



DSL-560I
ADSL Router
User's Guide

(September 2002)

651SL560I015

Wichtige Sicherheitshinweise

1. Bitte lesen Sie sich diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den spätern Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie keine Flüssig- oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
4. Um eine Beschädigung des Gerätes zu vermeiden sollten Sie nur Zubehörteile verwenden, die vom Hersteller zugelassen sind.
5. Das Gerät is vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf sichern Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen. Verwenden Sie nur sichere Standorte und beachten Sie die Aufstellhinweise des Herstellers.
7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.
9. Die Netzanschlußsteckdose muß aus Gründen der elektrischen Sicherheit einen Schutzleiterkontakt haben.
10. Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
11. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.
12. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
13. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. Elektrischen Schlag auslösen.
14. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden.
15. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
 - a – Netzkabel oder Netzstecker sint beschädigt.
 - b – Flüssigkeit ist in das Gerät eingedrungen.
 - c – Das Gerät war Feuchtigkeit ausgesetzt.
 - d – Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
 - e – Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
 - f – Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
16. Bei Reparaturen dürfen nur Originalersatzteile bzw. den Originalteilen entsprechende Teile verwendet werden. Der Einsatz von ungeeigneten Ersatzteilen kann eine weitere Beschädigung hervorrufen.
17. Wenden Sie sich mit allen Fragen die Service und Repartur betreffen an Ihren Servicepartner. Somit stellen Sie die Betriebssicherheit des Gerätes sicher.
18. Zum Netzanschluß dieses Gerätes ist eine geprüfte Leitung zu verwenden, Für einen Nennstrom bis 6A und einem Gerätegewicht großer 3kg ist eine Leitung nicht leichter als H05VV-F, 3G, 0.75mm² einzusetzen

Limited Warranty

Hardware:

D-LINK WARRANTS EACH OF ITS HARDWARE PRODUCTS TO BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS UNDER NORMAL USE AND SERVICE FOR A PERIOD COMMENCING ON THE DATE OF PURCHASE FROM D-LINK OR ITS AUTHORIZED RESELLER AND EXTENDING FOR THE LENGTH OF TIME STIPULATED BY THE AUTHORIZED RESELLER OR D-LINK BRANCH OFFICE NEAREST TO THE PLACE OF PURCHASE.

THIS WARRANTY APPLIES ON THE CONDITION THAT THE PRODUCT REGISTRATION CARD IS FILLED OUT AND RETURNED TO A D-LINK OFFICE WITHIN NINETY (90) DAYS OF PURCHASE. A LIST OF D-LINK OFFICES IS PROVIDED AT THE BACK OF THIS MANUAL, TOGETHER WITH A COPY OF THE REGISTRATION CARD.

IF THE PRODUCT PROVES DEFECTIVE WITHIN THE APPLICABLE WARRANTY PERIOD, D-LINK WILL PROVIDE REPAIR OR REPLACEMENT OF THE PRODUCT. D-LINK SHALL HAVE THE SOLE DISCRETION WHETHER TO REPAIR OR REPLACE, AND REPLACEMENT PRODUCT MAY BE NEW OR RECONDITIONED. REPLACEMENT PRODUCT SHALL BE OF EQUIVALENT OR BETTER SPECIFICATIONS, RELATIVE TO THE DEFECTIVE PRODUCT, BUT NEED NOT BE IDENTICAL. ANY PRODUCT OR PART REPAIRED BY D-LINK PURSUANT TO THIS WARRANTY SHALL HAVE A WARRANTY PERIOD OF NOT LESS THAN 90 DAYS, FROM DATE OF SUCH REPAIR, IRRESPECTIVE OF ANY EARLIER EXPIRATION OF ORIGINAL WARRANTY PERIOD. WHEN D-LINK PROVIDES REPLACEMENT, THEN THE DEFECTIVE PRODUCT BECOMES THE PROPERTY OF D-LINK.

WARRANTY SERVICE MAY BE OBTAINED BY CONTACTING A D-LINK OFFICE WITHIN THE APPLICABLE WARRANTY PERIOD, AND REQUESTING A RETURN MATERIAL AUTHORIZATION (RMA) NUMBER. IF A REGISTRATION CARD FOR THE PRODUCT IN QUESTION HAS NOT BEEN RETURNED TO D-LINK, THEN A PROOF OF PURCHASE (SUCH AS A COPY OF THE DATED PURCHASE INVOICE) MUST BE PROVIDED. IF PURCHASER'S CIRCUMSTANCES REQUIRE SPECIAL HANDLING OF WARRANTY CORRECTION, THEN AT THE TIME OF REQUESTING RMA NUMBER, PURCHASER MAY ALSO PROPOSE SPECIAL PROCEDURE AS MAY BE SUITABLE TO THE CASE.

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. THE PACKAGE MUST BE MAILED OR OTHERWISE SHIPPED TO D-LINK WITH ALL COSTS OF MAILING/SHIPPING/INSURANCE PREPAID. D-LINK SHALL NEVER BE RESPONSIBLE FOR ANY SOFTWARE, FIRMWARE, INFORMATION, OR MEMORY DATA OF PURCHASER CONTAINED IN, STORED ON, OR INTEGRATED WITH ANY PRODUCT RETURNED TO D-LINK PURSUANT TO THIS WARRANTY.

ANY PACKAGE RETURNED TO D-LINK WITHOUT AN RMA NUMBER WILL BE REJECTED AND SHIPPED BACK TO PURCHASER AT PURCHASER'S EXPENSE, AND D-LINK RESERVES THE RIGHT IN SUCH A CASE TO LEVY A REASONABLE HANDLING CHARGE IN ADDITION MAILING OR SHIPPING COSTS.

Software:

WARRANTY SERVICE FOR SOFTWARE PRODUCTS MAY BE OBTAINED BY CONTACTING A D-LINK OFFICE WITHIN THE APPLICABLE WARRANTY PERIOD. A LIST OF D-LINK OFFICES IS PROVIDED AT THE BACK OF THIS MANUAL, TOGETHER WITH A COPY OF THE REGISTRATION CARD. IF A REGISTRATION CARD FOR THE PRODUCT IN QUESTION HAS NOT BEEN RETURNED TO A D-LINK OFFICE, THEN A PROOF OF PURCHASE (SUCH AS A COPY OF THE DATED PURCHASE INVOICE) MUST BE PROVIDED WHEN REQUESTING WARRANTY SERVICE. THE TERM "PURCHASE" IN THIS SOFTWARE WARRANTY REFERS TO THE PURCHASE TRANSACTION AND RESULTING LICENSE TO USE SUCH SOFTWARE.

D-LINK WARRANTS THAT ITS SOFTWARE PRODUCTS WILL PERFORM IN SUBSTANTIAL CONFORMANCE WITH THE APPLICABLE PRODUCT DOCUMENTATION PROVIDED BY D-LINK WITH SUCH SOFTWARE PRODUCT, FOR A PERIOD OF NINETY (90) DAYS FROM THE DATE OF PURCHASE FROM D-LINK OR ITS AUTHORIZED RESELLER. D-LINK WARRANTS THE MAGNETIC MEDIA, ON WHICH D-LINK PROVIDES ITS SOFTWARE PRODUCT, AGAINST FAILURE DURING THE SAME WARRANTY PERIOD. THIS WARRANTY APPLIES TO PURCHASED SOFTWARE, AND TO REPLACEMENT SOFTWARE PROVIDED BY D-LINK PURSUANT TO THIS WARRANTY, BUT SHALL NOT APPLY TO ANY UPDATE OR REPLACEMENT WHICH MAY BE PROVIDED FOR DOWNLOAD VIA THE INTERNET, OR TO ANY UPDATE WHICH MAY OTHERWISE BE PROVIDED FREE OF CHARGE.

D-LINK'S SOLE OBLIGATION UNDER THIS SOFTWARE WARRANTY SHALL BE TO REPLACE ANY DEFECTIVE SOFTWARE PRODUCT WITH PRODUCT WHICH SUBSTANTIALLY CONFORMS TO D-LINK'S APPLICABLE PRODUCT DOCUMENTATION. PURCHASER ASSUMES RESPONSIBILITY FOR THE SELECTION OF APPROPRIATE APPLICATION AND SYSTEM/PLATFORM SOFTWARE AND ASSOCIATED REFERENCE MATERIALS. D-LINK MAKES NO WARRANTY THAT ITS SOFTWARE PRODUCTS WILL WORK IN COMBINATION WITH ANY HARDWARE, OR ANY APPLICATION OR SYSTEM/PLATFORM SOFTWARE PRODUCT PROVIDED BY ANY THIRD PARTY, EXCEPTING ONLY SUCH PRODUCTS AS ARE EXPRESSLY REPRESENTED, IN D-LINK'S APPLICABLE PRODUCT DOCUMENTATION AS BEING COMPATIBLE. D-LINK'S OBLIGATION UNDER THIS WARRANTY SHALL BE A REASONABLE EFFORT TO PROVIDE COMPATIBILITY, BUT D-LINK SHALL HAVE NO OBLIGATION TO PROVIDE COMPATIBILITY WHEN THERE IS FAULT IN THE THIRD-PARTY HARDWARE OR SOFTWARE. D-LINK MAKES NO WARRANTY THAT OPERATION OF ITS SOFTWARE PRODUCTS WILL BE UNINTERRUPTED OR ABSOLUTELY ERROR-FREE, AND NO WARRANTY THAT ALL DEFECTS IN THE SOFTWARE PRODUCT, WITHIN OR WITHOUT THE SCOPE OF D-LINK'S APPLICABLE PRODUCT DOCUMENTATION, WILL BE CORRECTED.

D-Link Offices for Registration and Warranty Service

THE PRODUCT'S REGISTRATION CARD, PROVIDED AT THE BACK OF THIS MANUAL, MUST BE SENT TO A D-LINK OFFICE. TO OBTAIN AN RMA NUMBER FOR WARRANTY SERVICE AS TO A HARDWARE PRODUCT, OR TO OBTAIN WARRANTY SERVICE AS TO A SOFTWARE PRODUCT, CONTACT THE D-LINK OFFICE NEAREST YOU. AN ADDRESS/TELEPHONE/FAX/E-MAIL/WEB SITE LIST OF D-LINK OFFICES IS PROVIDED IN THE BACK OF THIS MANUAL.

LIMITATION OF WARRANTIES

IF THE D-LINK PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, THE CUSTOMER'S SOLE REMEDY SHALL BE, AT D-LINK'S OPTION, REPAIR OR REPLACEMENT. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. D-LINK NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION MAINTENANCE OR USE OF D-LINK'S PRODUCTS

D-LINK SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY THE CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLIGENCE, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO REPAIR, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING OR OTHER HAZARD.

LIMITATION OF LIABILITY

IN NO EVENT WILL D-LINK BE LIABLE FOR ANY DAMAGES, INCLUDING LOSS OF DATA, LOSS OF PROFITS, COST OF COVER OR OTHER INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES ARISING OUT THE INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE OR INTERRUPTION OF A D- LINK PRODUCT, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY. THIS LIMITATION WILL APPLY EVEN IF D-LINK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

IF YOU PURCHASED A D-LINK PRODUCT IN THE UNITED STATES, SOME STATES DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

Trademarks

Copyright ©2000 D-Link Corporation.

Contents subject to change without prior notice.

D-Link is a registered trademark of D-Link Corporation/D-Link Systems, Inc.

All other trademarks belong to their respective proprietors.

Copyright Statement

No part of this publication may be reproduced in any form or by any means or used to make any derivative such as translation, transformation, or adaptation without permission from D-Link Corporation/D-Link Systems Inc., as stipulated by the United States Copyright Act of 1976

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.

TABLE OF CONTENTS

ABOUT THIS USER'S GUIDE	VII
Guide Overview	vii
Before You Start	vii
Requirements	vii
Web Browser.....	viii
Ethernet Port (NIC Adapter)	viii
About Bridged Ethernet Connections (RFC 1483)	viii
About IPoA Connections (RFC 1577)	ix
Additional PVC Settings	ix
Packing List	ix
INTRODUCTION	1
What is ADSL?	1
Router Description and Operation	1
Router Features.....	2
Front Panel	3
Rear Panel	4
LED Indicators	5
HARDWARE INSTALLATION	7
Connect ADSL Line	7
Computer to Router Connection.....	7
Connect Ethernet LAN to Router.....	8
Hub or Switch to Router Connection	8
Power On Router	9
CONFIGURING THE ROUTER FOR THE FIRST TIME	10
Configuring IP Settings on Your Computer.....	10
Access the Configuration Manager	17
Configure the Router.....	17
WEB-BASED MANAGEMENT	20
Accessing the Web Manager.....	20
Folders and Menus	21
BASIC	21
Router Configuration	21
Configuring the WAN Connection	22
Additional Virtual Connections (PVCs)	23

Configuring LAN IP Settings.....	26
Access Control	27
ADSL Link Status	29
Routing Setup.....	30
Save and Reboot.....	30
Erase and Reboot	31
ADVANCED	32
ADSL Mode.....	33
Redirect Port	33
NAT	34
DHCP Server.....	35
SNMP	36
Interface	37
VCC	39
PPPoE	41
PPPoA	42
IGMP Proxy	42
Bridge.....	43
Spanning Tree	44
Filter.....	46
Interface	47
TCP-IP	48
DHCP-Lease	49
AAL5	49
SNDCP.....	50
Loopback.....	50
Ping	51
TECHNICAL SPECIFICATIONS.....	52
LAN IP SETUP.....	54
Assigning Network IP Addresses.....	54
Using the Default IP Address.....	54
Manual IP Address Assignment.....	54
Using DHCP	55
Changing the IP Address of the Router.....	55
IP CONCEPTS	56
IP Addresses	56
Subnet Mask.....	58
MICROFILTERS AND SPLITTERS	59
Microfilters	59
Line Splitter	60

About This User's Guide

This user's guide provides instructions on how to install the DSL-560I ADSL Router and use it to connect a computer or Ethernet LAN to the Internet.

If you are using a computer with a functioning Ethernet port, you can use the Quick Installation Guide to quickly establish your ADSL connection and access the Internet.

Guide Overview

Introduction – Describes the Router and its key features. Provides an introduction to ADSL. Lists standards to which the Router complies. Contains a packing list.

Hardware Installation – Discusses how to connect the Router to an Ethernet LAN.

Configuring the Router for the First Time – Provides information on how to configure the Router and establish the WAN connection using the web-based manager.

Web-based Configuration – Describes how to use the web-based manager to change Router settings and configure additional virtual connections (PVCs).

Appendix A - Technical Specifications – Lists the technical specifications of the Router, including standards compliance.

Appendix B - Low Pass Filters – Illustrated examples of how to use low pass filters.

Before You Start

Please read and make sure you understand all the prerequisites for proper installation of your new Modem. Have all the necessary information and equipment on hand before beginning the installation.

Installation Overview

The procedure to install the Router can be described in general terms in the following steps:

1. Gather information and equipment needed to install the device. Before you begin the actual installation make sure you have all the necessary information and equipment.
2. Install the hardware, that is, connect the cables (Ethernet and telephone) to the device and connect the power adapter.
3. Check the IP settings on your computer and change them if necessary so the computer can access the web-based software built into the Router.
4. Use the web-based management software to configure the device to suit the requirements of your ADSL account.

Requirements

To install and use the Router you need a computer equipped with an Ethernet port (such as an Ethernet NIC) and a web browser. You may also need to use information given to you by your ISP. This information is stored in the Router's memory and used to establish the WAN connection and confirm your identity. Read the next page for more details about these requirements.

Low Pass Filters

Since ADSL and telephone services share the same copper wiring to carry their respective signals, a filtering mechanism may be necessary to avoid mutual interference. A low pass filter device can be installed for each telephone that shares the line with the ADSL line. These filters are easy to install passive devices that connect to the ADSL device and/or telephone using standard telephone cable. Ask your service provider for more information about the use of low pass filters with your installation. Appendix B provides illustrated examples of how to install two common styles of low pass filters.

Operating System

The DSL-560I uses a HTML-based web interface for setup and management. The web configuration manager may be accessed using any operating system capable of running web browser software.

Web Browser

Any common web browser can be used to configure the Router by accessing its web configuration management software. The program is designed to work best with more recently released browsers such as Microsoft Internet Explorer® version 5.0, Netscape Navigator® version 4.7, or later versions. The web browser must have JavaScript enabled. JavaScript is enabled by default on many browsers. Make sure JavaScript has not been disabled by other software (such as virus protection or web user security packages) that may be running on your computer.

Ethernet Port (NIC Adapter)

Any computer that uses the Router must be able to connect to it through the Ethernet port on the Router. This connection is an Ethernet connection and therefore requires that your computer be equipped with an Ethernet port as well. Nowadays, most notebook computers are already sold with the installed Ethernet adapter. Likewise, most fully assembled desktop computers come with an Ethernet NIC card as standard equipment. If your computer does not have an Ethernet port, you must install an Ethernet NIC adapter before you can access the Router. If you must install an adapter, follow the installation instructions that come with the Ethernet NIC adapter.

Additional Software

It may be necessary to install software on your computer that enables the computer to access the Internet. Additional software must be installed if you are using what is called a “bridged” connection. For a bridged connection, the information needed to make and maintain the Internet connection is stored on your computer, not in the Router. This type of connection is similar to the arrangement used for analog dial-up modems, but the connection speed is much faster. Various terms are used to describe a bridged ADSL connection including the term “RFC 1483 Bridge” which is also used in this guide.

If your ADSL service is delivered through a PPP (Point to Point Protocol) connection, the information needed to establish and maintain the Internet connection can be stored in the Router. In this case, it is not necessary to install any PPP software on your computer.

Account Information (User Name and Password)

Most users will need to supply a user name and password used to access the service provider's network (and ultimately, the Internet). This information is stored either in the Router's memory or on your computer depending on the type of ADSL connection you have.

ACCOUNT INFORMATION (PPP Connections Only)
User Name:
Password:

About Bridged Ethernet Connections (RFC 1483)

Using this method, the DSL-560I acts as a transparent bridge, and is invisible to other devices on both the WAN and LAN side of the bridge. It is therefore necessary to provide some means of acquiring global IP settings for your account.

All connections to the Internet require a unique global IP address. For bridged connections, the global IP settings must reside in a TCP/IP enabled device on the LAN side of the bridge, such as a PC, server or firewall hardware. The IP address can be assigned in a number of ways. Your network service provider will give you instructions about any additional connection software or NIC configuration that may be required.

About IPoA Connections (RFC 1577)

IP over ATM connections may require global IP settings for the device. Your service provider will give you IP settings information if needed. Some IPoA connections function like peer-to-peer connections and therefore do not require IP settings on the WAN interface.

Additional PVC Settings

If you are using multiple virtual connections it will be necessary to provide additional VPI and VCI values for the device. These numbers define a unique route used on the ATM backbone of the WAN. Chapter 5 contains instruction on how to set up additional PVCs for accounts using more than one virtual connection.

Packing List

Open the shipping carton and carefully remove all items. In addition to this User's Guide, ascertain that you have:

1. One DSL-560I ADSL Ethernet Router
2. One User's Guide
3. One twisted-pair telephone cable used for ADSL connection
4. One straight-through Ethernet cable
5. One AC power adapter suitable for your electric service

Introduction

This section provides a brief description of the Router, its associated technologies and a list of Router features.

What is ADSL?

Asymmetric Digital Subscriber Line (ADSL) is an access technology that utilizes ordinary copper telephone lines to enable broadband high-speed digital data transmission and interactive multimedia applications for business and residential customers. For ADSL services, it is not necessary to use expensive new cabling or condition the line in any way.

ADSL greatly increases the signal carrying capacity of copper telephone lines without interfering with regular telephone services. For the ADSL user, this means faster downloads and more reliable connectivity. ADSL devices make it possible to enjoy benefits such as high-speed Internet access without experiencing any loss of quality or disruption of voice/fax telephone capabilities.

ADSL provides a dedicated service over a single telephone line operating at speeds of up to 8 Mbps downstream and up to 640 Kbps upstream, depending on local telephone line conditions. A secure point-to-point connection is established between the user and the central office of the service provider.

D-Link ADSL devices incorporate the recommendations of the ADSL Forum regarding framing, data format, and upper layer protocols.

Router Description and Operation

The DSL-560I ADSL Router is designed to provide a simple, cost-effective and secure ADSL Internet connection for your small- to medium-sized private network. The DSL-560I combines the benefits of high-speed ADSL connection technology and TCP/IP routing with a conventional Ethernet interface in one compact and convenient package. ADSL connection technology enables many interactive multi-media applications such as video conferencing and collaborative computing.

The Router is easy to install and use. The DSL-560I connects to an Ethernet LAN via a standard Ethernet 100BASE-T interface using RJ-45 connectors. The ADSL connection is made using ordinary twisted-pair telephone line with standard RJ-11 connectors. This arrangement means that several PCs can be networked and connected to the Internet using a single WAN interface and IP address.

The Router supports transparent bridging and can be used for IP packet routing over the Internet. Cost saving features of the Router such as NAT (Network Address Translator) and DHCP (Dynamic Host Configuration Protocol) improve administration efficiency and improve security. The advanced security enhancements, packet filtering and port redirection, can help protect your network from potentially devastating intrusions by malicious agents from outside your network.

Router Features

The DSL-560I ADSL Ethernet Router utilizes the latest ADSL enhancements to provide a reliable Internet portal suitable for most small to medium sized offices. DSL-560I advantages include:

- **PPP (Point-to-Point Protocol) Security** The DSL-560I ADSL Router supports PAP (Password Authentication Protocol) and CHAP (Challenge Handshake Authentication Protocol) for PPP connections.
- **DHCP Support** Dynamic Host Configuration Protocol automatically and dynamically assigns all LAN IP settings to each host on your network. This eliminates the need to reconfigure every host whenever changes in network topology occur.
- **Network Address Translation (NAT)** For small office environments, the DSL-560I allows multiple users on the LAN to access the Internet concurrently through a single Internet account. This provides Internet access to everyone in the office for the price of a single user.

NAT improves network security in effect by hiding the private network behind one global and visible IP address. NAT address mapping can also be used to link two IP domains via a LAN-to-LAN connection.

- **TCP/IP (Transfer Control Protocol/Internet Protocol)** The DSL-560I supports TCP/IP protocol, the language used for the Internet. It is compatible with access servers manufactured by major vendors.
- **RIP-1/RIP-2** The DSL-560I supports both RIP-1 and RIP-2 exchanges with other routers. Using both versions lets the Router to communicate with all RIP enabled devices.
- **Static Routing** This allows you to select a data path to a particular network destination that will remain in the routing table and never "age out". If you wish to define a specific route that will always be used for data traffic from your LAN to a specific destination within your LAN (for example to another router or a server) or outside your network (to a ISP defined default gateway for instance).
- **Default Routing** This allows you to choose a default path for incoming data packets for which the destination address is unknown. This is particularly useful when if the Router functions as the sole connection to the Internet.
- **ATM (Asynchronous Transfer Mode)** The DSL-560I supports *Bridged Ethernet over ATM* (RFC1483), *IP over ATM* (RFC1577) and *PPP over ATM* (RFC 2364).
- **Precise ATM Traffic Shaping** Traffic shaping is a method of controlling the flow rate of ATM data cells. This function helps to establish the Quality of Service for ATM data transfer.
- **G.hs (Auto-handshake)** This allows the Router to automatically choose either the G.lite or G.dmt ADSL connection standards.
- **High Performance** Very high rates of data transfer are possible with the Router. Up to 8 Mbps downstream bit rate using the G.dmt.
- **Full Network Management** The DSL-560I incorporates SNMP (Simple Network Management Protocol) support for web-based management and text-based network management via an RS-232 or **Telnet** connection.
- **Telnet Connection** The Telnet enables a network manager to access the Router's management software remotely.
- **Easy Installation** The DSL-560I uses a web-based graphical user interface program for convenient management access and easy set up. Any common web browser software can be used to manage the Router.
- **Multiple PVC Support** Up to eight PVCs can be assigned for use by the Modem. This can be useful to ADSL clients who wish to dedicate a PVC for a specific application, LAN or server.

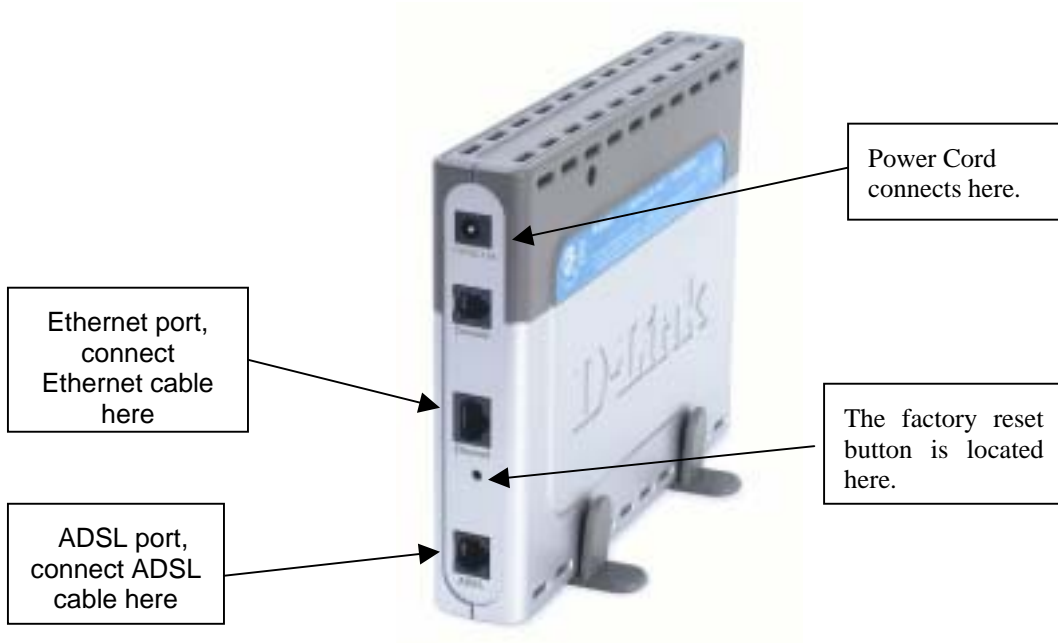
Front Panel

Place the Router in a location that allows a view of the LED indicators on the front panel.



Rear Panel

All cable connections to the Router are made at the rear panel. The power switch and factory reset button is located here as well.



LED Indicators



The LED Indicators read as follows:

Power Steady green light indicates the unit is powered on.

Status Blinking light indicates a normal state. Off or steady On means the device is malfunction.

ADSL: Link Steady green light indicates a valid ADSL connection. This will light after the ADSL negotiation process has been settled.

ADSL: Act Blinking green light indicates an active WAN session.

Ethernet: Link Steady green light indicates a valid Ethernet connection.

Ethernet: Act Blinking green indicates an active Ethernet session.

Hardware Installation

In this chapter you will learn about the various connections you will need to make in order to use the Router.

When selecting the location for the Router, make sure to allow room to access the connections on the rear panel. You will want to place the Router so that you will be able to see the LED indicators on the front panel. Allow some space above the Router for ventilation to avoid problems with overheating.

It may be convenient for you by placing the Router near the PC which you intend to use for initial Router configuration.

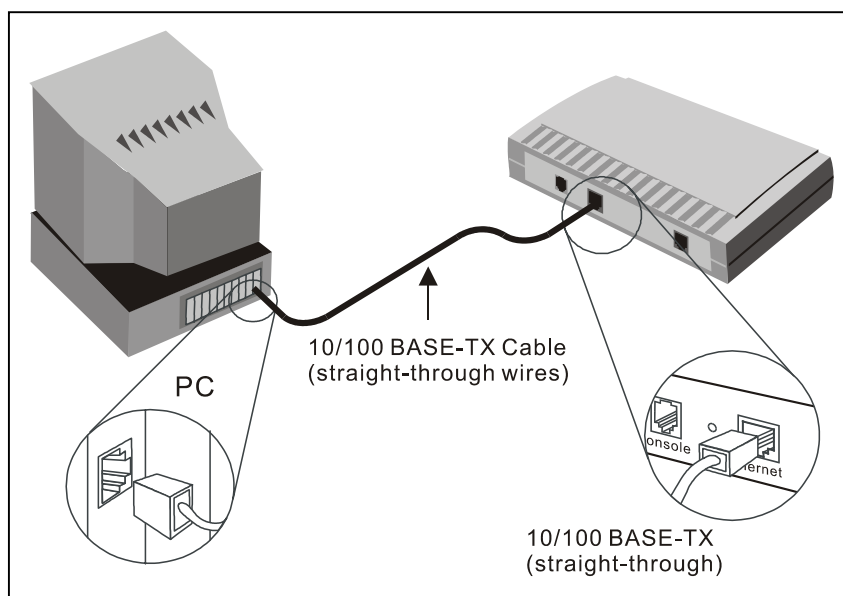
Connect ADSL Line

Use the standard phone cable that comes with the Router to connect it to your telephone outlet. Simply plug one end of the cable into the Router's ADSL port (RJ-11 receptacle) on its rear panel, and insert the other end into the wall jack. The ADSL connection is the WAN interface. It links the Router to the network service provider's backbone infrastructure. This is the Router's access point to the Internet.

The Router must undergo a negotiation process to establish the terms of the ADSL connection. During this negotiation the ADSL Link/Activity LED will flash in a steady interval, after the line is established which it will become steadily On. When the ADSL line traffic starts, it will then begin flashing according to the traffic activities. If the ADSL line is disconnected, the whole ADSL negotiation process will repeat itself again.

Computer to Router Connection

You can connect the Router directly to a 10/100BASE-TX Ethernet adapter card (NIC) installed on a PC using the Ethernet cable provided as shown in this diagram.



Connect Ethernet LAN to Router

The Router may be connected to any 10/100BASE-TX Ethernet LAN. Any connection to an Ethernet concentrating device such as a switch or hub can operate at a speed of 10/100 Mbps. When connecting the Router to any Ethernet device that is capable of operating at speeds higher than 10Mbps, be sure that the Ethernet device has auto-negotiation (NWay) enabled for the connecting port.

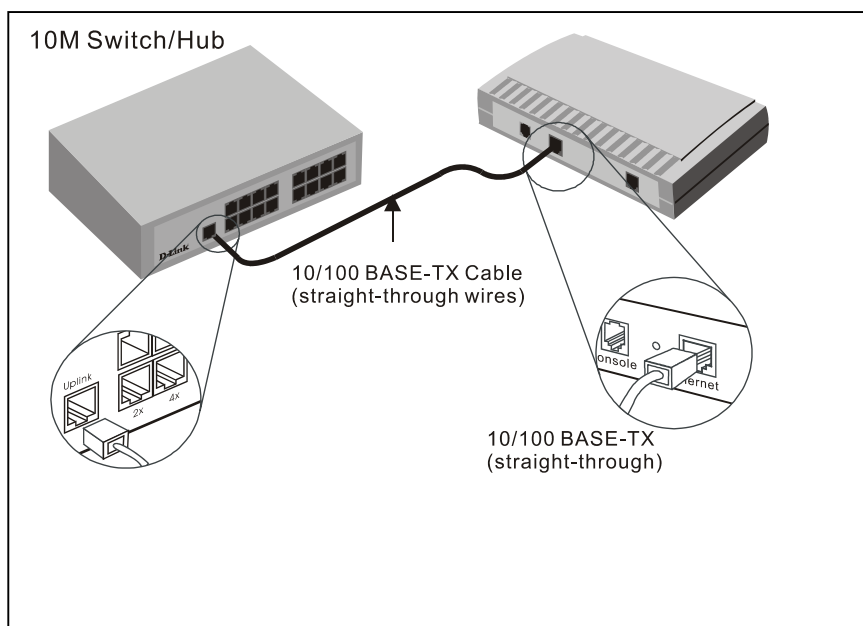
Use standard CAT-5 cable with RJ-45 connectors. The RJ-45 port on the Router is a crossed port (MDI-X). Follow standard Ethernet guidelines when deciding what type of cable to use to make this connection. When connecting the Router directly to a PC or server use a normal straight-through cable. You should use a crossed cable when connecting the Router to a normal (MDI-X) port on a switch or hub. Use a normal straight-through cable when connecting it to an uplink (MDI-II) port on a hub or switch. The Ethernet Link LED indicator will indicate a valid connection.

The rules governing Ethernet cable lengths apply to the LAN to Router connection. Be sure that the cable connecting the LAN to the Router does not exceed 100 meters.

Hub or Switch to Router Connection

Connect the Router to an uplink port (MDI-II) on an Ethernet hub or switch with a straight-through CAT-5 networking twisted pair cable as shown in the diagram below:

If you wish to reserve the uplink port on the switch or hub for another device, connect to any on the other MDI-X ports (1x, 2x, etc.) with a crossed cable.



Power On Router

To power on the device:

1. Insert the AC Power Adapter cord into the power receptacle located on the Router's back panel, and plug the adapter into a nearby power source.
2. You should see the Power LED indicator light up and remain lit.

Configuring the Router for the First Time

The first time you setup the Router, it is recommended that you configure the Router's WAN connection by using a single stand-alone computer that only connects to the Router's Ethernet port. Once the WAN port is properly setup and its connection is fully functional, you may continue making changes to its other configurations including the IP settings and/or its DHCP server options. This chapter will focus on how to properly setup your Router's WAN connection. The following chapter describes the various menus used to configure and monitor the Router including how to change IP settings and DHCP server options.

WAN Configuration Summary

1. **Connect to the Router** To configure the Router's WAN connection, it is necessary to communicate with the Router through its management interface, which is HTML-based, and it can be accessed using a web browser. To access the management software, your computer must be able to "see" the Router. Your computer can see the Router if it is in the same "neighborhood" or subnet as the Router's. This is accomplished by making sure that your computer has the correct IP settings which place it in the same subnet as the Router's. The easiest way to make sure your computer has the correct IP settings is to enable your PC's DHCP client option, and to automatically get the assigned IP addresses from the default Router's DHCP server operation. The next section describes how to change the IP configuration for a computer running a Windows OS to be a DHCP client.
2. **Configure the WAN Connection** Once you have successfully logged-in the Router's Web configuration menu, you can proceed to change the settings for the ADSL connection and the Service Provider's signing-on process. There are different methods used to establish the connection to the service provider's network and ultimately to the Internet. You should know what Encapsulation and connection type you are required to use for your ADSL service. It is also possible that you must change the PVC settings used for the ADSL connection. Your service provider should provide all the information you need to configure the WAN connection.

Configuring IP Settings on Your Computer

In order to configure your system to receive IP addresses from the Router, it must first have the TCP/IP protocol installed. If you have an Ethernet port on your computer, it probably already has TCP/IP protocol installed. If you are using Windows XP, the TCP/IP is enabled by default for the standard installations. Below is an illustrated example of how to configure a Windows XP system to automatically obtain the IP addresses from the Router. Following this example is a step-by-step description of the procedures used with other Windows operating systems. No matter what OS you have loaded on the PC, you will need to check first to see if its TCP/IP protocol has been installed. If the TCP/IP protocol is not installed, you will need to go through the PC's network protocol installation process (provided in the later session) to properly install the TCP/IP protocol. Once the protocol has been installed you can configure the PC to receive IP addresses from the Router.

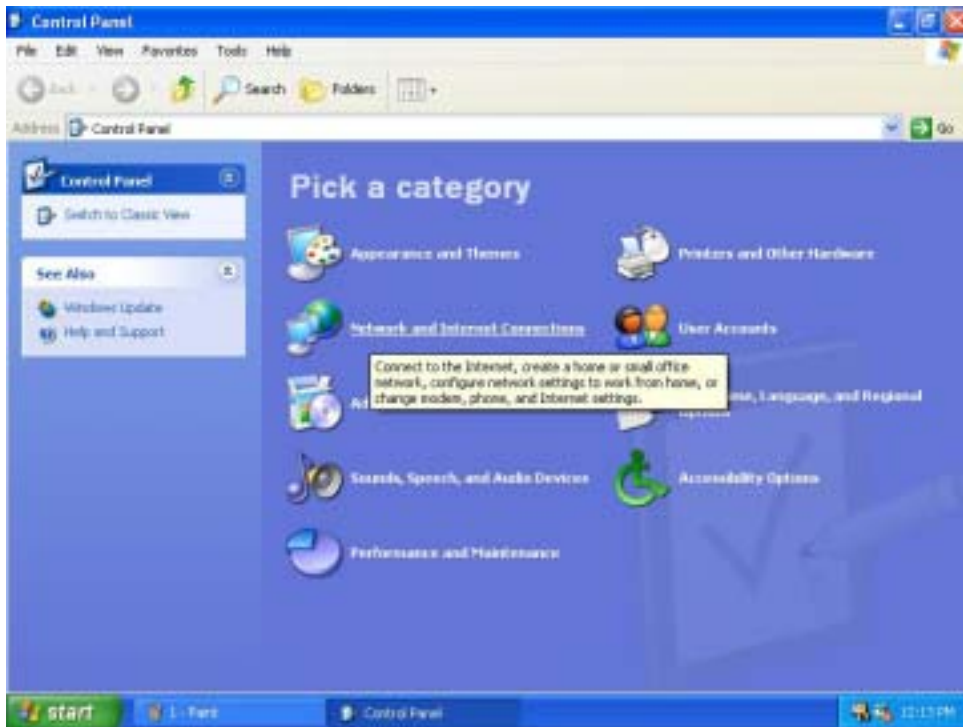
Configure Windows XP for DHCP

Use the following steps to configure a computer running Windows XP to be a DHCP client.

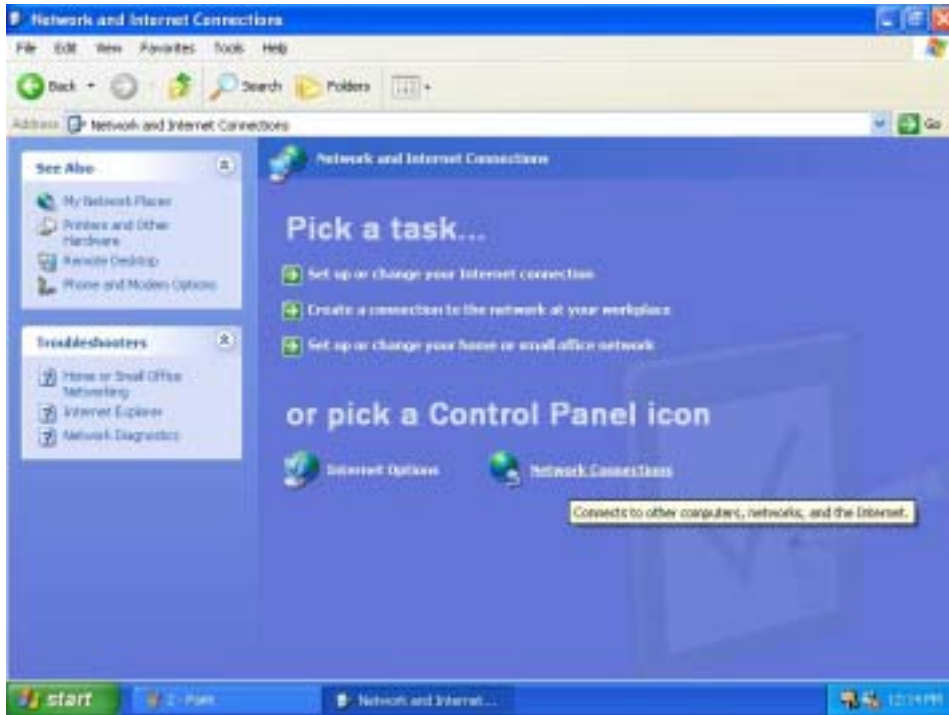
1. From the **Start** menu on your desktop, go to click on **Control Panel**.



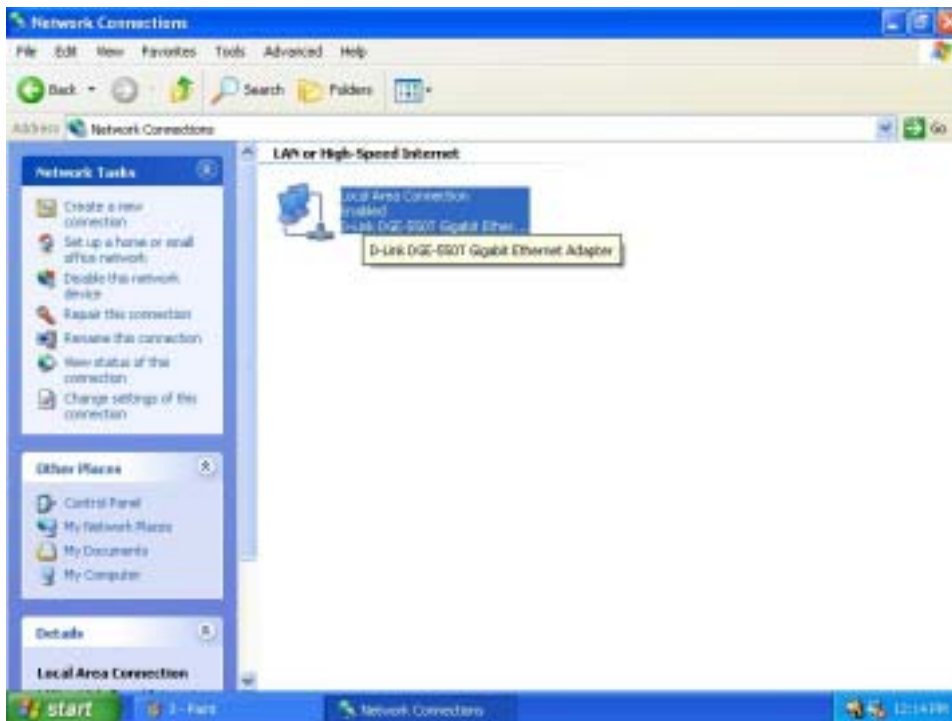
2. In the Control Panel folder, click on **Network and Internet Connections**.



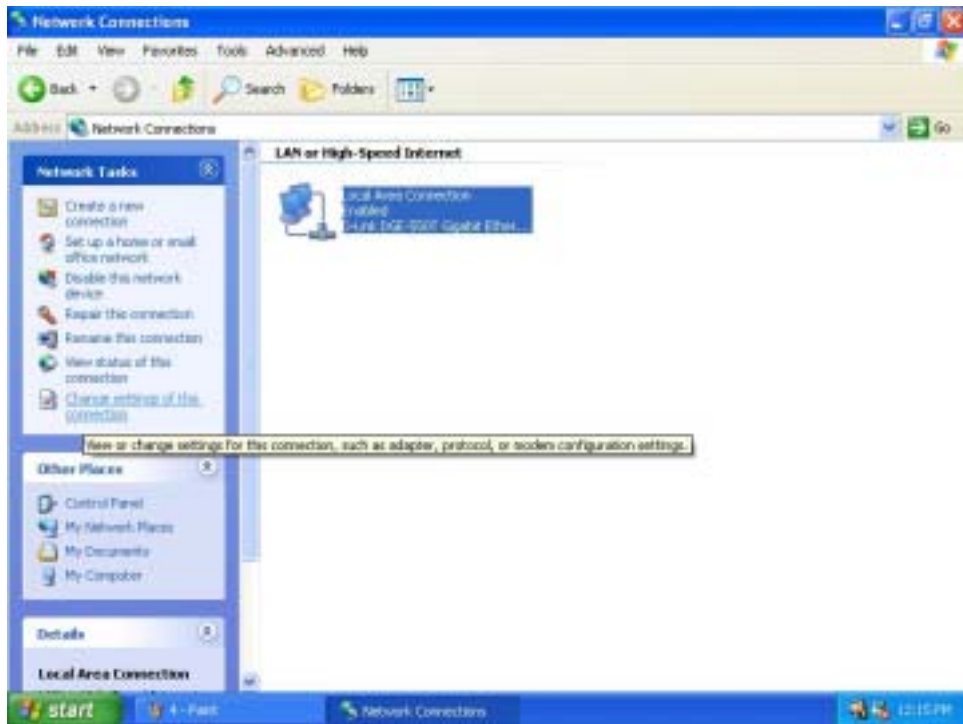
3. In the Network and Internet Connections folder, click on **Network Connections**.



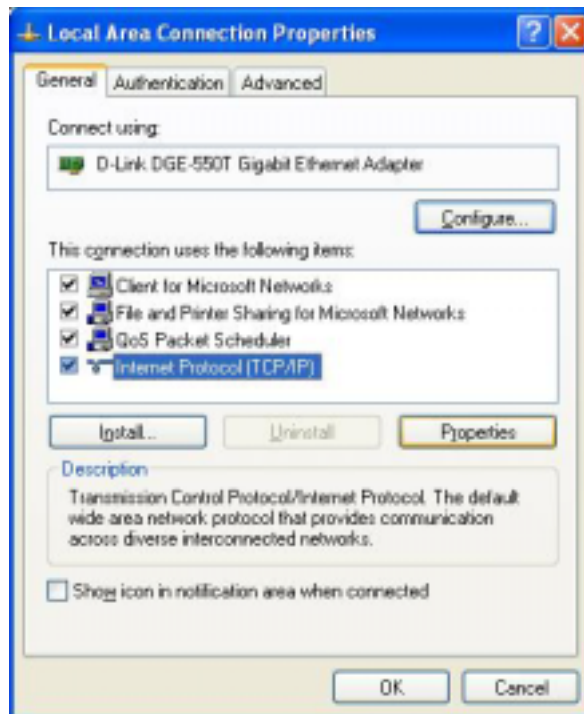
4. In the Network Connections folder, highlight the **Local Area Connection** icon by clicking on it once. A new option is revealed under Network Tabs in the left side panel.



5. Click on **Change settings of the connection** under Network Tabs.



6. In the **General** Tab of the **Local Area Connection Properties** menu, highlight **Internet Protocol (TCP/IP)** under “This connection uses the following items:” by clicking on it once. Click on the **Properties** button.



7. Select "Obtain an IP address automatically" by clicking once in the circle. Click the **OK** button.



Your computer is now ready to obtain its IP addresses from the Router's DHCP server.

Windows 2000

First, check for the IP protocol and, if necessary, install it:

1. In the Windows task bar, click the Start button, point to **Settings**, and then click **Control Panel**.
2. Double-click the Network and Dial-up Connections icon.
3. In the Network and Dial-up Connections window, right-click the Local Area Connection icon, and then select **Properties**.
4. The Local Area Connection Properties dialog box displays with a list of currently installed network components. If the list includes Internet Protocol (TCP/IP), then the protocol has already been enabled, skip ahead to *Configure Windows 2000 for DHCP*.
5. If Internet Protocol (TCP/IP) does not display as an installed component, click **Install**.
6. In the Select Network Component Type dialog box, select **Protocol**, and then click **Add**.
7. Select **Internet Protocol (TCP/IP)** in the Network Protocols list, and then click **OK**.
8. You may be prompted to install files from your Windows 2000 installation CD or other media. Follow the instructions to install the files.
9. If prompted, click **OK** to restart your computer with the new settings.

Configure Windows 2000 for DHCP

1. In the Control Panel, double-click the Network and Dial-up Connections icon.
2. In Network and Dial-up Connections window, right-click the Local Area Connection icon, and then select **Properties**.
3. In the Local Area Connection Properties dialog box, select **Internet Protocol (TCP/IP)**, and then click **Properties**.
4. In the Internet Protocol (TCP/IP) Properties dialog box, click the button labeled **Obtain an IP address automatically**.
5. Double-click **OK** to confirm and save your changes, and then close the Control Panel.

Your computer is now ready to obtain its IP addresses from the Router's DHCP server.

Windows ME

First, check for the IP protocol and, if necessary, install it:

1. In the Windows task bar, click the Start button, point to **Settings**, and then click **Control Panel**.
2. Double-click the Network and Dial-up Connections icon.
3. In the Network and Dial-up Connections window, right-click the Network icon, and then select **Properties**.
4. The Network Properties dialog box displays with a list of currently installed network components. If the list includes Internet Protocol (TCP/IP), then the protocol has already been enabled. Skip ahead to *Configure Windows ME for DHCP*.
5. If Internet Protocol (TCP/IP) does not display as an installed component, click **Add**.
6. In the Select Network Component Type dialog box, select **Protocol**, and then click **Add**.
7. Select **Microsoft** in the Manufacturers box.
8. Select **Internet Protocol (TCP/IP)** in the Network Protocols list, and then click **OK**.
9. You may be prompted to install files from your Windows Me installation CD or other media. Follow the instructions to install the files.
10. If prompted, click **OK** to restart your computer with the new settings.

Configure Windows ME for DHCP

1. In the Control Panel, double-click the Network and Dial-up Connections icon.
2. In Network and Dial-up Connections window, right-click the Network icon, and then select **Properties**.
3. In the Network Properties dialog box, select **TCP/IP**, and then click **Properties**.
4. In the TCP/IP Settings dialog box, click the **Obtain and IP address automatically** option.
5. Double-click **OK** twice to confirm and save your changes, and then close the Control Panel.

Your computer is now ready to obtain its IP addresses from the Router's DHCP server.

Windows 95, 98

First, check for the IP protocol and, if necessary, install it:

1. In the Windows task bar, click the Start button, point to **Settings**, and then click **Control Panel**. Double-click the Network icon.
2. The Network dialog box displays with a list of currently installed network components. If the list includes TCP/IP, and then the protocol has already been enabled, skip to *Configure IP Information Windows 95, 98*.
3. If TCP/IP does not display as an installed component, click **Add**. The Select Network Component Type dialog box displays.
4. Select **Protocol**, and then click **Add**. The Select Network Protocol dialog box displays.
5. Click on **Microsoft** in the Manufacturers list box, and then click **TCP/IP** in the Network Protocols list box.
6. Click **OK** to return to the Network dialog box, and then click **OK** again. You may be prompted to install files from your Windows 95/98 installation CD. Follow the instructions to install the files.
7. Click **OK** to restart the PC and complete the TCP/IP installation.

Configure Windows 95, 98 for DHCP

1. Open the Control Panel window, and then click the Network icon.
2. Select the network component labeled TCP/IP, and then click **Properties**.
3. If you have multiple TCP/IP listings, select the listing associated with your network card or adapter.
4. In the TCP/IP Properties dialog box, click the IP Address tab.
5. Click the **Obtain an IP address automatically** option.
6. Double-click **OK** to confirm and save your changes. You will be prompted to restart Windows.
7. Click **Yes**.

When the PC is restarted, your computer is ready to obtain its IP addresses from the Router's DHCP server.

Windows NT 4.0 workstations:

First, check for the IP protocol and, if necessary, install it:

1. In the Windows NT task bar, click the Start button, point to **Settings**, and then click **Control Panel**.
2. In the Control Panel window, double click the Network icon.
3. In the Network dialog box, click the Protocols tab.
4. The Protocols tab displays a list of currently installed network protocols. If the list includes TCP/IP, then the protocol has already been enabled. Skip to "Configure IP Information"
5. If TCP/IP does not display as an installed component, click **Add**.
6. In the Select Network Protocol dialog box, select **TCP/IP**, and then click **OK**. You may be prompted to install files from your Windows NT installation CD or other media. Follow the instructions to install the files.
7. After all files are installed, a window displays to inform you that a TCP/IP service called DHCP can be set up to dynamically assign IP information.
8. Click **Yes** to continue, and then click **OK** if prompted to restart your computer.

Configure Windows NT 4.0 for DHCP

1. Open the Control Panel window, and then double-click the Network icon.
2. In the Network dialog box, click the Protocols tab.
3. In the Protocols tab, select **TCP/IP**, and then click **Properties**.
4. In the Microsoft TCP/IP Properties dialog box, click the **Obtain an IP address automatically** option.
5. Click **OK** twice to confirm and save your changes, and then close the Control Panel.

Access the Configuration Manager

Now that your computer's IP settings allow it to communicate with the Router, you can access the configuration software.

Note: Be sure that the web browser on your computer is not configured to use a proxy server in the Internet settings. In Windows Internet Explorer, you can check if a proxy server is enabled using the following procedure:

1. In Windows, click on the START button, go to Settings and choose Control Panel.
2. In the Control Panel window, double-click on the Internet Options icon.
3. Click the Connections tab and click on the LAN Settings button.
4. Verify that the "Use proxy server" option is NOT checked. If it is checked, click in the checked box to deselect the option and click OK.

Alternatively you can access this Internet Options menu using the Tools pull down menu in Internet Explorer.

To use the web-based management software, launch a suitable web browser and direct it to the IP address of the Router. Type in **http://** followed by the default IP address, **192.168.0.1** in the address bar of the browser. The URL in the address bar should read: **http://192.168.0.1**.

A new window will appear and you will be prompted for a user name and password to access the web-based manager. Use the default user name **admin** and password **admin** for first time set up. You should change the web-based manager access user name and password once you have verified that a connection can be established. The user name and password allows any PC within the same subnet as the Router to access the web-based manger.



Figure 4 - 1. Login to Router

Note: Do not confuse the user name and password used to access the web-based manager with the ADSL account user name and password needed for PPP connections to access the service provider's network.

Configure the Router

The WAN Setup page displays the menu you need to configure the Router so it can connect to the Internet. The WAN Setup menu is used to configure the Router's WAN connection and also used to add other virtual connections (PVCs). The remainder of this chapter describes how to establish this WAN connection.

WAN Setup

VPI : VCI : LLC/SNAP Vc Multiplexing Enable NAPT

RFC1483 Bridged

RFC1483 Routed

WAN IP address: WAN subnet mask:

PPPoE

User name:

Password:

Mode: Idle Timeout(min) : Authentication: Enable

DHCP Server:

PPPoA

User name:

Password:

Authentication:

Current ATM PVC List

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	PPP Mode	Status
<input type="radio"/>	Bridged	1	32	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	PPPoA	0	35	LLC	Off	None	None	pppoa	Chap	NA	NA	InActive

Figure 4 - 1. Configuring the WAN Connection (First Time Setup)

When the Router is used to provide Internet access it actually must first access your service provider's network, that is, it must communicate with computers and other routers owned by your service provider. These computers and routers then provide access to the Internet. The Router must be configured to communicate with the systems that give it access to the larger network. There are different methods or protocols used to make this communication possible, and both ends of the communication must agree on what method to use and how to set up the connection. This is what you will configure the Router to do, to agree with the service provider's equipment and negotiate the terms of the connection using a language or protocol that both sides understand.

Sometimes it is also necessary to configure settings that control the actual ADSL connection. The ADSL connection is what actually carries the data from one point to the other. So in addition to telling the Router what method it must use, you may also be asked to change the PVC (Permanent Virtual Channel) settings. These settings are defined by two numbers, the VPI (Virtual Path Indicator) and the VCI (Virtual Channel Indicator).

All the information you need to make the changes needed for a functioning WAN connection should have been provided to you by your ISP or network service provider.

To configure the WAN connection, open the WAN Setup menu and perform the steps listed below. Some of the settings do not need to be changed when you first set up the device but can be changed later if you choose.

- 1 Do not change the **VPI** or **VCI** values unless you are required to do so. If these settings are incorrect, the ADSL connection will not function. Many users will be able to use the default settings. If you are told to change these, type in the values given to you by your service provider.

- 2 Select the **Encapsulation** method used for your connection. The options available are *RFC1483Bridged*, *RFC1483Routed*, *PPPoE*, and *PPPoA*. The default Encapsulation is RFC1483 Bridged.
- 3 The remaining settings that must be configured are different for the different Encapsulations.
 - 3.1 If you have selected a PPPoE or PPPoA Encapsulation you must supply a **User Name** and **Password** used to verify the identity of your account. Type in the User Name and Password used for your PPP connection. Also select the **Authentication** method used, *pap* or *chap*, choose *Enabled* for **Connect On Demand** and leave the **Idle Time** setting at 0.
 - 3.2 If you have selected a Bridge Encapsulation, there is no more change needed to establish the WAN connection for the Router. However, you will probably have to install some sort of connection software on your computer. Go to step 6 and finalize the Router configuration, then install any additional software. Follow the instructions given to you by your ISP or network service provider.
- 4 Click the **Add** button when you have entered all the information. The web browser will briefly go blank. After a few seconds the PVC profile listed in the Current ATM PVC List at the bottom of the web page will show the changes that you have just configured.

Web-based Management

The DSL-560I offers a web-based (HTML) graphical user interface allowing users to manage the Router from anywhere on the LAN using a standard browser. A web browser is used to communicate directly with the Router and make changes to the configuration or monitor status.

Accessing the Web Manager

In order to use the web-based management software it will be necessary to use a computer that occupies the same subnet as the Router. The simplest way to do this for many users will be to use DHCP server that is enabled by default on the Router. Chapter 4 provides instructions on how to configure a system running Windows operating systems to be DHCP client. You may also specify IP settings for your computer. The Router has a default IP address of 192.168.0.1 and a subnet mask of 255.255.255.0. Once you have accessed the configuration software you can configure the Router's IP settings and DHCP server configuration to suit your preferences.

To use the web-based management software run the browser you have installed on your computer and direct it to the Router's HTML interface using its LAN IP address. If this is the first time you are accessing the web-based manager you must type its default IP address, **192.168.0.1** in the address bar of the browser. The URL in the address bar should read: **http://192.168.0.1**. If you change the IP address you will use the new IP address to access the web-based manager.

In the page that opens, click on the **Login to web-based management module** button.

A new window will appear and you will be prompted for a user name and password. Use default user name **admin** and password **admin** for first time set up.

Note: Be sure that the web browser on your computer is not configured to use a proxy server in the Internet settings. In Windows Internet Explorer, you can check if a proxy server is enabled using the following procedure:

1. In Windows, click on the START button, go to Settings and choose Control Panel.
2. In the Control Panel window, double-click on the Internet Options icon.
3. Click the Connections tab and click on the LAN Settings button.
4. Verify that the "Use proxy server" option is NOT checked. If it is checked, click in the checked box to deselect the option and click OK.

Alternatively you can access this same menu using the Tools pull down menu in Internet Explorer.

If this is the first time you are accessing the configuration manager and you simply want to establish a connection to the Internet, you may want to read the section titled Configure the Router in the previous chapter.

Folders and Menus

The web manager interface (GUI) displays two fields that can be scrolled with your mouse to view areas of the field that may be hidden from view. The field located on the left side of the GUI contains two folders that can be opened with a double left click of the mouse. Open the Basic and Advanced folders and you will see that they each contain a number of labeled buttons. You can click the button or the hyperlinked title of these buttons to view the menu associated with it. These are the menus you will use to configure, manage and monitor the Router.

Basic

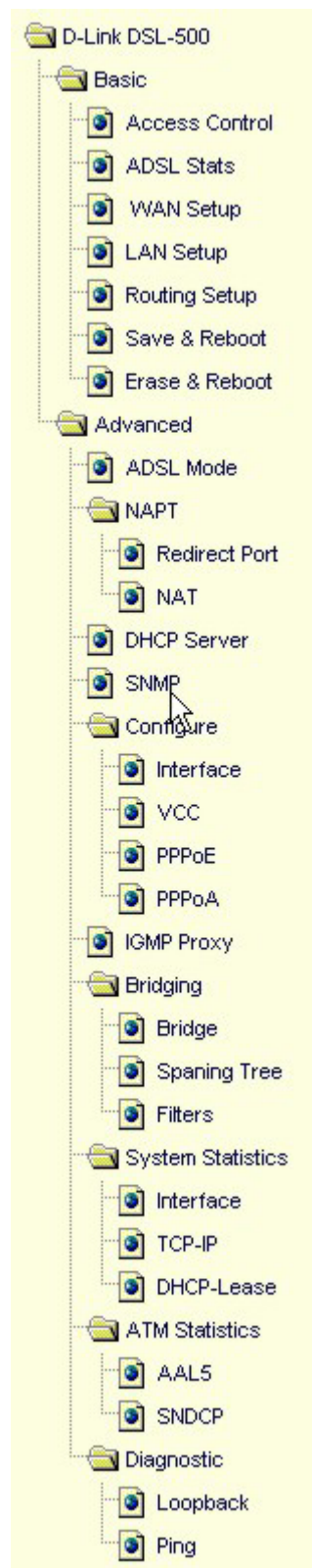
The information contained in the Basic folder are

- Access Control
- ADSL Stats
- WAN Setup
- LAN Setup
- Routing Setup
- Save & Reboot
- Erase & Reboot

Router Configuration

All the settings that define Router operations on both the LAN and WAN can be configured with the menus located in the **Basic** folder. These menus are described in the first part of this chapter presented in the same order that they appear in your browser.

The **Advanced** folder contains menus useful for system upkeep and analysis. These menus are described later in this chapter.



Configuring the WAN Connection

Use the WAN Setup menu to configure the WAN interface for PVC settings and other settings used to configure the ADSL connection and the connection to the service provider's network. Use this menu to add, change or delete PVC connection profiles if you have a multiple PVC account.

WAN Setup

VPI : VCI : LLC/SNAP Vc Multiplexing Enable NAPT

RFC1483 Bridged

RFC1483 Routed

WAN IP address: WAN subnet mask:

PPPoE

User name:

Password:

Mode: Idle Timeout(min) : Authentication: Enable

DHCP Server:

PPPoA

User name:

Password:

Authentication:

Current ATM PVC List

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	PPP Mode	Status
<input type="radio"/>	Bridged	1	32	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	PPPoA	0	35	LLC	Off	None	None	pppoa	Chap	NA	NA	InActive

Figure 5 - 1. WAN Configuration

The Router may be configured to use common Encapsulation and connection methods commonly used for ADSL service. The information that is needed for the different method varies according to connection type. Therefore the menu will change to offer different settings depending on whether the connection is a PPP or Bridged connection type.

To configure a single PVC profile, select the **Encapsulation** setting first. This may change the user configurable variables that are offered. The default Encapsulation used is RFC1483 Bridged. Table 5 - 1. WAN Connection Configuration on the next page lists the configuration settings for the different Encapsulation types.

In the WAN Setup menu configure the WAN interface settings described in the table below.

All connections must configure:	
VPI	Type in the new VPI setting (0-255)
VCI	Type in the new VCI setting (32-65535)
Encapsulation	From the drop-down menu select <i>RFC1483 Bridged</i> , <i>RFC1483 Routed</i> , <i>PPPoE</i> , <i>PPPoA</i> . Default=RFC1483 Bridged.
Login User Name	Used for authentication by your network service provider.
Login Password	Used for authentication by your network service provider
Authentication	Protocol used to confirm the identity of the subscriber. Choose chap (default) or pap from the drop-down menu.
Idle Time	A value of 0 means that the PPP connection will remain connected. If your network account is billed according to the amount of time the Router is actually connected to the Internet, enter an appropriate Idle Time value (in seconds). This will disconnect the Router after the WAN connection has been idle for the amount of time specified. The default value = 0.

Table 5 - 1. WAN Connection Configuration

Additional Virtual Connections (PVCs)

The Router can use up to eight simultaneous PVC connections. These additional connections occupy the same bandwidth used for ADSL service. Additional PVC connections can be added to establish a private connection to remote offices or maintain a server accessible through the WAN port. Provision for additional PVC profiles must be done through the telephone company or telecommunications services company. The remote user must have suitable ADSL equipment for a successful connection.

Use the WAN Setup menu to add, delete or modify additional PVCs as described below.

WAN Setup

VPI : VCI : LLC/SNAP Vc Multiplexing Enable NAPT

RFC1483 Bridged

RFC1483 Routed
 WAN IP address: WAN subnet mask:

PPPoE
 User name:
 Password:
 Mode: Idle Timeout(min) : Authentication: Enable
 DHCP Server:

PPPoA
 User name:
 Password:
 Authentication:

Current ATM PVC List

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	PPP Mode	Status
<input type="radio"/>	Bridged	1	32	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	PPPoA	0	35	LLC	Off	None	None	pppoa	Chap	NA	NA	InActive

Figure 5 - 2. Multiple PVC Menu

In order to use additional PVCs, each profile must have a unique (to the Router) Item Name and a unique VCI/VCI combination. You may use any available Encapsulation or connection type. Follow the instructions on the next page to set up multiple PVCs.

To add a PVC:

1. Type in a new **VPI** and **VCI** value. This combination may not be used for another PVC profile on the Router.
2. Select the **Encapsulation** method used for the new PVC.
3. For PPP connections (PPPoE or PPPoA), you must supply a new **User Name** and **Password**. You may use the same user name/password combination for more than one PVC unless you are specifically told not to do this by your service provider. It is recommended however that a different combination be used whenever it is practical. Also for PPP connections, select the **Authentication** and **Idle Time** settings (see Table 5 - 1. WAN Connection Configuration).
4. Click the **Add** button when you have entered all the information. The web browser will briefly go blank. After a few seconds the new PVC profile appears listed in the Current ATM PVC List at the bottom of the web page.

To modify an existing PVC:

1. Select the PVC profile you want to change by clicking on the item in the Current ATM PVC List.
2. Change the settings as desired making sure not to duplicate a VPI/VCI setting.

3. Click the **Modify** button. The modified PVC profile will appear with the new settings in the Current ATM PVC List menu.

To delete an exiting PVC:

1. Select the PVC profile you want to delete by selecting the item in the Current ATM PVC List.
2. Click the **Delete** button. The PVC profile will disappear from the Current ATM PVC List at the bottom of the page.

Configuring LAN IP Settings

Use the LAN Setup menu to change the Router's Ethernet LAN IP address.

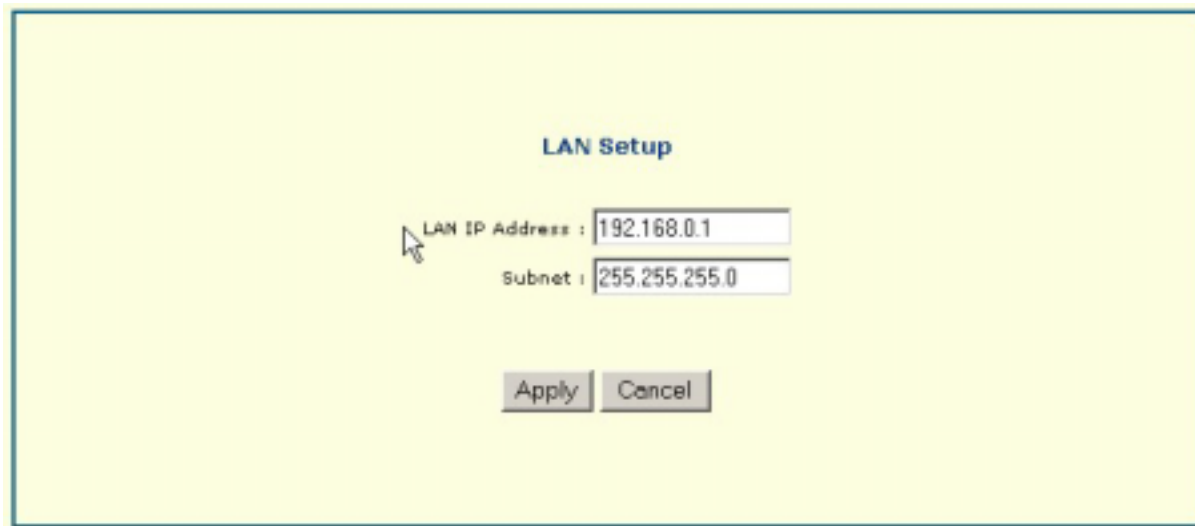


Figure 5 - 3. Ethernet IP Address Menu

The Ethernet IP Address displays the current LAN IP settings of the Router. To change the IP address, type in the new LAN **IP Address** in the space provided and type in a **Subnet Mask**. Click on the **Apply** button.

You will be prompted again to restart the device. Restart now or continue to make changes and save the changes later.

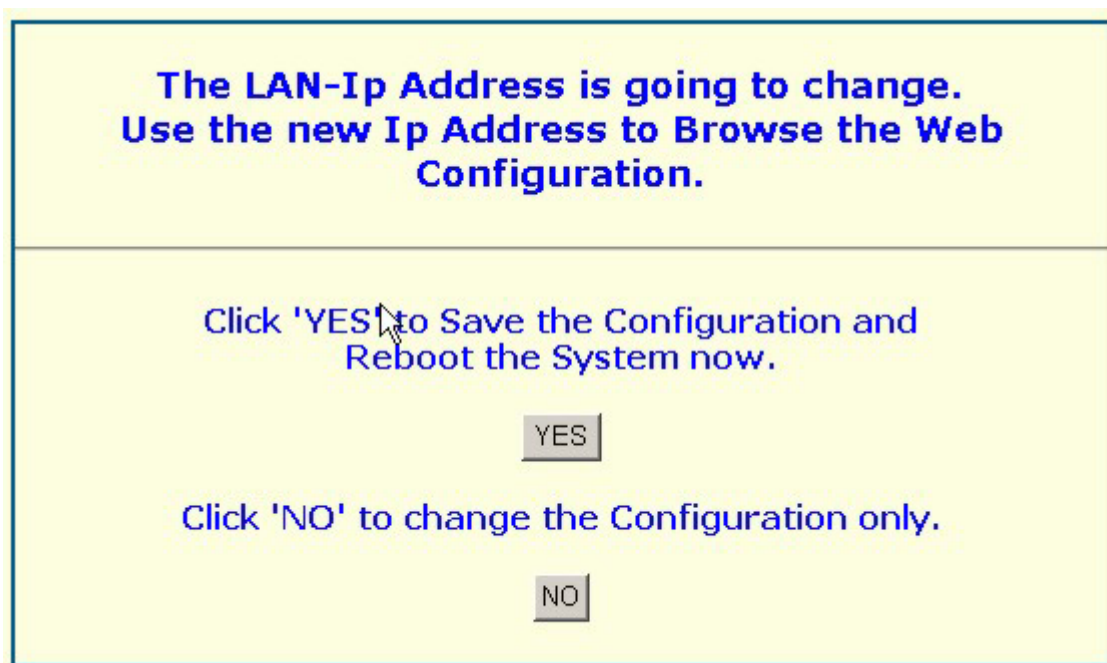


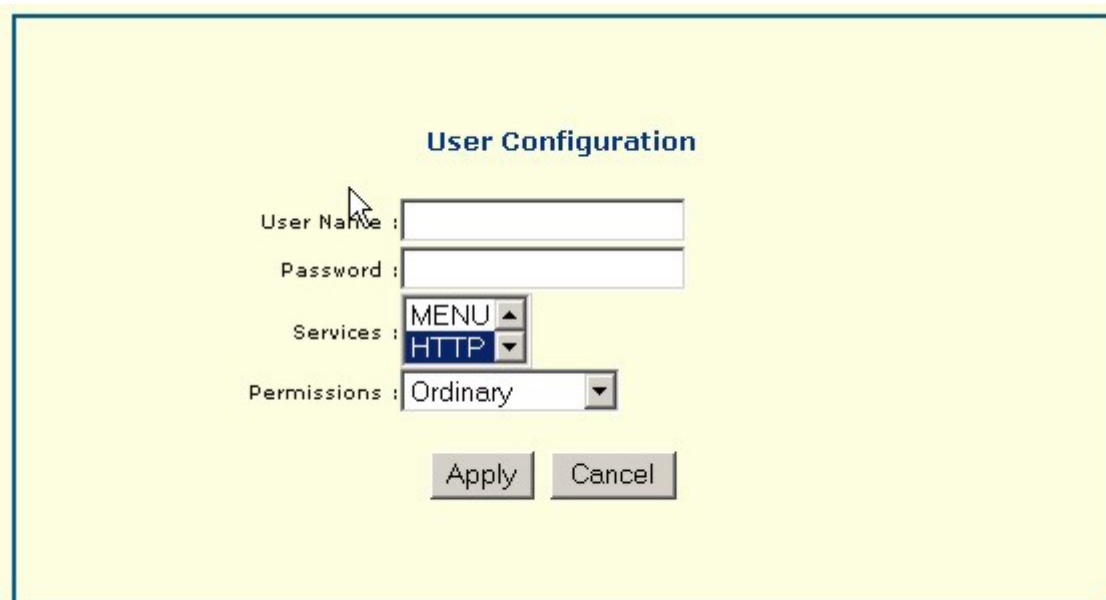
Figure 5 – 4.

Access Control

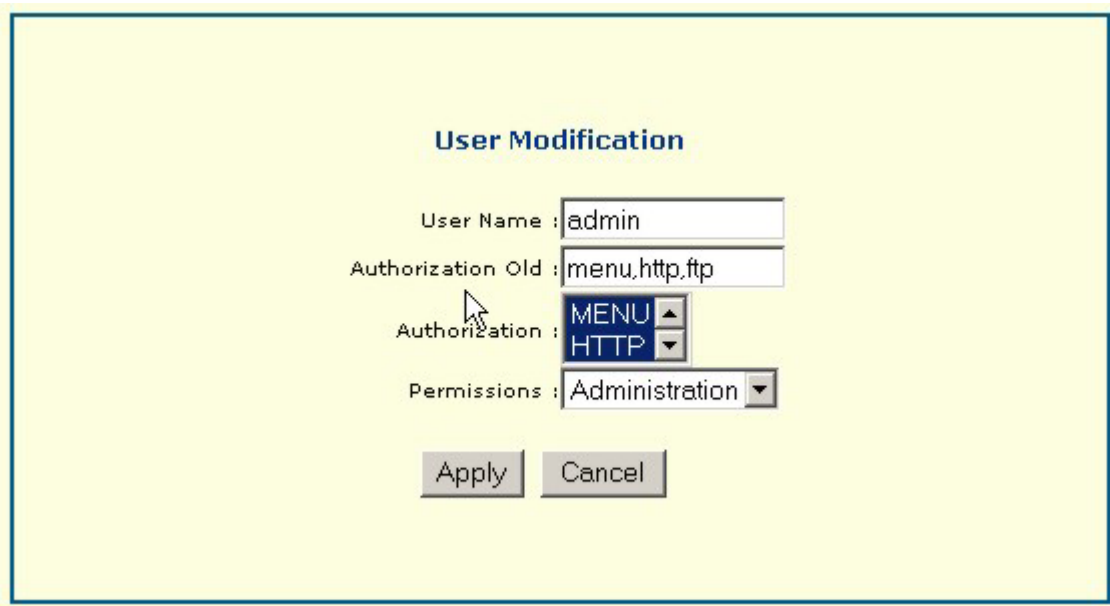
This menu allows you to change the user configuration (user name, password, and other options) to access the web manager. You may add, modify, and delete new user profiles. You may also just change the password on an existing user profile.



The following screen will appear when you click **Add**. Enter a User Name and Password. Select Menu or HTTP under Services and enter Permissions. Then click **Apply** to create user profile. It will then appear under List of Users.



The following screen will appear when you click **Modify**. Enter User Name, Authorization Old, Authorization, and Permission settings. Then click **Apply** to put modifications into effect.



User Modification

User Name :

Authorization Old :

Authorization :

Permissions :

To change the password on a user profile that already exists click on **Password** to bring up the menu below. Enter the Old Password, New Password, and Confirm Password settings to change password of existing user profile.



Password Configuration

Old Password :

New Password :

Confirm Password :

ADSL Link Status

This is a read-only menu item. The following table explains the information given in the ADSL Link Status menu.

Adsl Line Status	UNTRAINED
Adsl Mode	G.DMT
Up Stream	0 kbps (Interleave)
Down Stream	0 kbps (Interleave)
Attenuati	Near End: 0.0
	Far End: 0.0
SNR Margin	Near End: 0
	Far End: 0
HEC Count	0
Firmware	0x40e4be17
15 min ES Counter	0
CRC Errors	0
1 day ES Counter	0

Adsl Line Status	Tells whether the line is trained or untrained.
Adsl Mode	Modulation technique used for ADSL connection, G.DMT or G.lite
Up Stream	Rate of data transmission upstream (kbps)
Down Stream	Rate of data transmission downstream (kbps)
Attenuation	Downstream/Upstream attenuation of signal in dB (Near end and Far end)
SNR Margin	Downstream/Upstream Signal-to-Noise Ratio in dB (Near end and Far end)
HEC Count	Header Error Check count
Firmware	Firmware version
15 min ES Counter	
CRC Errors	Cyclic Redundancy Control errors
1 day ES Counter	

Routing Setup

Routing Setup

Routes Configuration

Destination Network ID :

Destination Subnet Mask :

Next Hop IP :

List of Static Routes

Select	Network ID	Subnet Mask	Next Hop IP
<input type="radio"/>	10.0.0.0	255.255.255.252	10.0.0.1
<input type="radio"/>	192.168.0.0	255.255.255.0	192.168.0.1

Rip Information

Rip Status : Version :

Use Static Routing to specify a route used for data traffic within your Ethernet LAN or to route data on the WAN. This is used to specify that all packets destined for a particular network or subnet use a predetermined gateway. The **List of Static Routes** table tells you how many routes are currently configured and the Network ID, Subnet Mask, and Next Hop IP of each route. The **Rip Information** option lets you select Rip Status (Off or On) and Version information.

Save and Reboot

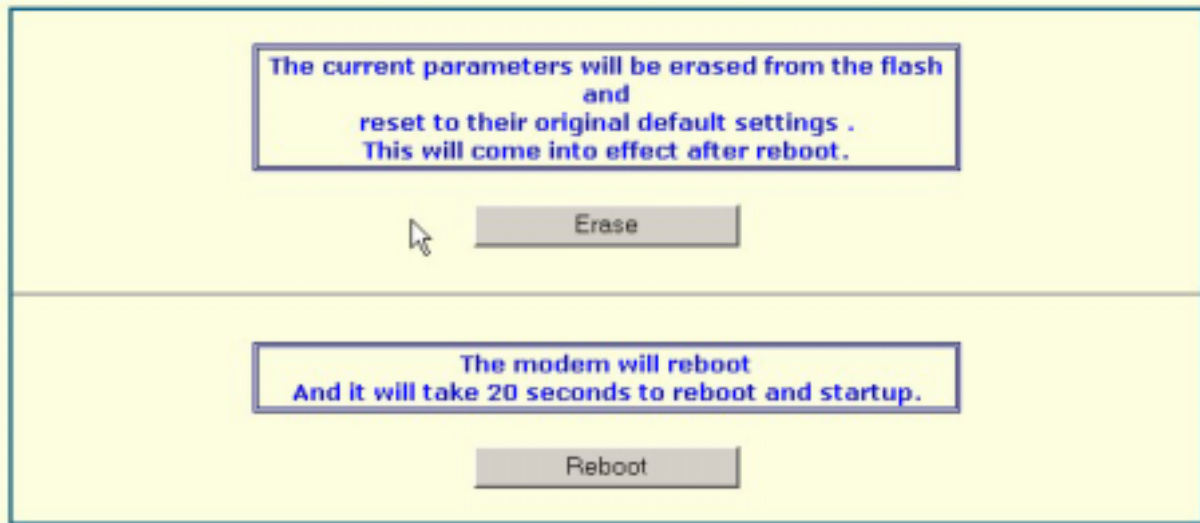
Gives you to the option to save the current configuration or reboot the Router.

**Saves the current configuration to the flash memory.
Do not turn off the power before the next page is
displayed,
Or else the unit will be damaged !!!**

**The modem will reboot
And it will take 20 seconds to reboot and startup.**

Erase and Reboot

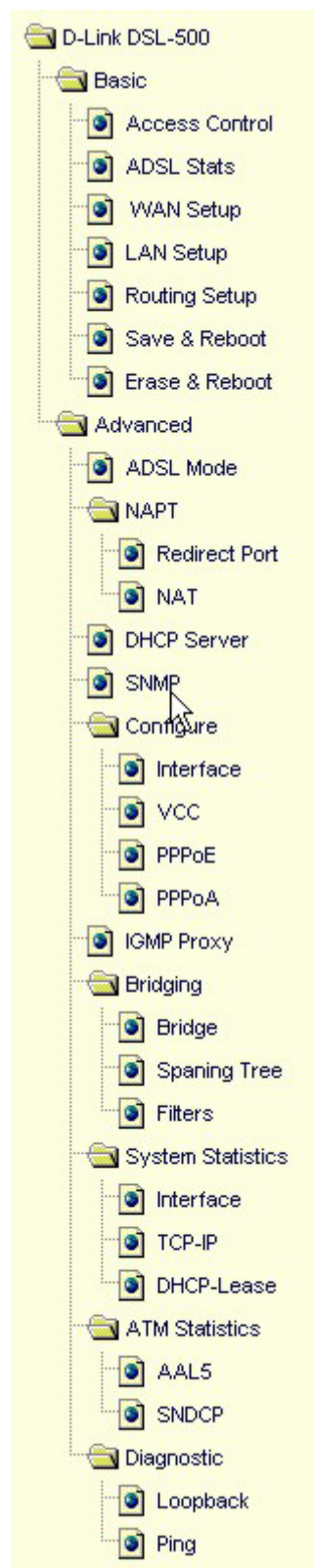
Gives you the option to erase current settings or reboot Router.



Advanced

The information contained in the Advanced folders are listed as follows:

- ADSL Mode
- Redirect Port
- NAT
- DHCP Server
- SNMP
- Interface
- VCC
- PPPoE
- PPPoA
- IGMP Proxy
- Bridge
- Spanning Tree
- Filters
- Interface
- TCP-IP
- DHCP-Lease
- AAL5
- SND CP
- Loopback
- Ping



ADSL Mode

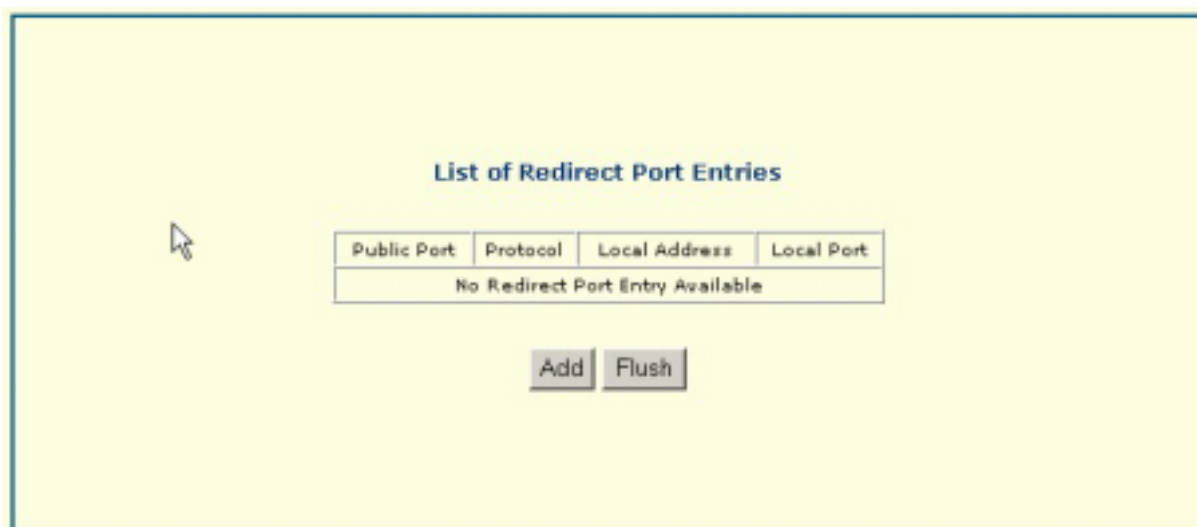
Displays modulation technique used for ADSL connection, G.DMT or G.lite. You can change the modulation technique by selecting the appropriate ADSL Standard and click **Apply**.



Redirect Port

The Port Redirection feature of the Router is used in conjunction with NAT or IP Masquerading to improve security and efficiency. Port redirection can be used to direct potentially hazardous packets to a proxy server outside your firewall. For example, you can configure the Router to direct HTTP packets to a designated HTTP server in the DMZ. Other common applications might include directing incoming SMTP packets to an Email server for data scrutiny and improved network efficiency.

Port Redirection can be used to redirect TCP or UDP packets to a specified port and a specified IP address on your local network. You can define a set of instructions for a specific incoming port or for a range of incoming ports. Each instruction set or rule is indexed and can be modified or deleted later as needed.



NAT

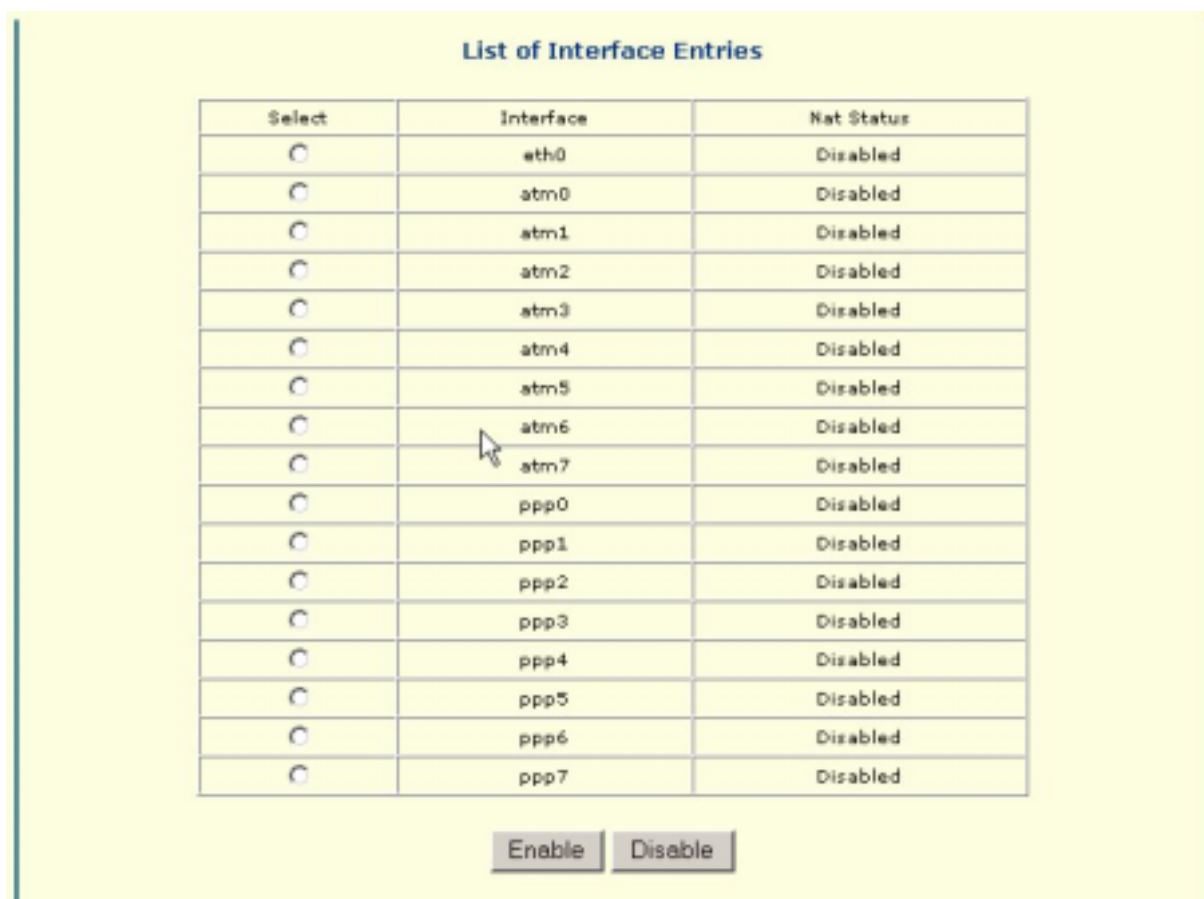
Network Address Translation (NAT) is a routing protocol that allows your network to become a *private* network that is isolated from, yet connected to the Internet. It does this by changing the IP address of packets from a *global* IP address usable on the Internet to a *local* IP address usable on your private network (but not on the Internet) and vice-versa. The Router allows up to 128 host IP addresses.

NAT has two major benefits. First, NAT allows many users to access the Internet using a single global IP address. This can greatly reduce the costs associated with Internet access and helps alleviate the current shortage of Internet IP addresses. Secondly, the NAT process creates an added degree of security by hiding your private network behind one IP address. The NAT function will normally only allow incoming packets that are generated in response to a request from a host within the LAN.

If your network uses web servers, FTP servers or other proxies used for data requests from outside the private network, you can use NAT in conjunction with Port Redirection to allow appropriate use of your servers by outside users. See the section on Port Redirection for more information.

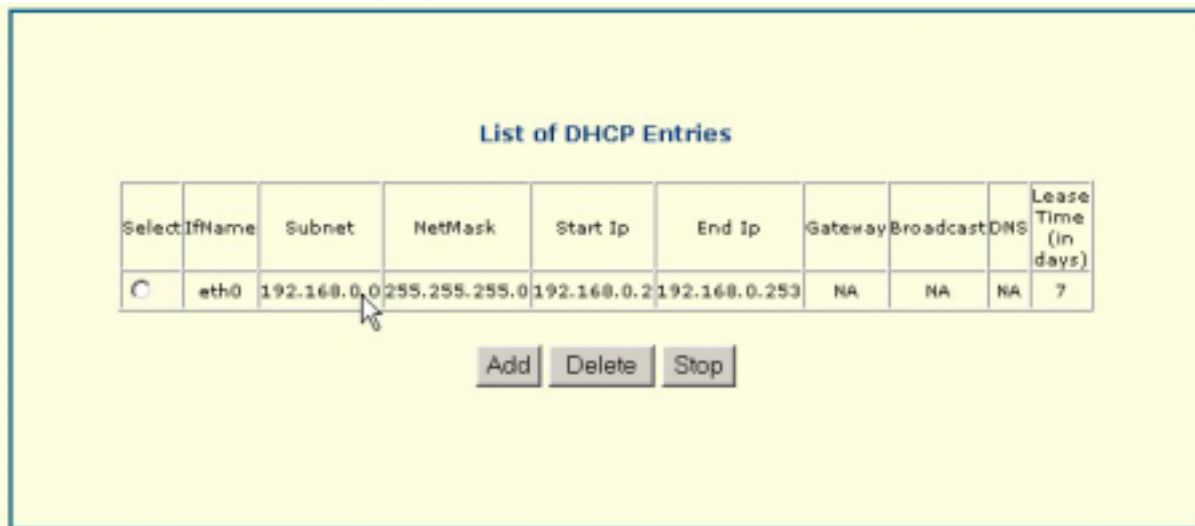
For the purposes of network administration, NAT is almost indispensable. Hosts and servers on the internal network can be moved easily. Using NAT together with DHCP can greatly reduce the workload of a network manager while allowing tremendous flexibility.

Select the Interface entry to enable or disable.

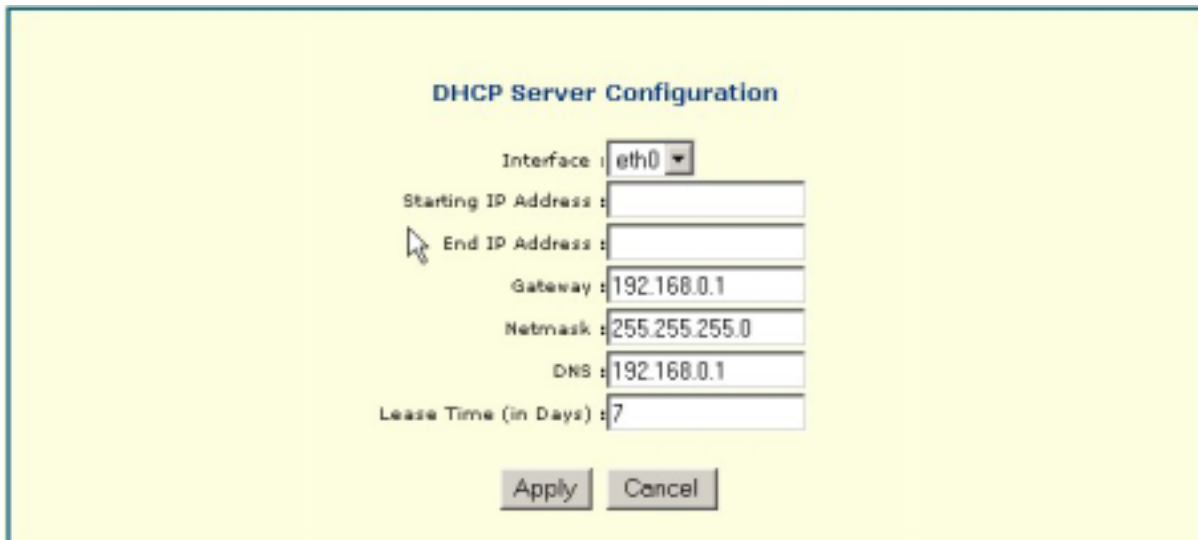


DHCP Server

Use the DHCP Server menu to configure the Router to act as a DHCP server for the LAN. This menu lists DHCP Entries.



To add another entry click **Add** and enter the appropriate settings—IfName, Subnet mask, NetMask, StartIp, End Ip, Gateway, Broadcast, DNS, Lease Time.



To delete a DHCP entry, simply select the entry and click **Delete**.

SNMP

This menu lists SNMP parameters.

List of SNMP Parameters

System Version Description	D-Link Corp.; DSL-560I ADSL CPE Router
System Contact	D-Link Corp.
System Location	Worldwide Business Units
System ID	1 3 6 1 4 1 171 255
Default Trap Address	192.168.0.1
Community for Reading MIB	public
Community for modifying MIB1	pub
Community for modifying MIB2	chip

You may modify by clicking **Modify** and entering the appropriate settings.

SNMP Configuration

System Version Description : D-Link Corp.; DSL-560I ADSL CPE

System Contact : D-Link Corp.

System Location : Worldwide Business Units

System ID : 171

Default Trap Address : 192.168.0.1

Community for Reading MIB : public

Community for modifying MIB1 : pub

Community for modifying MIB2 : chip

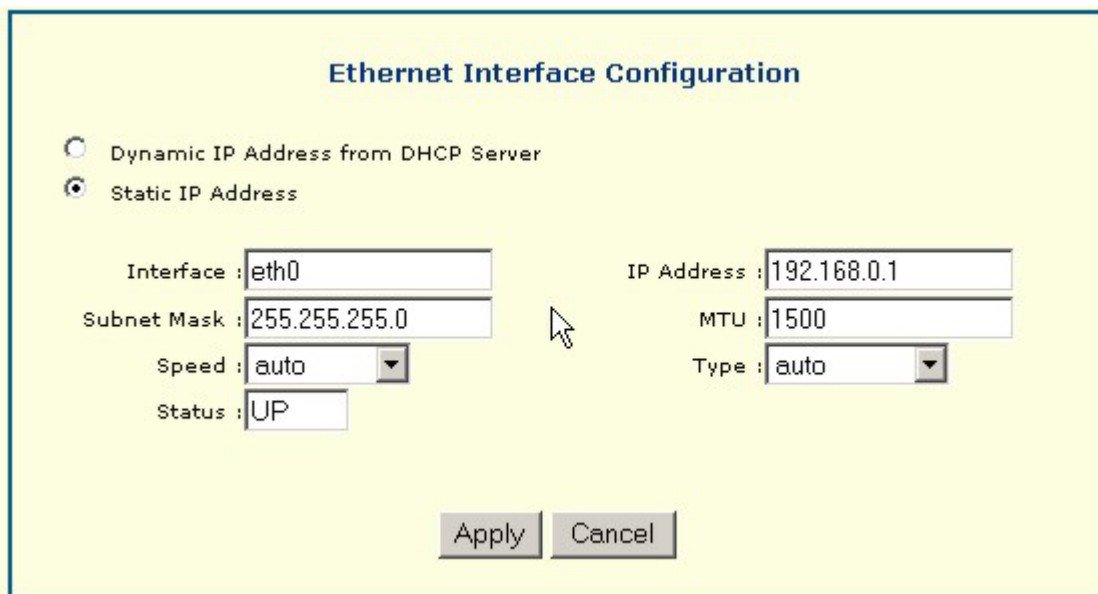
Interface

This menu gives a list of interface entries. For each entry an IP address, subnet mask, MAC address and status are given.

List of Interface Entries

Select	Interface Name	IP Address	Subnet Mask	MAC Address	Status
<input type="radio"/>	eth0	192.168.0.1	255.255.255.0	0:50:ba:12:34:56	UP
<input type="radio"/>	mer0	None	None	NA	DOWN
<input type="radio"/>	lo0	127.0.0.1	255.0.0.0	NA	UP
<input type="radio"/>	atm0	10.0.0.1	255.255.255.252	NA	UP
<input type="radio"/>	atm1	None	None	NA	DOWN
<input type="radio"/>	atm2	None	None	NA	DOWN
<input type="radio"/>	atm3	None	None	NA	DOWN
<input type="radio"/>	atm4	None	None	NA	DOWN
<input type="radio"/>	atm5	None	None	NA	DOWN
<input type="radio"/>	atm6	None	None	NA	DOWN
<input type="radio"/>	atm7	None	None	NA	DOWN
<input type="radio"/>	ppp0	None	None	NA	DOWN
<input type="radio"/>	ppp1	None	None	NA	DOWN
<input type="radio"/>	ppp2	None	None	NA	DOWN
<input type="radio"/>	ppp3	None	None	NA	DOWN
<input type="radio"/>	ppp4	None	None	NA	DOWN
<input type="radio"/>	ppp5	None	None	NA	DOWN
<input type="radio"/>	ppp6	None	None	NA	DOWN
<input type="radio"/>	ppp7	None	None	NA	DOWN

To configure interface, select interface entry and click on **Configure Interface**. A screen such as the one below should appear for an Ethernet Interface Configuration.



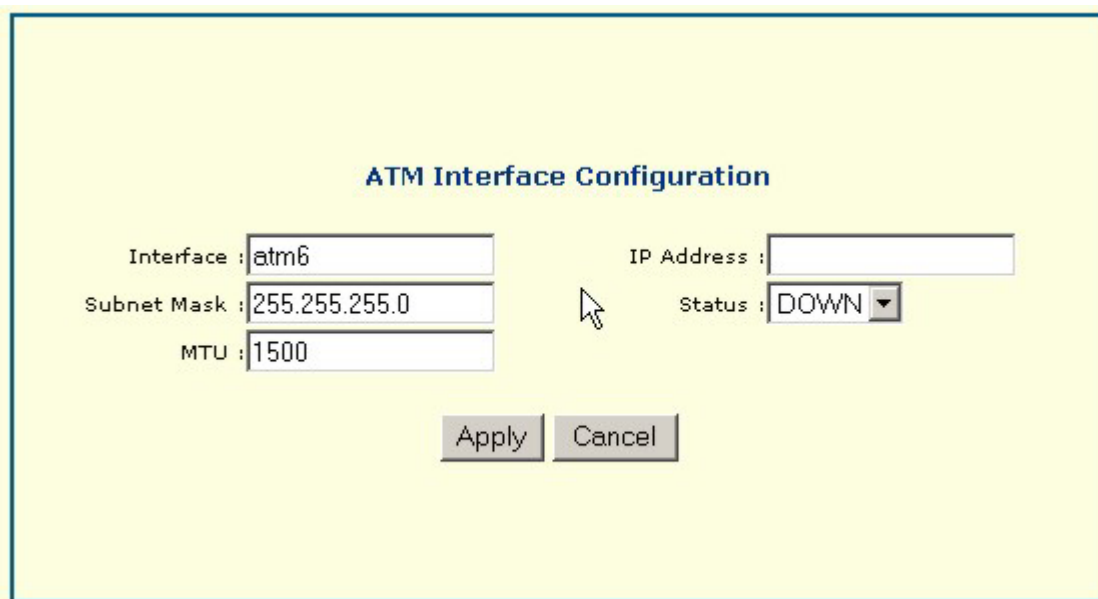
Ethernet Interface Configuration

Dynamic IP Address from DHCP Server
 Static IP Address

Interface : eth0 IP Address : 192.168.0.1
Subnet Mask : 255.255.255.0 MTU : 1500
Speed : auto Type : auto
Status : UP

Apply Cancel

Each interface is configured in its own separate screen. For an ATM Interface Configuration a screen such as the one below will appear.



ATM Interface Configuration

Interface : atm6 IP Address :
Subnet Mask : 255.255.255.0 Status : DOWN
MTU : 1500

Apply Cancel

To configure your DNS & Default Gateway, click on **DNS & Default G/W**. A screen such as the one below will appear. Enter the appropriate settings.

DNS & Default Gateway Configuration

Domain Name :

Primary DNS Server :

Secondary DNS Server :

Default Gateway :

VCC

This menu provides a list of VCCs.

List of VCCs

Select	VPI	VCI	Type(Data/Voice)	Encapsulation	Interface	IPaddress
<input type="radio"/>	1	32	Data	Bridge	None	None
<input type="radio"/>	0	35	Data	None	None	None

Click **List Ipoa** to bring up a list of IPOAs that are configured.

List of IPOA

Interface Name	VPI	VCI	Encapsulation	Dest Address	State	Type
IPOA not configured						

To configure a VCC click on **Add**. The following screen will appear. Enter the information requested and click **Apply**. To delete simply select the VCC you wish to delete and click **Delete**.

VCC Configuration

VPI :	<input type="text"/>	VCI :	<input type="text"/>
Peak Cell Rate (cells/sec):	<input type="text" value="3000"/>	Avg. Cell Rate (cells/sec):	<input type="text" value="3000"/>
Burst Size (cells):	<input type="text" value="45"/>	CDVT (cells):	<input type="text" value="500000"/>
Type :	<input type="text" value="Data"/>	Service Type :	<input type="text" value="UBR"/>

For data flow:

Routed

Interface :

IPoA

Interface :

Default PVC :

Next Hop IP Address :

PPPoA

Profile Id :

User Name :

Password :

Authentication Type :

Encapsulation Type :

SubnetMask :

Interface :

Trace :

NAT :

PPPoE

Profile Id :

User Name :

Password :

Authentication Type :

Mode :

Encapsulation Type :

SubnetMask :

Interface :

Idle Time (min) :

Trace :

NAT :

Click on **Show VCC Quality** to display the screen below.

List of VCC's

VPI	VCI	Flow Type	Service Type	PCR	SCR	Burst Size	CVDT
0	35	Data	UBR	3000	3000	45	500000

PPPoE

This menu lists PPPoE Entries. Click **Start** to initiate the process. Click **Stop** to terminate the process. You may delete an entry by clicking **Delete**. PPPoE entries are entered in the Wan Setup page.

List of PPPoE Entries

Select	Profile Id	Vpi	Vci	Interface Name	UserName	Password	Authentication Protocol
	Mode	Idle TimeOut	Nat	Subnet Mask	Valid	Active	Default

No PPPoE Entry Available

PPPoA

This menu lists PPPoA connections. Click **Start** to initiate the process. Click **Stop** to terminate the process. You may delete an entry by clicking **Delete**. PPPoA entries are entered in the Wan Setup page.

List of PPPoA Entries

Select	Profile Id	Vpi	Vci	Interface Name	UserName	Password
	Authentication Protocol	Nat	Subnet Mask	Valid	Active	Default
<input type="radio"/>	1	0	35	ppp1	pppoa	*****
	chap	Enabled	255.255.255.255	Valid	Inactive	No

IGMP Proxy

This menu lists IGMP Proxy entries.

List of IGMP Proxy Entries

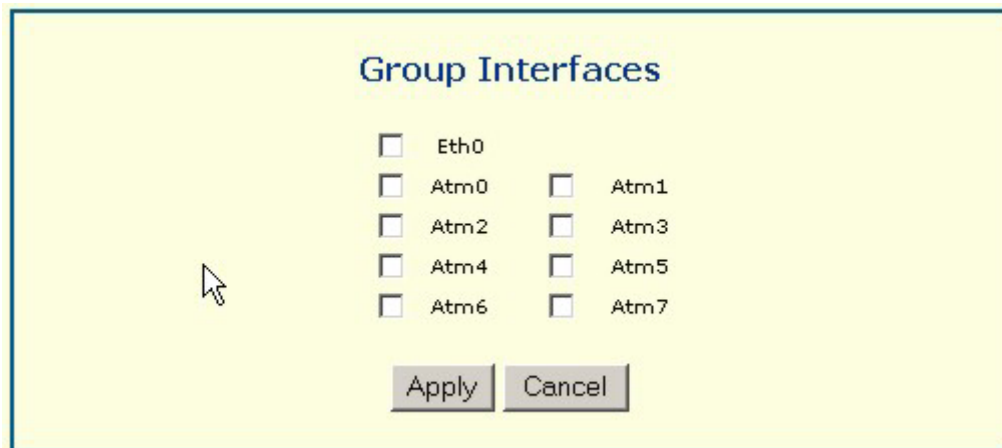
Select	InterfaceName	Type	Ip Address
No IGMP Interfaces configured			

Bridge

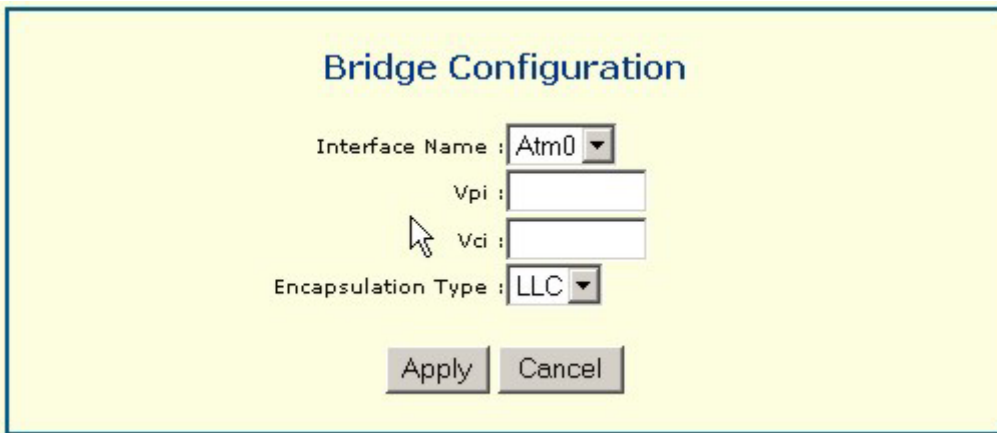
This menu lists bridge entries.



Click on **GroupInfo** to bring up Group Interfaces window. Click on interfaces to select them and then click on **Apply** to put them into effect.



Click on **AddPVC** to bring up the following Bridge Configuration menu. Enter the interface name, vpi settings, vci settings, and encapsulation type. Then click **Apply** to place configuration into effect.



The Bridge Configuration menu is displayed on a light yellow background. It features the title "Bridge Configuration" at the top center. Below the title, there are four input fields: "Interface Name" with a dropdown menu showing "Atm0", "Vpi" with an empty text box, "Vci" with an empty text box, and "Encapsulation Type" with a dropdown menu showing "LLC". At the bottom of the form, there are two buttons: "Apply" and "Cancel".

Spanning Tree

This menu provides a list of spanning tree entries.



The List of Spanning Tree Entries menu is displayed on a light yellow background. It features the title "List of Spanning Tree Entries" at the top center. Below the title, there is a table with the following columns: "Select", "Port", "State", "Port Id", "Link Cost", "Tx CBpdu", "Rx CBpdu", "TX TBpdu", and "RX TBpdu". The table is currently empty, and the text "No Spanning Tree Entries Available" is displayed in the center. Below the table, there are three buttons: "STP Parameters", "Config Port", and "Enable".

Click on **STP Parameters** to bring up read-only window List of Spanning Tree Parameters. Click **Continue** to proceed.

List of Spaning Tree Parameters

STP	Disabled
Active Ports	0
Bridge Id	00:00:00:00:80:00
Root Id	00:00:00:00:00:00
Hello Time	2
Max Age	20
Forwarded Delay	15
Root Port	0
Root Path Lost	0
Hold Time	1

Click **ConfigPort** to bring up Port Configuration window below. Enter settings and click **Apply** to put settings into effect.

Port Configuration

Port Parameters

Interface Name : Port Priority :

Link Cost :

Bridge Parameters

Bridge Priority : Hello Time :

Max Age Time : Forward Delay Priority :

Filter

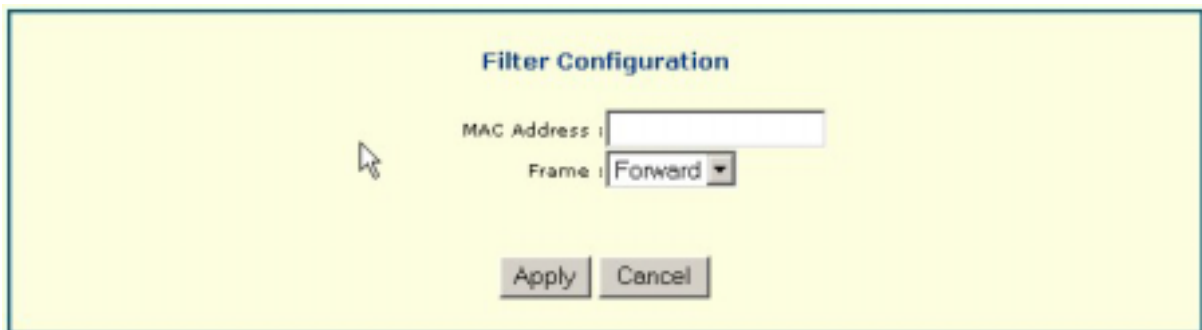
This menu displays a list of filter entries.



Click on **Filter Parameters** to bring up read-only List of Filter Parameters.



Click on **Add** to configure filter by entering a MAC address and Frame option. Click **Apply** to place settings into effect.



Interface

This menu gives a read-only list of interface statistics ordered by interface name.

Interface Name	Admin Status	Octets In	Unicast PktsIn	Broadcast PktsIn	Discards In	Errors In	Octets Out	Unicast PktsOut	Broadcast PktsOut	Discards Out	Errors Out
eth0	UP	413921	3932	0	0	0	690874	1129	0	0	0
mer0	UP	0	0	0	0	0	0	0	0	0	0
lo0	UP	0	0	0	0	0	0	0	0	0	0
atm0	UP	0	0	0	0	0	0	0	0	0	0
atm1	DOWN	0	0	0	0	0	0	0	0	0	0
atm2	DOWN	0	0	0	0	0	0	0	0	0	0
atm3	DOWN	0	0	0	0	0	0	0	0	0	0
atm4	DOWN	0	0	0	0	0	0	0	0	0	0
atm5	DOWN	0	0	0	0	0	0	0	0	0	0
atm6	DOWN	0	0	0	0	0	0	0	0	0	0
atm7	DOWN	0	0	0	0	0	0	0	0	0	0
ppp0	DOWN	0	0	0	0	0	0	0	0	0	0
ppp1	DOWN	0	0	0	0	0	0	0	0	0	0
ppp2	DOWN	0	0	0	0	0	0	0	0	0	0
ppp3	DOWN	0	0	0	0	0	0	0	0	0	0
ppp4	DOWN	0	0	0	0	0	0	0	0	0	0
ppp5	DOWN	0	0	0	0	0	0	0	0	0	0
ppp6	DOWN	0	0	0	0	0	0	0	0	0	0
ppp7	DOWN	0	0	0	0	0	0	0	0	0	0

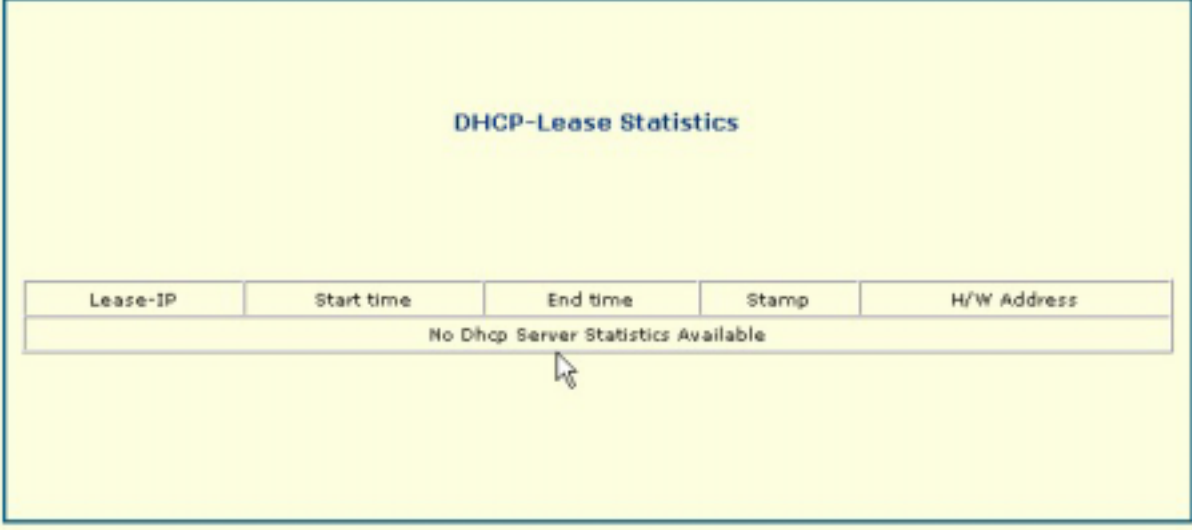
TCP-IP

This menu provides TCP-IP Statistics.

TCP-IP Statistics							
IP Statistics							
In receives	1757	In Errors	0	In Unknown Protos	4	Forwarded Datagrams	1135
Out Requests	1135	Out Discards	0	Out No Routes	0		
Udp Statistics							
Data grams In	604	Datagrams Out	0	Errors In	0		
Tcp Statistics							
Active Opens	0	Passive Opens	47	Attempt Fails	0	Current Establishments	1
Segments In	1084	Segments Out	1139	Segments retransmitted	0	Errors In	0
Icmp Statistics							
IN							
Messages	0	Errors	0	Destination Unreaches	0	Time Exceeds	0
Source Quenches	0	Redirects	0	Echos	0	Echo Replys	0
OUT							
Messages	0	Errors	0	Destination Unreaches	0	Time Exceeds	0
Source Quenches	0	Redirects	0	Echos	0	Echo Replys	0

DHCP-Lease

This menu gives DHCP-Lease Statistics.

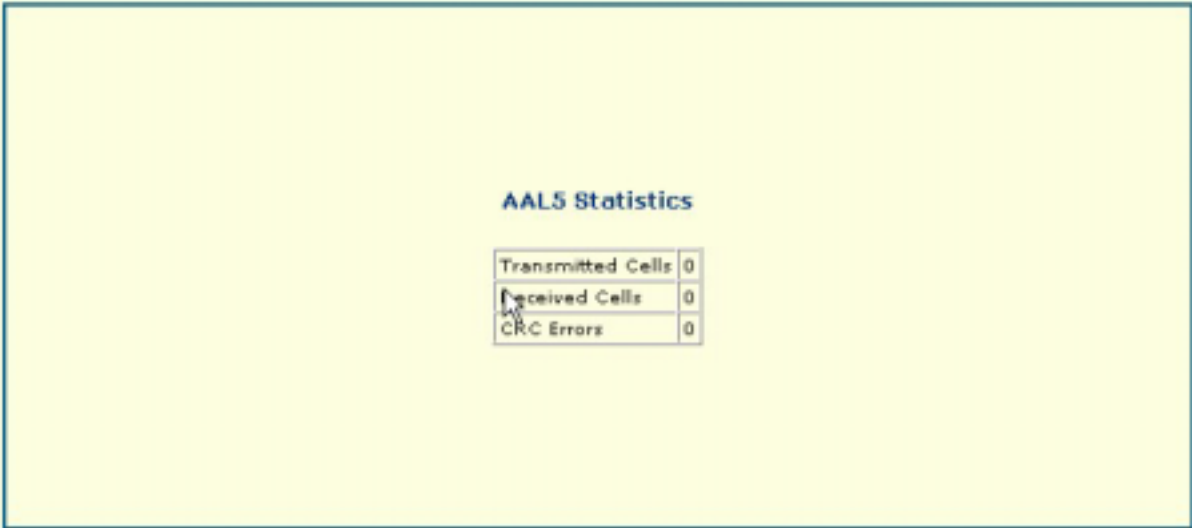


DHCP-Lease Statistics

Lease-IP	Start time	End time	Stamp	H/W Address
No Dhcp Server Statistics Available				

AAL5

This menu gives AAL5 Statistics.

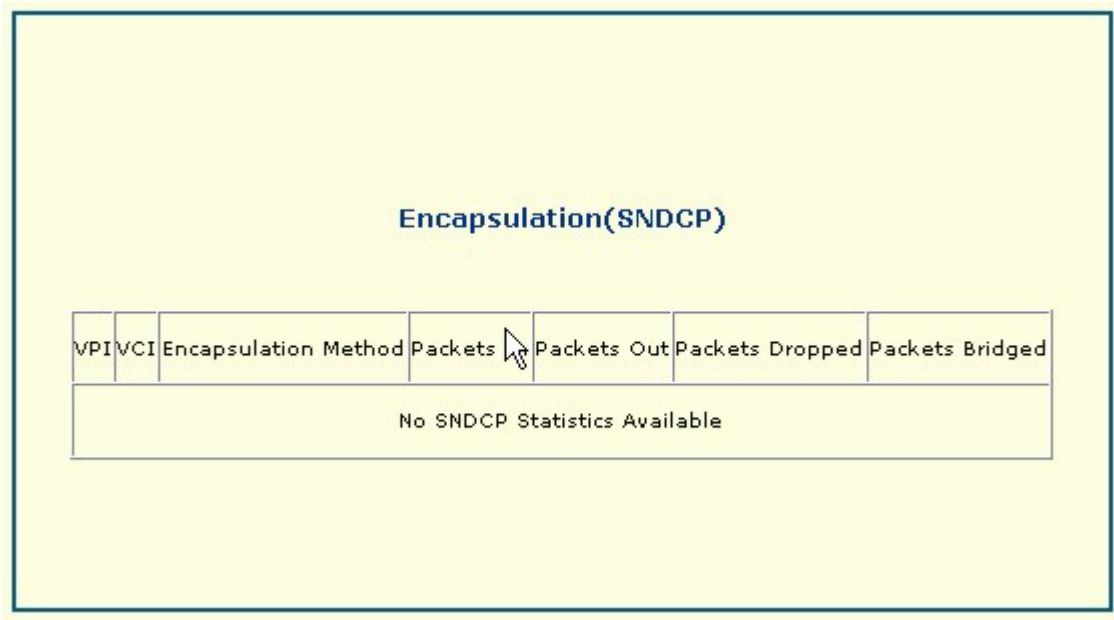


AAL5 Statistics

Transmitted Cells	0
Received Cells	0
CRC Errors	0

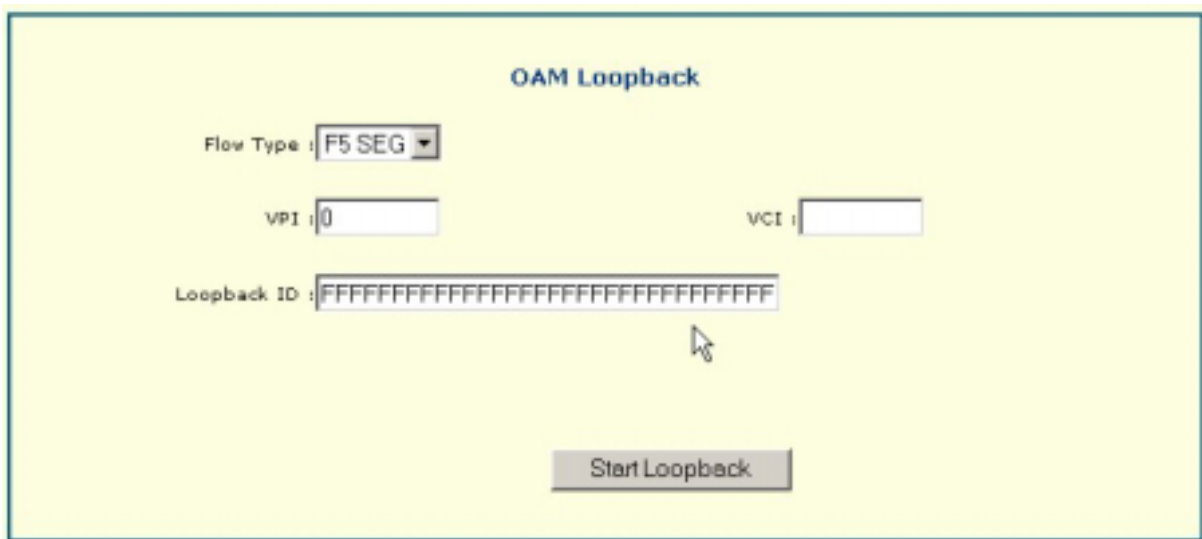
SNDTCP

This menu gives SNDTCP statistics.



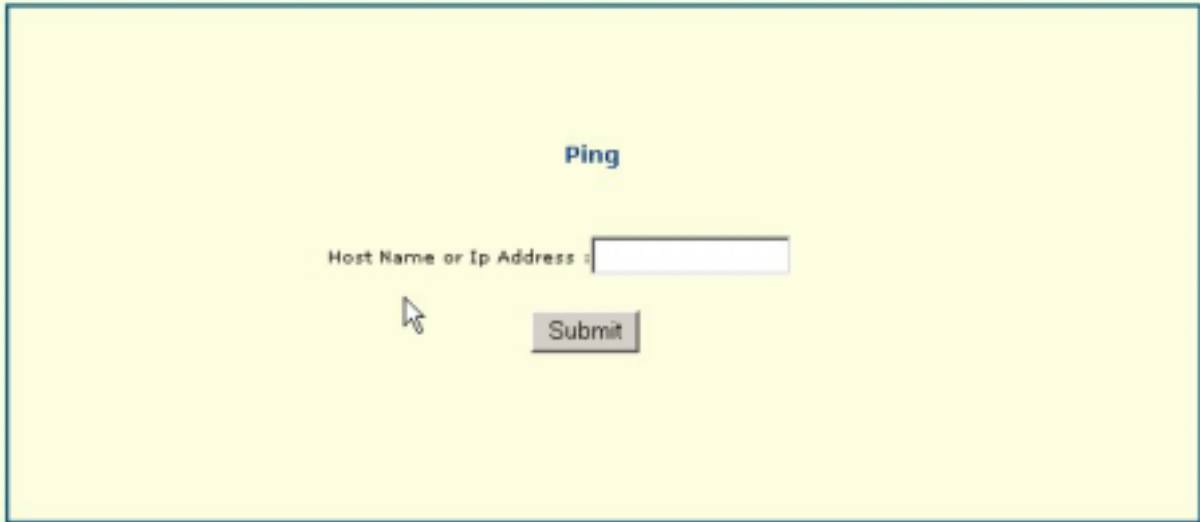
Loopback

This menu item allows the user to perform an OAM Loopback by entering Flow Type, VPI settings, VCI settings, and Loopback ID. Click **Start Loopback** to initiate loopback test.



Ping

This menu allows the user to perform a Ping test by entering the host name or IP address. Click **Submit** to initiate ping.



The screenshot shows a web interface for performing a ping test. At the top center, the word "Ping" is displayed in a blue font. Below it, the text "Host Name or Ip Address :" is followed by a white rectangular input field. A mouse cursor is positioned over the input field. To the right of the input field is a grey rectangular button labeled "Submit". The entire interface is set against a light yellow background.



Technical Specifications

GENERAL		
STANDARDS:	<ul style="list-style-type: none"> • ITU G.992.1 (G.dmt) • ITU G.992.2 (G.lite) • ITU G.994.1 (G.Hs) • ITU-T Rec. I.361 • ITU-T Rec. I.610 • IEEE 802.3 • IEEE 802.3u • IEEE 802.1d • RFC 791 (IP Routing) • RFC 792 (UDP) • RFC 826 (ARP) • RFC 1058 (RIP 1) • RFC 1389 (RIP 2) • RFC 1213 compliant • RFC 1483 (Bridged Ethernet) • RFC 1577 (IP over ATM) 	<ul style="list-style-type: none"> • RFC 1661 (PPP) • RFC 1994 (CHAP) • RFC 1334 (PAP) • RFC 2364 (PPP over ATM) • RFC 1631 (NAT) • RFC 1877 (Automatic IP assignment) • RFC 2516 (PPP over Ethernet) • Supports RFC 2131 and RFC 2132 (DHCP) • Compatible with all T1.413 issue 2 (full rate DMT over analog POTS), and CO DSLAM equipment • Supports ATM Forum UNI V3.1 PVC
PROTOCOLS:	TCP/IP UDP RIP-1 RIP-2 IGMP	DHCP BOOTP ARP AAL5
DATA TRANSFER RATE:	G.dmt full rate: Downstream up to 8 Mbps Upstream up to 640 Kbps G.lite: Downstream up to 1.5 Mbps Upstream up to 512 Kbps	
MEDIA INTERFACE EXCHANGE:	RJ-11 port ADSL telephone line connection RJ-45 port for 10BASET Ethernet connection RJ-14 console port for local configuration (requires adapter)	

Physical and Environmental	
DC inputs:	Input: 100V ~ 240V AC 50 ~ 60Hz
Power Adapter:	Output: 7.5V DC, 1.5A
Power Consumption:	5 Watts (max)
Operating Temperature:	5° to 40° C
Humidity:	5 to 95% (non-condensing)
Dimensions:	190 mm x 116.8 mm x 30.9 mm
Weight:	360 gm
EMI:	CE Class B
Safety:	CSA International
Reliability:	Mean Time Between Failure (MTBF) min. 4 years



LAN IP Setup

The DSL-560I is designed to provide network administrators maximum flexibility for IP addressing on the Ethernet LAN. The easiest IP setup choice in most cases is to let the Router do it using DHCP, which is enabled by default. This appendix briefly describes various options including DHCP, used for IP setup on a LAN. If you are new to IP networking, the next appendix provides some background information on basic IP concepts.

Assigning Network IP Addresses

The IP address settings, which include the IP address, subnet mask and gateway IP address are the first and most important internal network settings that need to be configured. The Router is assigned a default LAN IP address and subnet mask. If you do not have a preexisting IP network and are setting one up now, using the factory default IP address settings can greatly ease the setup process. If you already have a preexisting IP network, you can adjust the IP settings for the Router to fit within your existing scheme.

Using the Default IP Address

The Router is shipped with a preset default IP address setting of 192.168.0.1 for the LAN port. There are two ways to use this default IP address, you can manually assign an IP address and subnet mask for each PC on the LAN or you can instruct the Router to automatically assign them using DHCP. The simplest method is to use DHCP. The DHCP function is active by default.

Manual IP Address Assignment

Manually configuring IP settings for the LAN means you must manually set an IP address, subnet mask and IP address of the default gateway (the Router's IP address) on each networked computer. The example listed below describes IP configuration for computers running Windows 98 or Windows 95. Regardless of what operating system is used on each workstation, the three network IP settings must be defined so the network interface used by each workstation can be identified by the Router, and vice versa. For detailed information about configuring your workstations IP settings, consult the user's guide included with the operating system or the network interface card (NIC).

1. In Windows 95/98, click on the **START** button, go to **Settings** and choose **Control Panel**.
2. In the window that opens, double-click on the **Network** icon.
3. Under the Configuration tab, select the **TCP/IP** component and click *Properties*.
4. Choose the *Specify an IP address* option and edit the address settings accordingly. Consult the table below for IP settings on a Class C network.

Using Default IP without DHCP			
Host	IP Address	Subnet Mask	Gateway IP
Router	192.168.0.1	255.255.255.0	
Computer #1	192.168.0.2	255.255.255.0	192.168.0.1
Computer #2	192.168.0.3	255.255.255.0	192.168.0.1
Computer #3	192.168.0.4	255.255.255.0	192.168.0.1

LAN IP Setup - Example #1

Please note that when using the default IP address as in the above example, the first three numbers in the IP address must always be the same with only the fourth number changing. The first three numbers define the network IP address (all machines must belong to the same IP network), while the last number denotes the host IP address (each computer must have a unique address to distinguish it on the network). The IP address scheme used in Example #1 can be used for any LAN that requires up to 253 separate IP addresses (excluding the Router). Notice that the subnet mask is the same for all machines and the default gateway address is the LAN IP address of the Router.

It is a good idea to make a note of each device's IP address for reference during troubleshooting or when adding new stations or devices.

Using DHCP

The second way to use the default settings is to allow the Router to automatically assign IP settings for workstation using DHCP. To do this, simply make sure your computers' IP addresses are set to 0.0.0.0 (under Windows, choose the option Obtain an IP address automatically in the TCP/IP network component described above). When the computers are restarted, their IP settings will automatically be assigned by the Router. The Router is set by default to use DHCP. See the discussion in Chapter 5 for information on how to use configure the Router for DHCP.

Changing the IP Address of the Router

When planning your LAN IP address setup, you may use any scheme allowed by rules that govern IP assignment. It may be more convenient or easier to remember an IP scheme that use a different address for the Router. Or you may be installing the Router on a network that has already established the IP settings. Changing the IP address is a simple matter and can be done using the web manager (see *LAN IP Address* in Chapter 5). If you are incorporating the Router into a LAN with an existing IP structure, be sure to disable the DHCP function. Also, consider the effects of the NAT function which is enable by default.

An IP addressing scheme commonly used for Ethernet LANs establishes 10.0.0.1 as the base address for the network. Using Example #2 below, the Router is assigned the base address 10.0.0.1 and the remaining addresses are assigned manually or using DHCP.

Alternative IP Assignment			
Host	IP Address	Subnet Mask	Gateway IP
Router	10.0.0.1	255.255.255.0	
Computer #1	10.0.0.2	255.255.255.0	192.168.0.1
Computer #2	10.0.0.3	255.255.255.0	192.168.0.1
Computer #3	10.0.0.4	255.255.255.0	192.168.0.1

LAN IP Setup - Example #2

These two examples are only examples you can use to help you get started. If you are interested in more advanced information on how to use IP addressing on a LAN there are numerous resources freely available on the Internet. There are also many books and chapters of books on the subject of IP address assignment, IP networking and the TCP/IP protocol suite.



IP Concepts

This appendix describes some basic IP concepts, the TCP/IP addressing scheme and show how to assign IP Addresses.

When setting up the Router, you must make sure it has a valid IP address. Even if you will not use the WAN port (ADSL port), you should, at the very least, make sure the Ethernet LAN port is assigned a valid IP address. This is required for telnet, in-band SNMP management, and related functions such as “trap” handling and TFTP firmware download.

IP Addresses

The Internet Protocol (IP) was designed for routing data between network sites all over the world, and was later adapted for routing data between networks within any site (often referred to as “subnetworks” or “subnets”). IP includes a system by which a unique number can be assigned to each of the millions of networks and each of the computers on those networks. Such a number is called an IP address.

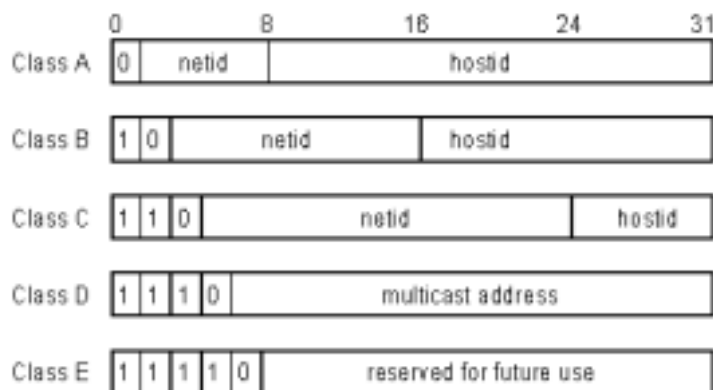
To make IP addresses easy to understand, the originators of IP adopted a system of representation called “dotted decimal” or “dotted quad” notation. Below are examples of IP addresses written in this format:

201.202.203.204 189.21.241.56 125.87.0.1

Each of the four values in an IP address is the ordinary decimal (base 10) representation of a value that a computer can handle using eight “bits” (binary digits — 1s and 0s). The dots are simply convenient visual separators.

Zeros are often used as placeholders in dotted decimal notation; 189.21.241.56 can therefore also appear as 189.021.241.056.

IP networks are divided into three classes on the basis of size. A full IP address contains a network portion and a “host” (device) portion. The network and host portions of the address are different lengths for different classes of networks, as shown in the table below.



Networks attached to the Internet are assigned class types that determine the maximum number of possible hosts per network. The previous figure illustrates how the net and host portions of the IP address differ among the three classes. Class A is assigned to networks that have more than 65,535 hosts; Class B is for networks that have 256 to 65534 hosts; Class C is for networks with less than 256 hosts.

IP Network Classes			
Class	Maximum Number of Networks in Class	Network Addresses (Host Portion in Parenthesis)	Maximum Number of Hosts per Network
A	126	1(.0.0.0) to 126(.0.0.0)	16,777,214
B	16,382	128.1(.0.0) to 191.254(.0.0)	65,534
C	2,097,150	192.0.1(.0) to 223.255.254(.0)	254

Note: All network addresses outside of these ranges (Class D and E) are either reserved or set aside for experimental networks or multicasting.

When an IP address's host portion contains only zero(s), the address identifies a network and not a host. No physical device may be given such an address.

The network portion must start with a value from 1 to 126 or from 128 to 223. Any other value(s) in the network portion may be from 0 to 255, except that in class B the network addresses 128.0.0.0 and 191.255.0.0 are reserved, and in class C the network addresses 192.0.0.0 and 223.255.255.0 are reserved.

The value(s) in the host portion of a physical device's IP address can be in the range of 0 through 255 as long as this portion is not all-0 or all-255. Values outside the range of 0 to 255 can never appear in an IP address (0 to 255 is the full range of integer values that can be expressed with eight bits).

The network portion must be the same for all the IP devices on a discrete physical network (a single Ethernet LAN, for example, or a WAN link). The host portion must be different for each IP device — or, to be more precise, each IP-capable port or interface — connected directly to that network.

The network portion of an IP address will be referred to in this manual as a **network number**; the host portion will be referred to as a **host number**.

To connect to the Internet or to any private IP network that uses an Internet-assigned network number, you must obtain a registered IP network number from an Internet-authorized network information center. In many countries you must apply through a government agency, however they can usually be obtained from your Internet Service Provider (ISP).

If your organization's networks are, and will always remain, a closed system with no connection to the Internet or to any other IP network, you can choose your own network numbers as long as they conform to the above rules.

If your networks are isolated from the Internet, e.g. only between your two branch offices, you can assign any IP Addresses to hosts without problems. However, the Internet Assigned Numbers Authority (IANA) has reserved the following three blocks of IP Addresses specifically for private (stub) networks:

Class	Beginning Address	Ending Address
A	10.0.0.0	10.255.255.255
B	172.16.0.0	172.31.255.255
C	192.168.0.0	192.168.255.255

It is recommended that you choose private network IP Addresses from the above list. For more information on address assignment, refer to RFC 1597, *Address Allocation for Private Internets* and RFC 1466, *Guidelines for Management of IP Address Space*.

Subnet Mask

In the absence of subnetworks, standard TCP/IP addressing may be used by specifying subnet masks as shown below.

IP Class	Subnet Mask
Class A	255.0.0.0
Class B	255.255.0.0
Class C	255.255.255.0

Subnet mask settings other than those listed above add significance to the interpretation of bits in the IP address. The bits of the subnet mask correspond directly to the bits of the IP address. Any bit in a subnet mask that is to correspond to a net ID bit in the IP address must be set to 1.



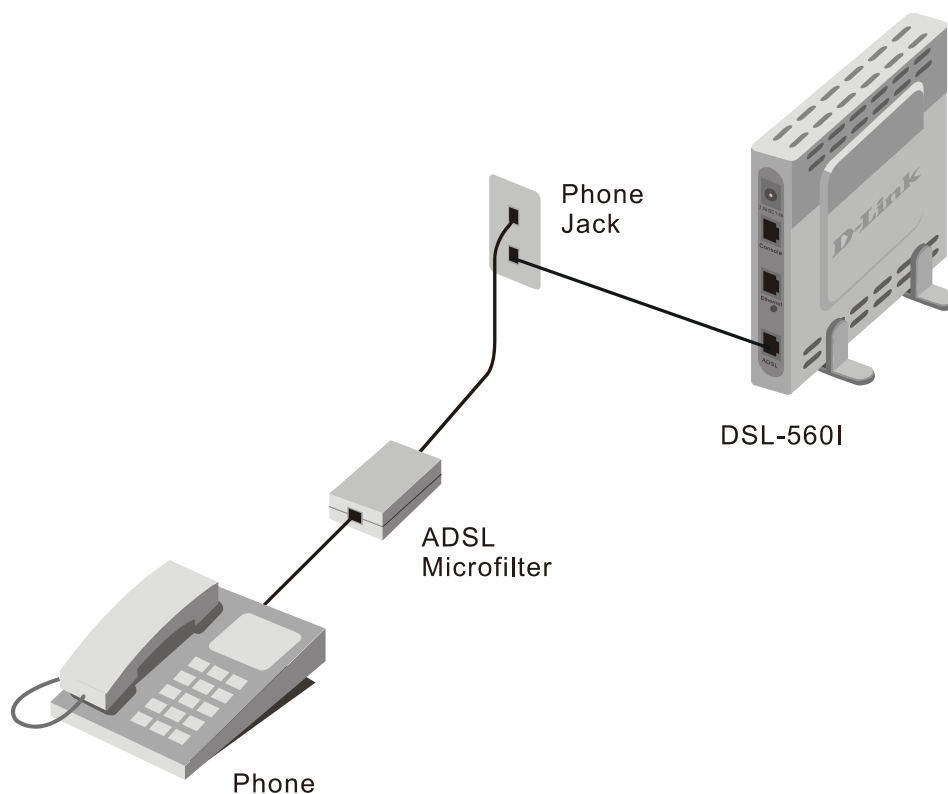
Microfilters and Splitters

Most ADSL clients will be required to install a simple device that prevents the ADSL line from interfering with regular telephone services. These devices are commonly referred to as microfilters or sometimes called (inaccurately) line splitters. They are easy to install and use standard telephone connectors and cable.

Some ADSL service providers will send a telecommunications technician to modify the telephone line, usually at the point where the telephone line enters the building. If a technician has divided or split your telephone line into two separate lines - one for regular telephone service and the other for ADSL - then you do not need to use any type of filter device. Follow the instructions given to you by your ADSL service provider about where and how you should connect the Modem to the ADSL line.

Microfilters

Unless you are instructed to use a “line splitter” (see below), it will be necessary to install a microfilter (low pass filter) device for each telephone or telephone device (answering machines, Faxes etc.) that share the line with the ADSL service. Microfilters are easy-to-install, in-line devices, which attach to the telephone cable between the telephone and wall jack. Microfilters that install behind the wall plate are also available. A typical in-line microfilter installation is shown in the diagram below.



Microfilter Installation

Important: Do not install the microfilter between the Modem and the telephone jack. Microfilters are only intended for use with regular telephones, Fax machines and other regular telephone devices.

Line Splitter

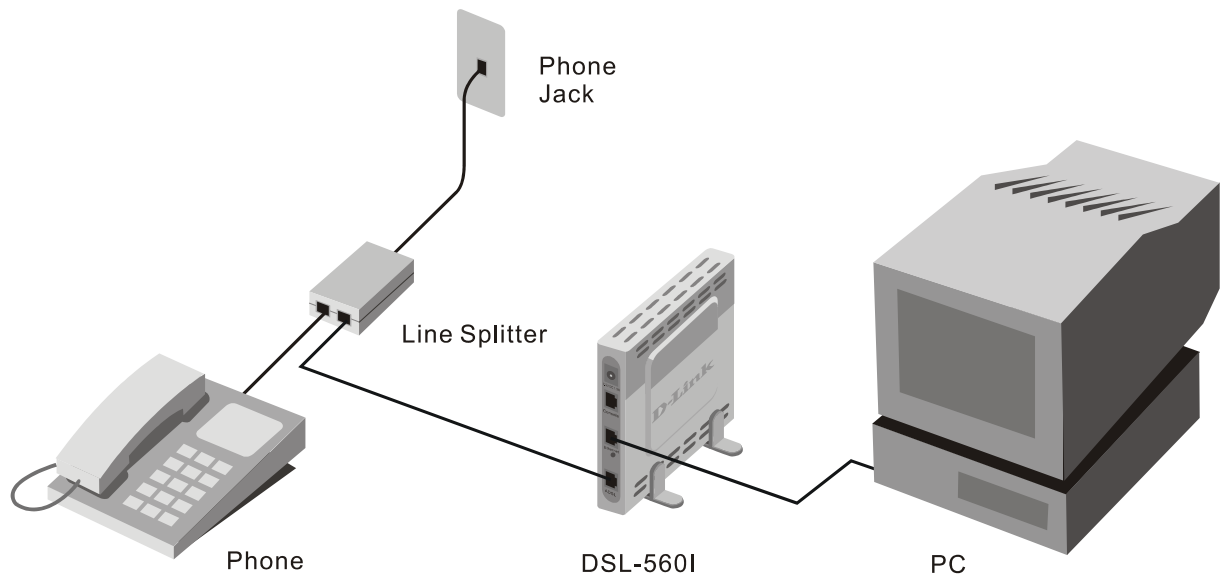
If you are instructed to use a “line splitter”, you must install the device between the Modem and the phone jack. Use standard telephone cable with standard RJ-11 connectors. The splitter has three RJ-11 ports used to connect to the wall jack, the Modem and if desired, a telephone or telephone device. The connection ports are typically labeled as follows:

Line - This port connects to the wall jack.

ADSL – This port connects to the Modem.

Phone – This port connects to a telephone or other telephone device.

The diagram below illustrates the proper use of the splitter.



Line Splitter Installation

D-Link Offices

- Australia** **D-Link Australasia**
Unit 16, 390 Eastern Valley Way, Roseville, NSW 2069 Australia
TEL: 61-2-9417-7100 FAX: 61-2-9417-1077 TOLL FREE (Australia): 1800-177100
TOLL FREE (New Zealand): 0800-900900
URL: www.dlink.com.au E-MAIL: support@dlink.com.au & info@dlink.com.au
- Level 1, 434 St. Kilda Road, Melbourne, Victoria 3004 Australia
TEL: 61-3-9281-3232 FAX: 61-3-9281-3229 MOBILE: 0412-660-064
- Canada** **D-Link Canada**
2180 Winston Park Drive, Oakville, Ontario, L6H 5W1 Canada
TEL: 1-905-829-5033 FAX: 1-905-829-5095 BBS: 1-965-279-8732
TOLL FREE: 1-800-354-6522 URL: www.dlink.ca
FTP: ftp.dlinknet.com E-MAIL: techsup@dlink.ca
- Chile** **D-Link South America**
Isidora Goyechea 2934 of 702, Las Condes, Santiago, Chile, S. A.
TEL: 56-2-232-3185 FAX: 56-2-232-0923 URL: www.dlink.cl
E-MAIL: ccasassu@dlink.cl & tsilva@dlink.cl
- China** **D-Link China**
2F, Sigma Building, 49 Zhichun Road, Haidan District, 100080 Beijing, China
TEL: 86-10-88097777 FAX: 86-10-88096789 URL: www.dlink.com.cn
E-MAIL: liwei@digitalchina.com.cn
- Denmark** **D-Link Denmark**
Naverland 2, DK-2600 Glostrup, Copenhagen, Denmark
TEL: 45-43-969040 FAX: 45-43-424347 URL: www.dlink.dk E-MAIL: info@dlink.dk
- Egypt** **D-Link Middle East**
7 Assem Ebn Sabet Street, Heliopolis, Cairo, Egypt
TEL: 20-2-635-6176 FAX: 20-2-635-6192 URL: www.dlink-me.com
E-MAIL: support@dlink-me.com & fateen@dlink-me.com
- Finland** **D-Link Finland**
Thlli-ja Pakkahuone Katajanokanlaituri 5, FIN- 00160 Helsinki
TEL: 358-9-622-91660 FAX: 358-9-622-91661 URL: www.dlink-fi.com
- France** **D-Link France**
Le Florilege #2, Allee de la Fresnerie, 78330 Fontenay le Fleury, France
TEL: 33-1-3023-8688 FAX: 33-1-3023-8689 URL: www.dlink-france.fr
E-MAIL: info@dlink-france.fr
- Germany** **D-Link Central Europe/D-Link Deutschland GmbH**
Schwalbacher Strasse 74, D-65760 Eschborn, Germany
TEL: 49-6196-77990 FAX: 49-6196-7799300 URL: www.dlink.de
BBS: 49-(0) 6192-971199 (analog) BBS: 49-(0) 6192-971198 (ISDN)
INFO: 00800-7250-0000 (toll free) HELP: 00800-7250-4000 (toll free)
REPAIR: 00800-7250-8000 E-MAIL: info@dlink.de
- India** **D-Link India**
Plot No.5, Kurla-Bandra Complex Rd., Off Cst Rd., Santacruz (E), Bombay, 400 098 India
TEL: 91-22-652-6696 FAX: 91-22-652-8914 URL: www.dlink-india.com
E-MAIL: service@dlink.india.com
- Italy** **D-Link Mediterraneo Srl/D-Link Italia**
Via Nino Bonnet n. 6/b, 20154, Milano, Italy
TEL: 39-02-2900-0676 FAX: 39-02-2900-1723 URL: www.dlink.it E-MAIL: info@dlink.it
- Japan** **D-Link Japan**
10F, 8-8-15 Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan
TEL: 81-3-5434-9678 FAX: 81-3-5434-9868 URL: www.d-link.co.jp
E-MAIL: kida@d-link.co.jp
- Netherlands** **D-Link Benelux**
Fellenoord 1305611 ZB, Eindhoven, the Netherlands
TEL: 31-40-2668713 FAX: 31-40-2668666 URL: www.d-link-benelux.nl

Norway **D-Link Norway**
Waldemar Thranesgt. 77, 0175 Oslo, Norway
TEL: 47-22-991890 FAX: 47-22-207039

Russia **D-Link Russia**
Michurinski Prospekt 49, 117607 Moscow, Russia
TEL: 7-095-737-3389 & 7-095-737-3492 FAX: 7-095-737-3390 URL: www.dlink.ru
E-MAIL: vl@dlink.ru

Singapore **D-Link International**
1 International Business Park, #03-12 The Synergy, Singapore 609917
TEL: 65-774-6233 FAX: 65-774-6322 E-MAIL: info@dlink.com.sg
URL: www.dlink-intl.com

South Africa **D-Link South Africa**
102 – 106 Witchhazel Avenue, Einstein Park 2, Block B, Highveld Technopark,
Centurion, South Africa
TEL: 27 (0) 12-665-2165 FAX: 27 (0) 12-665-2186 URL: www.d-link.co.za
E-MAIL: attie@d-link.co.za

Spain **D-Link Iberia**
C/Sabino De Arana, 56 Bajos, 08028 Barcelona, Spain
TEL: 34 93 4090770 FAX: 34 93 4910795 URL: www.dlinkiberia.es
E-MAIL: info@dlinkiberia.es

Sweden **D-Link Sweden**
P. O. Box 15036, S-167 15 Bromma, Sweden
TEL: 46-(0) 8-564-61900 FAX: 46-(0) 8-564-61901 E-MAIL: info@dlink.se
URL: www.dlink.se

Taiwan **D-Link Taiwan**
2F, No. 119 Pao-Chung Rd, Hsin-Tien, Taipei, Taiwan
TEL: 886-2-2910-2626 FAX: 886-2-2910-1515 URL: www.dlinktw.com.tw
E-MAIL: dssqa@tsc.dlinktw.com.tw

Turkey **D-Link Middle East**
Deniz Bilgisayar, Buyukdere Cad. Naci Kasim Sk., No. 5 Mecidiyekoy, Istanbul, Turkey
TEL: 90-212-213-3400 FAX: 90-212-213-3420 E-MAIL: smorovati@dlink-me.com

U.A.E. **D-Link Middle East**
CHS Aptec (Dubai), P.O. Box 33550 Dubai U.A.E.
TEL: 971-4-366-885 FAX: 971-4-355-941 E-MAIL: Wxavier@dlink-me.com

U.K. **D-Link Europe**
4th Floor, Merit House, Edgware Road, Colindale, London NW9 5AB United Kingdom
TEL: 44 (0) 20-8731-5555 FAX: 44 (0) 20-8731-5511 BBS: 44 (0) 181-235-5511
URL: www.dlink.co.uk E-MAIL: info@dlink.co.uk

U.S.A. **D-Link U.S.A.**
53 Discovery Drive, Irvine, CA 92618, USA
TEL: 1-949-788-0805 FAX: 1-949-753-7033 BBS: 1-949-455-1779 & 1-949-455-9616
INFO: 1-800-326-1688 URL: www.dlink.com
E-MAIL: tech@dlink.com & support@dlink.com

Registration Card

Print, type or use block letters.

Your name: Mr./Ms _____

Organization: _____ Dept. _____

Your title at organization: _____

Telephone: _____ Fax: _____

Organization's full address: _____

Country: _____

Date of purchase (Month/Day/Year): _____

Product Model	Product Serial No.	* Product installed in type of computer (e.g., Compaq 486)	* Product installed in computer serial No.

(* Applies to adapters only)

Product was purchased from:

Reseller's name: _____

Telephone: _____ Fax: _____

Reseller's full address: _____

Answers to the following questions help us to support your product:

1. Where and how will the product primarily be used?

Home Office Travel Company Business Home Business Personal Use

2. How many employees work at installation site?

1 employee 2-9 10-49 50-99 100-499 500-999 1000 or more

3. What network protocol(s) does your organization use ?

XNS/IPX TCP/IP DECnet Others _____

4. What network operating system(s) does your organization use ?

D-Link LANsmart Novell NetWare NetWare Lite SCO Unix/Xenix PC NFS 3Com 3+Open
 Banyan Vines DECnet Pathwork Windows NT Windows NTAS Windows '95
 Others _____

5. What network management program does your organization use ?

D-View HP OpenView/Windows HP OpenView/Unix SunNet Manager Novell NMS
 NetView 6000 Others _____

6. What network medium/media does your organization use ?

Fiber-optics Thick coax Ethernet Thin coax Ethernet 10BASE-T UTP/STP
 100BASE-TX 100BASE-T4 100VGAnyLAN Others _____

7. What applications are used on your network?

Desktop publishing Spreadsheet Word processing CAD/CAM
 Database management Accounting Others _____

8. What category best describes your company?

Aerospace Engineering Education Finance Hospital Legal Insurance/Real Estate Manufacturing
 Retail/Chainstore/Wholesale Government Transportation/Utilities/Communication VAR
 System house/company Other _____

9. Would you recommend your D-Link product to a friend?

Yes No Don't know yet

10. Your comments on this product? _____

PLEASE
PLACE STAMP
HERE

TO:

D-Link®