
Chapter 1

U.S. Robotics ADSL Ethernet Modem Overview

Description

The ADSL Ethernet modem provides home connectivity to an ADSL service provider network over an Asynchronous Transfer Mode (ATM)/ADSL physical layer. It receives adaptive rates of up to 8Mbps downstream and transmits 640Kbps upstream.

System Features

This section introduces the system features of the ADSL Ethernet modem.

Standards Compliance:

- ◆ ITU-T G.992.1, G.992.2, and ANSI T1.413 Issue 2
- ◆ Handshake Protocol: defined in ITU-T G.994.1
- ◆ IEEE 802.3 10BaseT physical layer specification

Hardware Features

- ◆ Discrete Multi-Tone based ADSL physical layer
- ◆ Rate adaptive with maximum downstream data rates up to 8Mbps and upstream data rate up to 640Kbps.
- ◆ 10BaseT Ethernet interface, compliant with IEEE 802.3.
- ◆ Status LEDs indicating Ethernet and ADSL activity
- ◆ Restart and operate automatically after the input power is restored from a power failure.
- ◆ Management console support.

Software Features

Multiple data encapsulation formats support

- ◆ RFC 2364 PPP over ATM AAL5
- ◆ RFC 2516 PPP over Ethernet with third party client

- ◆ RFC 1483 (bridge and routing mode) multi-protocol encapsulation over ATM AAL5
- ◆ RFC 1577 Classical IP and ARP over ATM

ATM support

- ◆ ADSL physical connection supports ATM AAL5
- ◆ Support for 8 PVCs
- ◆ End-to-end OAM loopback

Network Access

- ◆ IP routing protocols: Static routing and RIPv1, v2
- ◆ 802.1d transparent bridging
- ◆ DHCP server automatically assigns IP addresses to PCs on the LAN
- ◆ NAT enables multiple PCs on the LAN to access the Internet via single public IP address

Network management

- ◆ Web-based configuration software
- ◆ TFTP firmware upgrade and configuration backup and restore
- ◆ TELNET server for remote management
- ◆ SNMPv1 agent
- ◆ MIBs support with RFC1213, RFC1493 (bridged mode only), RFC1573, RFC2662

Security

- ◆ password protected system management terminal
- ◆ PAP/CHAP authentication for PPP mode

Environmental Constraints

This ADSL Ethernet modem should be operated in an ambient temperature environment of 0 to 50 degree C. The Ethernet modem should be stored in an ambient temperature environment of -10 to 70 degree C and relative humidity in the range of 10% and 90% non-condensing.

Chapter 2

Hardware Installation

Standard Shipment Contents

Contents
1 ADSL Ethernet modem
1 Installation Guide
1 Power Adapter (18 VAC)
1 RJ-11 Cable
1 Ethernet Cable
1 Installation CD
1 Registration Card

If you did not receive all of the items above, contact your service provider or dealer.

Hardware Requirements

The following hardware is necessary to configure and use the ADSL modem:

- ◆ A 10/100 Ethernet Network Interface Card (NIC) installed on your computer.
- ◆ A PC with a Web browser, either Internet Explorer 4.0 or above or Netscape 4.0 or above. (If you do not have the required browser, visit <http://www.microsoft.com/> or <http://www.netscape.com/> to download and update your browser. While installing the software, you should enable JAVA functionality for web-based configuration to work.)
- ◆ A PC with communications software, such as HyperTerminal in Win 95/98, for flash crash recovery.
- ◆ For the management console port option, a PC equipped with an available DB-9 or DB-25 serial port.
- ◆ A line filter may be required for each telephone that will share a line with the ADSL modem. Make sure there is no filter installed between the ADSL modem and the phone wall

jack. Microfilters may be supplied by your DSL Internet Service Provider.

Front Panel LEDs of ADSL Modem



LEDs	Description
PWR	The power LED is illuminated when power is applied to the ADSL Router. Check your power adapter connection if the LED is not illuminated.
ALM	The alarm LED is illuminated when an error occurs.
LAN	It is illuminated when there is an Ethernet connection between the ADSL router and your computer. It will be blinking when there is Ethernet traffic. It will not be illuminated if an Ethernet cable is not connected.
DSL	It is illuminated when there is an ADSL connection. It will be blinking when there is ADSL traffic. It will not be illuminated when the ADSL cable is not connected or the ADSL connection fails.

Note: All the LED's will be illuminated for approximately 30 seconds when you power on or reboot the ADSL modem.

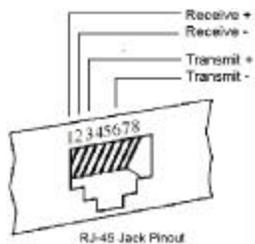
Rear Panel Connectors of ADSL Modem



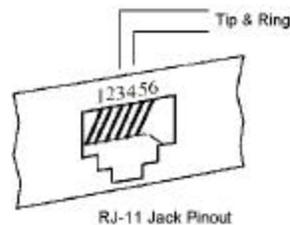
Connector Label	Description
PWR	Power Plug – connects to the power adapter.
LAN	Ethernet Port – connects to the Ethernet port on your PC or an Ethernet hub.
CONSOLE	Management RS-232 Console Port – connects to the serial port on your PC.
DSL	ADSL Port – connects to the phone wall jack.

LAN Connector

The pin-out of the ADSL modem's RJ-45 jack is the same as a standard Ethernet UTP jack.



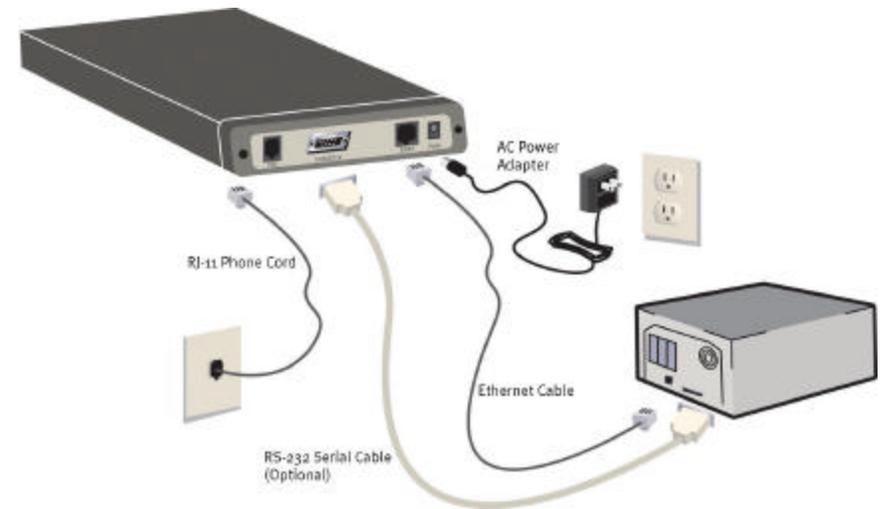
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ADSL Connector

The RJ-11 jack of the Router uses pin 3 and pin 4.

Install the ADSL Ethernet Modem



1. Connect one end of the RJ-11 phone cord to the DSL port on the rear of your ADSL modem. Connect the other end of the RJ-11 phone cord to your wall phone jack.
2. Connect one end of the Ethernet cable to the ENET port on the rear of the ADSL modem. Connect the other end of the Ethernet cable to the Ethernet port on the NIC in your computer.

Note: To connect the ADSL modem directly to a PC or to the uplink port of a hub or router, use the Ethernet cable that was provided with your ADSL modem. The Ethernet cable that came with your ADSL modem is a straight-through UTP copper cable. To connect the ADSL modem to a port other than the uplink port of a hub, a crossover UTP cable must be used.

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3. Plug the AC power adapter cord into the PWR jack at the rear of the ADSL modem. Plug the AC power adapter into a standard wall outlet. The ADSL modem is always supplied with power, so there is no power switch to turn on. The PWR LED on the front panel of the ADSL modem will be illuminated if power is being supplied to the modem. If your computer is not on, turn it on now.

II. Verification of correct operation

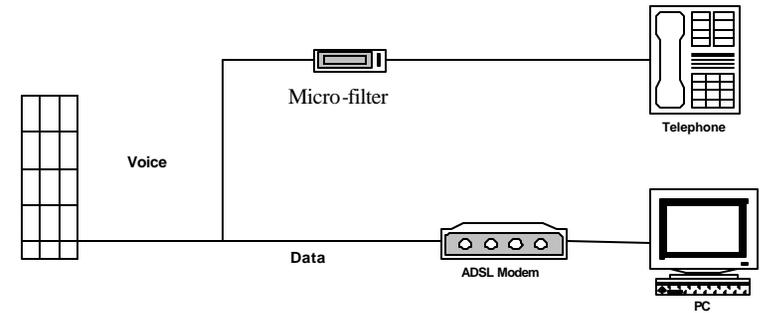
Use the following procedures to verify the installation and operation of the ADSL modem. Refer to the Troubleshooting section of this guide if any problems occur.

1. Launch an Internet browser on the computer connected to the ADSL modem.
2. Enter a URL of your choice or enter <http://www.usr.com> in your Web browser.
3. Watch the DSL LED on the front of the ADSL modem blink as data is transmitted or received. If the selected Web page comes up in the Internet browser screen, the network connection is successfully established.

Additional Options

Install External Micro-filter for the Telephone

In certain situations without a POTS splitter, transient noise from a telephone can interfere with the operation of the ADSL modem and the ADSL modem may introduce noise to the telephone line. To prevent this from happening, a small external micro-filter must be connected to each telephone.



Chapter 3 Configuration Guide

Purpose

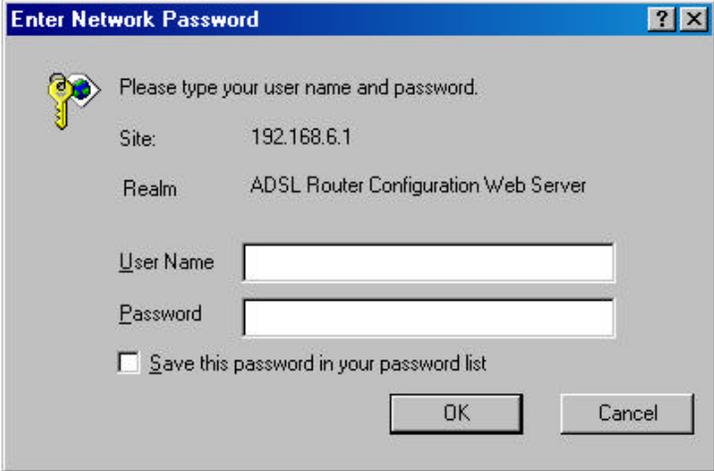
This chapter will provide the configuration steps for the ADSL modem.

The ADSL modem automatically trains up to the ideal line speed. By default, the ADSL modem is provisioned with rates of 8 Mbps downstream and 640 Kbps upstream. The maximum operative rate is determined by your DSL service provider. After establishing a connection between your ADSL modem and your DSL service provider, you will have an always-on connection. There are logical connections that should be set up upon initial configuration, which establish the virtual channel for different applications. To configure the logical connections, you must provision ATM virtual connections.

On the ADSL modem, the ADSL physical interface is always ready to send and receive network traffic. You may need to define an ATM virtual connection (VC) when communicating across an ATM network for logical connection setup. The ATM connection is identified by two indicators: virtual path identifiers (VPI) and virtual circuit identifiers (VCI). Each connection must have a unique pair of VPI and VCI settings. Check with your service provider for details.

Log on to the ADSL Modem

In order to configure the ADSL modem, open a Web browser and enter the default IP address of **http://192.168.1.1**. The default password is **12345**. No **User Name** is required. You must use the default password the first time you log in, but you should change the password for your ADSL modem after the first login. Refer to the **Change Password** section for details.



Enter Network Password

Please type your user name and password.

Site: 192.168.6.1

Realm: ADSL Router Configuration Web Server

User Name:

Password:

Save this password in your password list

OK Cancel

Select the ADSL Protocol

The US Robotics ADSL Ethernet Modem supports the following four different ADSL protocols:

- Multi-mode (default)
- G.DMT (G.992.1)
- G.Lite (G.992.2)
- ANSI T 1.413 Issue 2



ADSL Protocol

Multi-mode

ANSI T1.413 issue 2

G.DMT

G.Lite

OK

When using the multi-mode setting, the ADSL Ethernet modem will attempt to automatically determine which protocol is being used. In most cases, the default setting of Multi-mode should not be changed. This setting should only be changed if your service provider has specified that a specific protocol should be used. To use a different ADSL Protocol, select the appropriate button and click **OK**.

Note: After you click **OK**, you will be prompted to save your settings. Click **Save** to save the changes you have made.

Configuring the Service Provider Settings

The ADSL modem supports four Service Provider WAN services:

- RFC1483 Bridged Mode (To be used as an Ethernet bridge)
- RFC1483 Routed Mode
- PPP over ATM (PPPoA) Mode
- PPP over Ethernet (PPPoE) Mode

A more detailed description of each connection mode follows.

Configure RFC1483 Bridged Mode

Service Provider Settings	
VPI:	<input type="text"/>
VCI:	<input type="text"/>
<input checked="" type="radio"/> LLC/SNAP <input type="radio"/> Vc Multiplexing <input type="checkbox"/> Enable NAPT	
<input checked="" type="radio"/> RFC1483 Bridged	
<input type="radio"/> RFC1483 Routed	
WAN IP address:	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
WAN subnet mask:	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
<input type="radio"/> PPPoA <input type="radio"/> PPPoE	
User name:	<input type="text"/>
Password:	<input type="text"/>
Authentication:	<input checked="" type="radio"/> CHAP <input type="radio"/> PAP
<input type="button" value="Add"/> <input type="button" value="Modify"/> <input type="button" value="Delete"/>	

Select **RFC1483 Bridged** to use RFC1483 Bridged mode. Bridging is a standardized layer 2 technology. It is typically used in corporate networks to extend the physical reach of a single LAN segment and increase the number of stations on the common LAN without compromising performance. Bridged data is encapsulated using the RFC1483 protocol to enable data transport.

One important characteristic of bridging is the number of bridge ports. The ADSL modem has eight remote virtual ports on the ADSL interface and one local port (Ethernet) on the user interface.

The ports on the ADSL interface are described as virtual because they are associated with the ATM virtual connections that are configured on the ADSL line. To establish a connection from any of the remote destinations to the bridge port, PVCs must be configured end-to-end through the network. Your DSL service provider will provide you with the VPI/VCI values to use after you subscribe to the service.

The bridged mode comes with the following parameters:

Parameters	Description
VPI	Virtual path identifier
VCI	Virtual circuit identifier
LLC	Logical Link Control allows multiple protocol running over one virtual circuit with a little bit more overhead.
VCMUX	Virtual Circuit Multiplexer (null encapsulation) allows only one protocol running per virtual circuit with less overhead.
Enable NAPT	This option is only for a routed connection and cannot be used in bridged or PPPoE mode.

VPI/VCI

The ATM connection is identified by the two following indicators: virtual path identifiers (VPI) and virtual circuit identifiers (VCI). Each connection must have a unique pair of <VPI, VCI> settings.

RFC 1483 Bridged Setup

Create a new RFC1483 Bridged Connection

1. Enter the correct numbers in the VPI and VCI fields.
2. Select the appropriate encapsulation - LLC or VCMUX.
3. Click **Add**. This will create a new VPI/VCI connection. Up to 8 VPI/VCI connections can be set.
4. Click **OK** to save the settings.*

Modify a RFC1483 Bridged Connection

1. Select one VPI/VCI pair from the Connection List.
2. Modify the numbers in the VPI and VCI fields and select the appropriate encapsulation - LLC or VCMUX.
3. Click **Modify**.
4. Click **OK** to save the settings.*

Delete a RFC1483 Bridged Connection

1. Select a VPI/VCI pair from the Connection List.
2. Click **Delete**.
3. Click **OK** to save the settings.*

Note: After you click **OK**, you will be prompted to save your settings. Make sure you are finished making all your changes before you save your settings. When you are finished making your changes, click **Save**.

Configure RFC1483 Routed Mode

Service Provider Settings

VPI: VCI:
 LLC/SNAP
 Vc Multiplexing
 Enable NAPT

RFC1483 Bridged
 RFC1483 Routed

WAN IP address: . . .
WAN subnet mask: . . .

PPPoA
 PPPoE

User name:
Password:

Authentication: CHAP PAP

Select **RFC1483 Routed** to use a RFC1483 Routed connection mode. Routing is the act of moving information across a network from a source to a destination. Along the way, at least one intermediate node is typically encountered. Routing is often contrasted with bridging. The primary difference between the two is that bridging occurs at Layer 2 (the

link layer) of the OSI reference model, whereas routing occurs at Layer 3 (the network layer).

The ADSL Modem has eight remote virtual ports on the ADSL interface and one local port (Ethernet) on the user interface.

The ports on the ADSL interface are described as virtual because they are associated with the ATM virtual connections configured on the ADSL line. To establish a connection from any of the remote destinations to the ADSL modem port, PVCs must be configured end-to-end through the network.

RFC 1483 Routed Setup

Your DSL service provider will provide you with the values of VPI/VCI to use after you sign up for the service.

Each PVC comes with the following parameters:

Parameters	Description
VPI	Virtual path identifier
VCI	Virtual circuit identifier
WAN IP Address	Selected PVC's WAN IP address
WAN Subnet Mask	Selected PVC's WAN Subnet Mask
LLC	Logical Link Control allows multiple protocol running over one virtual circuit with a little bit more overhead.
VCMUX	Virtual Circuit Multiplexer (null encapsulation) allows only one protocol running per virtual circuit with less overhead.
Enable NAPT	Network Address Port Translation allows multiple computers to share a single WAN IP Address

Check your ISP for the related IP information for the WAN connection including WAN IP, WAN Subnet Mask, and Default Gateway.

To set the VPI/VCI/WAN IP/WAN Subnet Mask parameters, including adding, modifying, and deleting, refer to the "Set up VPI/VCI " section in this manual.

Create a new RFC1483 Routed Connection

1. Enter the correct numbers in the VPI and VCI fields.
2. Select the appropriate encapsulation - LLC or VCMUX.
3. Select **Enable NAPT** if an Internet connection will be shared among multiple computers.
4. Enter the WAN IP address and the WAN subnet mask.
5. Click **Add**. This will create a new VPI/VCI connection. Up to eight VPI/VCI connections can be set.
6. Click **OK** to save the settings.*

Note: If you are setting the NAPT inbound server, please refer to the **LAN Settings** section of this manual for more configuration instructions.

Modify a RFC1483 Routed Connection

1. Select one VPI/VCI pair from the Connection List.
2. Modify the numbers in the VPI and VCI fields and select the appropriate encapsulation - LLC or VCMUX.
3. Select **Enable NAPT** if an Internet connection will be shared among multiple computers.
4. Enter the WAN IP address and the WAN subnet mask.
5. Click **Modify**.
6. Click **OK** to save the settings.*

Delete a RFC1483 Bridged Connection

1. Select a VPI/VCI pair from the Connection List.
2. Click **Delete**.
3. Click **OK** to save the settings.*

Note: After you click **OK**, you will be prompted to save your settings. Make sure you are finished making all your changes before you save your settings. When you are finished making your changes, click **Save**.

Configure PPPoA Mode

Service Provider Settings	
VPI:	<input type="text"/>
VCI:	<input type="text"/>
<input checked="" type="radio"/> LLC/SNAP <input type="radio"/> Vc Multiplexing <input type="checkbox"/> Enable NAPT	
<input type="radio"/> RFC1483 Bridged	
<input checked="" type="radio"/> RFC1483 Routed	
WAN IP address:	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
WAN subnet mask:	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
<input checked="" type="radio"/> PPPoA <input type="radio"/> PPPoE	
User name:	<input type="text" value="USR"/>
Password:	<input type="password" value="password"/>
Authentication: <input checked="" type="radio"/> CHAP <input type="radio"/> PAP	
<input type="button" value="Add"/> <input type="button" value="Modify"/> <input type="button" value="Delete"/>	

Click the **PPPoA** button to use PPP over ATM connection mode. PPP is a single link or multi-link interface between two packet switching devices, such as a router or bridge. PPP is an efficient conduit for multiple protocols such as IP and IPX, which are encapsulated across the communications datalink. PPP over ATM is PPP frames that are carried over ATM cells, which are the common transport and backbone used by DSL service providers.

Your service provider, usually the telephone company or the ISP, will tell you the values of VPI/VCI to use after you sign up the service. Your service provider must also provide your User name, Password, and Authentication protocol. To set the VPI/VCI parameters including adding, modifying, and deleting, refer to "Set up VPI/VCI " in this manual.

The following are the required settings for a PPPoA connection:

Parameters	Description
VPI	Virtual path identifier
VCI	Virtual circuit identifier
User name	User name assigned or verified by your service provider.
Password	The password that will allow login in conjunction

	with your user name.
LLC	Logical Link Control allows multiple protocol running over one virtual circuit with a little bit more overhead.
VCMUX	Virtual Circuit Multiplexer (null encapsulation) allows only one protocol running per virtual circuit with less overhead.
Enable NAPT	Network Address Port Translation allows multiple computers to share a single WAN IP Address
CHAP	Challenge Handshake Access Protocol encrypts the password through a DES/MD5 algorithm which provides more security.
PAP	Use Plain-text As Password format for a lesser security.

Create a new PPPoA Connection

1. Enter the correct numbers in the VPI and VCI fields.
2. Select the appropriate encapsulation - LLC or VCMUX.
3. Select **Enable NAPT** if an Internet connection will be shared among multiple computers.
4. Enter the **User name, Password and Authentication – CHAP or PAP**.
5. Click **Add**. This will create a new VPI/VCI connection. Up to eight VPI/VCI connections can be set.
6. Click **OK** to save the settings.*

Note: If you are setting the NAPT inbound server, please refer to the **LAN Settings** section of this manual for more configuration instructions.

Modify a PPPoA Connection

1. Select one VPI/VCI pair from the Connection List.
2. Modify the numbers in the VPI and VCI fields and select the appropriate encapsulation - LLC or VCMUX.
3. Select **Enable NAPT** if an Internet connection will be shared among multiple computers.

4. Enter the **User name, Password and Authentication – CHAP or PAP**.
5. Click **Modify**.
6. Click **OK** to save the settings.*

Delete a PPPoA Connection

1. Select a VPI/VCI pair from the Connection List.
2. Click **Delete**.
3. Click OK to save the settings.*

Note: After you click **OK**, you will be prompted to save your settings. Make sure you are finished making all your changes before you save your settings. When you are finished making your changes, click **Save**.

Configure PPPoE Mode

Service Provider Settings

VPI: VCI: LLC/SNAP Vc Multiplexing Enable NAPT

RFC1483 Bridged

RFC1483 Routed

WAN IP address: . . .

WAN subnet mask: . . .

PPPoA

PPPoE

User name:

Password:

Authentication: CHAP PAP

Click the **PPPoE** button to use PPP over Ethernet connection mode. PPP is a single link or multi-link interface between two packet switching devices, such as a router or bridge. PPP is an efficient conduit for multiple protocols such as IP and IPX, which are encapsulated across the communications datalink. PPP over Ethernet is PPP frames that are carried over standard 802.3 Ethernet frames over ATM.

Your service provider, usually the telephone company or the ISP, will tell you the values of VPI/VCI to use after you sign up the service. Your service provider must also provide your User name, Password, and Authentication protocol. To set the VPI/VCI parameters including adding, modifying, and deleting, refer to "Set up VPI/VCI " in this manual.

The following are the required settings for a PPPoE connection:

Parameters	Description
VPI	Virtual path identifier
VCI	Virtual circuit identifier
User name	User name assigned or verified by your service provider.
Password	The password that will allow login in conjunction with your user name.
LLC	Logical Link Control allows multiple protocol running over one virtual circuit with a little bit more overhead.
VCMUX	Virtual Circuit Multiplexer (null encapsulation) allows only one protocol running per virtual circuit with less overhead.
Enable NAPT	Network Address Port Translation allows multiple computers to share a single WAN IP Address
CHAP	Challenge Handshake Access Protocol encrypts the password through a DES/MD5 algorithm which provides more security.
PAP	Use Plain-text As Password format for a lesser security.

Create a new PPPoE Connection

1. Enter the correct numbers in the VPI and VCI fields.
2. Select the appropriate encapsulation - LLC or VCMUX.
3. Select **Enable NAPT** if an Internet connection will be shared among multiple computers.
4. Enter the **User name, Password** and **Authentication – CHAP** or **PAP**.

5. Click **Add**. This will create a new VPI/VCI connection. Up to eight VPI/VCI connections can be set.
6. Click **OK** to save the settings.*

Note: If you are setting the NAPT inbound server, please refer to the **LAN Settings** section of this manual for more configuration instructions.

Modify a PPPoE Connection

1. Select one VPI/VCI pair from the Connection List.
2. Modify the numbers in the VPI and VCI fields and select the appropriate encapsulation - LLC or VCMUX.
3. Select **Enable NAPT** if an Internet connection will be shared among multiple computers.
4. Enter the **User name, Password** and **Authentication – CHAP** or **PAP**.
5. Click **Modify**.
6. Click **OK** to save the settings.*

Delete a PPPoE Connection

1. Select a VPI/VCI pair from the Connection List.
2. Click **Delete**.
3. Click **OK** to save the settings.*

Note: After you click **OK**, you will be prompted to save your settings. Make sure you are finished making all your changes before you save your settings. When you are finished making your changes, click **Save**.

LAN Settings

The US Robotics ADSL Ethernet Modem has an integrated network processor, which means it supports network features such as routing, NATP, DHCP, and DNS services. When configuring the modem for routing, the following settings may need to be configured: Management IP, NATP, DHCP/DNS, and Routing Table. To access these settings, click **LAN Settings**. These options will be shown at the bottom of the Setup Menu. The configuration steps for these options are below.

Management IP

Management IP Address Configuration	
IP Address:	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
Subnet Mask:	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
<p>Note: Changing LAN IP address will trigger saving configuration to flash automatically. This operation will take 20 seconds to finish. Please wait for response message before unplugging the power.</p>	
<input type="button" value="OK"/>	

The Management IP address is the address of the inside Local Area Network (LAN). This is a private address that is only accessible to the computers that are connected to the US Robotics ADSL Ethernet Modem. When packets are sent outside the network of the US Robotics ADSL Ethernet Modem, the IP address gets converted to a globally accessible IP address, or a WAN IP. The Subnet Mask is applied to an IP address in order to mask a portion of the address. This will distinguish the network ID from the host ID.

To access the Management IP address configuration, click **LAN Settings** and then click **Management IP**. To change the Management IP Address and the Subnet Mask, enter the values that were provided by your service provider and click **OK**. The default IP address is 192.168.1.1 and the default subnet mask is 255.255.255.0. Usually these settings will not need to be changed.

Configuring NATP

NAPT Inbound Servers		
Interface:	<input type="text" value="Mode-VPI/WCI-DSL IP address"/>	
Port Num:	<input type="text"/> Protocol: <input type="text" value="TCP"/>	
Server IP Address:	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	
<input type="button" value="Add"/> <input type="button" value="Modify"/> <input type="button" value="Delete"/>		
<table border="1"><thead><tr><th>VPI/WCI-Port-Proto-Server IP address-</th></tr></thead><tbody></tbody></table>		VPI/WCI-Port-Proto-Server IP address-
VPI/WCI-Port-Proto-Server IP address-		

The NATP feature converts IP addresses on a private network (designated as inside or LAN) to global IP addresses that can forward packets to another registered network (designated as "outside" or "WAN"). It enables multiple PCs on the LAN to access the Internet for the cost of one IP address. NATP is a special case of NAT, where many IP numbers are hidden behind a number of addresses. In contrast to the original NAT, the number of connections is not limited to that number. With NATP, an almost arbitrary number of connections is multiplexed using TCP port information. Enabling the NATP inbound server will allow WAN devices to access your LAN.

To set up the NATP feature, you must select the appropriate Interface. You must then select the Port number, Protocol (UDP or TCP), and the Server IP Address for each port that you want to enable. Click **OK** to save the settings.

Configuring DHCP/DNS Service

DHCP / DNS service	
LAN IP address: 192.168.1.254 Subnet Mask: 255.255.255.128	
DHCP server: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	
<input checked="" type="checkbox"/>	System allocates address pool
<input type="checkbox"/>	Assign address pool range
Beginning IP address:	192.168.1. <input type="text"/>
End IP address:	192.168.1. <input type="text"/>
Max Lease Time:	<input type="text"/>
DNS server IP address: <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	
DNS Relay	
DNS relay: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	
<input checked="" type="checkbox"/>	Auto-discovery
<input type="checkbox"/>	Manual Setting: <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
<input type="button" value="OK"/>	

Dynamic Host Configuration Protocol (DHCP) is the protocol that is used to automatically assign an IP address to a client computer. Domain Name Server (DNS) is the Internet protocol for mapping host names, domain names, and aliases to IP addresses.

Setting DHCP Service

When enabling NAPT or using the modem in PPPoA mode, the DHCP server should be enabled. To enable the DHCP server, click the **Enable** button. When the DHCP server is enabled, IP addresses will automatically be assigned. This can be seen by selecting **System allocates address pool**. When you have completed the setup, click **OK** to save the configuration.

If you need to assign the range for the beginning and end IP addresses, select **Assign address pool range**. You will then need to enter the Beginning IP address, the End IP address, and the Max Lease Time. The Max Lease Time must be entered in

increments of seconds. When you have completed the setup, click **OK** to save the configuration.

Setting DNS Service

Most service providers will automatically assign the DNS Server IP address by using Auto Discovery. Once DNS Relay is enabled, Auto Discovery will be enabled by default. If your service provider requires a static DNS entry to be set, **Disable** must be selected for DNS Relay. You must then enter the DNS Server IP address in the Manual Setting field. When you have completed the setup, click **OK** to save the configuration.

Create a Routing Table

Each routing table entry comes with the following parameters:

Parameters	Description
RIP on/off	Checked to enable RIP (Router Information Protocol) function
Dest. Network ID	The network ID of the destination IP address
Dest. Subnet mask	The subnet mask of the destination IP address
Mask	The subnet mask of the destination subnet
Next Hop IP	The IP address of the neighbor/peer interface for routing purpose

There are two ways to create a routing table. One is to enable RIP and the system will create a routing table dynamically through the routing information. The other is to disable RIP option and create a static routing table manually. Once RIP is enabled, the routing table entries will disappear. While the RIP is disabled, the user must create a routing table for a specific routing path. RIP is enabled/disabled by selecting/de-selecting **RIP on/off**.

Monitor Your ADSL Status Using Web UI

Setup Menu

[ADSL Connection Status](#) | [ADSL Protocol](#) | [Service Provider Settings](#)
[LAN Settings](#) | [Change Password](#) | [Save Configuration](#) | [Reboot](#)

ADSL Connection Status

Downstream Fast Channel: kbps
Upstream Fast Channel: kbps
Downstream Interleaved Channel: kbps
Upstream Interleaved Channel: kbps
Downstream Noise Margin: dB
Upstream Noise Margin: dB
Downstream Attenuation: dB
Upstream Attenuation: dB

Modem Information

Model Version:
Firmware version:
Web UI Version:
DSL Firmware Version:

To monitor the ADSL operation status while using Web UI, click the ADSL connection STATUS button on the top of the Setup Menu.

In addition to the following parameters, the status monitor also shows firmware revision, ADSL link status, and the PPP connection status if available.

Downstream Fast Channel shows the ADSL downstream physical rate in Fast Channel Mode.

Downstream Interleaved Channel shows the ADSL downstream physical rate in Interleaved channel mode.

Downstream CRC Error shows the number of CRC errors of downstream traffic.

Downstream Noise Margin shows the noise margin of downstream traffic.

Downstream Attenuation shows the power loss in the downstream signal.

Upstream Fast Channel shows the ADSL upstream physical rate in Fast Channel Mode.

Upstream Interleaved Channel shows the ADSL upstream physical rate in Interleaved channel mode.

Upstream CRC Error shows the number of CRC errors of upstream traffic.

Upstream Noise Margin shows the noise margin of upstream traffic.

Upstream Attenuation shows the power loss in the upstream signal.

The Web monitor also displays the following modem information: Model Version, Firmware Version, Web UI Version, and DSL Firmware Version.

Test your Configuration

After completing the configuration process, you may test the operation of the ADSL modem by launching a Web browser and accessing a remote Web site, such as <http://www.usr.com>.

Change the Password

The ADSL modem provides password protection. The default login password for the router is **12345**. After logging in the first time, change the password by clicking **Change Password**.

Password Configuration	
Current password:	<input type="password"/>
New password:	<input type="password"/>
Confirm password:	<input type="password"/>
<input type="button" value="Change"/>	<input type="button" value="Reset"/>

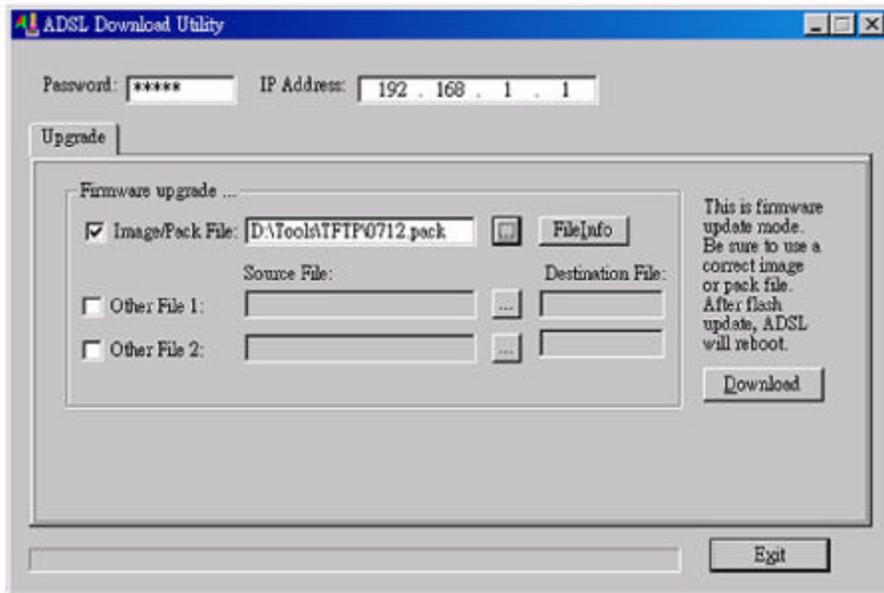
Note: After you have changed your password, write the new password down in a safe place in case you forget it in the future. Click **Verify** to make sure the settings are correct and then click **OK** to save the settings.

Upgrade Firmware Using TFTP

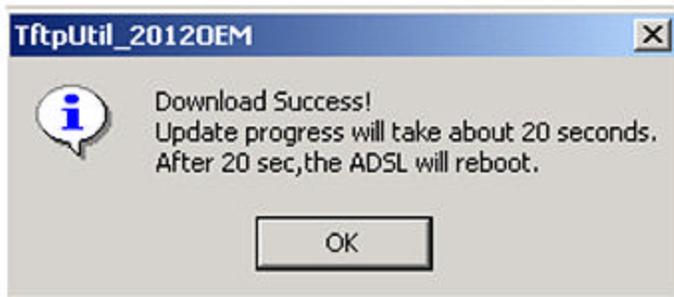
The ADSL modem is bundled with one TFTP download utility, which allows you to remotely download the latest version of firmware via LAN connection to the ADSL modem. The utility program tftputil.exe is included with the ADSL modem.

You may run tftputil.exe directly from the CD or copy it to your hard drive and run it from there.

Type your password, the LAN IP address for the ADSL modem, and then Image/Pack File. Click **Download** to start the firmware download. Make sure the IP address of the ADSL modem is located on the same subnet as the computer that runs the download utility or there is a valid routing path in between. If you need to download more than one file at the same time, click **Other File 1** and/or **Other File 2** and type the Source File. Click **Download** to start the firmware download.



If everything is OK, you will get the following prompt:



Note: Refer to the "Recover from a crashed flash Image" section in this manual if a power failure occurs during the firmware download.

Configure the CONSOLE Port

If you configure the ADSL modem using the console port, for the best access to the ADSL Router, use the terminal emulation program to set your CONSOLE port to the following settings:

- VT100 terminal emulation
- Baud rate: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow Control: None

Recovering from a Crashed Flash Image

When there is a power failure during TFTP software upgrade, the flash image may crash. The ADSL modem provides Flash Crash Recovery mechanism to recover the crashed flash image.

You must contact your service provider to obtain the current, necessary Bin file.

Start a terminal emulation program (such as HyperTerminal) to enter the Console mode. The Console mode prompts as follows:

```
PP flash boot
SDRAM size = 0x800000, type = 0x5
Flash boot failed.
Entered console ...
]
```

Follow these steps:

1. Enable xmodem by entering]xmodem fast.
2. Set the communication port baud rate to 38400.
 - a. Click **Call** and then click **Disconnect**.
 - b. Select **File/Properties** and the Property window will be on the screen.
 - c. Click **Configure** and change bit per second to 38400.
 - d. Select **Transfer/Send File** and specify the targeted .bin file. Select **Xmodem** and click **Send**.

When the file transfer is complete, you will see the following messages:

```
]xmodem fast Image relocated - type quit to boot
```

3. Follow step 2 to change the baud rate back to the default setting of 9600.
4. Type quit to reboot for the changes to take effect.

```
]
quit.....
.....
```

```
Decode image finish...
Found valid boot information block
No, or invalid, configuration information in
EEPROM - trying FLASH
Valid configuration (size 256)

NP software version is 0x00000701 (reply took
12us)
Model Number      :T60M10411.13
Firmware version  :x.x.x
Web UI version    :x.x.xx
DSL firmware version :x.x.x
Copyright (c) 2000
```

```
Current Modem State (11) : ACTIVATING
```

5. Enter **flashfs** and update image.

```
192.168.1.1> flashfs
192.168.1.1 flashfs> update
Updating flash filing system ...
done
192.168.1.1 flashfs>
```

6. Restart the ADSL Router by unplugging and plugging the power adapter back in. The CONSOLE will prompt you with

```
NBfIs3
PP flash boot
SDRAM size = 0x800000, type = 0x3
N.n.....
.....
```

```
Decode image finish...
```

```
No boot information block
No, or invalid, configuration information in
EEPROM - trying FLASH
Valid configuration (size 256)
atmos_main::atmos_memsize= 800000
```

```
NP software version is 0x00000701 (reply took
12us)
Model Number      :T60M10411.13
Firmware version  :x.x.x
Web UI version    :x.x.xx
DSL firmware version :x.x.x
Copyright (c) 2000
```

```
Current Modem State (11) : ACTIVATING
```

7. Press **Enter**. You will see the following:

```
Please input the PASSWORD:*****
```

8. At the password prompt, type your password and press **Enter** to switch to the CONTROL home prompt.

192.168.1.1>

The flash image will be recovered and ready for further configuration and operation.

Chapter 4

Troubleshooting

Problem:
None of the LEDs are illuminated when the ADSL modem is powered on.

Possible Solution

Check the connection of the AC power adapter to the ADSL modem and to the wall outlet.

Problem:
The initialization of the DSL connection failed.

Possible Solution

Make sure that the DSL cable is properly connected in the DSL port on the rear of the ADSL modem and in the phone wall jack in your home. The DSL LED on the front of the ADSL modem should be illuminated.

Possible Solution

Make sure that your VPI, VCI, type of encapsulation, and type of multiplexing settings match the information that was provided by your DSL service provider. Refer to the User Guide for more information.

Problem:
I cannot connect to my ISP.

Possible Solution

Check to see if the DSL LED on the front of the ADSL modem is illuminated. If it is not illuminated, make sure that the DSL cable is properly connected in the DSL port on the rear of the ADSL modem and in the phone wall jack in your home.

Possible Solution

Check to see if the LAN LED on the front of the ADSL modem is illuminated. If it is not illuminated, make sure that the Ethernet cable is properly connected in the ENET port on the rear of the ADSL modem and in the Ethernet jack in your computer.

Possible Solution

Make sure that your VPI, VCI, type of encapsulation, and type of multiplexing settings match the information that was provided by your DSL service provider. Refer to the User Guide for more information.

Possible Solution

Verify that you have entered your correct login name and password for your DSL service provider.

Possible Solution

Make sure that your TCP/IP property settings match the information supplied by your service provider. Most service providers require that the computer obtain an IP address directly from the provider using DHCP. On the network configuration control panel, click the **Obtain IP address automatically** button and the **Obtain DNS server address automatically** button.

Are You Still Having Problems?

1. Call the Dealer or ISP Who Provided You with this U.S. Robotics Product

The dealer may be able to troubleshoot the problem over the phone or may request that you bring the product back to the store for service.

2. Contact the U.S. Robotics Technical Support Department

For current support contact information, go to the following web site:
<http://www.usr.com/support/s-contact.asp>

IV. Regulatory Information

Manufacturer's Declaration of Conformity

FCC Declaration of Conformity

We declare under our sole responsibility that the U.S. Robotics ADSL Ethernet Modem to which this declaration relates, is in conformity with the following standards or other normative documents:

ANSI C63.4-1992 Methods of measurement
Federal Communications Commission 47 CFR Part 15, subpart B
15.107 (e) Class B Conducted Limits
15.109 (g) Class B Radiated Emissions Limits
Telecom: (U.S.) FCC Part 68, (Canada) Industry Canada (CS-03)

USR-Walnut
528 Spanish Lane
Walnut, CA 91789

In Canada:
U.S. Robotics
Unit-100, 13751 Mayfield Pl.
Richmond, B.C. Canada V6V 2G9

FCC Class B Statement

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

1. this device may not cause harmful electromagnetic interference, and
2. this device must accept any interference received including interference that may cause undesired operations.

Radio and Television Interference

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

- Reorient or relocate the receiving antenna or cable input device.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following information prepared by the Federal Communications Commission helpful: The CIB Interference Handbook and The CIB Telephone Interference Bulletin. These documents are available on the Internet through the FCC Compliance and Interference Bureau Home Page at <http://www.fcc.gov/cib> listed under documents. Select CIB Interference Handbook or CIB Telephone Interference Bulletin.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC Part 68 Registration

1. This equipment complies with Part 68 of the FCC rules. This unit bears a label, which contains the FCC registration number and ringer equivalence number (REN). If requested, this information must be provided to the telephone company.
2. This equipment uses the following standard jack types for network connection: RJ11-6
3. This equipment contains an FCC compliant modular jack. It is designed to be connected to the telephone network or premises wiring using compatible modular plugs and cabling which comply with the requirements of FCC Part 68 rules.
4. In the unlikely event that this equipment causes harm to the telephone network, the telephone company can temporarily disconnect your service. The telephone company will try to warn you in advance of any such disconnection, but if advance notice isn't practical, it may disconnect the service first and notify you as soon as possible afterwards. In the event such as disconnection is deemed necessary, you will be advised of your right to file a complaint with the FCC.
5. From time to time, the telephone company may make changes in its facilities, equipment, or operations, which could affect the operation of this equipment. If this occurs, the telephone company is required to provide you with advance notices so you can make the modifications necessary to maintain uninterrupted service.
6. If you experience difficulties, check your connection and software configurations.
7. There are no user repairs that can be done on the unit.

UL Listing/CUL Listing

This information technology equipment is UL-Listed and CUL-Listed for both the Canadian and US markets respectively.

Canadian notice:

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled Digital Apparatus, ICES-003 of Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: Appareils Numériques, NMB-003 édictée par l'Industrie Canada.

Your warranty and repair service center is:

Centre de garantie et de service après vente:

U.S. Robotics
Unit-100, 13751 Mayfield Pl.
Richmond, B.C. Canada V6V 2G9

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make electrical ground connections by themselves, but should contact the appropriate inspection authority or an electrician, as appropriate.

Glossary

ADSL (Asymmetric Digital Subscriber Line) - Transports information to and from customers and networks.

ATM (Asynchronous Transfer Mode) - This is a protocol that packs digital information into 53-byte cells which are switched throughout a network over virtual circuits.

Bandwidth - This is the amount of data that can be transmitted over a given time period.

DSLAM (Digital Subscriber Line Access Multiplexer) - This is a network device that receives signals from multiple customer Digital Subscriber Line connections and places them on higher speed lines with multiplexing techniques for the fastest phone line technology available.

DHCP (Dynamic Host Configuration Protocol) - This is a protocol for automatic TCP/IP configurations providing static and dynamic address allocation and management.

DNS (Domain Naming System) - This is a mechanism used in the Internet for translating names of host computers into addresses.

Encryption Type - This is the mathematical process whereby encoding information is created for the purposes of ciphering data.

Filter - This is an operating parameter used in LAN bridges and routers that when set, will cause these devices to block the transfer of packets from one LAN to another.

G.lite - Officially known as G.992.2, it is now a standard way to install Asymmetric Digital Subscriber Line service. G.lite makes it possible to have Internet connections to home and business computers at up to 1.5 Mbps over regular phone lines.

G.dmt - This refers to the ADSL standard approved by the International Telecommunications Union (ITU). G.dmt indicates full rate ADSL which provides standards for higher speed ADSL than G.lite. G.dmt provides maximum data rates of 8 Mbps downstream to the subscriber and 1.5 Mbps upstream from the subscriber.

Gateway - This is an entrance and an exit to a communications network.

IP (Internal Protocol) - This allows a packet of information to travel through many networks and LANs.

LAN (Local Area Network) - This is a network base covering a local geographic area.

Modulation Type - A modulation is the process of varying characteristic elements of the electrical carrier waves.

POTS (Plain Old Telephone Service) - This is a basic voice service available in residences throughout the United States.

RAM (Random Access Memory) - The primary memory in a computer, this is memory that can be overwritten with new information. The random access part of its name comes from the fact that the next bit of information in RAM can be located - no matter where it is - in an equal amount of time.

RJ-11 - This is a six-conductor modular telephone jack wired for up to four wires. The most common telephone jack in the world, the RJ-11 is typically used for connecting telephone instruments, modems and fax machines to a female RJ-11 jack on the wall or in the floor.

Subnet Mask - This is a portion of a network and is distinguished from other portions by the use of a mask or subnet number.

Splitter - This is an analogue voice transmitted at baseband frequencies and combined with the passband data transmission via a low-pass filter.

TCP/IP (Transmission Control Protocol/Internet Protocol) - This is a set of protocols designed to link dissimilar computers using a variety of networks and LANs.

Topology - The geometric physical or electrical configuration describing a local communication network. The most common distribution system topologies are the bus, ring, and star.

USB (Universal Serial Bus) - This is a new external bus standard that supports data transfer rates of 12 Mbps.

VCI (Virtual Channel Identifier) - This is the address of a virtual circuit.

VPI (Virtual Path Identifier) - This is the address of a virtual path corresponding to a connection on an ATM Network.

WAN (Wide Area Network) - This is a network base covering a large geographic area.

WINS (Windows Internet Name Service) - This is a service transposing Windows networking names into useable addresses for routing purposes.

U.S. Robotics Corporation Limited Warranty

HARDWARE: U.S. Robotics warrants to the end user ("Customer") that this hardware product will be free from defects in workmanship and materials, under normal use and service, for the following length of time from the date of purchase from U.S. Robotics or its authorised reseller:

Twelve (12) months

U.S. Robotics's sole obligation under this express warranty shall be, at U.S. Robotics's option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, U.S. Robotics may, in its sole discretion, refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of U.S. Robotics. Replacement products may be new or reconditioned. U.S. Robotics warrants any replaced or repaired product or part for ninety (90) days from shipment, or the remainder of the initial warranty period, whichever is longer.

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In The United States:
USR -Walnut
528 Spanish Lane
Walnut, CA 91789

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