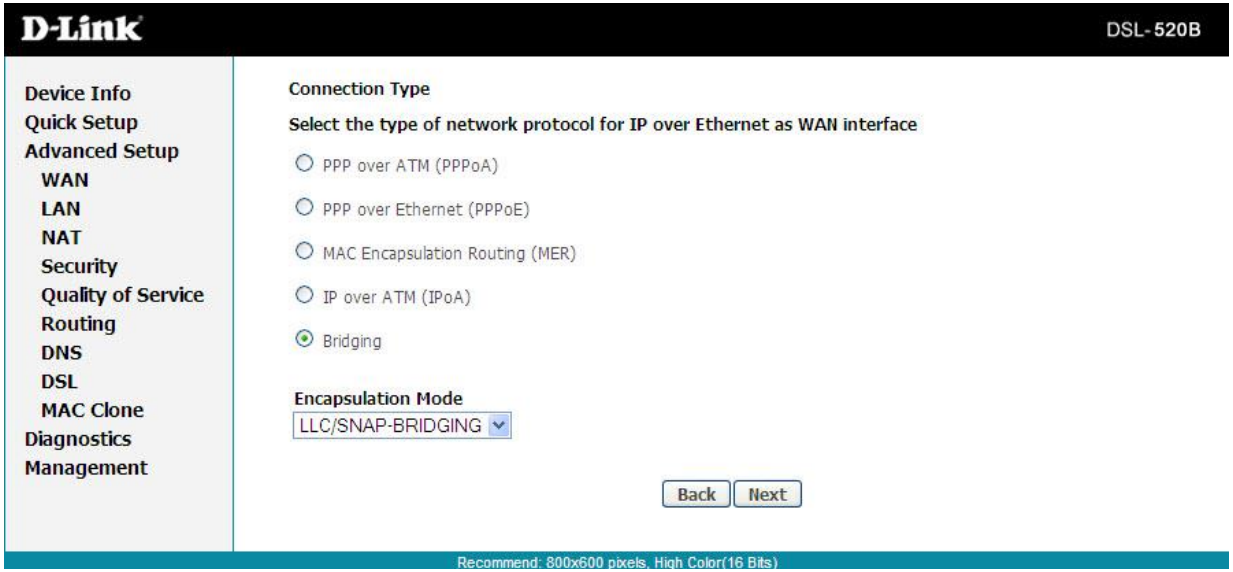
Connection Type: Select the connection type that your ISP has instructed to use.

- PPP over ATM (PPPoA)
- PPP over Ethernet (PPPoE)
- MAC Encapsulation Routing (MER)/DHCP
- IP over ATM (IPoA)
- Bridging

PPPoE, MER (also referred to as DHCP) and Bridging are the most common connection types in North America. To set up a PPPoE, MER or Bridging connection, follow the instructions on the following pages of this user manual. PPPoA and IPoA are more widely utilized in other regions. Setup for PPPoA and IPoA are similar to PPPoE and MER, respectively.

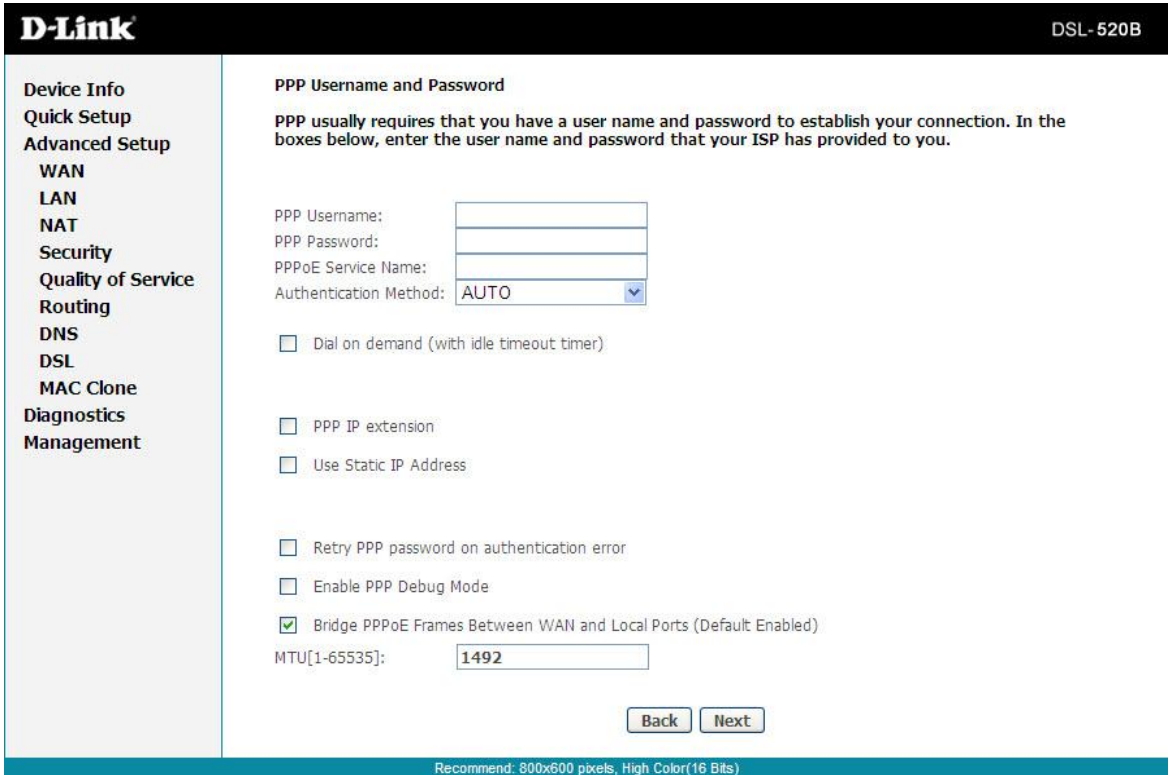
Encapsulation Mode: Use the default setting unless otherwise instructed by your ISP.

Note: *These settings are ISP dependant. For information regarding proper configuration, contact your ISP.*



PPP over Ethernet (PPPoE)

This page allows you to configure your PPPoE connection.



PPP Username: Enter your username as provided by your ISP.

PPP Password: Enter your password as provided by your ISP.

PPP Service Name: Enter any name that will help you identify your connection. This field will not affect your connection.

Dial on demand (with idle timeout timer): Allows you to manually connect to the Internet so you are not permanently connected. Idle timeout timer is included.

PPP IP extension: Used by some ISPs. Check with your ISP to see if it is required.

Use Static IP Address: Select if your ISP has provided you with a static IP address. If selected, you will be asked to enter the static IP address.

Retry PPP password on authentication error: Select if you want the router to automatically retry your PPP username and password when there is an authentication error on your DSL line.

Enable PPP Debug Mode: Select if you want to keep a log of connection negotiation transactions. This option is used for troubleshooting connection issues.

Bridge PPPoE Frames Between WAN and Local Ports (Default Enabled): Use the default setting unless otherwise instructed by your ISP.

MTU: Use the default setting of 1492 unless otherwise instructed by your ISP.

Click **Next**.

Network Address Translation Settings (PPPoE)

Enable NAT: Select if you would like to share your internet connection. Sharing your connection may also require an Ethernet switch to connect multiple computers.

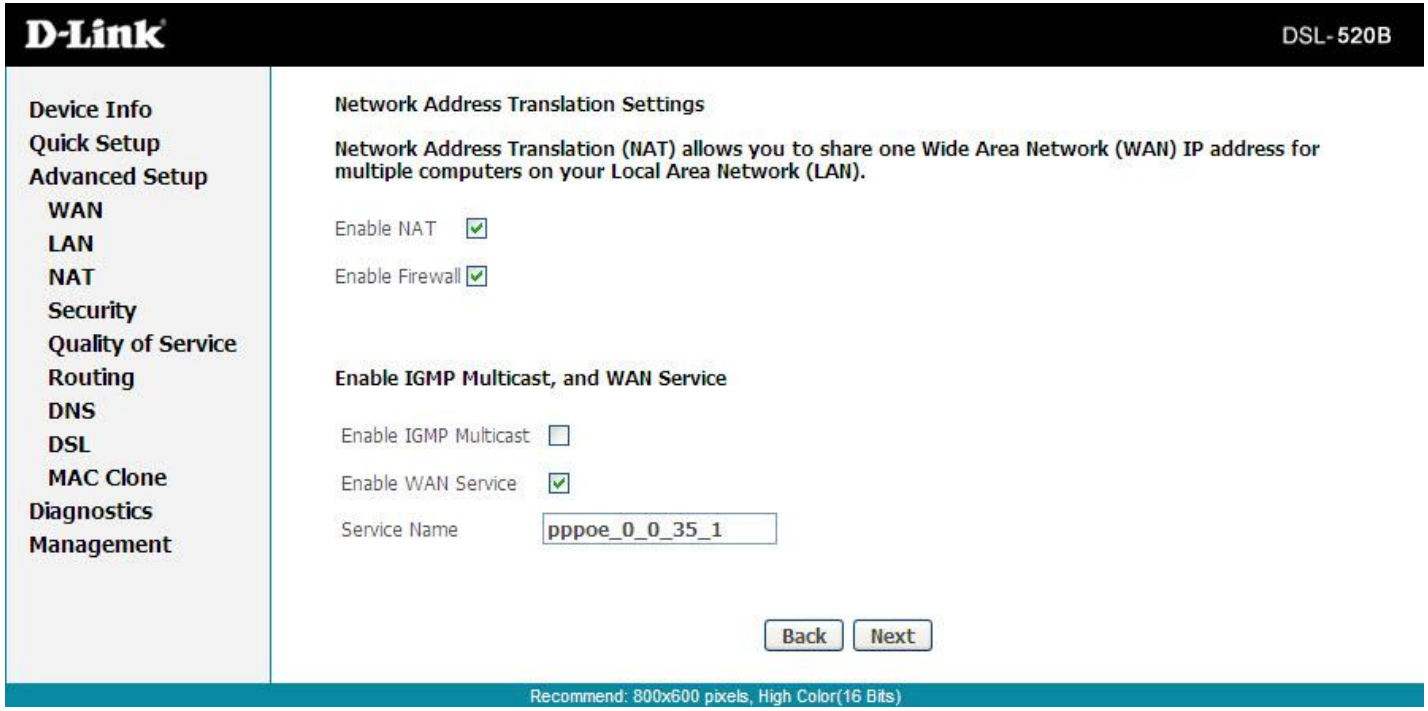
Enable Firewall: Select if you would like to utilize the firewall to help protect you from unwanted internet threats.

Enable IGMP Multicast: Use the default setting unless otherwise instructed by your ISP.

Enable WAN Service: This option is Enabled by default. Deselecting this option will cause your DSL connection to be disabled.

Service Name: Enter any name that will help you identify your connection. This field will not affect your connection.

Click **Next.**

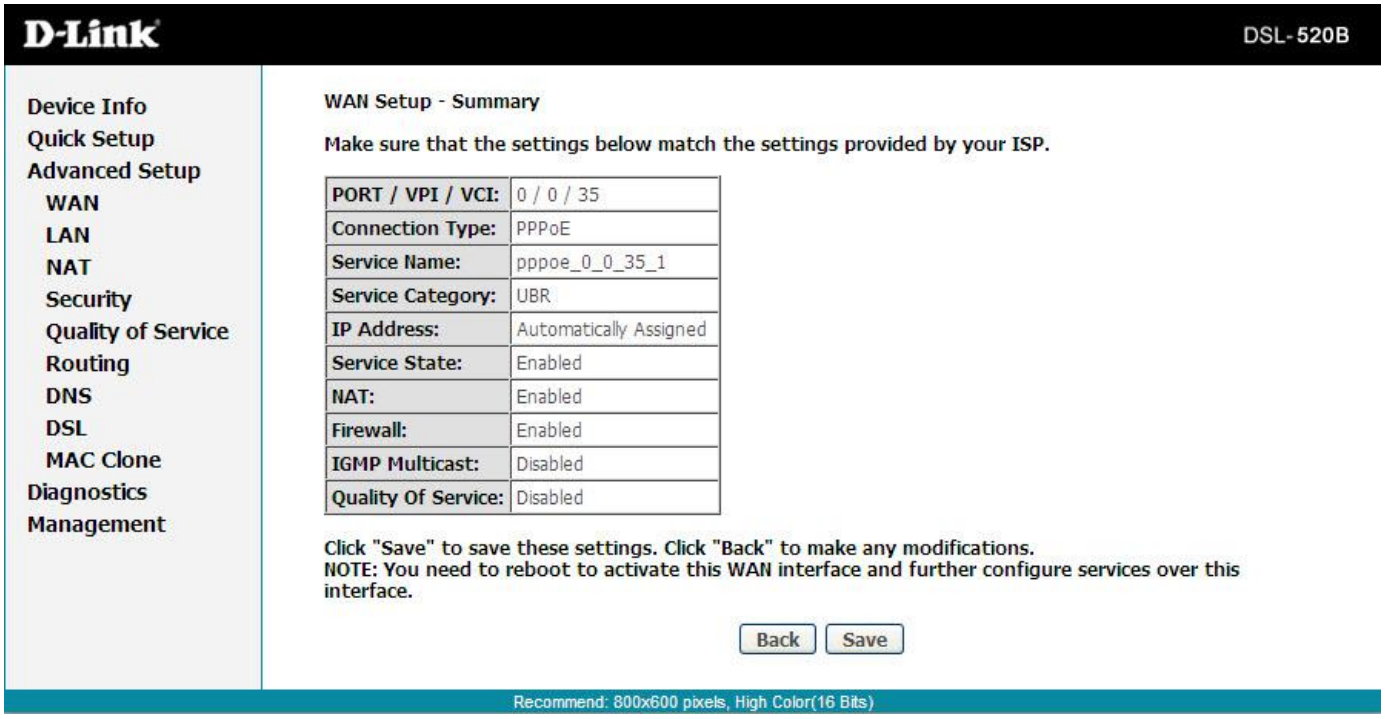


WAN Setup – Summary (PPPoE)

Confirm the settings on this page match the settings provided by your ISP. To make any changes, click **Back**.

If your settings are correct, click **Save**.

Note: After clicking **Save**, you will have to reboot the modem in order to activate your connection.



MAC Encapsulation Routing (MER) or DHCP

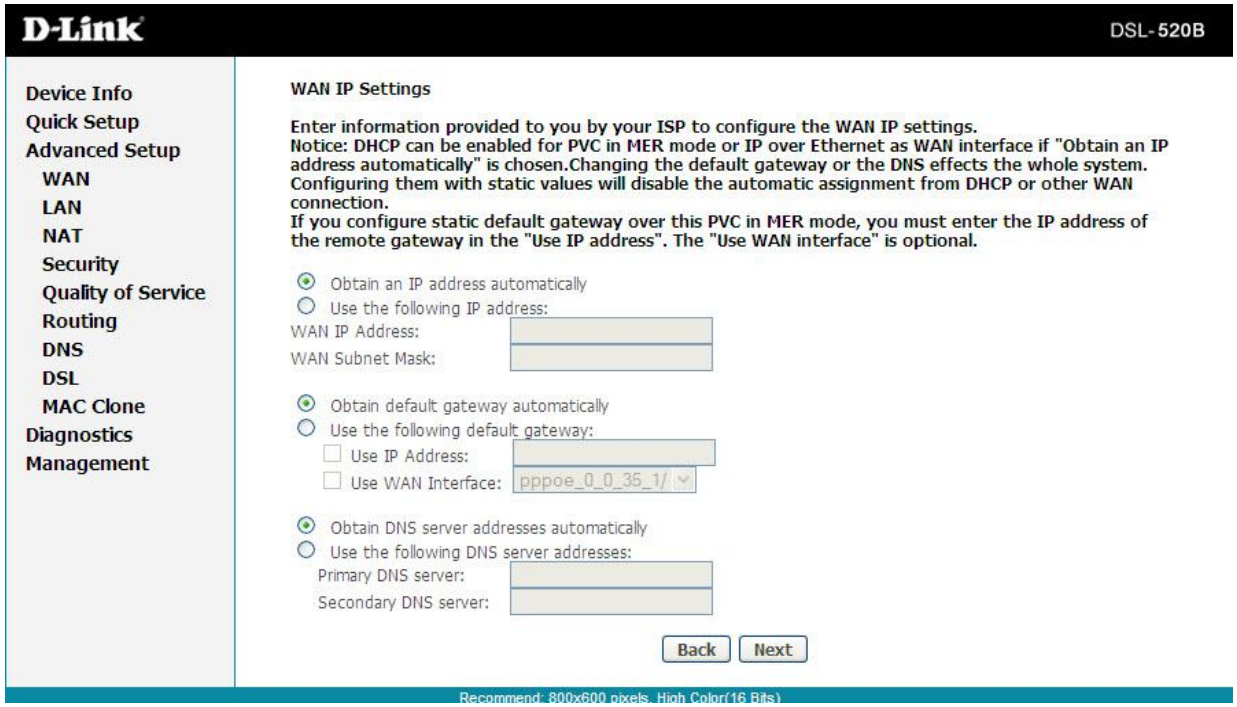
This page allows you to configure your MER/DHCP connection.

Obtain an IP address automatically: This is the default option. If your ISP has provided you with a static IP address, select Use the following IP address. Enter the IP address and Subnet Mask that your ISP has provided.

Obtain default gateway automatically: This is the default option. If your ISP has provided you with a static default gateway, select Use the following default gateway. Select Use IP Address and enter the default gateway that your ISP has provided. Alternately, you may choose to select Use WAN Interface.

Obtain DNS server addresses automatically: This is the default option. If your ISP has provided you with static DNS server addresses, select Use the following DNS server addresses. Enter the Primary and Secondary (if available) DNS server addresses that you ISP has provided.

Click **Next**.



Network Address Translation Settings (MER/DHCP)

Enable NAT: Select if you would like to share your internet connection. Sharing your connection may also require an Ethernet switch to connect multiple computers.

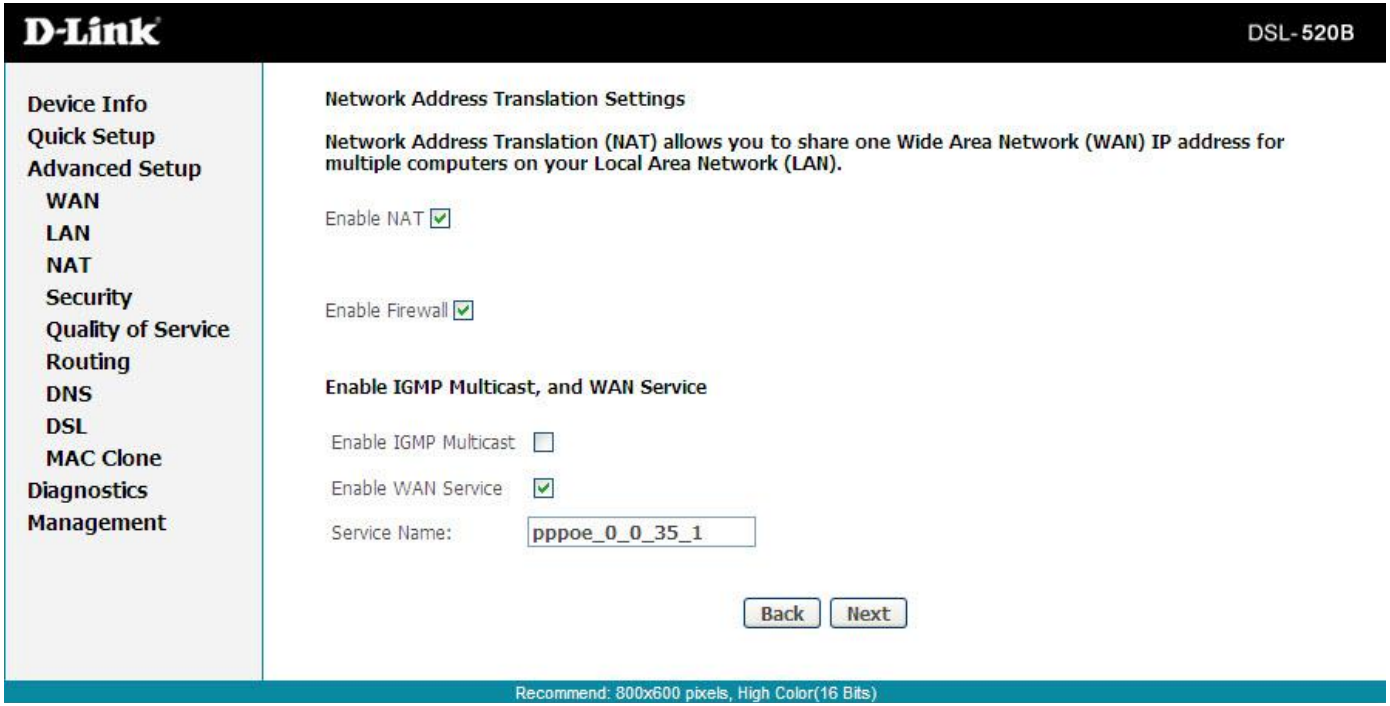
Enable Firewall: Select if you would like to utilize the firewall to help protect you from unwanted Internet threats.

Enable IGMP Multicast: Use default setting unless otherwise instructed by your ISP.

Enable WAN Service: This option is Enabled by default. Deselecting this option will cause your DSL connection to be disabled.

Service Name: Enter any name that will help you identify your connection. This field will not affect your connection.

Click **Next**.

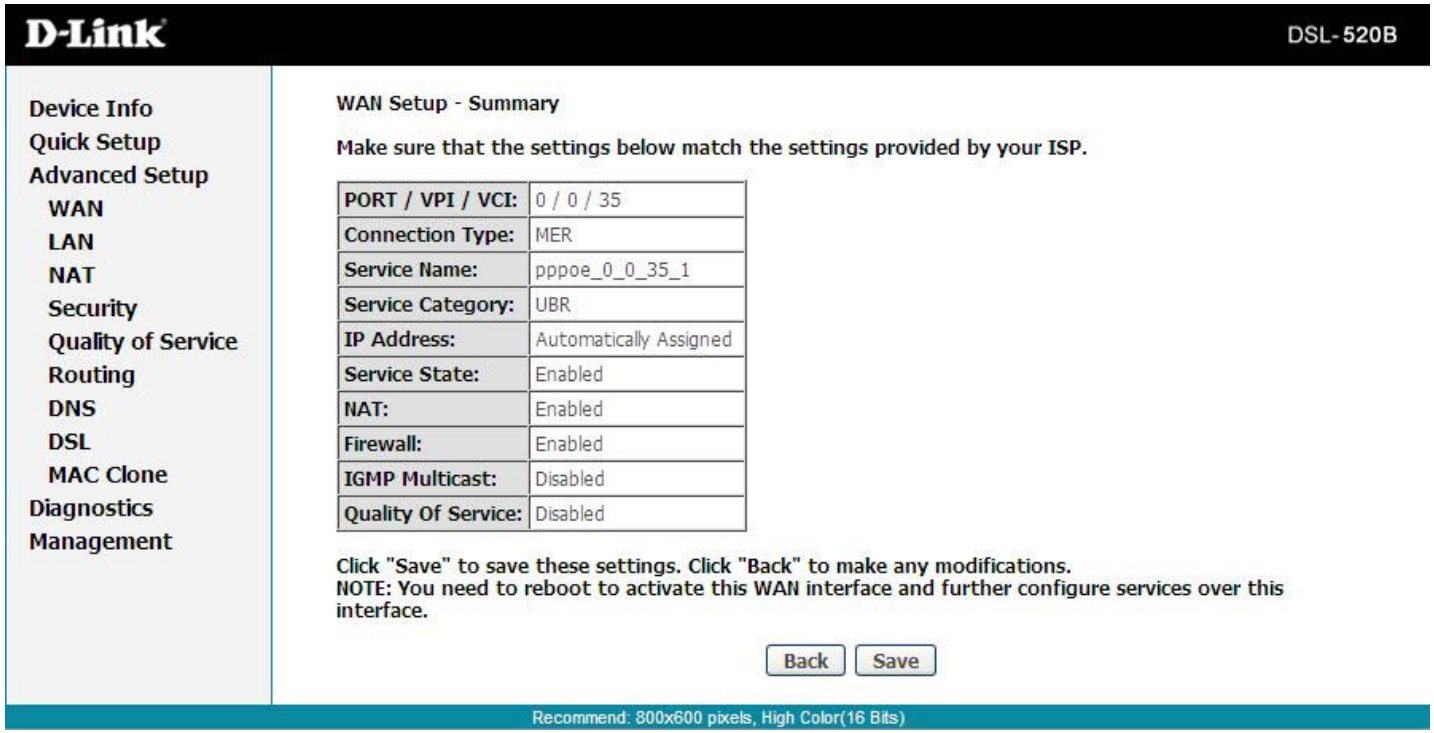


WAN Setup – Summary (MER/DHCP)

Confirm the settings on this page match the settings provided by your ISP. To make any changes, click **Back**.

If your settings are correct, click **Save.**

Note: *After clicking* **Save**, *you will have to reboot the modem in order to activate your connection.*

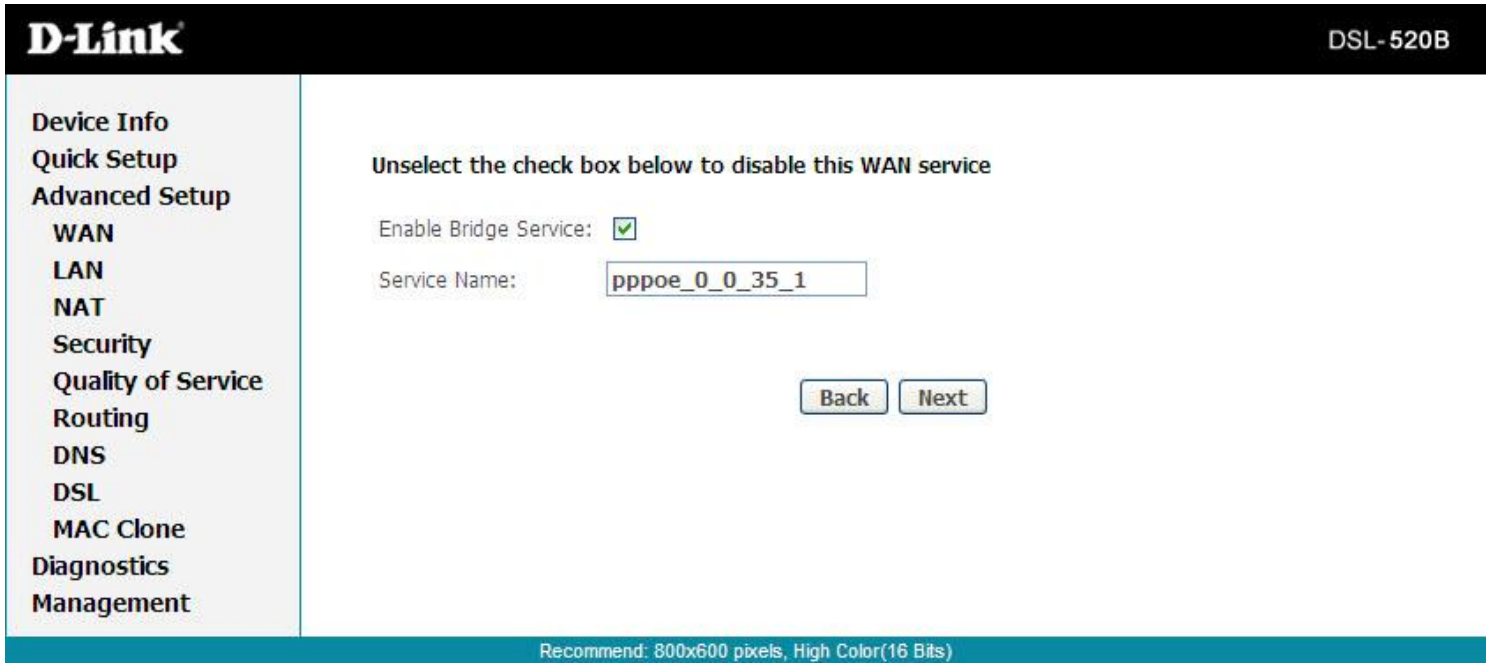


Bridging

Enable WAN Service: This option is **Enabled** by default. Deselecting this option will cause your DSL connection to be disabled.

Service Name: Enter any name that will help you identify your connection. This field will not affect your connection.

Click **Next**.

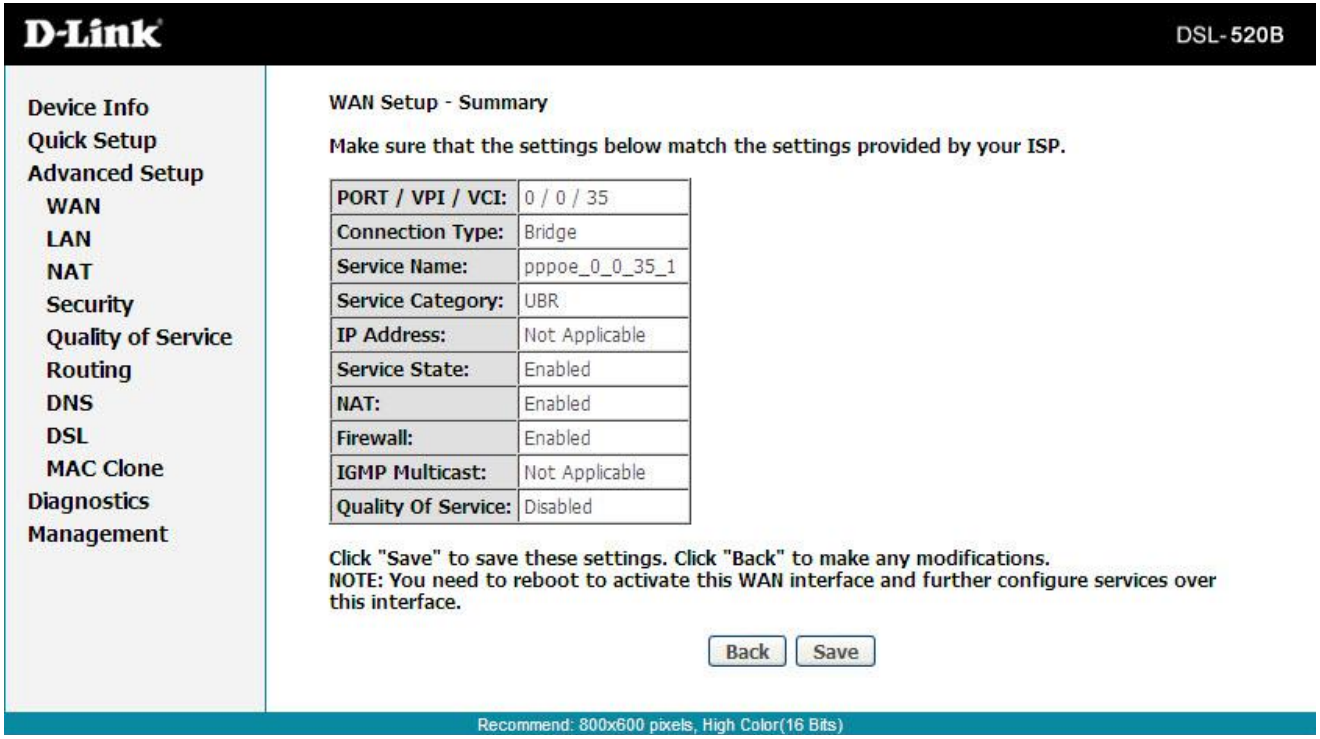


WAN Setup – Summary (Bridging)

Confirm the settings on this page match the settings provided by your ISP. To make any changes, click **Back**.

If your settings are correct, click **Save**.

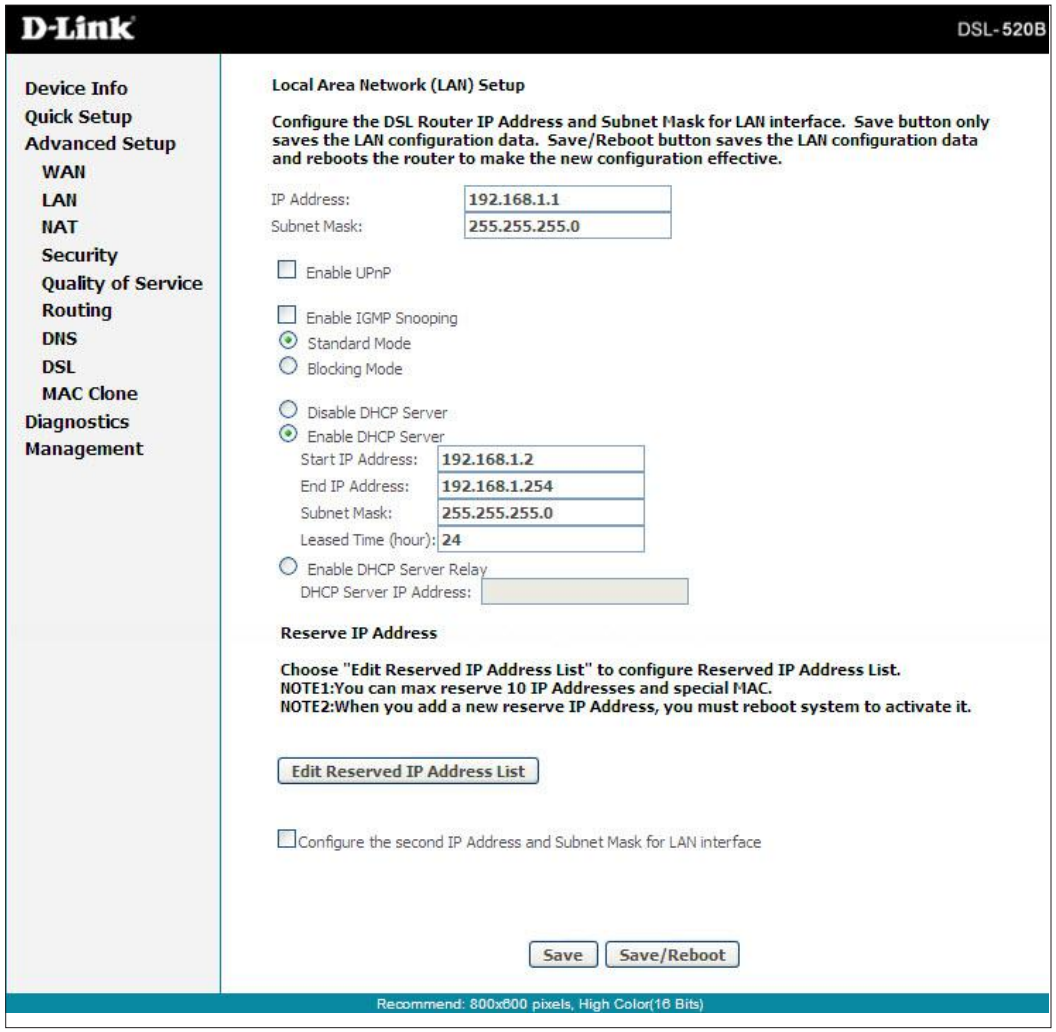
***Note:** After clicking **Save,** you will have to reboot the modem in order to activate your connection.*



LAN

You can configure the DSL Modem IP address and Subnet Mask for the LAN interface.

The **Save** button only saves the LAN configuration data, but does not apply the configurations. Select the **Save/Reboot** button to save the LAN configuration data, then reboot the modem and apply the new configuration.



NAT

Note: *You must enable the NAT service when you configure the WAN connection at first, the NAT item appears in the Advanced Setup directory. In the pure bridging mode, there is no NAT service.*

Overview - Setting up the NAT Function

The DSL router is equipped with the network address translation (NAT) function. With address mapping, several users in the local network can access the Internet via one or more public IP addresses. All the local IP addresses are assigned to the public IP address of the router by default.

One of the characteristics of NAT is that data from the Internet is not allowed into the local network unless it is explicitly requested by one of the PCs in the network. Most Internet applications can run behind the NAT firewall without any problems. For example, if you request Internet pages or send and receive e-mails, the request for data from the Internet comes from a PC in the local network, and so the router allows the data to pass through. The router opens one specific port for the application. A port in this context is an internal PC address, via which the data is exchanged between the Internet and a client on a PC in the local network. Communicating via a port is subject to the rules of a particular protocol (TCP or UDP).

If an external application tries to send a call to a PC in the local network, the router blocks it. There is no open port via which the data could enter the local network. Some applications, such as games on the Internet, require several links (that is, several ports), so that players can communicate with each other. In addition, these applications must also be permitted to send requests from other users on the Internet to users in the local network. These applications cannot run if NAT is activated.

Using port forwarding (the forwarding of requests to particular ports), the router is forced to send requests from the Internet for a certain service, for example, a game, to the appropriate port(s) on the PC on which the game is running. Port triggering is a special variant of port forwarding. Unlike port forwarding, the DSL router forwards the data from the port block to the PC which has previously sent data to the Internet via a certain port (trigger port). This means that approval for the data transfer is not tied to one specific PC in the network, but rather to the port numbers of the required Internet service.

Where configuration is concerned, you must define a so-called trigger port for the application and also the protocol (TCP or UDP) that this port uses. You then assign the public ports that are to be opened for the application to this trigger port. The router checks all outgoing data for the port number and protocol. If it identifies a match of port and protocol for a defined trigger port, then it opens the assigned public ports and notes the IP address of the PC that sent the data. If data comes back from the Internet via one of these public ports, the router allows it to pass through and directs it to the appropriate PC. A trigger event always comes from a PC within the local network. If a trigger port is addressed from outside, the router simply ignores it.

Note:

- *An application that is configured for port triggering can only be run by one user in the local network at a time.*
- *After public ports are opened, they can be used by unauthorized persons to gain access to a PC in the local network.*
- *When the DSL router is supplied, the NAT function is activated. For example, all IP addresses of PCs in the local network are converted to the public IP address of the router when accessing the Internet. You can use NAT settings to configure the DSL router to carry out the following tasks.*
- *For functions described as follows, IP addresses of the PCs must remain unchanged. If the IP addresses of the PCs are assigned via the DHCP server of the DSL router, you must disable DHCP server as the settings in the local network menu entry for the lease time or assign static IP addresses for the PCs.*
- *You can enable or disable the NAT function. By default, the NAT function is enabled.*

NAT - Virtual Server Setup

By default, DSL router blocks all external users from connecting to or communicating with your network. Therefore, the system is safe from hackers whom may try to intrude into the network and damage it.

However, you may want to expose your network to the Internet in limited and controlled ways in order to enable some applications to work from the LAN (for example, game, voice, and chat applications) and to enable Internet access to servers in the home network. The port forwarding feature supports both functions. This topic is also referred as Local Servers.

The port forwarding page is used to define applications that require special handling by DSL router. All you need to do is to select the application protocol and the local IP address of the computer that is using or providing the service. If required, you may add new protocols in addition to the most common ones provided by DSL router.

For example, if you wanted to use a file transfer protocol (FTP) application on one of your PCs, you would simply select FTP from the list and enter the local IP address or host name of the designated computer. All FTP-related data arriving at DSL router from the Internet henceforth is forwarded to the specific computer.

Similarly, you can grant Internet users access to servers inside your home network, by identifying each service and the PC that provide it. This is useful, for example, if you want to host a Web server inside your home network. When an Internet user points his/her browser to DSL router external IP address, the gateway forwards the incoming HTTP request to your Web server. With one external IP address (DSL router main IP address), different applications can be assigned to your LAN computers, however each type of application is limited to use one computer.

For example, you can define that FTP uses address X to reach computer A and Telnet also uses address X to reach omputer A. But attempting to define FTP to use address X to reach both computer A and B fails. DSL router, therefore, provides the ability to add additional public IP addresses to port forwarding rules, which you must obtain from your ISP, and enter into the IP addresses pool. Then, you can define FTP to use address X to reach computer A and address Y to reach computer B.

Additionally, port forwarding enables you to redirect traffic to a different port instead of the one to which it was designated.

For example, if you have a Web server running on your PC on port 8080 and you want to grant access to this server to any one who accesses DSL router via HTTP. To accomplish this, do as follows:

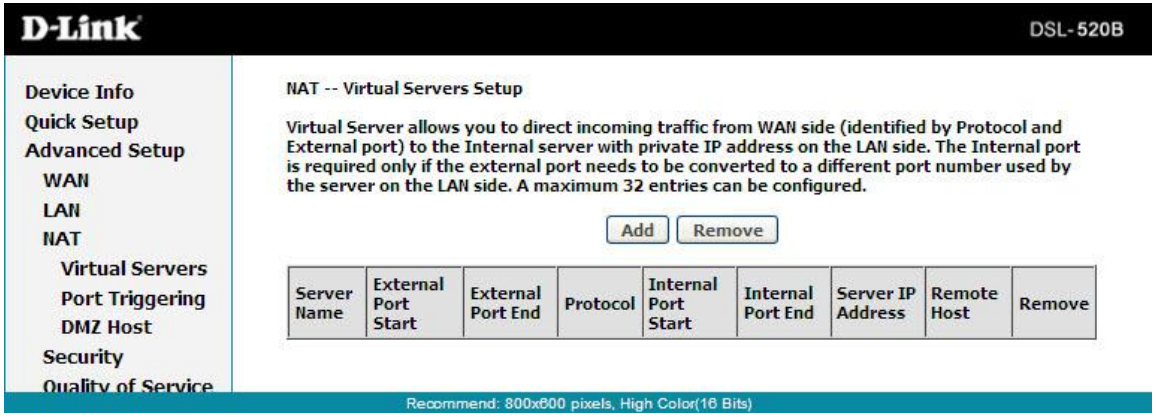
Step 1
Define a port forwarding rule for the HTTP service, with the PC IP or host name.

Step 2
Specify 8080 in the Forward to Port field.

All incoming HTTP traffic is forwarded to the PC running the Web server on port 8080. When setting a port forwarding service, ensure that the port is not used by another application, which may stop functioning. A common example is when using SIP signaling in Voice over IP, the port used by the gateway VoIP application (5060) is the same port, on which port forwarding is set for LAN SIP agents.

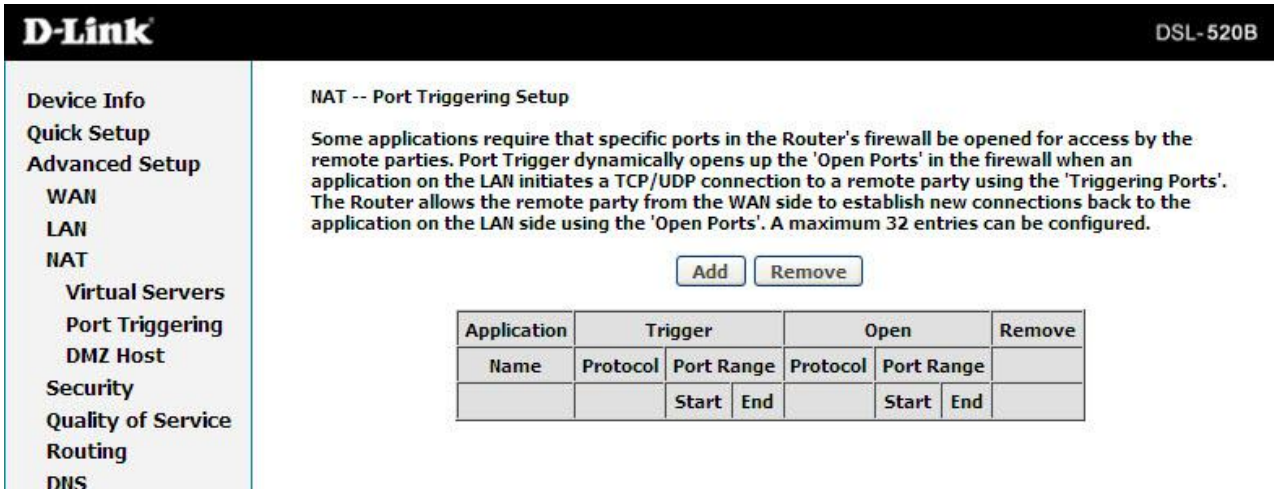
Note: *Some applications, such as FTP, TFTP, PPTP and H323, require the support of special specific application level gateway (ALG) modules in order to work inside the home network. Data packets associated with these applications contain information that allows them to be routed correctly. An ALG is needed to handle these packets and ensure that they reach their intended destinations. DSL router is equipped with a robust list of ALG modules in order to enable maximum functionality in the home network. The ALG is automatically assigned based on the destination port.*

Virtual servers are configured for this purpose.



Port Triggering

If you configure port triggering for a certain application, you must determine a so-called trigger port and the protocol (TCP or UDP) that this port uses. You then assign the public ports that are to be opened for the application to this trigger port. You can select known Internet services or manually assign ports or port blocks.



DMZ Host

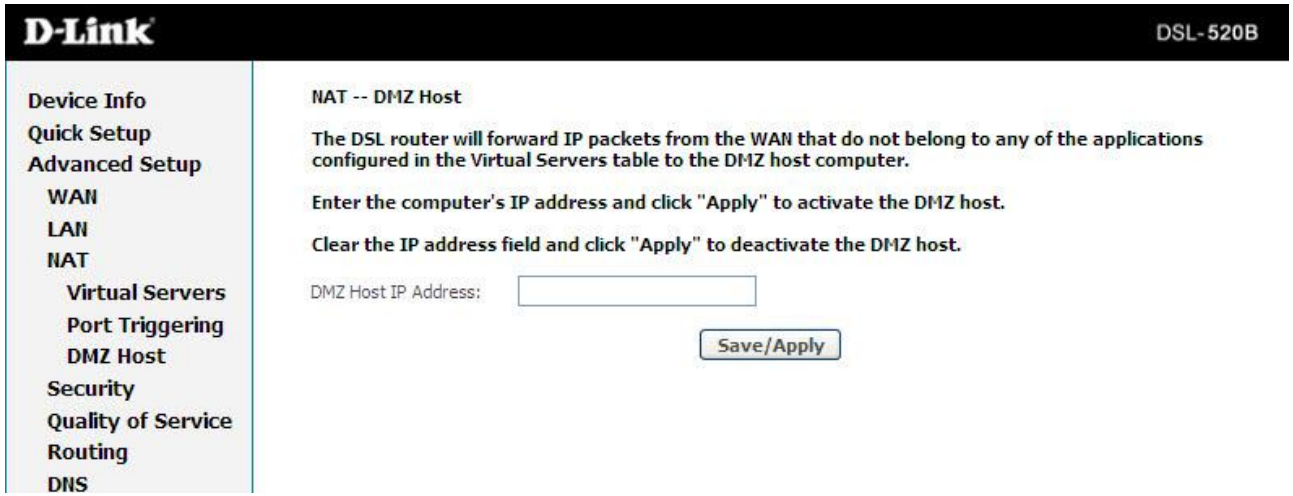
The demilitarized (DMZ) host feature allows one local computer to be exposed to the Internet. This function is applicable for:

- Users who want to use a special-purpose Internet service, such as an on-line game or video conferencing program, that is not in the port forwarding list and for which no port range information is available.
- Users who are not concerned with security and wish to expose one computer to all services without restriction.

Note: *A 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. Hence, when designating a DMZ host, you must consider the security implications and and take the appropriate precautions.*

You can set up a client in your local network as a DMZ host. Your device then forwards all incoming data traffic from the Internet to this client. You can, for example, operate your own Web server on one of the clients in your local network and make it accessible to Internet users. As the exposed host, the local client is directly visible to the Internet and therefore particularly vulnerable to attacks (for example, hacker attacks). Enable this function only when necessary (for example, to operate a Web server) and when other functions (for example, port forwarding) are inadequate. In this case, you should take appropriate measures for the clients concerned.

Note: *Only one PC per public IP address can be set up as an exposed host.*



Security

IP Filtering

Click **Security** > **IP Filtering** and the following interface appears. By default, the firewall is enabled. The firewall is used to block document transmissions between the Internet and your PC. It serves as a security gate and permits only authorized traffic to be sent to the LAN.

Note: *If the modem is configured to bridge mode only, IP filtering is disabled and the IP filtering interface does not appear.*

If the modem does not configure a PVC of Bridge mode, MAC filtering is disabled and the MAC Filtering interface does not appear.

Outgoing

Click **Security** > **IP Filtering** > **Outgoing** and the following page will appear.

By default, all outgoing IP traffic from LAN is allowed, but some IP traffic can be blocked by setting up filters.

Click **Add** and the page for defining the IP filtering rule appears. In this page, you can create a filter rule to identify outgoing IP traffic by specifying a new filter name and at least one condition. All specified conditions in the filtering rule must comply with the rule to take effect.

Click **Save/Apply** to save and activate the filter.

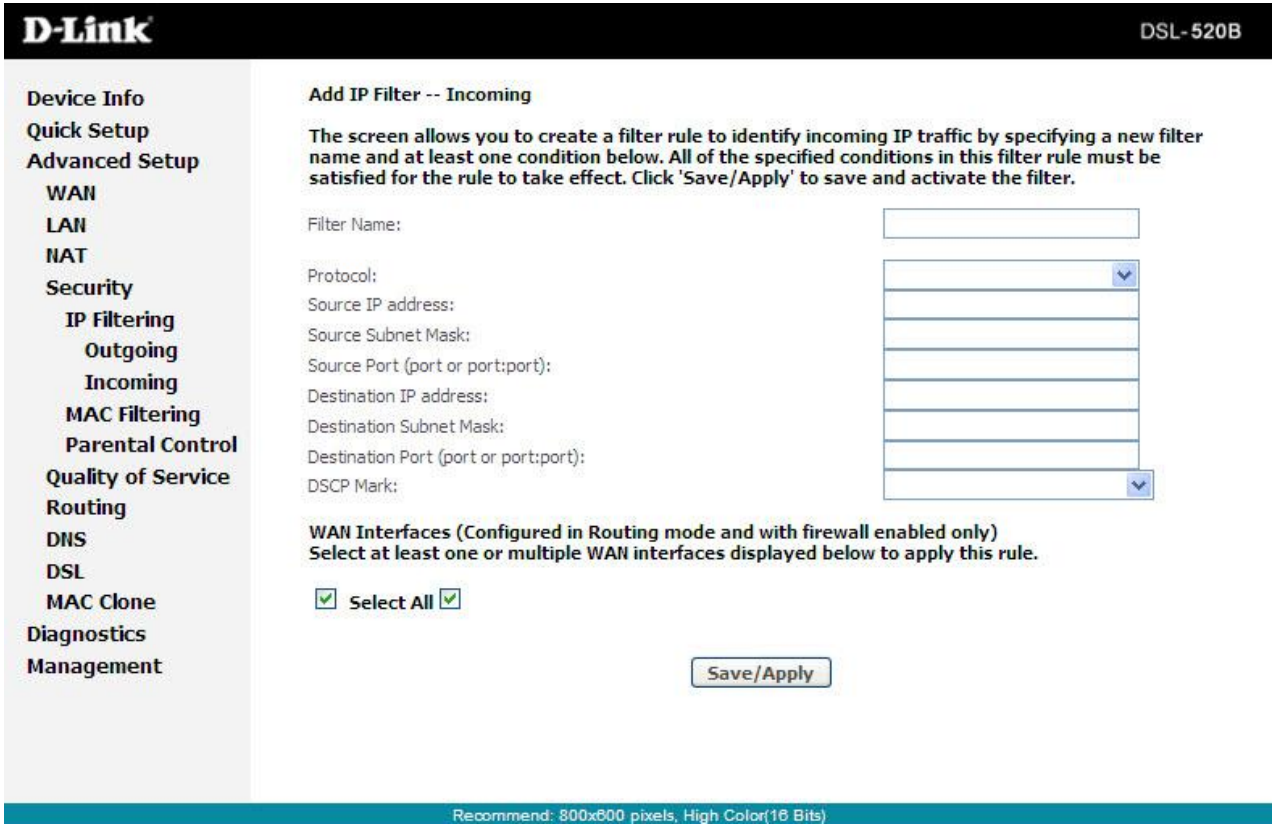
Incoming

Click **Security** > **IP Filtering** > **Incoming**.

By default, all incoming IP traffic from the WAN is blocked when the firewall is enabled. However, some IP traffic can be accepted by setting up filters.

Click **Add**, the following page appears. In this page, you can create a filter rule to identify incoming IP traffic by specifying a new filter name and at least one condition. All specified conditions in this filter rule must comply with the rule. Click **Save/Apply** to save and activate the filter.

You should select at least one WAN interface to apply this rule.



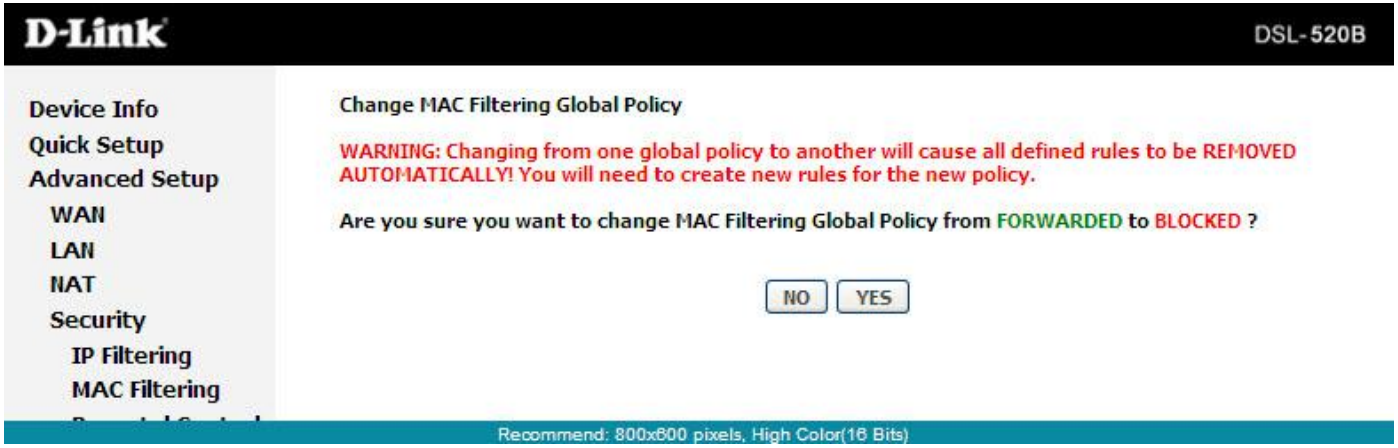
MAC Filtering

Click **Security** > **MAC Filtering**.

MAC Filtering is only effective on ATM PVCs configured in Bridge mode. Forwarded means that all MAC layer frames are forwarded except those matching any of the specified rules in the following table. Blocked means that all MAC layer frames are blocked except those matching with any of the specified rules in the following table.

Click **Change Policy** and the following page will appear. Then you can change the MAC Filtering Global Policy from **FORWARDED** to **BLOCKED**.

Read the warning information. Click **Yes** to change the MAC filtering global policy from Forwarded to Blocked. Click **No** to cancel.

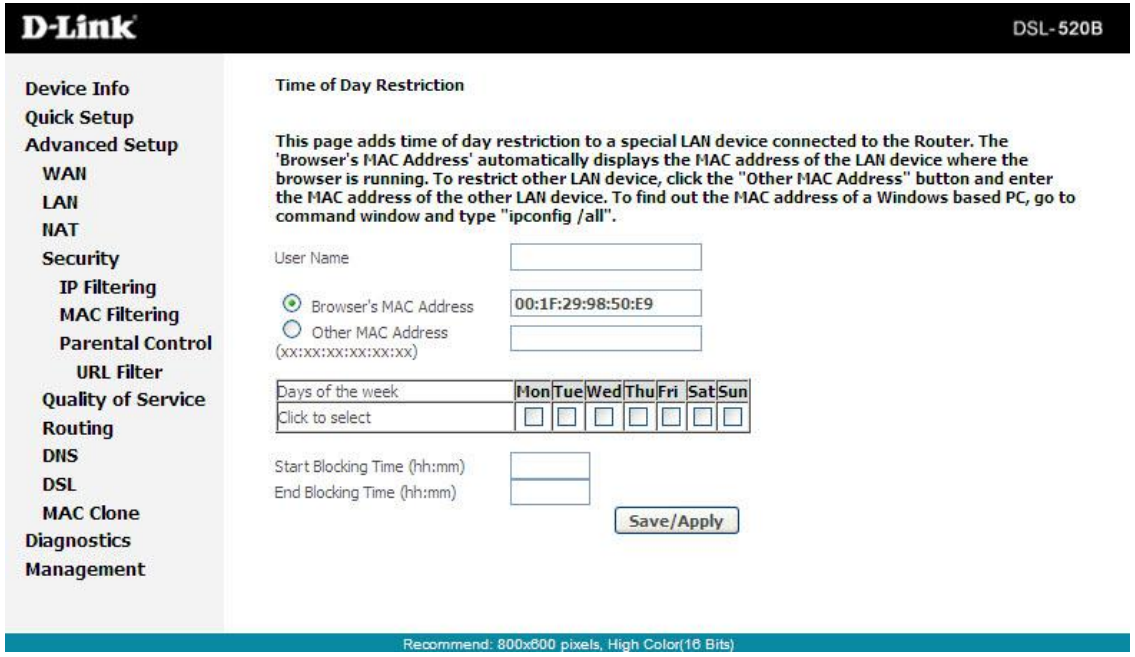


Parental Control

Click **Security** > **Parental Control.**

Click **Add** and the following page will appear.

On this page, you can add time of day restriction to a particular LAN device connected to the Router. The Browser's MAC Address automatically displays the MAC address of the LAN device where the browser is running. To restrict other LAN device, click **Other MAC Address** and enter the MAC address of the another LAN device. To obtain the MAC address of a Windows based PC, enter ipconfig /all in the DoS window.



Quality of Service

Many communication and multimedia applications require large, high-speed bandwidths to transfer data between the local network and the internet. However, for many applications there is often only one internet connection available with limited capacity. QoS divides this capacity between the different applications and provides undelayed, continuous data transfer in situations where data packets with higher priority are given preference.

Click **Quality of Service** and the following page will appear. Under Quality of Service, there are two network share modes: Queue Config and QoS Classification.

Network QoS is an industry-wide set of standards and mechanisms for ensuring high-quality performance for critical applications. By using QoS mechanisms, network administrators can use existing resources efficiently and ensure the required level of service without reactively expanding or over-provisioning their networks.

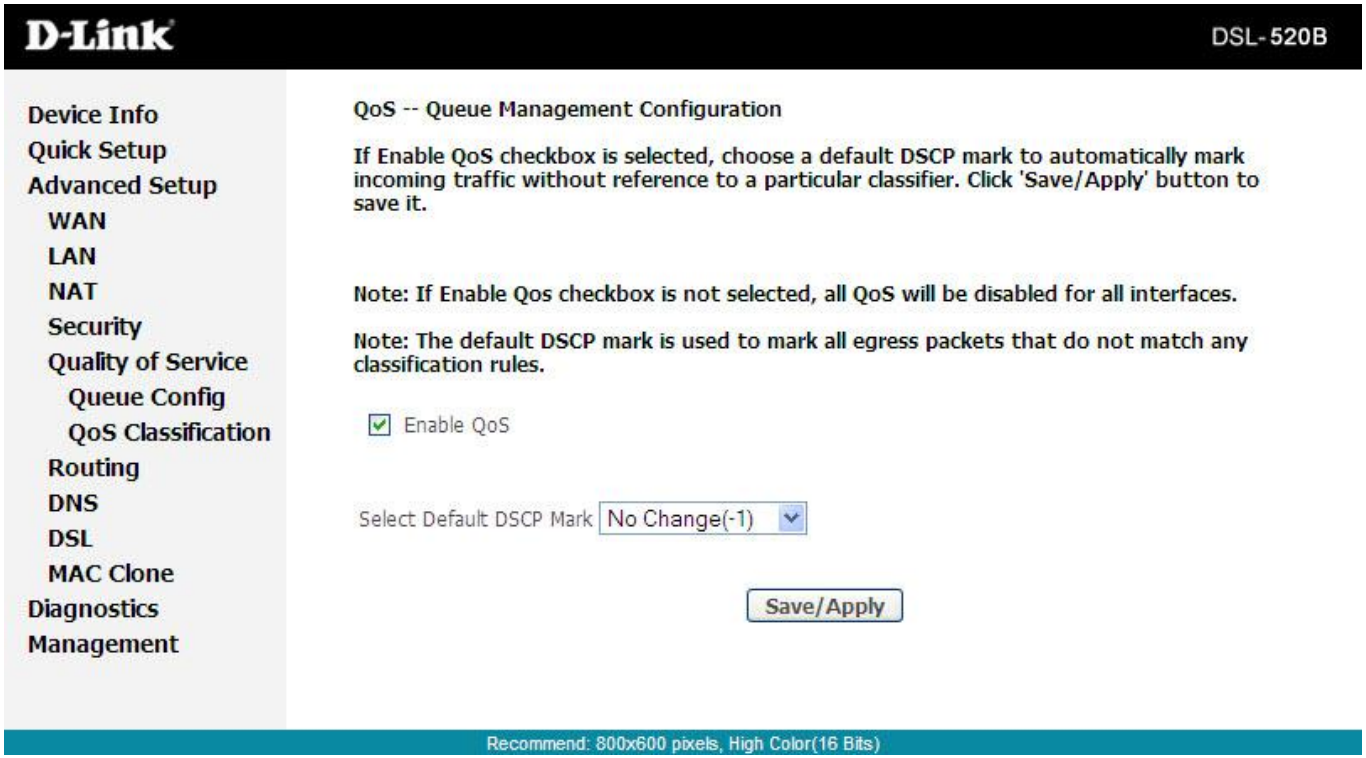
Traditionally, the concept of quality in networks meant that all network traffic was treated equally. The result was that all network traffic received the network's best effort, with no guarantees for reliability, delay, variation in delay, or other performance characteristics. With best-effort delivery service, however, a single bandwidth-intensive application can result in poor or unacceptable performance for all applications. The QoS concept of quality is one in which the requirements of some applications and users are more critical than others, which means that some traffic needs preferential treatment.

Enabling QoS

In this page, you can perform QoS queue management configuration. By default, the system enables QoS and sets a default DSCP mark to automatically mark incoming traffic without reference to particular classifier.

Select **Advanced Setup** > **Quality of Service** and the following page will appear.

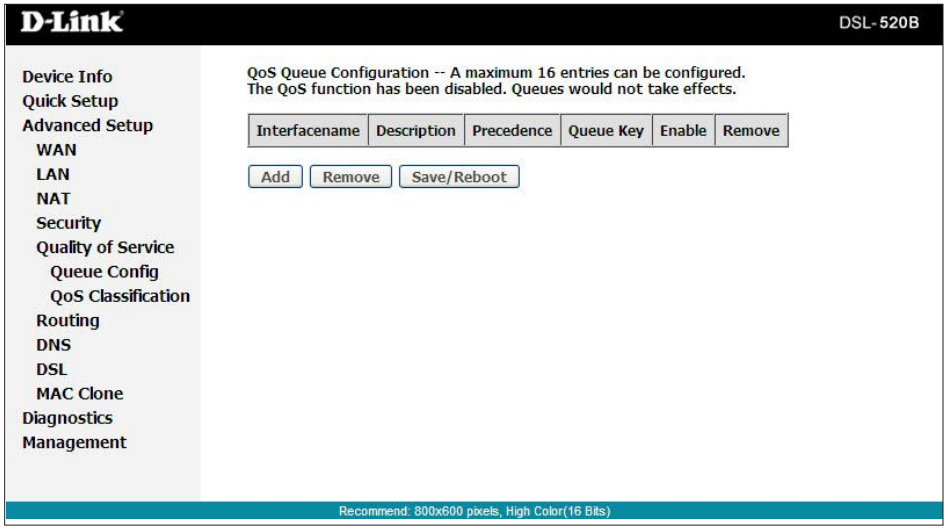
Select Enable QoS to enable QoS and set the default DSCP mark. Click **Save/Apply** to activate QoS.



QoS Configuration

The queuing in packet QoS goes into effect only when a packet is forwarded to a QoS-enabled PVC. Packet forwarding is determined by IP routing or bridging, not under control of the packet QoS.

Click **Queue Config**, and the following page will appear. In this page, you can configure QoS queue. A maximum of 16 entries can be configured.

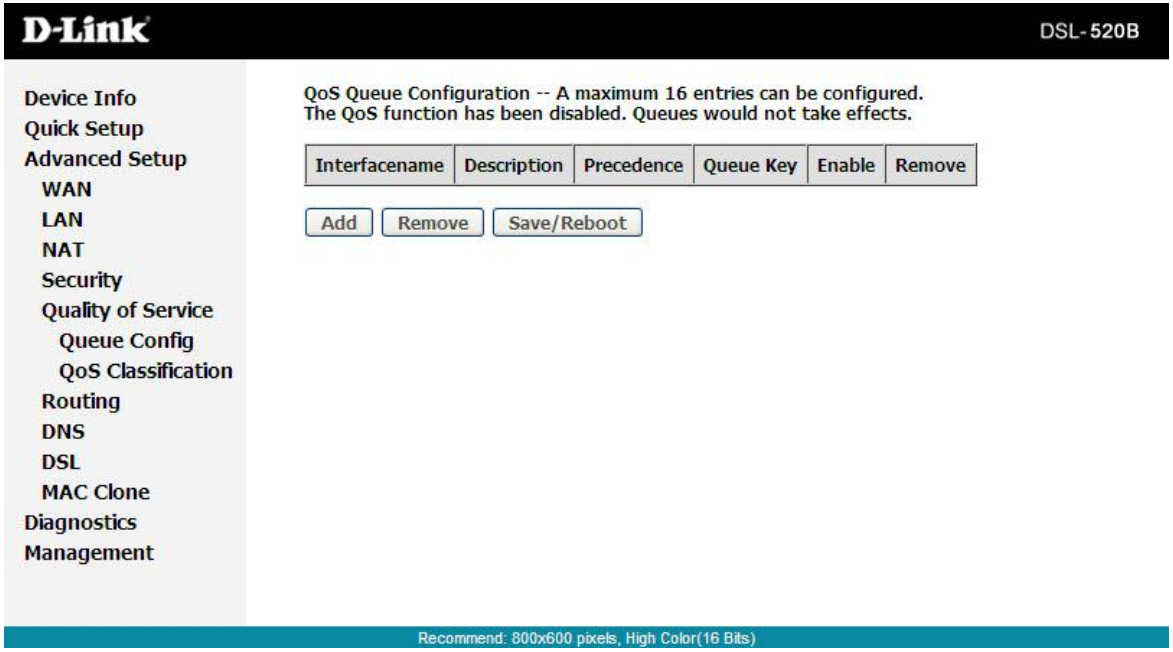


QoS Queue Configuration can allocate four queues. Each of the queues can be configured for a precedence value (Lower integer values for precedence imply higher priority for this queue relative to others). The queue entry configured is used by the classifier to place ingress packets appropriately.

Note: Lower integer values for precedence imply higher priority for this queue relative to others.

For example, add a QoS queue entry and allocate it to a specific network interface (PVC 0/0/35). Set integer values for queue precedence to 1.

Step 1
Click **Add**, and the following page will appear.



Queue Configuration Status: set to enable or disable a QoS queue.

Queue: Select a specific network interface. When you have already selected a network interface, the specific network interface selected automatically allocates to the queue.

Queue Precedence: Select an integer value for queue precedence. After you select an integer value, the queue entry appropriately places to ingress packets. Lower integer values for precedence imply higher priority for this queue relative to others.

Step 2
Add a QoS queue entry and assign it to a specific network interface (PVC 0/0/35), and set integer values for queue precedence to 1. See the following figure:

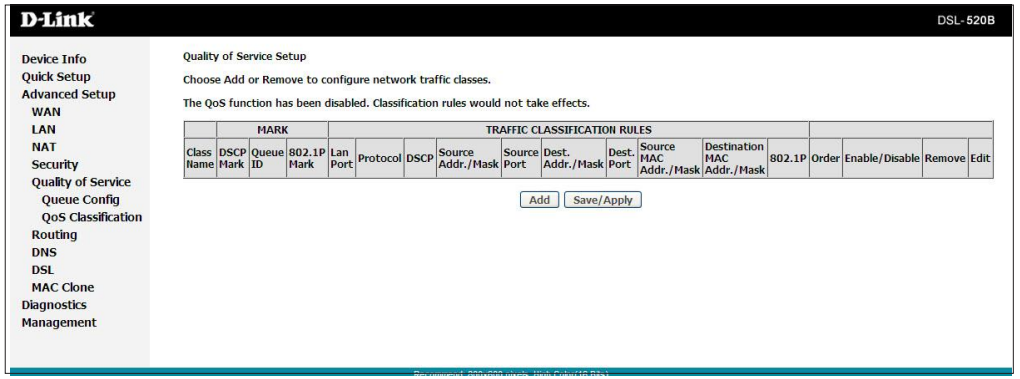
Step 3
After proper modifications, click **Save/Apply** and the following page will appear. This configuration takes effect immediately. To delete a certain queue, disable it, select it, and then click **Remove**. After the queue is configured, you can create several traffic class rules to classify the upstream traffic.

QoS Classification

Some applications require specific bandwidth to ensure its data be forwarded in time. QoS classification can creates traffic class rule to classify the upstream traffic. Assign queue which defines the precedence and the interface and optionally overwrite the IP header DSCP byte. After QoS classification, QoS divides capacity between different applications and provides undelayed, continuous data transfer where data packet with higher priority is given preference.

Click **QoS Classification** and the following page will appear. In this page, you can configure network traffic classes.

Click **Add** to continue.



Traffic Class Name: Enter a name of the class.

Rule Order: Select order for queue.

Rule Status: Enable or disable this traffic class rule.

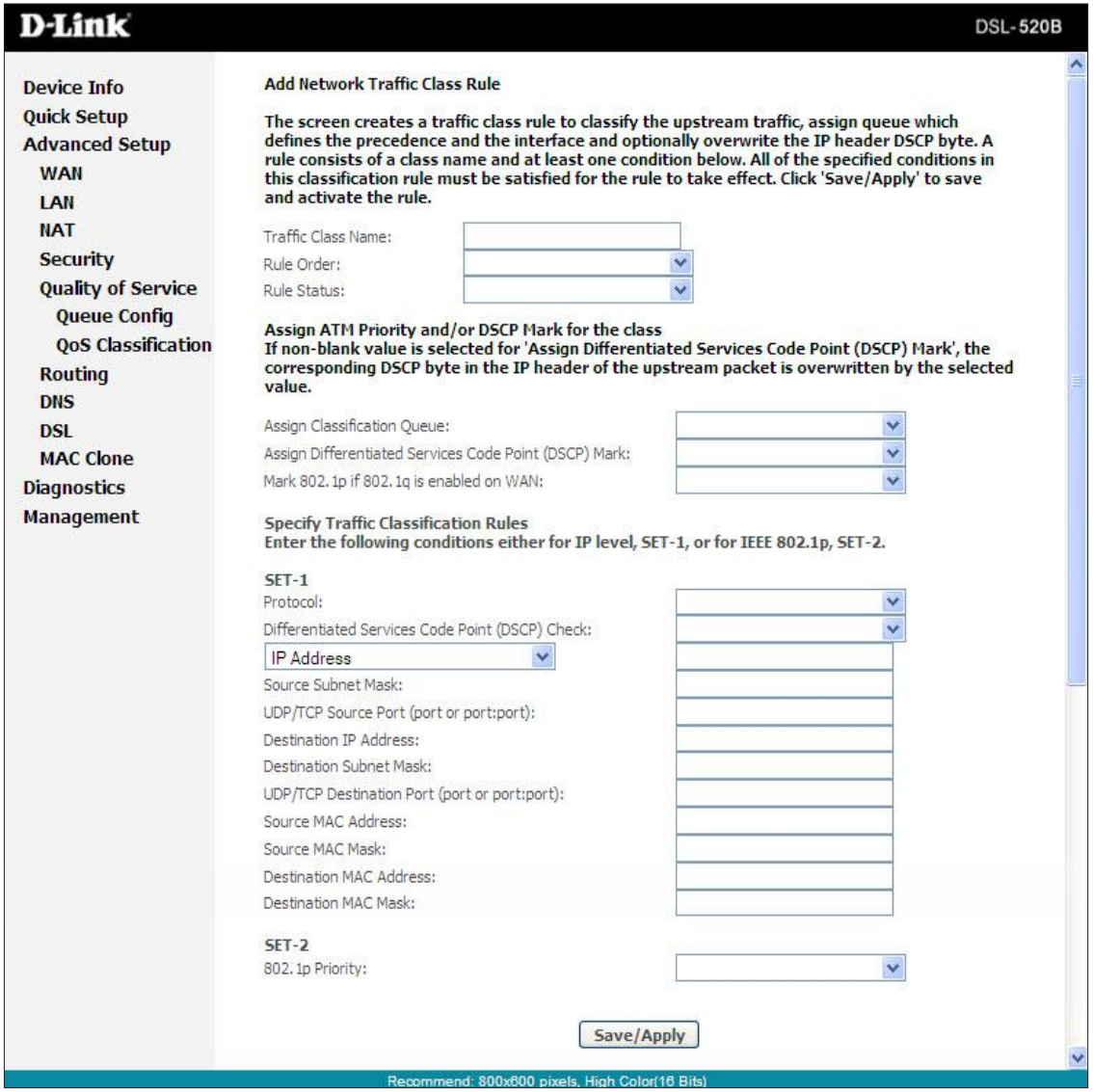
Assign Classification Queue: Select a classification queue.

Assign Differentiated Service Code Point (DSCP) Mark: Select a mark service that modifies the original packet IP header if all rules defined within the classification class are matched.(CS-Mark IP Precedence, AF-Assured Forwarding, EF-Expedited
Forwarding)

Mark 802.1p if 802.1q is Enabled: Select an 802.1p priority number that serves as the 802.1p value.

There are two sets of classification rules. Set-1 is based on different fields within TCP/UDP/IP layer plus physical LAN port. Set-2 is based on MAC layer IEEE 802.1p priority field.

Set-1 Rules contain the following:
Physical LAN Port: Select one among Ethernet ports and



wireless port.
Protocol: Select one among TCP/UDP TCP UDP or ICMP protocols.
Source IP Address
Source Subnet Mask
UPD/TCP Source Port
Destination IP Address
Destination Subnet Mask
UPD/TCP Destination Port or a Range of Ports
Source Mac Address
Source Mac Mask
Destination Mac Address
Destination Mac Mask

Set-2 Rules contain the following:
802.1p Priority: the 802.1p header includes a 3-bit prioritization field, which allows packets to be grouped into eight levels of priority (0-7), where level 7 is the highest one.

QoS-DSCP Setting

In order to understand Differentiated Services Code Point (DSCP), you should be familiar with the differentiated services model (Diffserv).

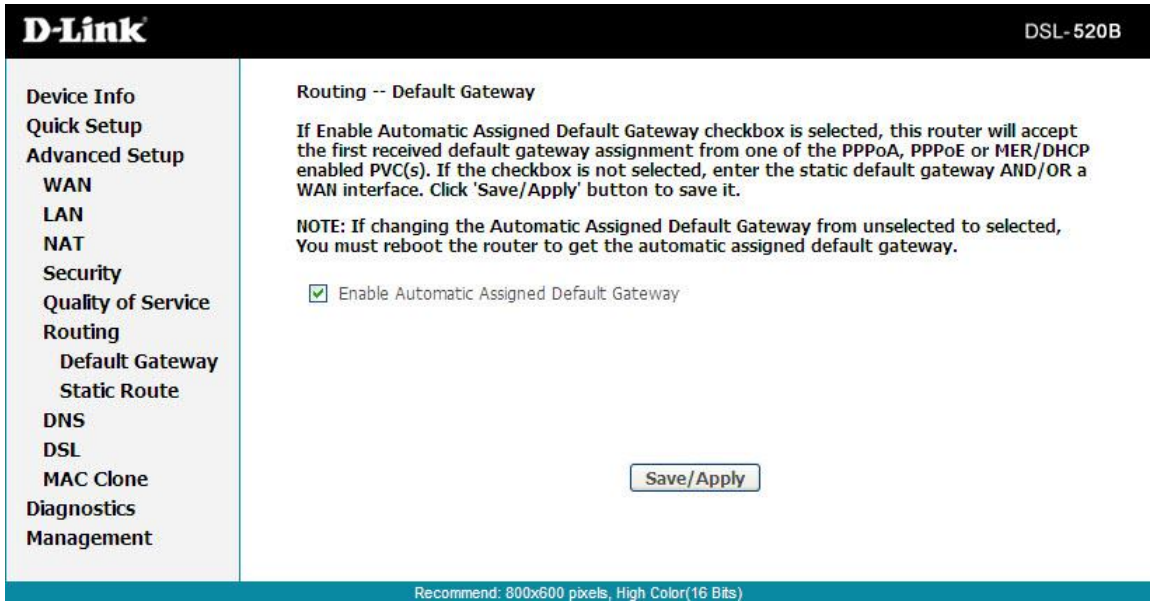
Diffserv is a Class of Service (CoS) model that enhances best-effort Internet services by differentiating individual user traffic, service requirements and other criteria. Packets are specifically marked, allowing network nodes to provide different levels of service via priority queuing or bandwidth allocation, or by choosing dedicated routes for
specific traffic flows.

As displayed in following diagram, the IPV4 packet has a TOS field. Diffserv defines TOS field in IP packet headers referred to as DSCP. Hosts or routes that pass traffic to a Diffserv-enabled network typically mark each transmitted packet with an appropriate DSCP. The DSCP markings are used by Diffserv network routers to appropriately classify packets and to apply particular queue handing or scheduling behavior.

Routing
Default Gateway

In this page, you can modify the default gateway settings. If you select Enable Automatic Assigned Default Gateway, this router can accept the first received default gateway assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s). If the check box is not selected, you must enter the static default gateway and/or a WAN interface. Then, click **Save/Apply**.

Note: If the Automatic Assigned Default Gateway check box is changed from deselected to selected, you must reboot the router to obtain the automatic assigned default gateway.



Static Route

In this page you can modify the static route settings. You can query the preset static routes, delete an existing static route, or add a new static route. By default, the system has no static route information.

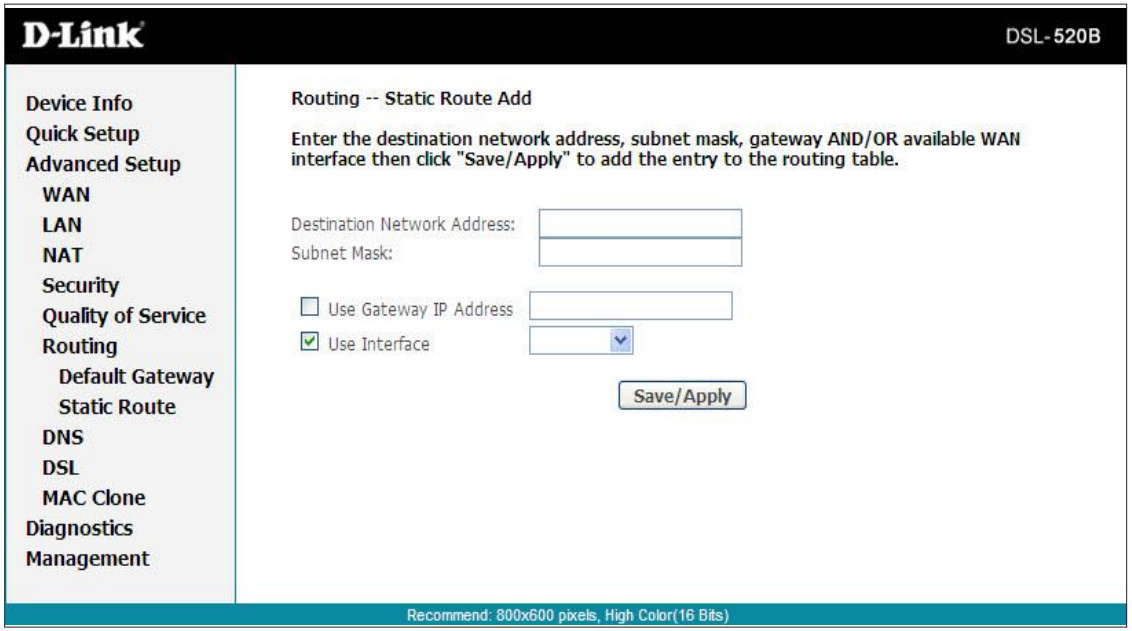
Destination: The IP address to which packets are transmitted.

Subnet Mask: The subnet mask of the destination IP address.

Gateway: The gateway that the packets pass by during transmission.

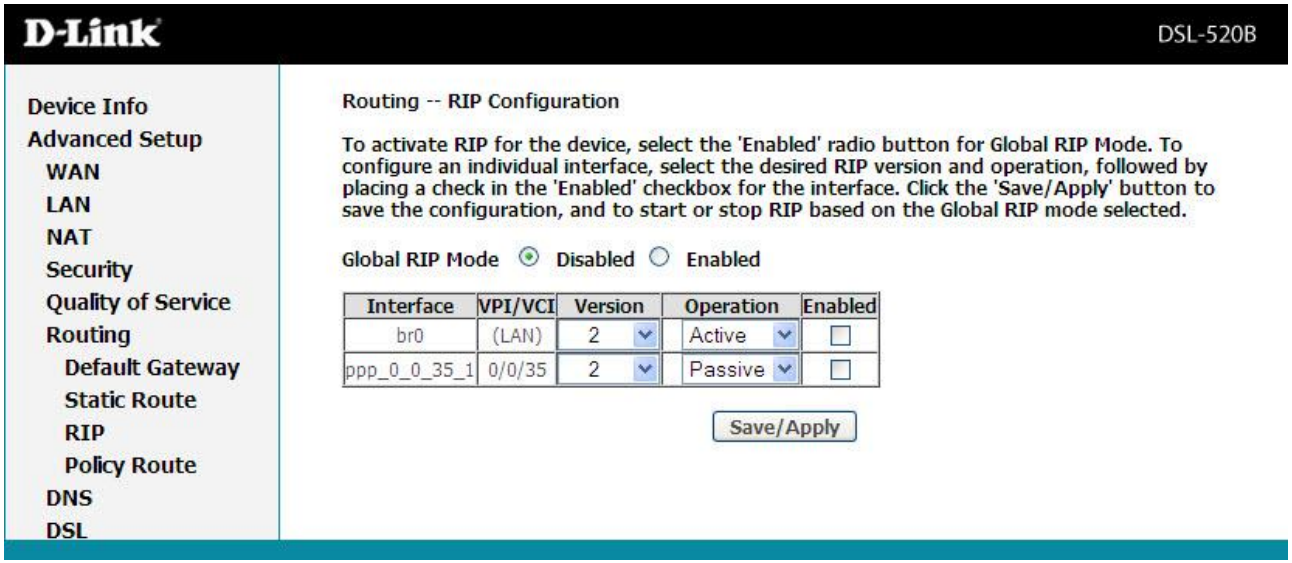
Interface: The interface that the packets pass through on the
modem.

Click **Add** and the following page will appear. Enter the destination network address, subnet mask, gateway AND/OR available WAN interface, then click **Save/Apply** to add the entry to the routing table.



RIP

To activate RIP for the device, select the **Enabled** radio button for Global RIP Mode. To configure an individual interface, select the desired RIP version and operation, followed by placing a check in the **Enabled** checkbox for the interface. Click the **Save/Apply** button to save the configuration, and to start or stop RIP based on the Global RIP mode selected.

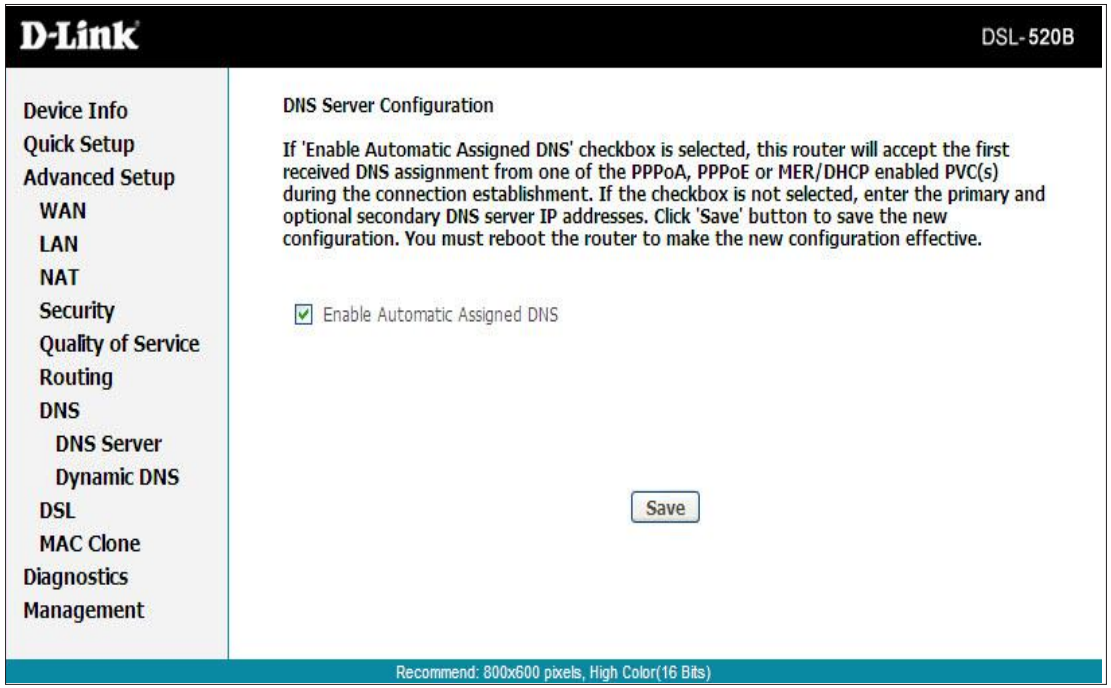


DNS

Server Configuration

In this page, you can modify the DNS server settings. If **Enable Automatic Assigned DNS** is selected, this router accepts the first received DNS assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s) during the connection establishment. If the checkbox is not selected, enter the primary and secondary (optional) DNS server IP addresses. The interface is as follows. Click **Save** to save the new configuration.

Note: You must reboot the router to make the new configuration take effect.

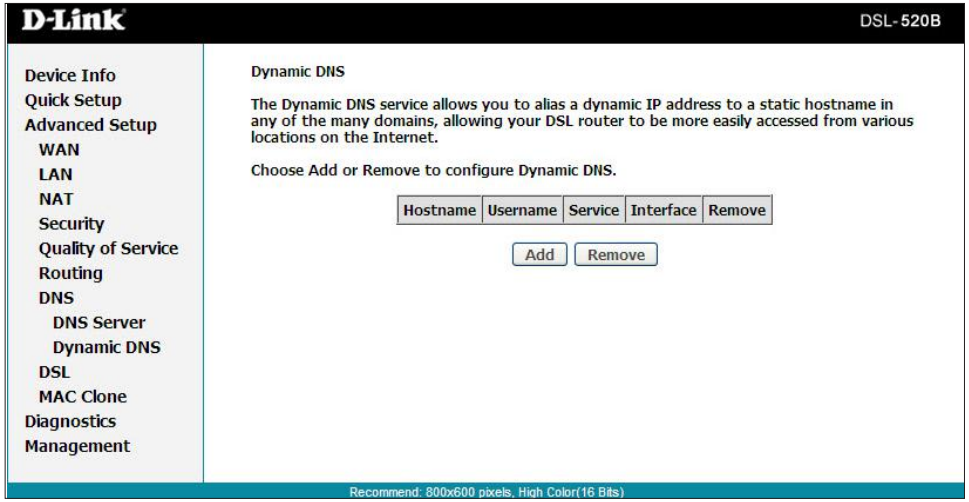


Dynamic DNS

In this interface, you can modify the Dynamic DNS settings.

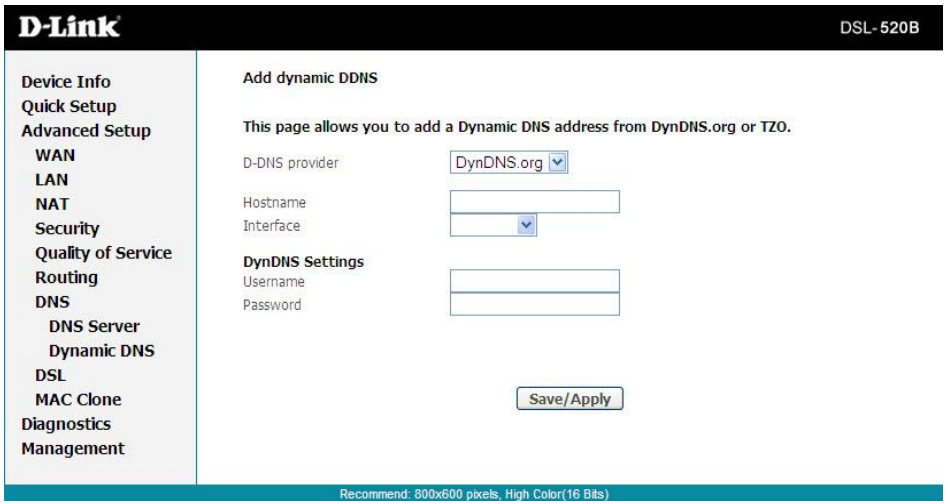
The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname in any of the many domains, allowing your DSL router to be more easily accessed from various locations on the Internet.

Click **Add** to add Dynamic DNS



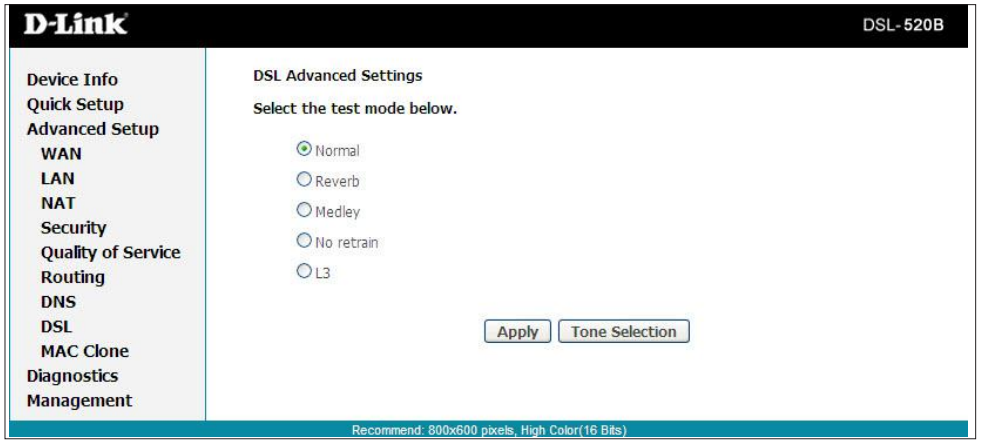
Add dynamic DNS

Enter your information in the spaces provided and click **Save**.



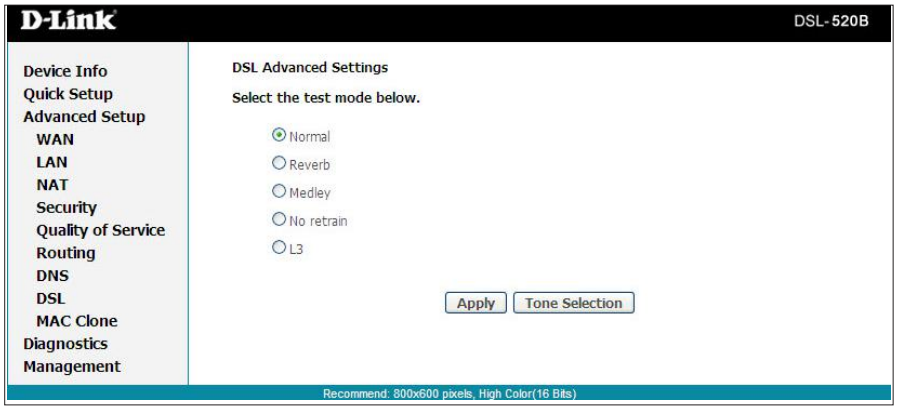
DSL

The DSL settings page contains modulation and capability settings. Consult your ISP to determine the correct settings. Click **Apply** if you are finished or click on **Advanced Settings** if you want to configure other advanced settings.



Advanced Settings

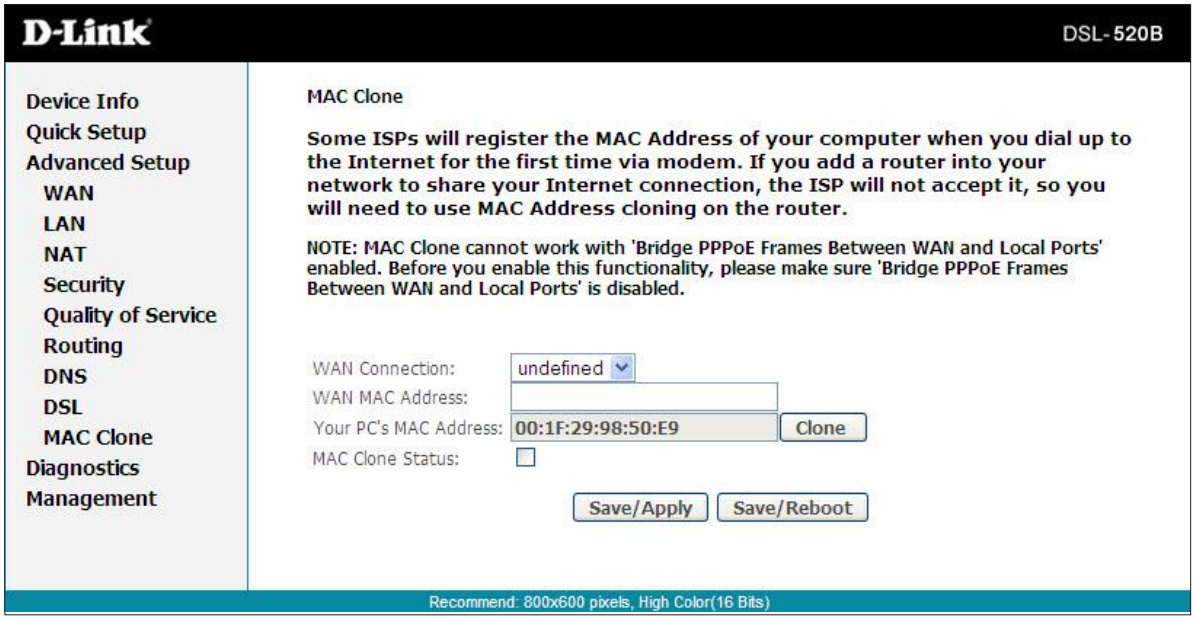
The test mode can be selected from the ADSL Advanced Settings page. Test modes include normal, reverb, medley, no retrain, and L3. After you make your selection, click on **Apply** to save these settings first before you go to T**one Selection**.



The frequency band of ADSL is split into 256 separate tones, each spaced 4.3125 kHz apart. Each tone carries separate data, so the modem operates as if 256 separate modems were running in parallel. The tone range is from 0 to 31 for upstream and from 32 to 255 for downstream. Do not change these settings unless directed by your ISP.

MAC Clone

This page allosw you to clone the MAC address on your router. This is needed when adding a router to your network in order to share your internet connection.

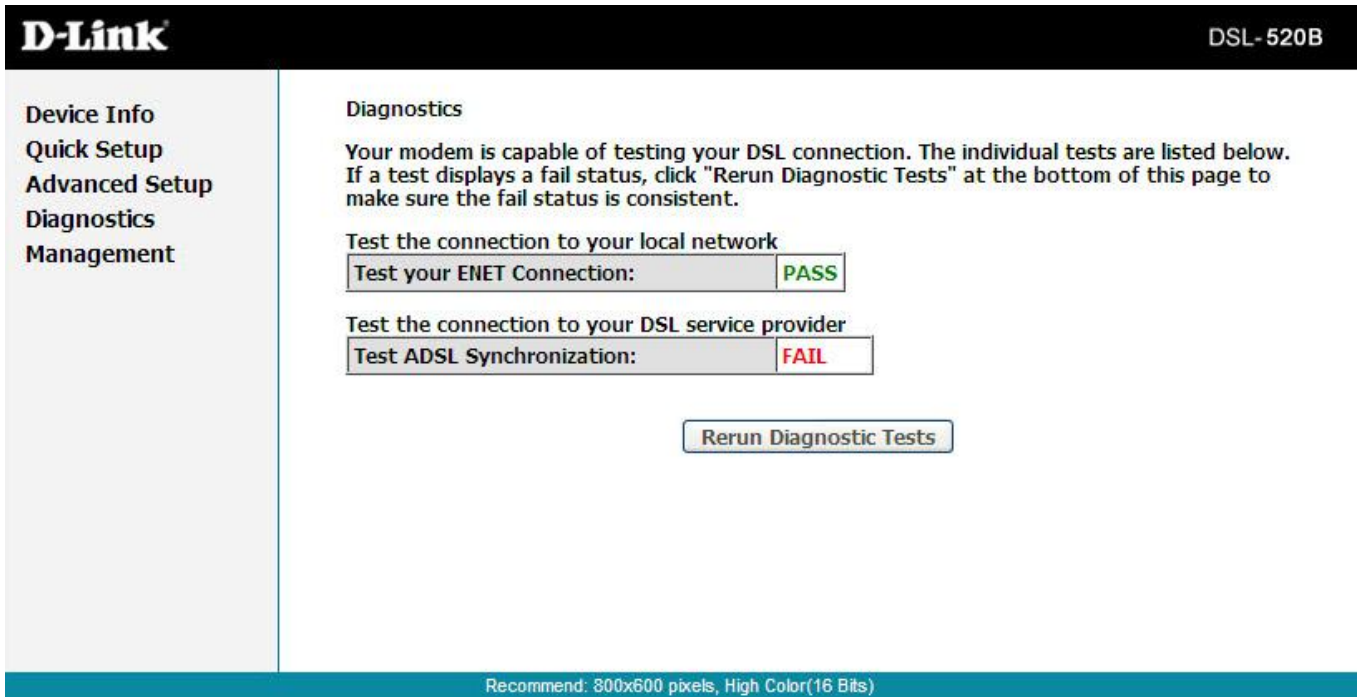


Diagnostics

The diagnostics screen allows you to run diagnostic tests to check your DSL connection. The results will show test results of two connections:

- Connection to your local network
- Connection to your DSL service provider

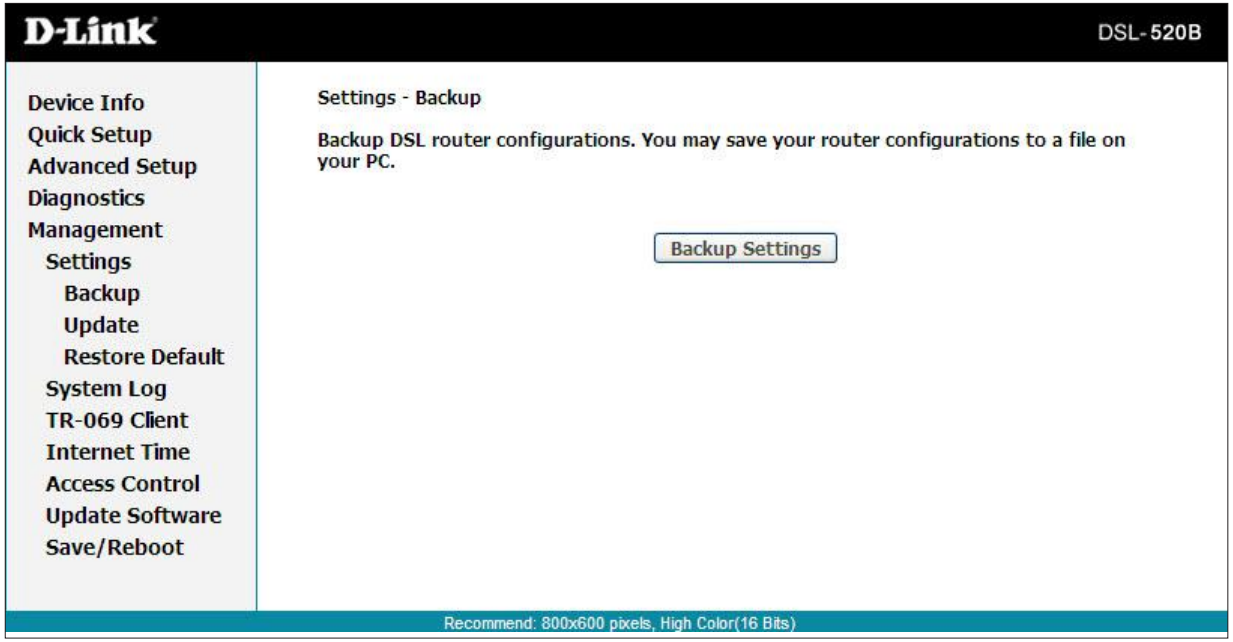
Click **Run Diagnostic Tests** to begin.



Management
Settings
Backup

The Backup Settings button allows you to save your router configuration to a file on your computer so that it may be accessed again later. This feature is useful if you have changed the configuration on the router, but would like to revert to a previous configuration.

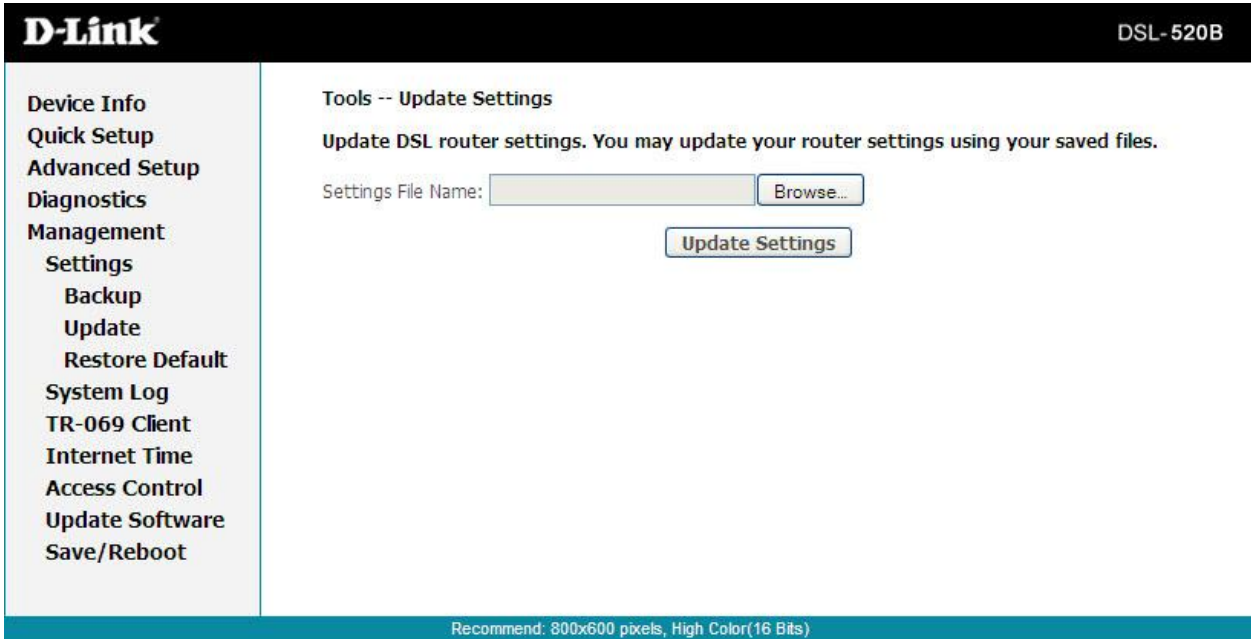
To save your current configuration, click the **Backup Settings** button. The following pop-up screen will appear with a prompt to open or save the file to your computer.



Update

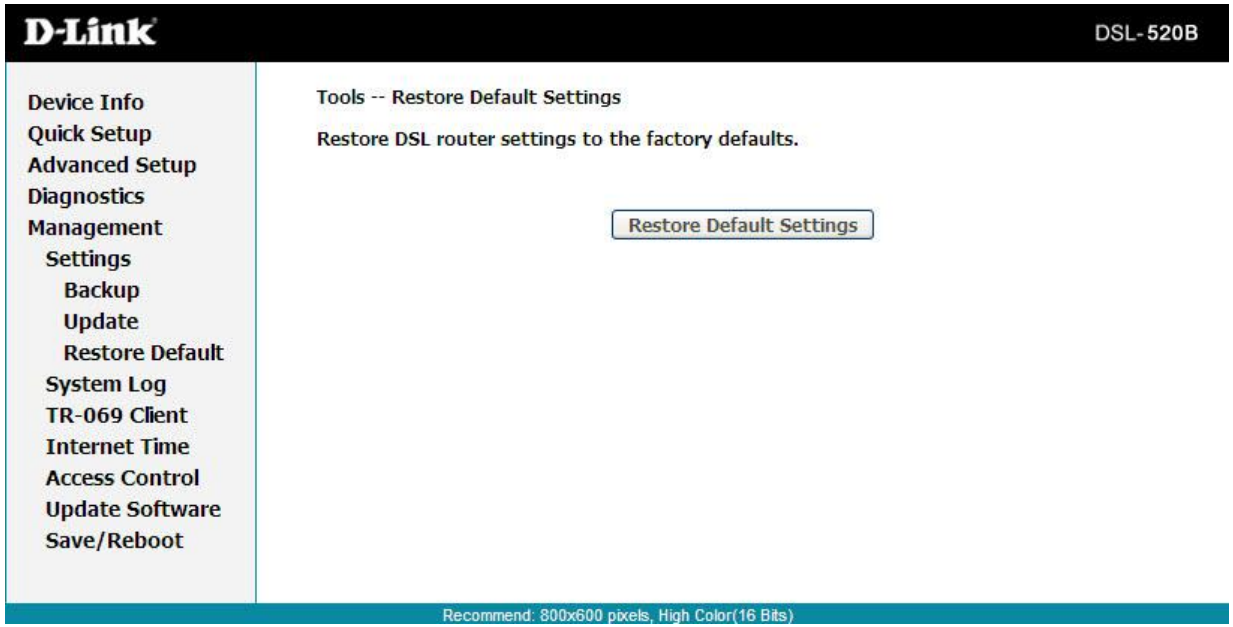
To load a previously saved configuration file onto your router, click **Browse**, select the file on your computer and then click on Update Settings.

The router will restore settings and reboot to activate the restored settings.



Restore Default

Restore Default Settings will delete all current settings and restore the router to factory default settings. Click on the **Restore Default Settings** button to proceed. The following confirmation dialog will appear confirming your decision to restore default settings. Click on **OK** to continue.



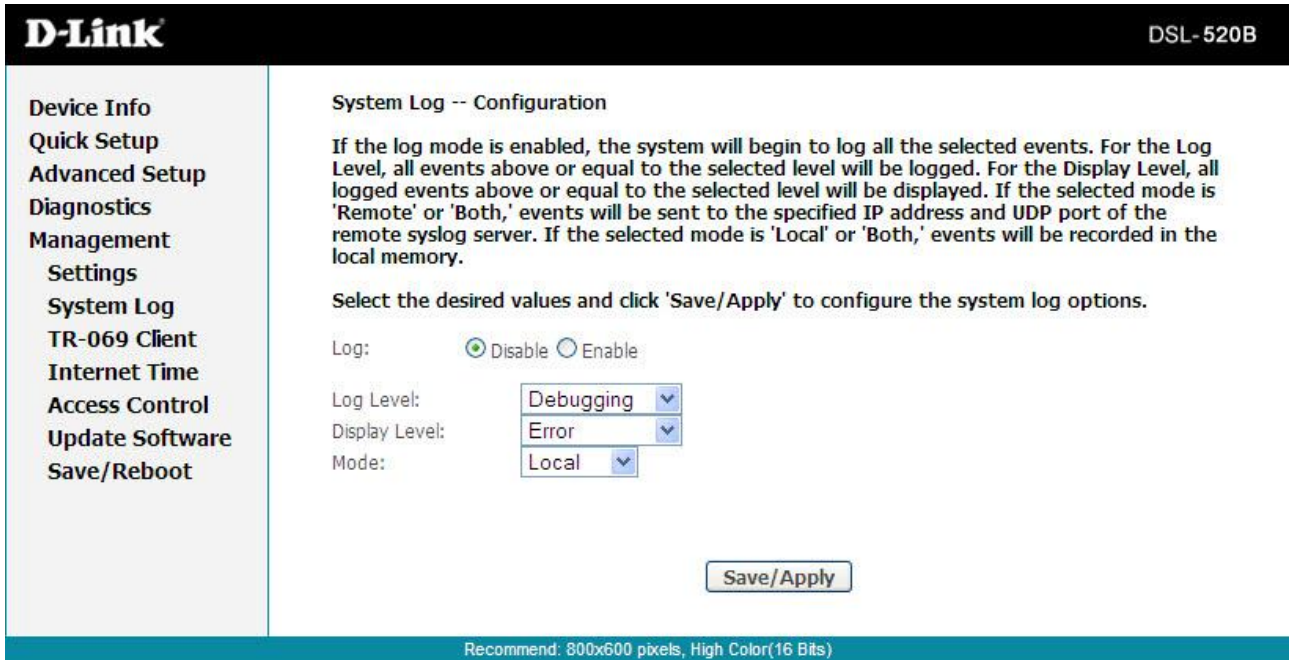
System Log

Click **View System Log** to show the following interface. 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 interface. You can enable or disable the system log and then select the **Log Level**, **Display Level** and **Mode**, and click **Apply** to end your configurations.

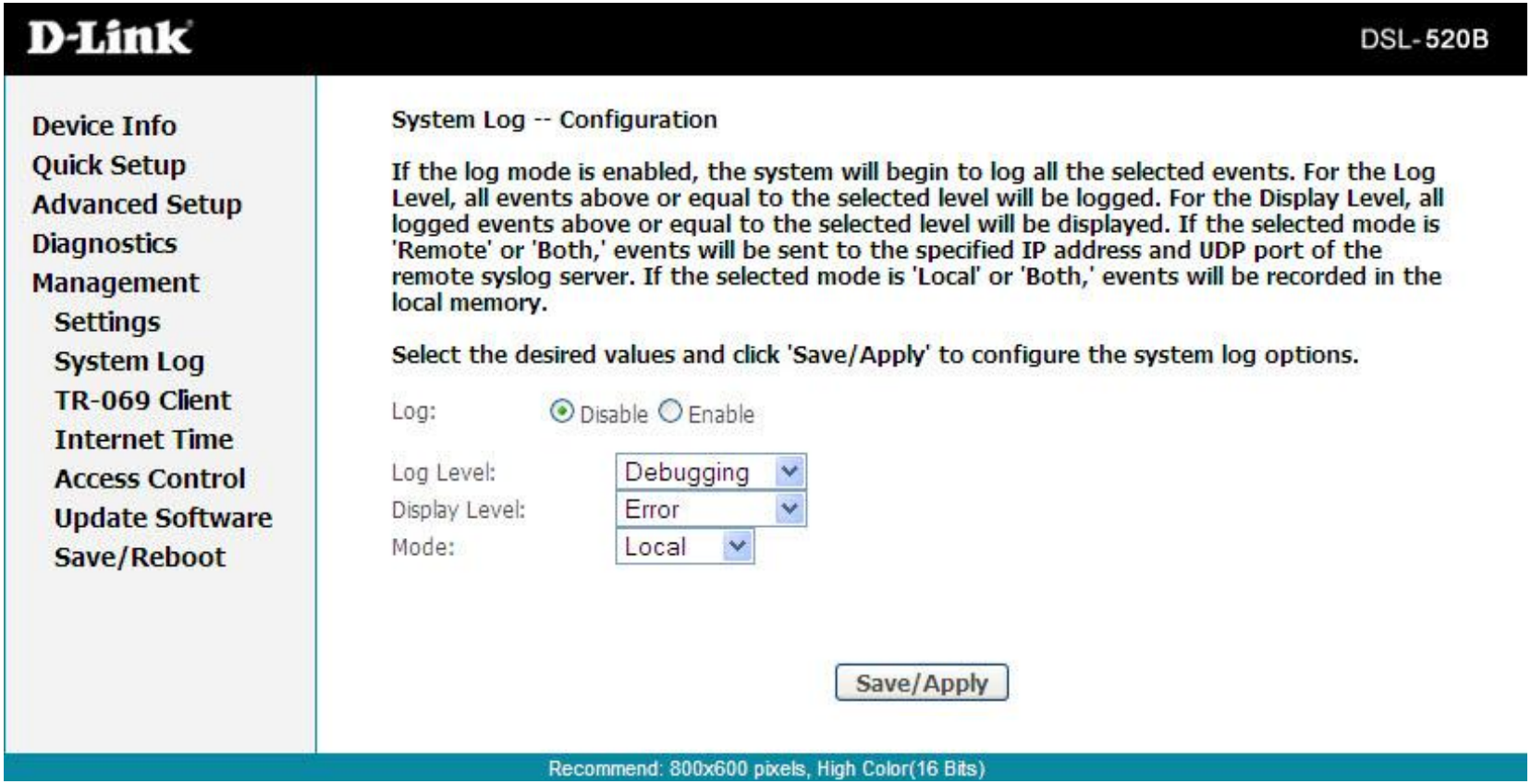
Both the log level and display level have eight choices. The default log level is **Debugging** and the default display level is Error. The mode options are **Local**, **Remote**, and **Both**. The default is **Local.**

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



System Log Configuration

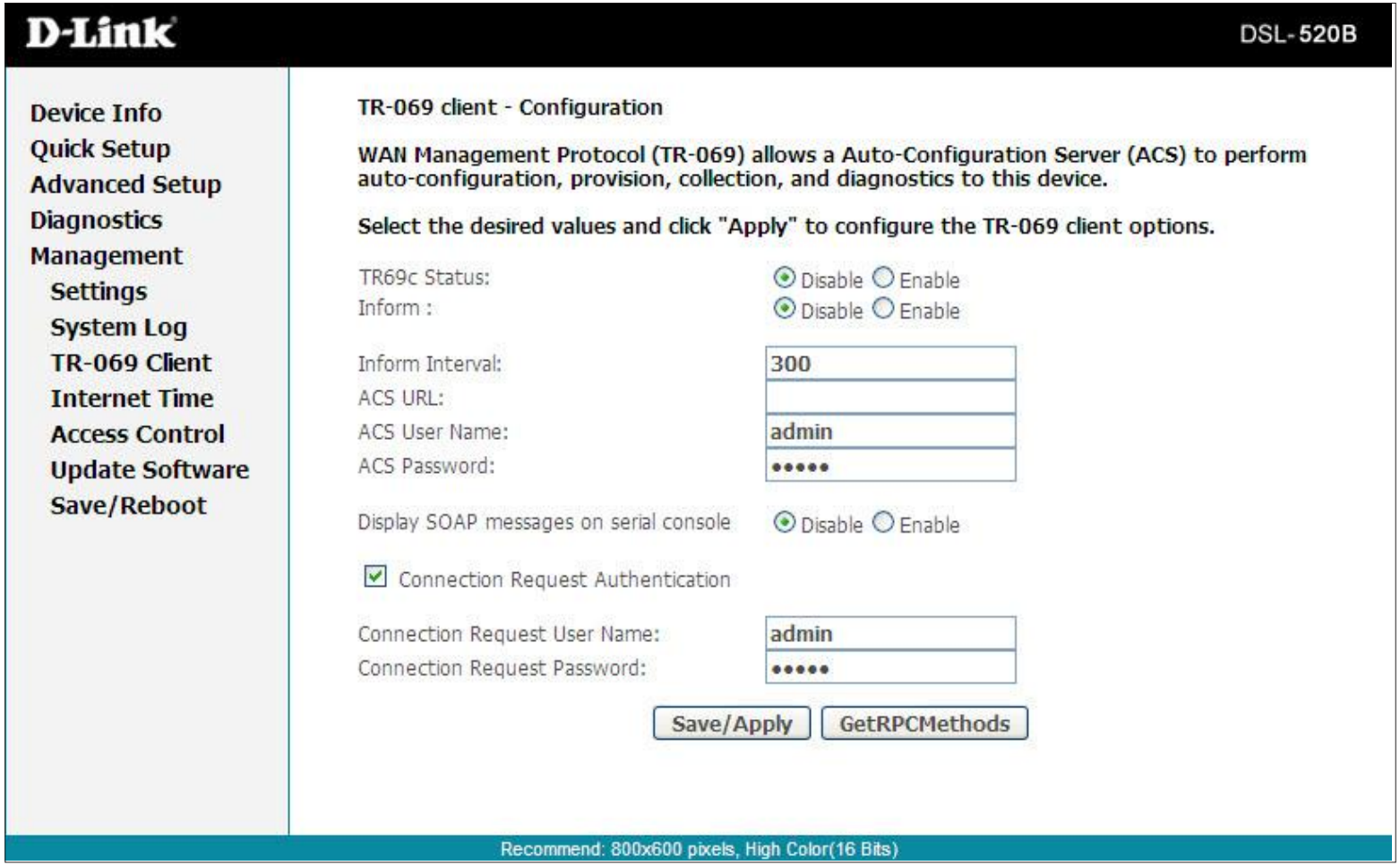
From the configuration screen, set the log to Enable, select the Log Level, Display Level and Mode. If the selected mode is "Remote" or "Both", events will be sent to a specified IP address and UDP port of a remote system log server. If the selected mode is "Local" or "Both", events will be recorded and viewed locally. Select the desired values and click **Apply** to save the system log options.



TR-069 Client

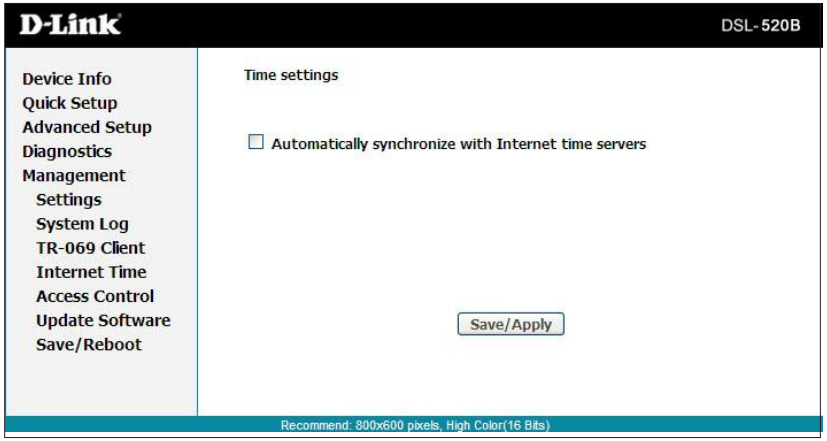
WAN Management Protocol (TR-069) allows a Auto-Configuration Server (ACS) to perform auto-configuration, provision, collection and diagnostics to this device.

If you wish to enable this protocol, then select **enable**. Contact your ISP to determine the ACS URL, ACS User Name, and ACS Password. You must click on the **Save/Reboot** button for the change to take place.

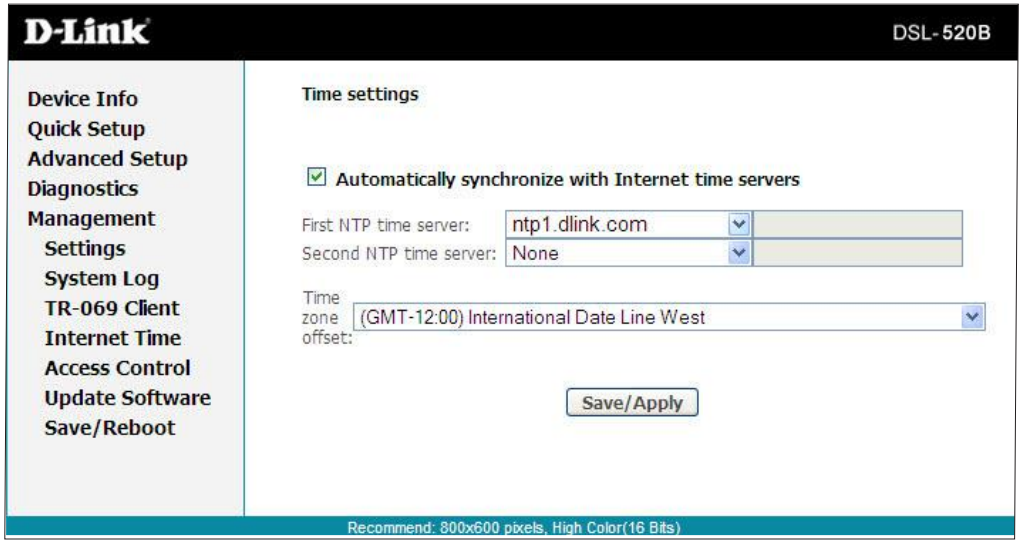


Internet Time

The **Time Settings** page allows you to automatically synchronize your time with a time server on the Internet. To set the modem's time, click on the **automatically synchronize with Internet time servers** checkbox. Additional time settings will appear below the checkbox.



Select from the list of NTP (Network Time Protocol) time servers. Then select the time zone that you are in and click **Apply** to save.



Access Control—Services

From this page you can enable/disable certain services from passing through your modem. Services that can be enabled/disabled on the LAN/WAN are FTP, HTTP, ICMP, SNMP, Telnet, and TFTP.

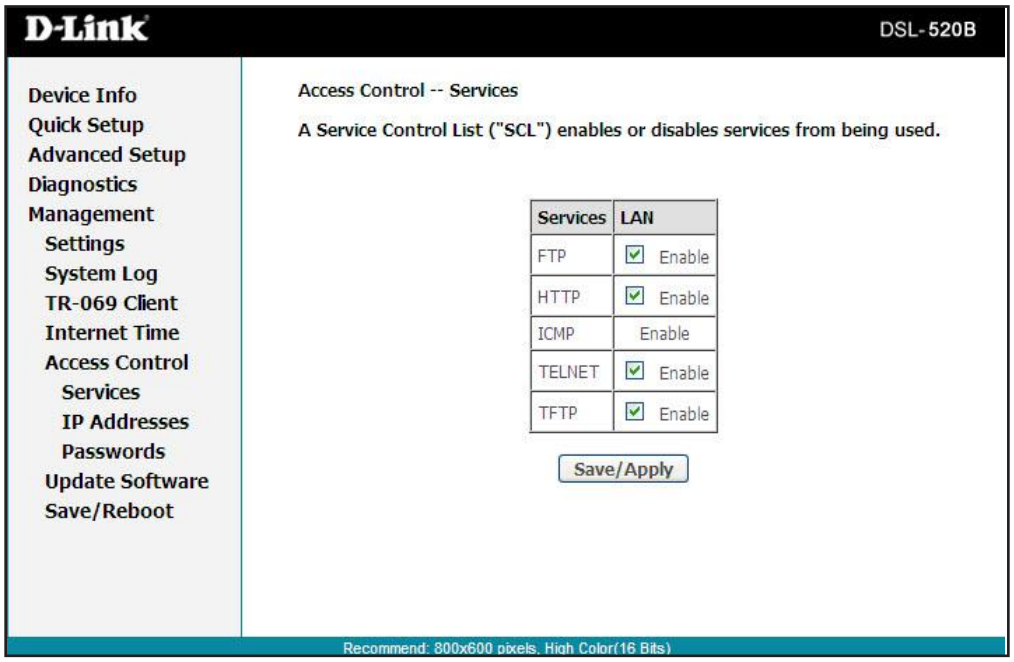
FTP: (File Transfer Protocol) Used for file transfer.

HTTP: (Hyper Text Transfer Protocol) A communications protocol that enables Web browsing.

ICMP: (Internet Control Message Protocol) supports packets containing error, control, and informational messages.

Telnet: A standard Internet protocol for accessing remote systems.

TFTP: (Trivial File Transfer Protocol) A very simple form of the File Transfer Protocol (FTP).

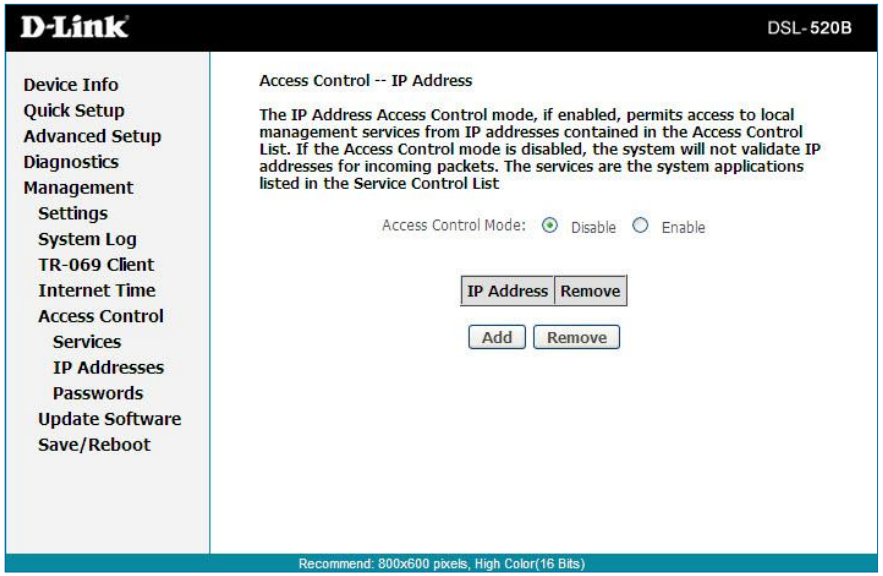


Access Control—IP Address

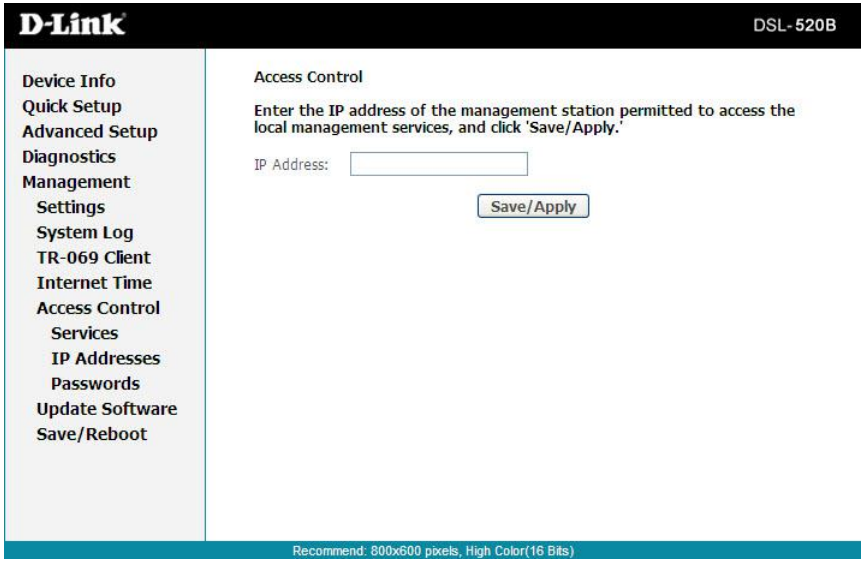
Web access to the modem can be limited when Access Control Mode is enabled.

Add the IP address to the IP address list by clicking on the **Add** button, then select **Enabled** to enable Access Control Mode.

If Access Control Mode is disabled, any workstation connected locally to your modem can access the web interface provided the correct username and password is supplied at log on.

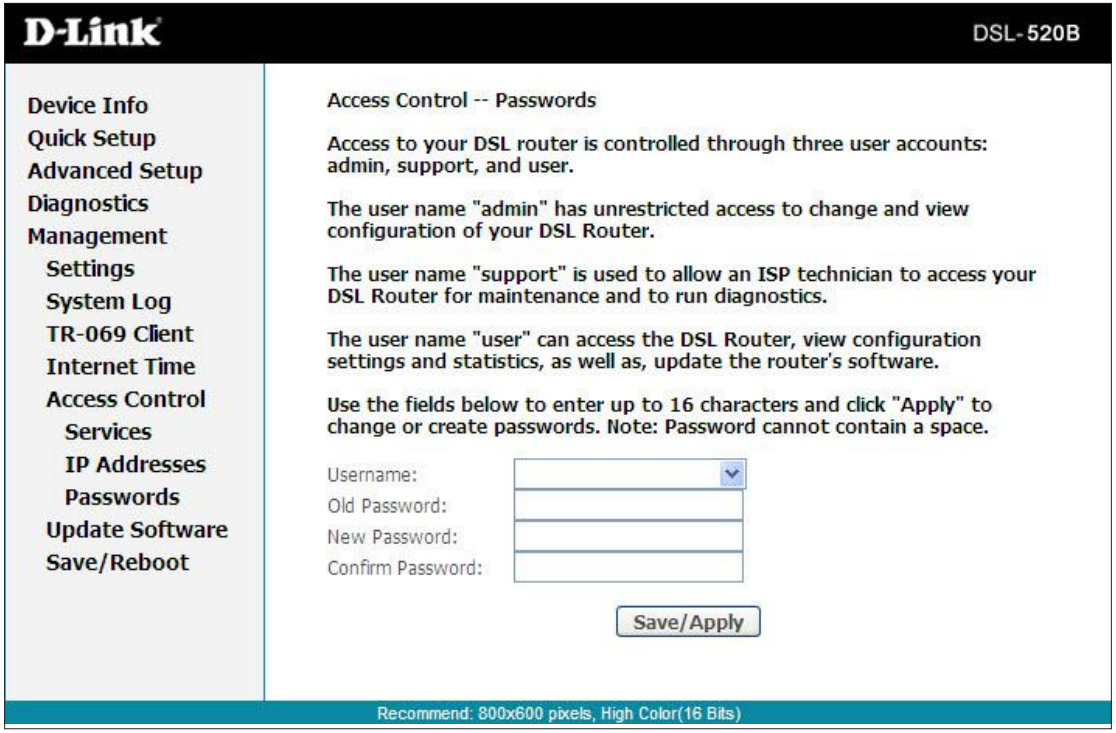


Enter the IP address of the management station permitted to access the local configuration and click **Apply**. This will return you to the previous screen where you can enable access control.



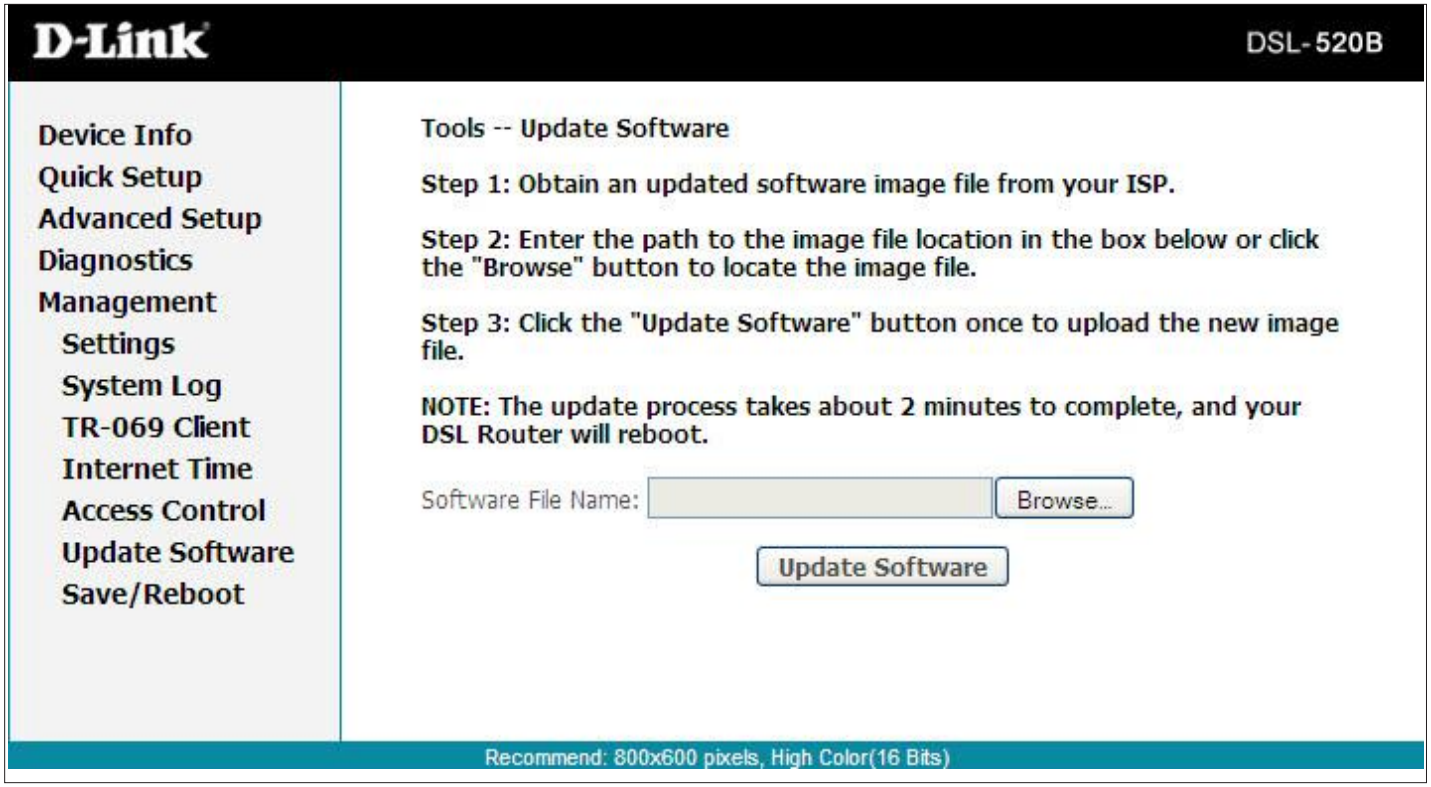
Access Control—Passwords

Access to your DSL router is controlled through three user accounts: **Admin, Support,** and **User**. "Admin" has unrestricted access to change and view configuration. "Support" is used to allowed an ISP technician to access your DSL router for maintenance and to run diagnostics. For "User", the user name can access the DSL router to view configuration settings, statistics, and update router's software. To change or create passwords, use the fields below and enter up to 16 characters.



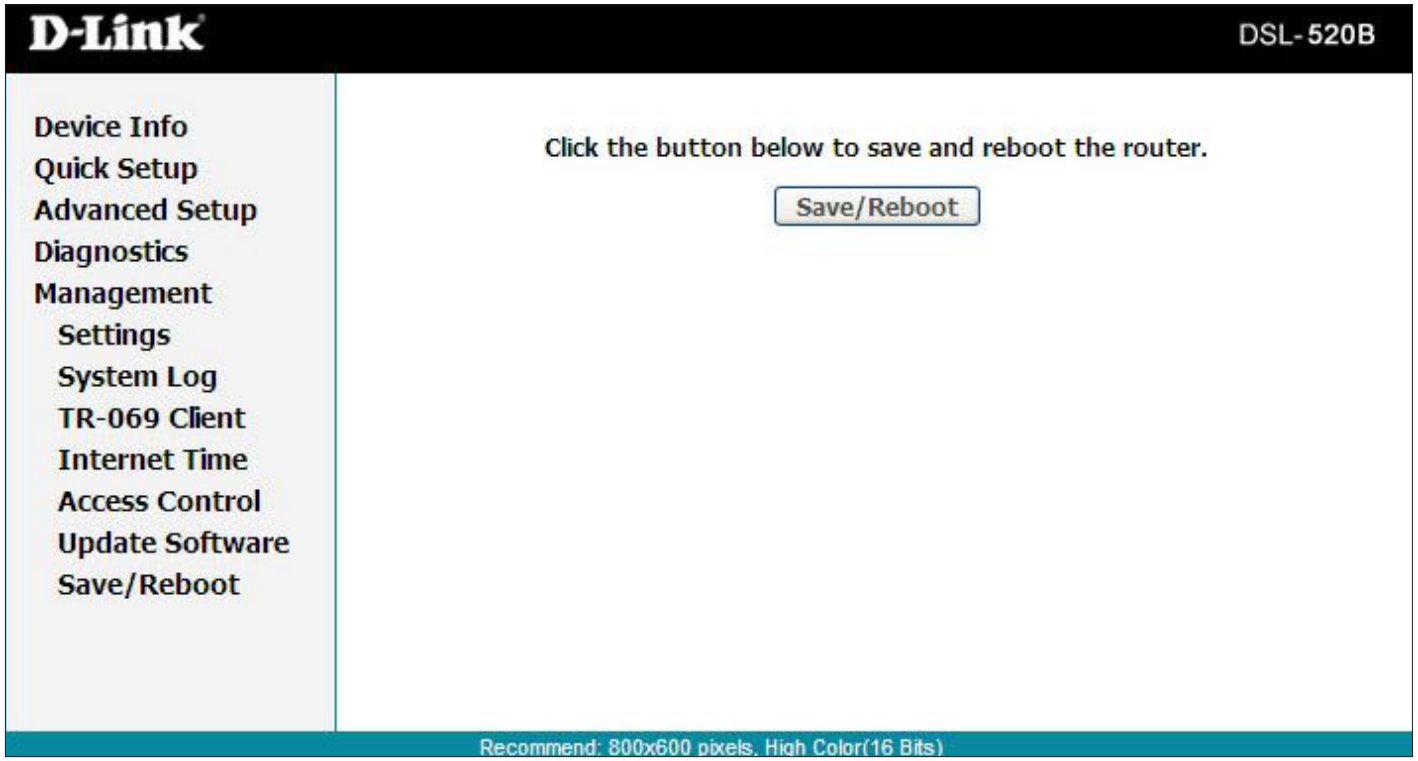
Update Software

You can update your software through this screen. Follow the screen's steps. Select **Browse** to search for your software file and **Update Software**.



Save and Reboot

When clicking the **Save/Reboot** button, it will save all configuration changes made on the modem and restart the device. All new configuration settings will take effect when the modem starts up again.



Troubleshooting

This chapter provides solutions to problems that can occur during the installation and operation of the DSL-520B. Read the following descriptions if you are having problems. (The examples below are illustrated in Windows® XP. If you have a different operating system, the screenshots on your computer will look similar to the following examples.)

1. Why can't I access the web-based configuration utility?

When entering the IP address of the D-Link modem (192.168.1.1 for example), you are not connecting to a website on the Internet or have to be connected to the Internet. The device has the utility built-in to a ROM chip in the device itself. Your computer must be on the same IP subnet to connect to the web-based utility.

• Make sure you have an updated Java-enabled web browser. We recommend the following:

  • Internet Explorer 6.0 or higher
  • Firefox 3.0 or higher

• Verify physical connectivity by checking for solid link lights on the device. If you do not get a solid link light, try using a different cable or connect to a different port on the device if possible. If the computer is turned off, the link light may not be on.

• Disable any internet security software running on the computer. Software firewalls such as Zone Alarm, Black Ice, Sygate, Norton Personal Firewall, and Windows® XP firewall may block access to the configuration pages. Check the help files included with your firewall software for more information on disabling or configuring it.

• Configure your Internet settings:

  • Go to **Start** > **Settings** > **Control Panel**. Double-click the **Internet Options** Icon. From the **Security** tab, click the button to restore the settings to their defaults.

  • Click the **Connection** tab and set the dial-up option to Never Dial a Connection. Click the LAN Settings button. Make sure nothing is checked. Click **OK**.

  • Go to the **Advanced** tab and click the button to restore these settings to their defaults. Click **OK** three times.

  • Close your web browser (if open) and open it.

• Access the web management. Open your web browser and enter the IP address of your D-Link modem in the address bar. This should open the login page for your the web management.

• If you still cannot access the configuration, unplug the power to the modem for 10 seconds and plug back in. Wait about 30 seconds and try accessing the configuration. If you have multiple computers, try connecting using a different computer.

2. What can I do if I forgot my password?

If you forgot your password, you must reset your modem. Unfortunately this process will change all your settings back to the factory defaults.

To reset the modem, locate the reset button (hole) on the rear panel of the unit. With the modem powered on, use a paperclip to hold the button down for 10 seconds. Release the button and the modem will go through its reboot process. Wait about 30 seconds to access the modem. For information about logging into the modem see page 16.

Networking Basics

Check your IP address

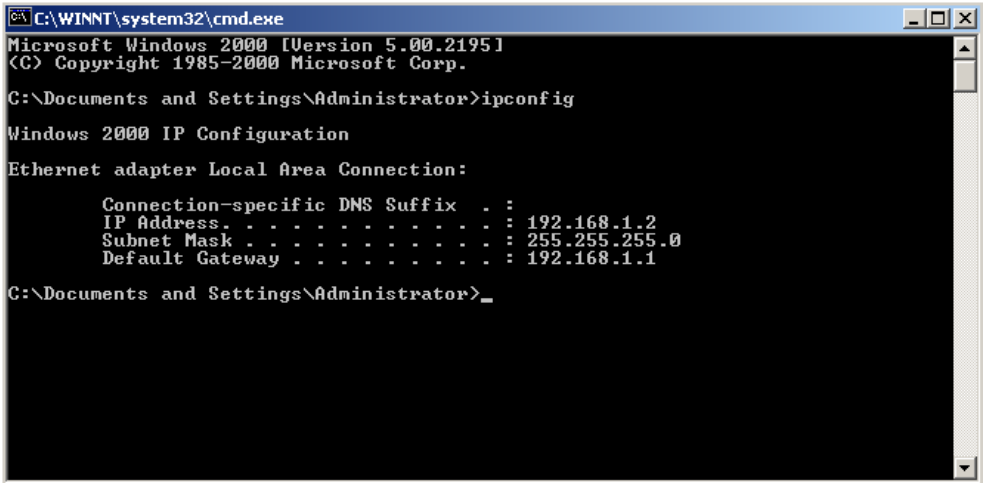
After you install your new D-Link device, by default, the TCP/IP settings should be set to obtain an IP address from a DHCP server (i.e. wireless modem) automatically. To verify your IP address, please follow the steps below.

Click on **Start** > **Run**. In the run box type ***cmd*** and click **OK**.

At the prompt, type ***ipconfig*** and press **Enter**.

This will display the IP address, subnet mask, and the default gateway of your adapter.

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



If you are connecting to a wireless network at a hotspot (e.g. hotel, coffee shop, airport), please contact an employee or administrator to verify their wireless network settings.

Check your MAC address

Click on **Start** > **Run**. In the run box type ***cmd*** and click **OK**.

At the prompt, type ***ipconfig /all*** and press **Enter**.

This will display information about all installed adapters on your computer. Your MAC address is listed as the "Physical Address" and should look like xx-xx-xx-xx-xx-xx or xx:xx:xx:xx:xx:xx

Statically Assign an IP address

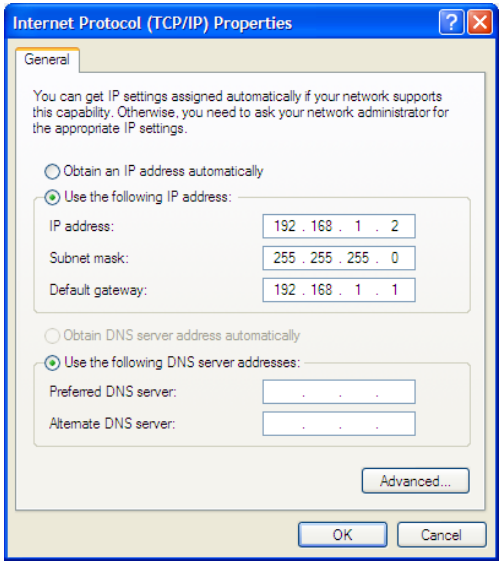
If you are not using a DHCP capable gateway/modem, or you need to assign a static IP address, please follow the steps below:

Step 1
Windows® XP - Click on **Start** > **Control Panel** > **Network Connections**.
Windows® 2000 - From the desktop, right-click **My Network Places** > **Properties**.

Step 2
Right-click on the **Local Area Connection** which represents your D-Link network adapter and select **Properties**.

Step 3
Highlight **Internet Protocol (TCP/IP)** and click **Properties**.

Step 4
Click **Use the following IP address** and enter an IP address that is on the same subnet as your network or the LAN IP address on your modem.



Example: If the modem´s LAN IP address is 192.168.1.1, make your IP address 192.168.1.X where X is a number between 2 and 99. Make sure that the number you choose is not in use on the network. Set Default Gateway the same as the LAN IP address of your modem (192.168.1.1).

Set Primary DNS the same as the LAN IP address of your modem (192.168.1.1). The Secondary DNS is not needed or you may enter a DNS server from your ISP.

Step 5
Click **OK** twice to save your settings.

Contacting Technical Support

U.S. and Canadian customers can contact D-Link technical support through our web site or by phone.

Before you contact technical support, please have the following ready:

- Model number of the product (e.g. DSL-520B)
- Hardware Revision (located on the label on the bottom of the modem (e.g. rev T1))
- Serial Number (s/n number located on the label on the bottom of the modem).

You can find software updates and user documentation on the D-Link website as well as frequently asked questions and answers to technical issues.

For customers within the United States:

Phone Support:
(877) 453-5465

Internet Support:
http://support.dlink.com

For customers within Canada:

Phone Support:
(800) 361-5265

Internet Support:
http://support.dlink.ca

Warranty

Subject to the terms and conditions set forth herein, D-Link Systems, Inc. (“D-Link”) provides this Limited Warranty:

- Only to the person or entity that originally purchased the product from D-Link or its authorized reseller or distributor, and
- Only for products purchased and delivered within the fifty states of the United States, the District of Columbia, U.S. Possessions or Protectorates, U.S. Military Installations, or addresses with an APO or FPO.

Limited Warranty: D-Link warrants that the hardware portion of the D-Link product described below (“Hardware”) will be free from material defects in workmanship and materials under normal use from the date of original retail purchase of the product, for the period set forth below (“Warranty Period”), except as otherwise stated herein.

- Hardware (excluding power supplies and fans): One (1) year
- Power supplies and fans: One (1) year
- Spare parts and spare kits: Ninety (90) days

The customer's sole and exclusive remedy and the entire liability of D-Link and its suppliers under this Limited Warranty will be, at D-Link’s option, to repair or replace the defective Hardware during the Warranty Period at no charge to the original owner or to refund the actual purchase price paid. Any repair or replacement will be rendered by D-Link at an Authorized D-Link Service Office. The replacement hardware need not be new or have an identical make, model or part. D-Link may, at its option, replace the defective Hardware or any part thereof with any reconditioned product that D-Link reasonably determines is substantially equivalent (or superior) in all material respects to the defective Hardware. Repaired or replacement hardware will be warranted for the remainder of the original Warranty Period or ninety (90) days, whichever is longer, and is subject to the same limitations and exclusions. If a material defect is incapable of correction, or if D-Link determines that it is not practical to repair or replace the defective Hardware, the actual price paid by the original purchaser for the defective Hardware will be refunded by D-Link upon return to D-Link of the defective Hardware. All Hardware or part thereof that is replaced by D-Link, or for which the purchase price is refunded, shall become the property of D-Link upon replacement or refund.

Limited Software Warranty: D-Link warrants that the software portion of the product (“Software”) will substantially conform to D-Link’s then current functional specifications for the Software, as set forth in the applicable documentation, from the date of original retail purchase of the Software for a period of ninety (90) days (“Software Warranty Period”), provided that the Software is properly installed on approved hardware and operated as contemplated in its documentation. D-Link further warrants that, during the Software Warranty Period, the magnetic media on which D-Link delivers the Software will be free of physical defects. The customer’s sole and exclusive remedy and the entire liability of D-Link and its suppliers under this Limited Warranty will be, at D-Link’s option, to replace the non-conforming Software (or defective media) with software that substantially conforms to D-Link’s functional specifications for the Software or to refund the portion of the actual purchase price paid that is attributable to the Software.

Except as otherwise agreed by D-Link in writing, the replacement Software is provided only to the original licensee, and is subject to the terms and conditions of the license granted by D-Link for the Software. Replacement Software will be warranted for the remainder of the original Warranty Period and is subject to the same limitations and exclusions. If a material non-conformance is incapable of correction, or if D-Link determines in its sole discretion that it is not practical to replace the non-conforming Software, the price paid by the original licensee for the non-conforming Software will be refunded by D-Link; provided that the non-conforming Software (and all copies thereof) is first returned to D-Link. The license granted respecting any Software for which a refund is given automatically terminates.

Non-Applicability of Warranty: The Limited Warranty provided hereunder for Hardware and Software portions of D-Link's products will not be applied to and does not cover any refurbished product and any product purchased through the inventory clearance or liquidation sale or other sales in which D-Link, the sellers, or the liquidators expressly disclaim their warranty obligation pertaining to the product and in that case, the product is being sold "As-Is" without any warranty whatsoever including, without limitation, the Limited Warranty as described herein, notwithstanding anything stated herein to the contrary.

Submitting A Claim: The customer shall return the product to the original purchase point based on its return policy. In case the return policy period has expired and the product is within warranty, the customer shall submit a claim to D-Link as outlined below:

- The customer must submit with the product as part of the claim a written description of the Hardware defect or Software nonconformance in sufficient detail to allow D-Link to confirm the same, along with proof of purchase of the product (such as a copy of the dated purchase invoice for the product) if the product is not registered.
- The customer must obtain a Case ID Number from D-Link Technical Support at 1-877-453-5465, who will attempt to assist the customer in resolving any suspected defects with the product. If the product is considered defective, the customer must obtain a Return Material Authorization ("RMA") number by completing the RMA form and entering the assigned Case ID Number at https://rma.dlink.com/.
- After an RMA number is issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit, and the RMA number must be prominently marked on the outside of the package. Do not include any manuals or accessories in the shipping package. D-Link will only replace the defective portion of the product and will not ship back any accessories.
- The customer is responsible for all in-bound shipping charges to D-Link. No Cash on Delivery ("COD") is allowed. Products sent COD will either be rejected by D-Link or become the property of D-Link. Products shall be fully insured by the customer and shipped to D-Link Systems, Inc., 17595 Mt. Herrmann, Fountain Valley, CA 92708. D-Link will not be held responsible for any packages that are lost in transit to D-Link. The repaired or replaced packages will be shipped to the customer via UPS Ground or any common carrier selected by D-Link. Return shipping charges shall be prepaid by D-Link if you use an address in the United States, otherwise we will ship the product to you freight collect. Expedited shipping is available upon request and provided shipping charges are prepaid by the customer.

D-Link may reject or return any product that is not packaged and shipped in strict compliance with the foregoing requirements, or for which an RMA number is not visible from the outside of the package. The product owner agrees to pay D-Link's reasonable handling and return shipping charges for any product that is not packaged and shipped in accordance with the foregoing requirements, or that is determined by D-Link not to be defective or non-conforming.

What Is Not Covered: The Limited Warranty provided herein by D-Link does not cover: Products that, in D-Link's judgment, have been subjected to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed; Initial installation, installation and removal of the product for repair, and shipping costs; Operational adjustments covered in the operating manual for the product, and normal maintenance; Damage that occurs in shipment, due to act of God, failures due to power surge, and cosmetic damage; Any hardware, software, firmware or other products or services provided by anyone other than D-Link; and Products that have been purchased from inventory clearance or liquidation sales or other sales in which D-Link, the sellers, or the liquidators expressly disclaim their warranty obligation pertaining to the product. While necessary maintenance or repairs on your Product can be performed by any company, we recommend that you use only an Authorized D-Link Service Office. Improper or incorrectly performed maintenance or repair voids this Limited Warranty.

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CE Mark Warning: This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

FCC Statement: 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 communication. 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.

For detailed warranty information applicable to products purchased outside the United States, please contact the corresponding local D-Link office.

Registration

Register your product online at support.dlink.com/register

Product registration is entirely voluntary and failure to complete or return this form will not diminish your warranty rights.

Version 1.0
July 29, 2010