ATU-R301

Transmission Unit

STANDALONE SERIES

USB ADSL Modem

Operating Manual

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About This Manual

This manual provides a comprehensive user's guide and installation manual for USB modem ATU-R301. It has been organized in such a way to make it easy to follow by users worldwide. In order to ensure optimal comprehension, the following list provides brief descriptions of the formatting styles used throughout this manual.

- **Commands:** Commands are always referred to by using the word "click" before them. These commands are always shown as bold-faced words. For example, click **Next,** click **OK**, or click **Cancel**.
- **Names of Windows (Dialog Boxes):** The names of the windows (also referred to as dialog boxes) that appear on the PC screen are always referred to in quotes. For example, the "Setup Complete" window.
- **Names of Options in Windows:** The names of options to choose from inside the windows that appear on the PC screen are always referred to in italics. For example, choose the *Yes, I want to restart my computer now* option from the window.
- **Notes:** In some cases, preparatory or cautionary information is needed before proceeding onto the next step in an installation process. This kind of information is provided in the form of notes, which are always referred to in bold-faced and italicized letters. For example, ***Note: To access the Control Panel, the driver must be running. Also, make sure the USB cable is plugged into the modem.***

Preface

The USB ADSL Modem ATU-R301 Manual

This manual contains information regarding the installation, operation, and configuration of the USB ADSL Modem ATU-R301. Additionally, it outlines the use of the Control Panel Application.

The following chapters are included in this manual:

- **Chapter 1:** "Overview" offers a brief description of ADSL, protocol and device driver selection, and the features of the USB ADSL Modem ATU-R301.
- **Chapter 2:** "USB ADSL Modem ATU-R301 Installation and Software Setup" describes the steps for installing the USB ADSL Modem ATU-R301 and details the software installation procedure.
- **Chapter 3:** "Customizing Communication Settings" provides detailed steps for altering the ATM Virtual Path ID (VPI), ATM Virtual Circuit ID (VCI), Encapsulation type and/or Modulation type values previously defined.
- **Chapter 4:** "Updating the USB ADSL Modem ATU-R301 Software" details the procedure for updating to a new version of the modem software.
- **Chapter 5:** "Control Panel Application" describes how to configure and check the performance of the USB ADSL Modem ATU-R301 and the ADSL connection.
- **Chapter 6:** "Software Uninstall" provides detailed steps for removing the USB ADSL modem ATU-R301 software from the PC.
- **Chapter 7:** "Trouble Shooting" answers some problems that might be encountered in installation and manipulation.

Chapter 1: Overview

About ADSL

Asymmetric Digital Subscriber Line (ADSL) technology provides high-speed data access across regular phone lines (copper wires) by making use of previously unused frequency bandwidth above the voice band. By placing the ADSL signal above the frequency of the voice signal, ADSL service is able to coexist on the same line with your telephone service. ADSL is asymmetric in the sense that it provides a higher data rate in the downstream (receive) direction than in the upstream (transmit) direction. Asymmetric operation is ideal for typical home and small office use where files and information are downloaded more frequently than uploaded.

There are several standard types of ADSL modulation techniques including Discrete Multitone (DMT) and Carrierless Amplitude and Phase (CAP). The USB ADSL Modem ATU-R301 is capable of supporting the following DSL standards: ANSI T1.413 Issue 2, ITU G.992.1 (G.DMT), ITU G.992.2 (G.lite), CAP (T1 TR-59), and ITU G.992 Annexes A, B, and C as applicable.

Protocol and Device Driver Selection

The USB ADSL Modem ATU-R301 can be easily connected to a USB port on the PC via a standard USB cable. The USB ADSL Modem ATU-R301 is fully software upgradeable so that new features and updates may be added by simply loading a new version of the device driver onto your PC.

ADSL modems employ ATM (Asynchronous Transfer Mode) framing. ATM is a protocol that divides packets into small fixed sized cells for rapid transmission over high-speed networks. The ATM protocol allows various types of traffic (e.g. data, voice, and video) to be securely and efficiently carried over the same network. ATM is being widely deployed by telecommunications carriers in their backbone networks. Two type of ATM connections are possible, PVC (Permanent Virtual Circuit) and SVC (Switched Virtual Circuit).

Several different protocols are used on top of ATM. The protocol required in your configuration depends on the equipment deployed by your DSL service provider. There are several possibilities:

1. Point to Point Protocol (PPP) Over ATM (RFC 2364) - PPP provides session setup, user authentication (login), and encapsulation for upper layer protocols such as IP (Internet Protocol). The use of PPP makes the modem appear as a dial modem to the operating system. Dial-Up Networking is used to establish a connection. PPP is supported by either the WAN (Wide Area Network) driver, or the ATM driver.
2. Bridged/Routed Ethernet/IP over ATM (RFC 1483) – This protocol makes the modem appear as a local area network (LAN) device to the operating system.

3. RFC 1577 – this is another local area network like protocol for IP address and ATM address mapping.
4. Point to Point Protocol (PPP) Over Ethernet (RFC 2516) - This protocol makes the modem appear as a local area network (LAN) device to the operating system. It allows multiple computer users on an Ethernet to share a common DSL connection to the Internet.

Three types of device drivers are provided for the ADSL USB modem ATU-R301, WAN, LAN, and ATM. Note that all three drivers support ATM protocol. In addition, the ATM driver works with ATM services that are available in recent Windows operating systems. The proper choice of driver depends on the combination of Windows operating system and protocol.

1. WAN driver – this driver causes the modem to resemble a dial-up modem. Call establishment is performed through Dial-Up Networking. This driver supports RFC 2364 with PVC connections. It can be used with Windows 98, Windows 98 SE, Windows 2000, and Windows Me.
2. LAN (RFC 1483) driver - this driver makes the modem appear as a LAN or Ethernet device. Connection establishment is automatic. This driver supports RFC 1483 with PVC connections. Additionally, PPPoE is supported. It can be used with Windows 98, Windows 98 SE, Windows 2000, and Windows Me.
3. ATM driver – this driver works in conjunction with ATM services provided by Windows. Both RFC 1577 and RFC 2364 are supported. The ATM driver uses Dial-Up Networking to create a PVC or SVC connection to establish a PPP (RFC 2364) connection. This driver can be used with Windows 98 SE, Windows 2000, and Windows Me.

The device driver choices are summarized in the table below:

Driver Type	**Protocol**	**Windows OS**
LAN	RFC 1483	Windows 98 Windows 98 SE Windows 2000 Windows Me
WAN	RFC 2364	Windows 98 Windows 98 SE Windows 2000 Windows Me
ATM	RFC 1577 RFC 2364	Windows 98 SE Windows 2000 Windows Me

Features

The USB ADSL Modem ATU-R301 provides the following features:

- Compliant with Universal Serial Bus Specification Revision 1.1
- USB bus-powered; an external power supply is not required
- Supports three device drivers: Microsoft NDIS 4.0 WAN Miniport, NDIS 4.0 LAN Miniport or NDIS 5.0 ATM Miniport
- Compatible with all T1.413, G.DMT, and G.lite compliant CO DSLAM equipment as well as the vast majority of deployed CAP RADSL CO equipment
- Software upgradeable
- ATM driver supports up to sixteen simultaneous ATM virtual connections
- Includes a Microsoft Windows control panel monitoring program for configuring the adapter and checking the status of the connection
- Provides an RJ-11 connector for connection to the telephone line
- Supports DSL downstream data rates up to 8 Mbps (125 times faster than standard 56K modems)
- Supports DSL upstream data rates up to 1024 Kbps
- Supports PPP over Ethernet (PPPoE) clients

Chapter 2: USB ADSL Modem ATU-R301 Installation and Software Setup

The following information may be required for software installation. Contact your DSL service provider before proceeding with software installation.

- IP Address Settings – the software installation process allows the server to dynamically assign IP Address settings. If your application requires static setting of specific address information you will need to know:

  IP Address
  Subnet Mask (for Bridged Ethernet applications only)
  Default Gateway (for Bridged Ethernet applications only)

- Name Server Information – the software installation process allows the server to dynamically assign Name Server Address settings. If your application requires static setting of specific address information you will need to know:

  Primary DNS Address
  Secondary DNS Address
  Primary WINS Address
  Secondary WINS Address

- Type of Driver to be Installed – WAN, LAN and ATM software drivers are supported. ***Note: Required if not using default value***
- ATM Virtual Path ID (VPI)

  Note: Required if not using default value
- ATM Virtual Circuit ID (VCI)

  Note: Required if not using default value
- Encapsulation type

  Note: Required if not using default value
- Modulation type

  Note: Required if not using default value
- User Name (for PPP applications only)
- Password (for PPP applications only).

Modem Hardware Installation

Install the USB ADSL Modem ATU-R301 by following these steps with the PC running:

1. Insert the rectangular end of a USB cable into the USB port of your PC.

2. Insert the square end of the USB cable into the USB port of the USB ADSL Modem ATU-R301.

   Note: The USB ADSL Modem ATU-R301 will be detected and informational messages will be displayed.

Software Setup

Note: The software setup process for all supported operating systems is described in this section with operating system specific differences noted. The USB ADSL Modem ATU-R301 should be connected to your PC prior to installing the software. No other Windows programs should be running on your PC during the software install process.

1. For Windows 98, Windows 98 SE, and Windows 2000 applications, a window will be displayed indicating that new drivers are required, click **Next** to start the installation procedure.(as Figure 1)

Figure 1. New driver required

2. A window will be displayed which allows you to specify the location of the driver software to be installed. Insert the USB ADSL Modem ATU-R301 installation CD into the CD drive; choose the option that allows the system to search for the best driver for your device by clicking inside the circle to the left of it; click **Next**.(as Figure 2)

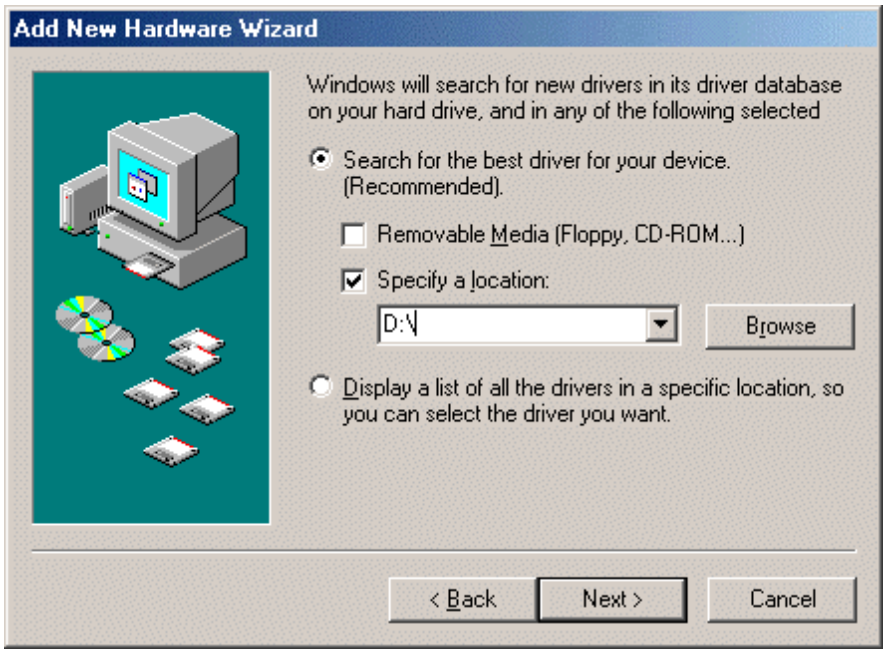


Figure 2. Specify driver location

Note: The appearance of the window and the wording of the options will be different for each operating system but the same procedure applies. The "recommended" option will always search for the appropriate driver software.

3. For Windows 98, Windows 98 SE, and Windows 2000 applications, you will be required to specify a location for the new driver software. Select the *CD_ROM drive* option (a check will appear in the box next to the selected option) with no other options selected and click **Next**.

4. For Windows 98, Windows 98 SE, and Windows 2000 applications, a message will indicate that the system is ready to install the device driver; click **Next**. (as Figure 3)

Figure 3. Windows is ready to install driver

5. For Windows Me applications, the “Select Other Driver” window may ask you to select the driver from a list of drivers. If asked, highlight the root directory, identified with “GROOTUSB.INF” in the Location column, and click **OK**.

6. A message will confirm that the device driver software has been installed; click **Finish**.

7. The “Welcome” window provides an opportunity to quit the setup process to exit all Windows programs before continuing. If the Windows programs were previously closed, click **Next**. (as Figure 4)

Figure 4. Welcome window

Note: If you quit this process, run setup.exe from the CD-ROM to resume the installation.

8. The “Select ISP” window allows you to specify your DSL service provider. A list of service providers is displayed. Default values for the Type of Driver, ATM Virtual Path ID (VPI), ATM Virtual Circuit ID (VCI), Encapsulation type and Modulation type are provided for each DSL service provider listed in the window. (as Figure 6)

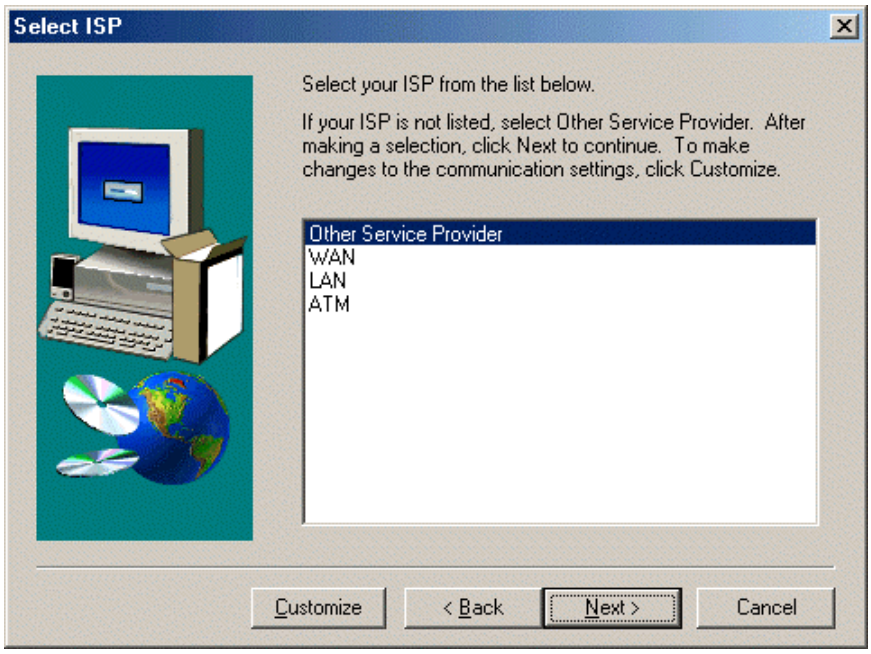


Figure 6. Select ISP window

If your DSL service provider is listed and you would like to accept the default values, highlight the provider's name and click **Next**. Continue with Step 10 below.

If your DSL service provider is listed and you would like to change the default values, highlight the provider's name and click **Customize**. Continue with Step 9a below.

If your DSL service provider is not listed select *Other Service Provider* and click **Next.** Continue with Step 9a below.

a) Select the type of driver to be installed from the “Select Driver Type” window and click **Next**. (as Figure 7)

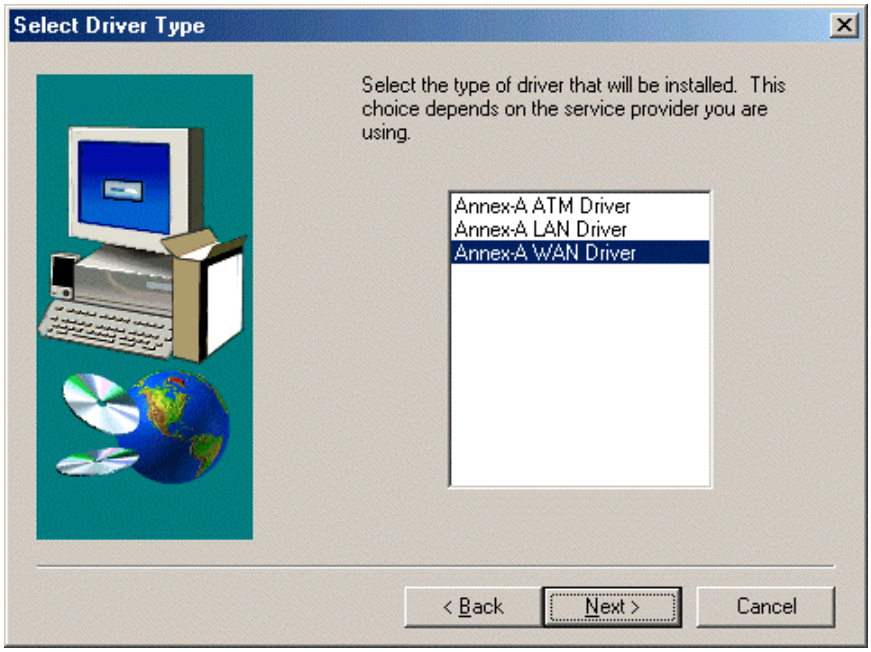


Figure 7. Select Driver Type window

b) Enter the VPI, VCI, Encapsulation type and Modulation type from the "Communication Settings" window and click **Next**. (as Figure 8)

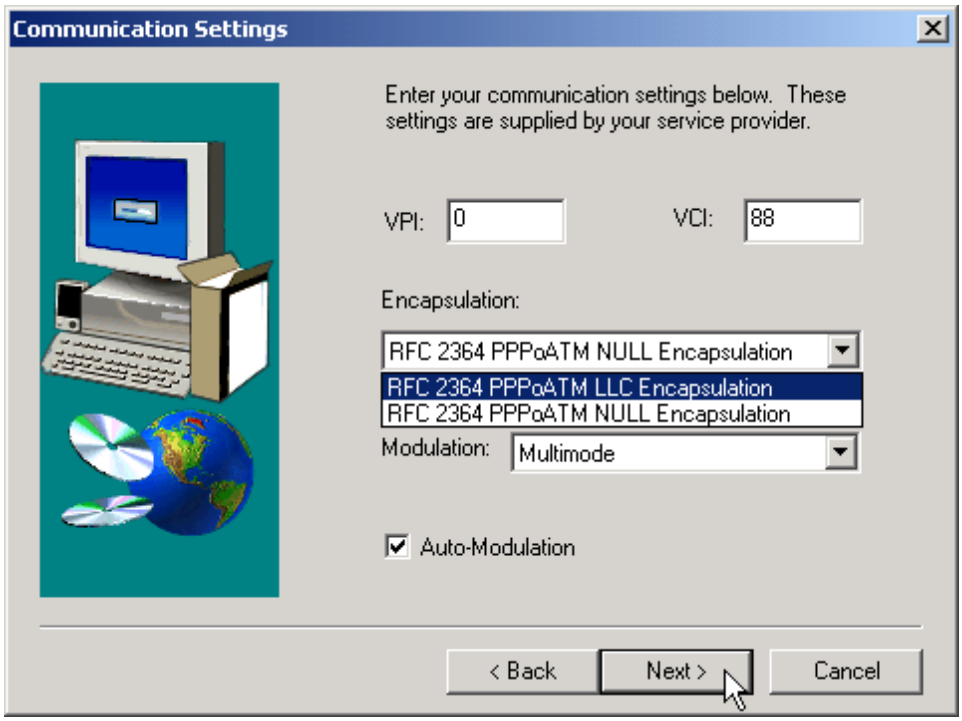


Figure 8. Communication Settings window

Note: Encapsulation types vary depending upon the application.

9. The “Start Copying Files” window will be displayed. You may review the current settings and click **Customize** or **Back** to change the settings. Click **Next** to accept the current settings; a message will be displayed indicating that files are being copied. (as Figure 9)

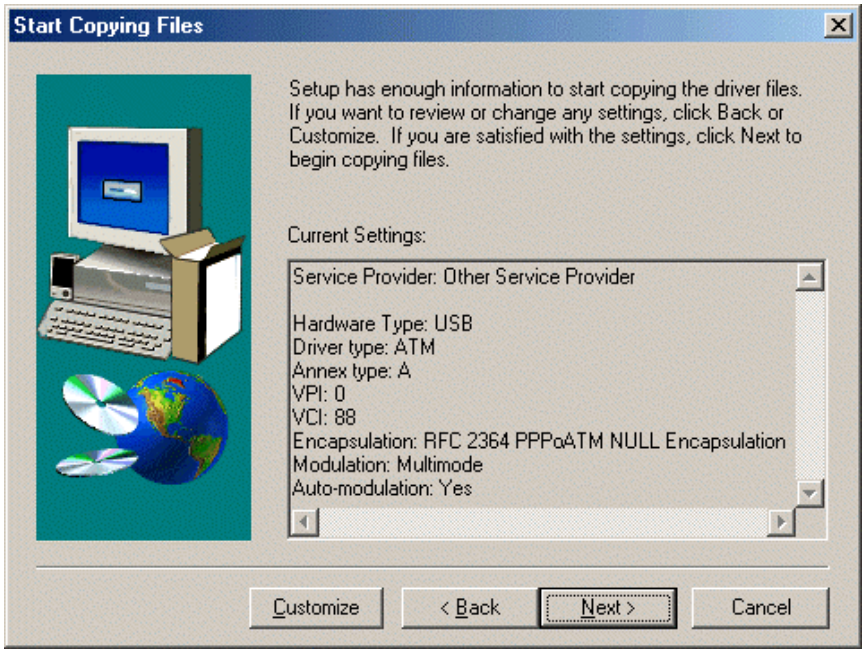


Figure 9. Start Copying Files window

10. For Windows 2000 applications, the “Digital Signature Not Found” window may appear warning that the installation software is not a digitally signed version. A digital signature is not necessary. Click **Yes** to allow the installation to continue.

11. The “Setup Complete” window indicates that files have been copied. Click **Finish** to complete the installation. (as Figure 10)

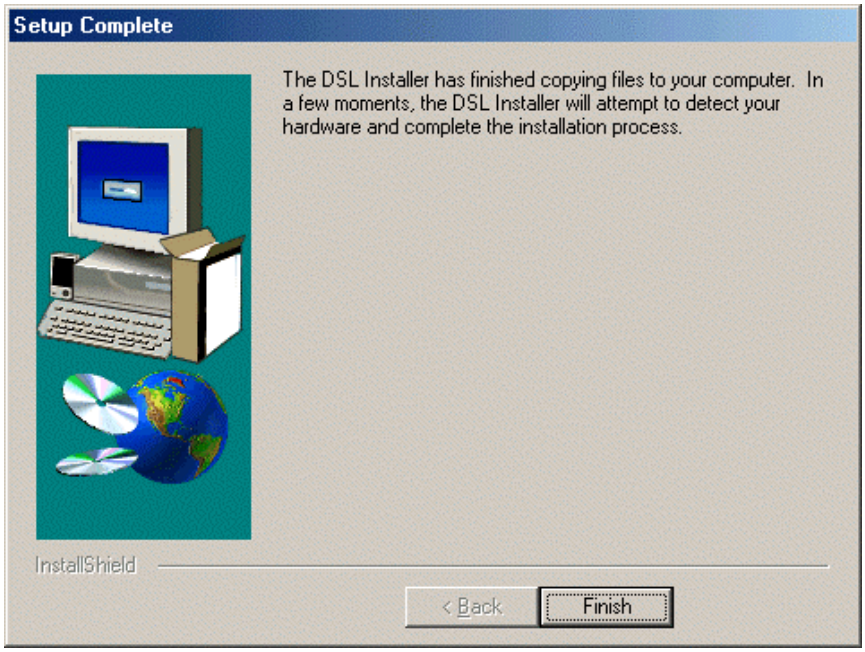


Figure 10. Setup Complete window

Note: You may need the Windows CD to complete the installation

12. Windows 2000 applications will display a message indicating that the system must be rebooted for the new settings to take effect. Click **Finish**.

13. After informational messages are displayed, the “System Settings Change” window will give you the opportunity to reboot the system. Remove all disks from their drives; click **Yes**.

14. Windows 98 WAN and ATM applications will ask you to provide telephone number and location information when the PC has rebooted. Enter the information and click **Close**.

NOTE: If it is necessary to change TCP/IP settings, please refer to the user manual of your PCs windows operation system.

Chapter 3: Customizing Communication Settings

Once the USB ADSL Modem ATU-R301 and software have been installed the communication settings may be easily updated by performing the following steps:

1. From your PC desktop click **Start** – **Programs** –**DSL Modem** – **Configure**. A notification message will appear indicating that the setup process has begun.

2. Click **Settings** from the “DSL Modem Installer” window.

3. The “Communication Settings” window will be displayed. Make the necessary changes to the VPI, VCI, Encapsulation type and/or Modulation type and click **Apply**.

4. The “Setup Complete” window indicates successful completion of the customization process. Select the *Yes, I want to restart my computer now* option, remove any disks from their drives, and click **Finish**. Your PC will reboot.

Chapter 4: Updating The USB ADSL Modem ATU-R301 Software

Once the USB ADSL Modem ATU-R301 has been installed, updating to a new version of the software is a simple process as detailed below.

1. From your PC desktop click **Start** – **Programs** –**DSL Modem** – **Configure**. A notification message will appear indicating that the setup process has begun.

2. Click **Update** from the "DSL Modem Installer" window.

3. A message will be displayed asking you to confirm the update, click **Yes**.

4. The "Select installation location" window will be displayed. Indicate the location of the Setup files and click **OK**.

5. Since updating the modem software requires removing the old version and installing a new one, a message will be displayed informing the user not to unplug the USB modem cable until the uninstall process has been completed. Click **OK**.

6. A message will be displayed indicating the software is being removed.

7. The "Setup Complete" window indicates successful completion of this portion of the updating process; click **Finish**.

8. Unplug the USB modem cable.

9. Processing will continue with Step 7 of the Software Setup process. Please turn to page 11, Step 7 to complete the installation portion of the updating process.

Chapter 5: Control Panel Application

The USB ADSL modem ATU-R301 control panel program provides a quick and easy way to configure and check the performance of the modem and the ADSL connection. When open, the monitor window updates every 2 seconds.

1. There are two methods to access the control panel:

   - From the “Control Panel” window (**Start** – **Settings** – **Control Panel**), double click the **DSL Modem** icon, or

   - From the PC desktop, double click the icon in the system tray.

   Note: To access the Control Panel, the driver must be running. Also, make sure the USB cable is plugged into the modem.

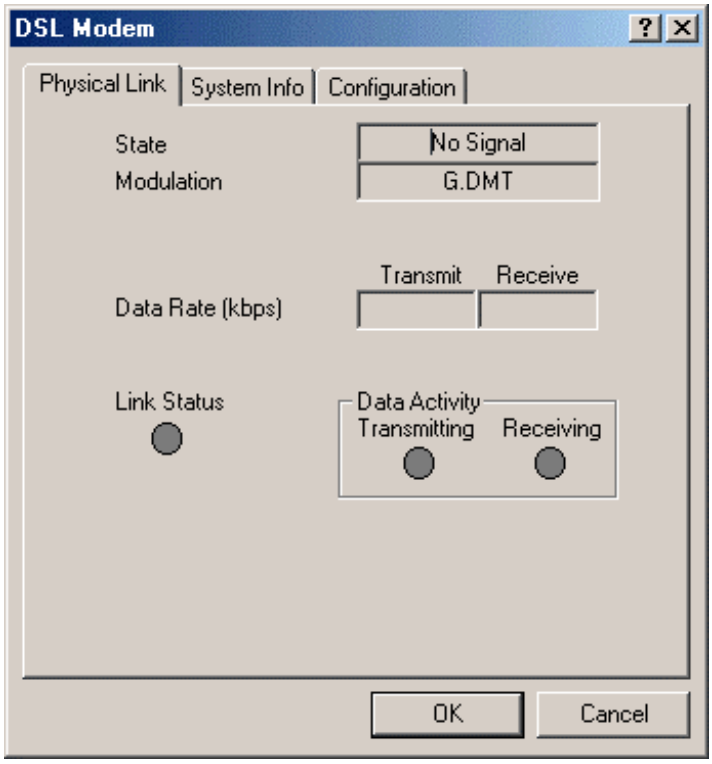


Figure 11. Physical Link window

2. The “Physical Link” tab of the “DSL Modem” window (Control Panel) allows you to review the current state of the USB ADSL Modem ATU-R301 and connection. The green indicator in the *Link Status* field signifies that a connection has been made. This indicator blinks while a connection is being established. Individual flashing yellow indicators show the *Transmitting* and *Receiving* data activity separately. (as Figure 11)

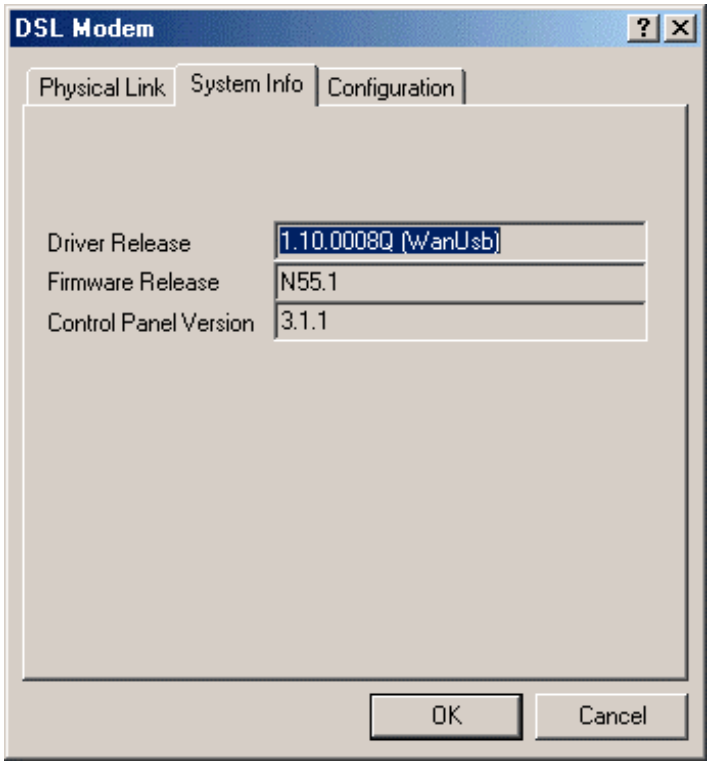


Figure 12. System Info window

3. The “System Info” tab displays the release number of the DSL modem driver, the firmware release number, and the control panel version that you are currently using. (as Figure 12)

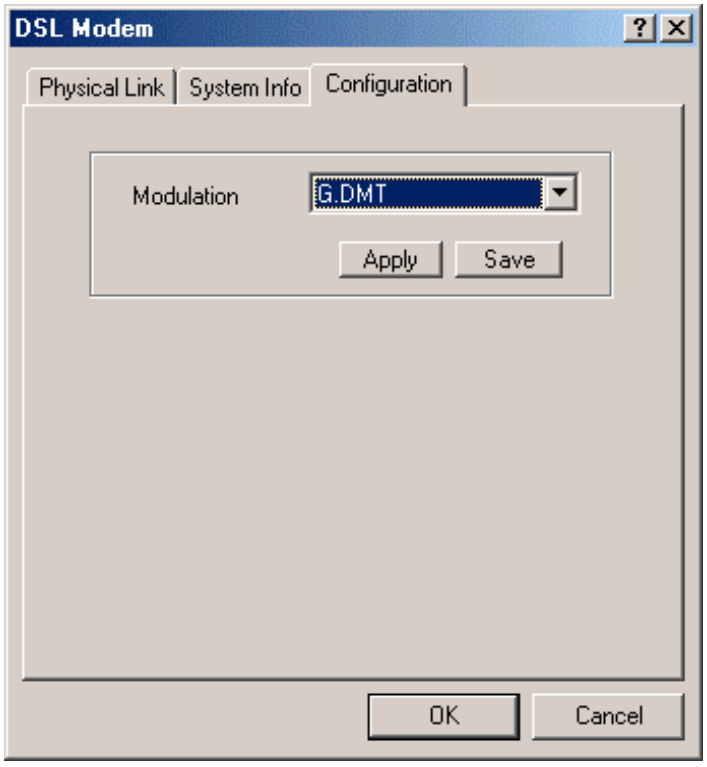


Figure 13. Configuration window

4. The “Configuration” tab offers driver appropriate Modulation, Encapsulation, and VPI and VCI values. If you are using a WAN or ATM driver, only the Modulation type will be displayed and may be modified. LAN driver applications will be able to view and modify the Modulation type, Encapsulation type, and VPI and VCI values. (as Figure 13)

Chapter 6: Software Uninstall

Remove the USB ADSL Modem ATU-R301 software drivers by performing the following steps.

Note: The USB cable should not be unplugged until after the uninstall process has been completed. For Windows 98 applications, the cable must be unplugged immediately following Step 6.

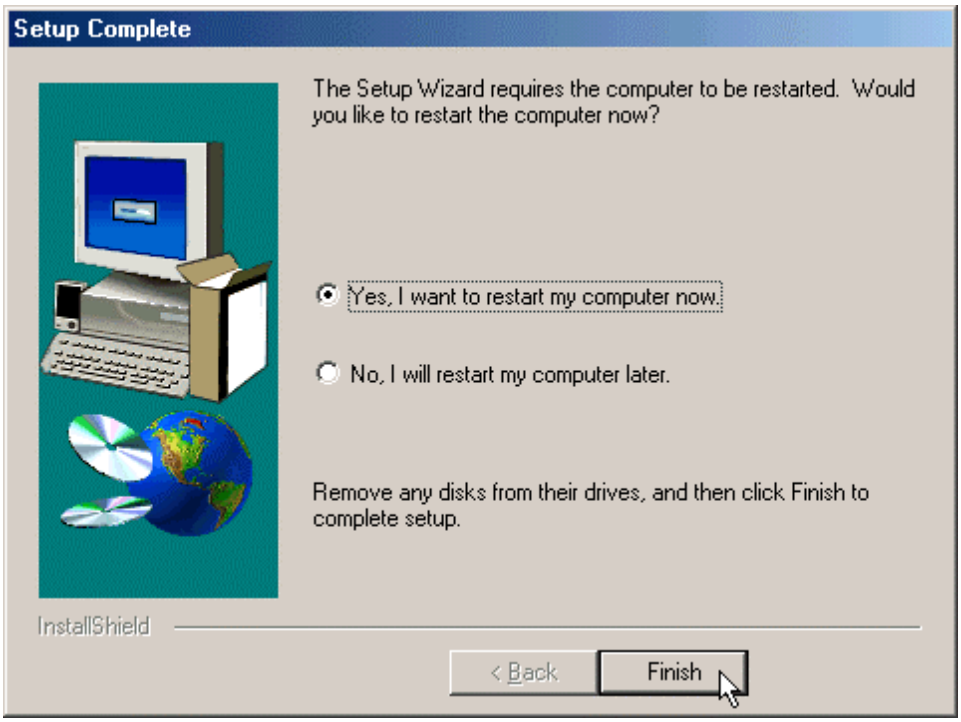
1. From your PC desktop click **Start** – **Programs** –**DSL Modem** – **Uninstall**. A notification message will appear indicating that the setup process has begun.

2. Click **Remove** from the "DSL Modem Installer" window.

3. A message will be displayed asking you to confirm the removal of the USB ADSL modem software, click **Yes**.

4. The "Information" window will be displayed reminding you not to unplug the USB cable until the uninstall process has been completed. Click **OK**.

5. A message will be displayed indicating the software is being removed.



6. The "Setup Complete" window indicates successful completion of the uninstall process. Remove any disks from the drives, select the *Yes, I want to restart my computer now* option by clicking in the circle to the left, and click **Finish**.

Note: The screen for Windows 2000 applications will not ask the user to reboot the system. Click Finish to complete the Uninstall process.

7. Unplug the USB cable from the PC.

Note: The USB cable must be unplugged before the system is rebooted. For Windows 98 applications the cable must be unplugged immediately as the reboot process was begun in Step 6.

Chapter 7: Trouble Shooting

1. If the LED of 'PWR' is dark :

- Please check – is the USB cable connected well ?

  -- is the PC powered on ?

  -- is the PC USB interface workable ?

- If the LED is still dark, please call your local agent for further help.

2. If the LED of 'ACT' is flashing :

- It indicates the connection of the modem is fail.
- Unplug-plug the USB cable to restart the modem. When there is a valid connection, the 'ACT' LED will remain solid. If the LED is still flashing, please call your local agent for help.

3. If the modem is installed as 'Modem Hardware Installation' of chapter 2 and the followed 'Software Setup' is not finished.

- This indicates the plug and play of your PC does not function well. Unplug your ATU-R301 and then run setup program from your USB ADSL Modem ATU-R301 installation CD. Follow the steps of Software Setup in chapter 2 to complete the software installation, and then a DSL Installer message will pop-up to ask you to plug in the USB cable to the modem.