Installation and User's Guide

ACEnic™ Adapter

For Windows 2000

Part Number: 050072, Revision A, April 2000

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Regulatory Compliance

FCC Class B Notice. The equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1) The device may not cause harmful interference, and 2) This equipment must accept any interference received, including interference that may cause undesired operation.

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

Do not make mechanical or electrical modifications to the equipment.

VCCI Class B Notice. The equipment is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

CE Notice. The CE mark on this equipment indicates that this equipment meets or exceeds the following technical standards: EN50082-1, EN55022, EN60555-2, EN61000-4-1, EN61000-4-2, EN61000-4-3, EN61000-4-4, and EN61000-4-5.

Contents

Preface

This manual describes how to install and use your ACEnic adapter in a Microsoft Windows 2000 operating environment. The procedures in this manual assume that you are a system or network administrator experienced in installing similar hardware.

How This Manual Is Organized

This manual is organized as follows:

Chapter 1, "About the ACEnic Adapter," describes the features of the ACEnic adapter. This chapter also describes the ACEnic adapter faceplate and LED indicators.

Chapter 2, "Installing the ACEnic Hardware," lists the hardware and software requirements for adapter installation and use, and provides instructions to physically install the adapter in your system.

Chapter 3, "Installing the ACEnic Driver Software," explains how to install the Gigabit Ethernet adapter software under Windows 2000.

Chapter 4, "Troubleshooting," provides a list of items to check for basic installation and configuration problems.

Appendix A, "Specifications," provides adapter hardware specifications.

Operating System Commands

This manual may not include all necessary hardware procedures or software commands. Instead, it may name specific tasks and refer you to operating system documentation or the hardware handbook that was shipped with your system.

You might need to use supplemental documentation for the following types of information:

- Shutting down the system
- Getting access to the system's PCI slots
- Booting the system
- Configuring devices
- Other basic software procedures

Typographic Conventions

The following table describes the typographic styles used in this book.

Table 1 Typographic Conventions

Typeface or Symbol	Meaning	Example
`AaBbCc123`	This type is used for names of commands, files, and directories used within the text.	View the `readme.txt` file.
	It also depicts on-screen computer output and prompts.	`Main#`
`AaBbCc123`	This bold type appears in command examples. It shows text that must be typed in exactly as shown.	`Main# sys`
AaBbCc123	This italicized type appears in command examples as a parameter placeholder. Replace the indicated text with the appropriate real name or value when using the command.	To establish a Telnet session, enter: `host# telnet` *IP-address*
	This also shows book titles, special terms, or words to be emphasized.	Read your *User's Guide* thoroughly.
[ ]	Command items shown inside brackets are optional and can be used or excluded as the situation demands. Do not type the brackets.	`host# ls [-a]`

Contacting Alteon WebSystems

Use the following information to access Alteon WebSystems support and sales.

- URL for Alteon WebSystems Online:

  `http://www.alteonwebsystems.com`

  This website includes product information, software updates, release notes, and white papers. The website also includes access to Alteon WebSystems Customer Support for accounts under warranty or that are covered by a maintenance contract.

- E-mail access:

  `support@alteon.com`

  E-mail access to Alteon WebSystems Customer Support is available to accounts that are under warranty or covered by a maintenance contract.

- Telephone access to Alteon WebSystems Customer Support:

  1-888-Alteon0 (or 1-888-258-3660)
  1-408-360-5695

  Telephone access to Alteon WebSystems Customer Support is available to accounts that are under warranty or covered by a maintenance contract. Normal business hours are 8 a.m. to 6 p.m. Pacific Standard Time.

- Telephone access to Alteon WebSystems Sales:

  1-888-Alteon2 (or 1-888-258-3662), and press 2 for Sales
  1-408-360-5600, and press 2 for Sales

  Telephone access is available for information regarding product sales and upgrades.

CHAPTER 1

About the ACEnic Adapter

Figure 1 The ACEnic 10/100/1000Base-T Gigabit Ethernet Adapter

The ACEnic adapter connects your PCI-compliant server or workstation to a Gigabit Ethernet network. The adapter incorporates a technology that transfers data at a maximum rate of one gigabit per second—10 times the rate of a Fast Ethernet adapter.

The ACEnic adapter targets the increased congestion experienced at the backbone and server in today's networks, while providing a future upgrade path for high-end workstations that require more bandwidth than Fast Ethernet can provide.

Included with your adapter is the following:

- Anti-static bag (used for protecting the adapter when stored or shipped). Keep the adapter in its packaging until ready for installation.
- CD-ROM with ACEnic adapter driver software and documentation.

Inform your network supplier of any missing or damaged items. If you need to return the adapter, you must pack it in the original (or equivalent) packing material or the warranty will be voided.

Features

Following is a list of the Gigabit Ethernet adapter features:

- Full-duplex Gigabit Ethernet interface (IEEE 802.3-1999)
- Jumbo Frame support (optional 9,000 byte frames for server-to-server traffic)
- Interoperability with existing Ethernet and Fast Ethernet equipment
- Standard Ethernet frame size (up to 1,518 bytes)
- Supports 32 multicast addresses
- Adaptive interrupt frequency (maximizes network throughput; adapts to traffic load)
- Dual DMA channels
- 33/66 MHz, 32-bit or 64-bit PCI bus master with adaptive DMA
- PCI Local Bus Rev 2.2 compliant: 17.3 cm x 10.7 cm (6.8" x 4.2")
- ASIC with on-chip MAC and dual RISC processors
- Universal dual voltage signaling (3.3V and 5V)
- Status LEDs

Key Protocols and Interfaces

The ACEnic adapter is interoperable with existing Ethernet equipment assuming standard Ethernet minimum and maximum frame size (64 to 1518 bytes), frame format, and compliance with the following standards and protocols:

- Gigabit Ethernet (IEEE 802.3-1999)
- Logical Link Control (IEEE 802.2)
- Flow Control (IEEE 802.3x)

Jumbo Frames Support

When sending Ethernet traffic at Gigabit speeds, considerable bandwidth is consumed by the overhead of handling a multitude of standard 1,500 byte packets. ACEnic adapters and ACE switches support Ethernet frames of up to 9,000 bytes. Host CPU utilization is significantly reduced and network throughput is enhanced when enabling Jumbo Frames between servers that have ACEnic PCI adapters.

For UDP traffic, an ACEnic adapter can support standard Ethernet frames and Jumbo Frames at the same time. When attached to an Alteon WebSystems switch, Jumbo Frames are sent only between servers that have ACEnic adapters. When attached to a standard Ethernet device, a

Jumbo Frames-enabled server may send UDP data in jumbo frames, but when the data reaches the switch, the switch will automatically fragment the data into standard Ethernet frames when sending to all other standard Ethernet devices.

For non-UDP traffic, Alteon WebSystems recommends that both servers support Jumbo Frames.

Adaptive Interrupt Frequency

The adapter driver intelligently adjusts host interrupt frequency based on traffic conditions, in order to increase overall application throughput. In light traffic, the adapter driver interrupts the host for each received packet, minimizing latency. When traffic is heavy, the adapter issues one host interrupt for multiple, back-to-back incoming packets, preserving host CPU cycles.

Dual DMA Channels

The PCI interface on the ACEnic adapter contains two independent DMA channels for simultaneous read and write operations.

32-bit or 64-bit PCI Bus Master

Compliant with PCI Local Bus Rev 2.2, the PCI interface on the ACEnic adapter is compatible with both 32-bit and 64-bit PCI buses. As a bus master, the adapter requests access to the PCI bus instead of waiting to be polled.

ASIC with Embedded RISC Processor

The core control for the ACEnic adapter resides in a tightly integrated, high-performance ASIC. The ASIC includes dual RISC processors. This provides the flexibility to add new features to the card and adapt it to future network requirements via software download. This also enables the adapter drivers to exploit the built-in host off-load functions on the adapter as host operating systems are enhanced to take advantage of these functions.

Physical Description

1000Base-SX and 1000Base-LX

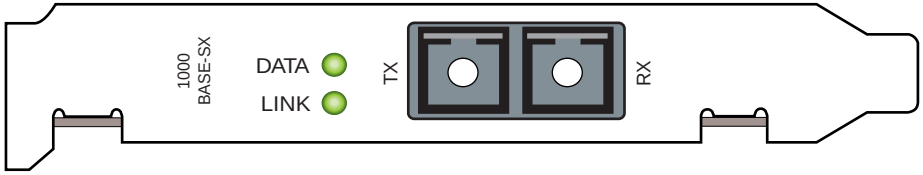

Figure 2 1000Base-SX and 1000Base-LX ACEnic adapter faceplate

Connectors

The faceplate of the ACEnic adapter has one 1000Base-SX/LX fiber-optic connector for connecting the adapter to a Gigabit Ethernet segment.

LEDs

There are two LEDs on the faceplate: one to indicate link status and one for data transfer status. Once the adapter hardware and its driver software have been properly installed on your system, the LEDs will indicate the following adapter states:

Table 2 1000Base-SX and 1000Base-LX ACEnic Port LED Activity

LED	State	Description
Data	Blinking	Data detected on the port.
	On	Data detected on the port.
	Off	No data detected on the port.
Link	Blinking slowly	Port has been disabled by software.
	On	Good link.
	Off	No link; possible bad cable, bad connector, or configuration mismatch.

10/100/1000Base-T

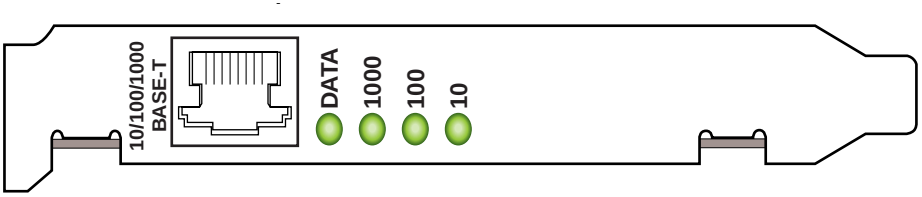

Figure 3 10/100/1000Base-T ACEnic adapter faceplate

Connectors

The faceplate on the 10/100/1000Base-T adapter provides an RJ-45 connector for connecting the adapter to another network device.

LEDs

The faceplate of the ACEnic 10/100/1000Base-T adapter has four LEDs: one for each port speed option (10Mbps, 100Mbps, and 1Gbps), to indicate which link is active, and one LED for data transfer status. Until the driver software is properly installed, all four LEDs will remain lit when the server is powered on.

Once the adapter hardware and its driver software have been properly installed on your system, the LEDs will indicate the following adapter states:

Table 3 10/100/1000Base-T ACEnic Port LED Activity

LED	State	Description
Data	Blinking On Off	Brief bursts of data detected on the port. Streams of data detected on the port. No data detected on the port.
10	On Off	Good 10 Mbps Ethernet link No 10 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch.
100	On Off	Good 100 Mbps Fast Ethernet link. No 100 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch.
1000	On Off	Good 1000 Mbps (Gigabit) Ethernet link. No 1000 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch.

NOTE – If all four LEDs remain lit simultaneously, the adapter driver software is either missing or improperly installed.

CHAPTER 2

Installing the ACEnic Hardware

The following instructions apply to installing the ACEnic adapter in most systems. Refer to the manuals that were supplied with your system for details about performing these tasks on your particular system.

System Requirements

Before installing the ACEnic adapter, make sure your system meets the requirements listed in the following table:

Table 4 System Requirements

Category	Requirements
Hardware	■ Pentium-based computer that meets Windows 2000 software requirements ■ One open 32-bit or 64-bit PCI slot ■ 128MB RAM (minimum)
Software	
Operating System	Microsoft Windows 2000 (server or professional), and Microsoft Windows 2000 Advanced Server
Adapter Software	ACEnic adapter driver software, version 2.3 (or higher) for Windows 2000. See the Alteon CD-ROM for these files in the `\W2K` directory: ■ `altnd5.sys` (network device driver file) ■ `altnd5.cat` (network device catalog file) ■ `netalt.inf` (information used by installation program)

Safety Precautions

CAUTION—The adapter is being installed in a system that operates with voltages that can be lethal. Before you remove the cover of your system, you must observe the following precautions to protect yourself and to prevent damage to the system components.

- Remove any metallic objects or jewelry from your hands and wrists.
- Make sure to use only insulated or nonconducting tools.
- Verify that the system is powered OFF and unplugged before accessing internal components.
- Installation or removal of adapters must be performed in a static-free environment. The use of a properly grounded wrist strap or other personal anti-static devices and an anti-static mat is strongly recommended.

Pre-Installation Checklist

1. **Check that your system meets the hardware and software requirements listed on Table 4 on page 15.**
2. **Verify that your system is using the latest BIOS.**
3. **Review the information in the `readme` file on the Alteon CD-ROM for important information not available at the time this manual was created.**

NOTE – If you acquired the adapter software on a floppy disk or from the Alteon WebSystems support website, please check the appropriate source for the most recent information.

4. **If your system is active, shut it down.**

   If Windows 2000 is currently up and running, close all applications and select “Start | Shut Down.” In the resulting dialog window, select “Shut down” from the pull-down options and click the “OK” button.

5. **When system shutdown is complete, power OFF and unplug your system.**
6. **Holding the adapter card by the edges, remove it from its shipping package and place it on an anti-static surface.**
7. **Check the adapter for visible signs of damage, particularly on the card’s edge connector. Never attempt to install any damaged adapter.**

   If the adapter is damaged, report it to your Alteon WebSystems Customer Support Representative. For more information, see “Contacting Alteon WebSystems” on page 7.

ACEnic Adapter Installation

To install an ACEnic adapter in your system, perform the following procedure.

1. **Observe all precautions and pre-installation instructions on page 16.**

   Before installing the adapter, ensure the system power is OFF and unplugged from the power outlet, and that proper electrical grounding procedures have been followed.

2. **Remove the system cover, and select any empty PCI slot.**

   If you do not know how to identify a PCI slot, refer to your system documentation.

3. **Remove the blank cover-plate from the slot that you selected. Retain the screw so that it can be replaced later.**

4. **Holding the PCI card by the edges, align the adapter's connector edge with the PCI connector dock in the system.**

NOTE – The connector dock in a 32-bit PCI slot is shorter than in a 64-bit PCI slot. Although the adapter is designed to fit in either slot type, when installed in a 32-bit PCI slot, part of the adapter's connector edge will remain undocked. This is perfectly normal.

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5. **Applying even pressure at both corners of the card, push the adapter card until it is firmly seated in the PCI slot.**

CAUTION—Do not use excessive force when seating the card, as this may damage the system or the adapter. If the card resists seating, remove it from the system, realign it, and try again.

When properly seated, the adapter's port connectors will be aligned with the slot opening, and its faceplate will be flush against the system chassis.

6. **Use the screw removed above (in Step 3) to secure the adapter in the PCI card cage.**

7. **Replace the system cover and disconnect any personal anti-static devices.**

8. **Power the system on.**

   Once the system returns to proper operation, the adapter hardware is fully installed. You must next connect the network cables (see page 18) and install the adapter driver software (see Chapter 3).

Connecting the Network Cables

This section provides information you'll find useful in attaching a network device to the ACEnic 1000Base-SX/LX or 10/100/1000Base-T adapter.

1000Base-SX/LX Adapter

The adapter has one SC-type connector used for attaching the server to a Gigabit Ethernet fiber-optic segment. The port is auto-negotiating and supports full-duplex operation.

1. **Prepare an appropriate cable.**

   The following table lists cable characteristics required for connecting to 1000Base-SX/LX ports:

   Table 5 1000Base-SX/LX Link Characteristics

	Medium Diameter	Frequency	Cable Type	Operating Range
SX	62.5 Microns	Shortwave (850 nanometers)	Multimode fiber	2 to 275 meters (6.5 to 902 feet)
	50 Microns	Shortwave (850 nanometers)	Multimode fiber	2 to 550 meters (6.5 to 1804 feet) (in compliance with IEEE 802.3-1999)
LX	62.5 Microns	Longwave (1300 nanometers)	Multimode fiber	2 to 440 meters (6.5 to 1443 feet)
	50 Microns	Longwave (1300 nanometers)	Multimode fiber	2 to 550 meters (6.5 to 1804 feet)
	9 Microns	Longwave (1300 nanometers)	Single mode fiber	2 to 5,000 meters (6.5 to 16,404 feet)

2. **As shown in the following diagram, connect one end of the cable to the ACEnic adapter.**

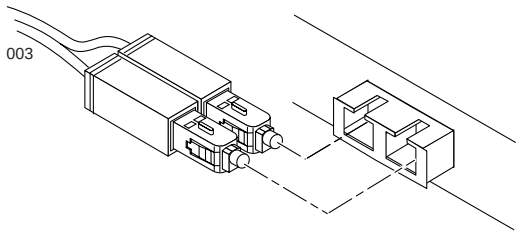

Figure 4 Connecting the network cable to the adapter

3. **Connect the other end of the cable to a Gigabit Ethernet network port.**

   Attach the cable connector so that the TX (transmit) port on the ACEnic adapter is connected to the RX (receive) port of the device at the other end of the cable.

NOTE – The adapter port LEDs are not functional (they will not reflect port link or data status) until the adapter driver software is installed. See Table 2 on page 12 and Table 3 on page 13 for descriptions of adapter port LED operation. See Chapter 3 for driver installation and configuration instructions.

10/100/1000Base-T Adapter

The adapter has one RJ-45 connector used for attaching the system to an Ethernet copper-wire segment. When automatic link negotiation is disabled, the port can be configured for 10Mbps, 100Mbps, or 1000Mbps signaling and either half-duplex or full-duplex operation.

1. **Prepare an appropriate cable.**

   The following table lists the cable characteristics for connecting to 10/100/1000Base-T ports:

Table 6 10/100/1000Base-T Cable Specifications

Port Type	Connector	Media	Maximum Distance
10Base-T	RJ-45	Cat. 3, 4, or 5 UTP	100 meters (325 feet)
100/1000Base-T	RJ-45	Cat. 5 UTP	100 meters (325 feet)

NOTE – 1000Base-T signaling requires four twisted pairs of Category 5 balanced cabling, as specified in ISO/IEC 11801:1995 and ANSI/EIA/TIA-568-A (1995) and tested using procedures defined in TIA/EIA TSB95.

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2. **Connect one end of the cable to the ACEnic adapter.**
3. **Connect the other end of the cable to an RJ-45 Ethernet network port.**

NOTE – The adapter port LEDs are not functional (they will not reflect port link or data status) until the adapter driver software is installed. See Table 3 on page 13 for a description of adapter port LED operation. See Chapter 3 for driver installation and configuration instructions.

CHAPTER 3

Installing the ACEnic Driver Software

A network device driver must be installed before the ACEnic adapter can be used with your Windows 2000 system. This chapter describes how to perform the following tasks:

- Install the driver software in the Windows 2000 environment
- Modify driver properties once the adapter is installed
- Move the adapter to a different slot
- Update or reinstall the driver software
- Move or remove the driver software

Installing the Driver Software

NOTE – The ACEnic adapter must be physically installed in your server or workstation prior to installing the driver software. See Chapter 2, "Installing the ACEnic Hardware," for details.

When the Windows 2000 system first boots up after installing a new hardware device such as an ACEnic adapter, the system automatically detects the new hardware and prompts you to install the driver software for the device.

A network driver must be installed before the ACEnic adapter can be used with your Windows 2000 system.

To install the adapter software for Windows 2000, perform the following procedure:

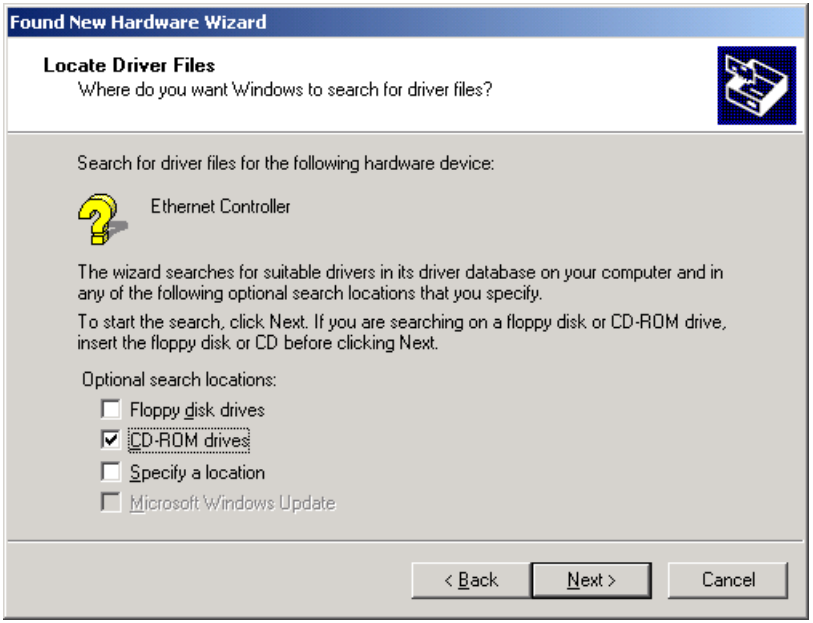
1. **Verify that the Windows 2000 system is upgraded to the latest version.**
2. **Start your Windows 2000 system and log in.**

   You must have Network Administrator privileges to install the driver software.

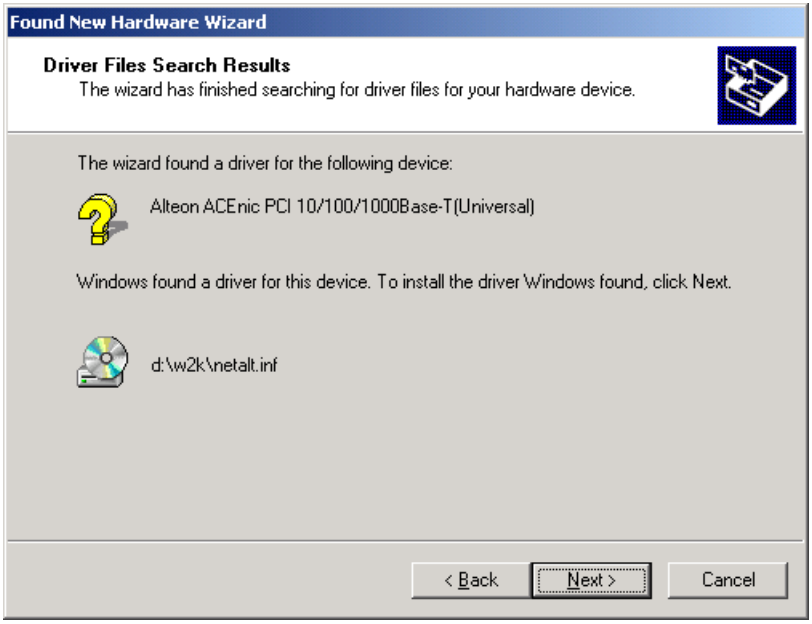
   When you boot up the Windows 2000 system after installing the adapter card, a series of "Found New Hardware Wizard" windows is displayed.

3. **In the Install Hardware Device Drivers window, click "Search for a suitable driver for my device (recommended)," then click the "Next" button.**

4. **In the Locate Driver Files window, check the "CD-ROM drives" box.**



5. **In the Driver Files Search Results window, verify that the correct path to the driver software is shown, then click the "Next" button.**



Once installation of the driver software has been completed, you are ready to configure adapter properties. For the procedure, see the section,"Modifying Configuration Parameters".

Modifying Configuration Parameters

Although the default values should be appropriate in most cases, you may change any of the available options to meet the requirements of your specific system. Once the adapter driver software has been installed, you can use this procedure to verify or change the following adapter properties:

- Full Duplex
- Link Negotiation
- Link Speed
- Network Address
- Jumbo Frames
- Rx flow control
- Tx flow control

Peform the following procedure to modify the adapter configuration:

1. **On the Desktop, right-click the “My Computer” icon and select the “Properties” option from the pop-up menu.**

   The System Properties window is displayed.

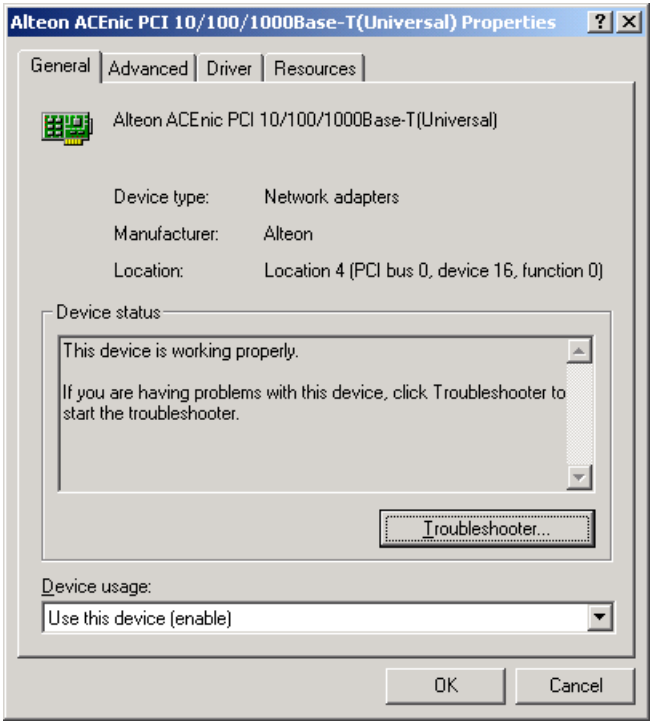
2. **Click the “Hardware” tab and then click the “Device Manager” button.**

   The Device Manager window is displayed.

3. **Scroll down the list of hardware devices to “Network Adapters.” Click the plus (+) to the left of the icon to display the list of adapters that are currently configured.**

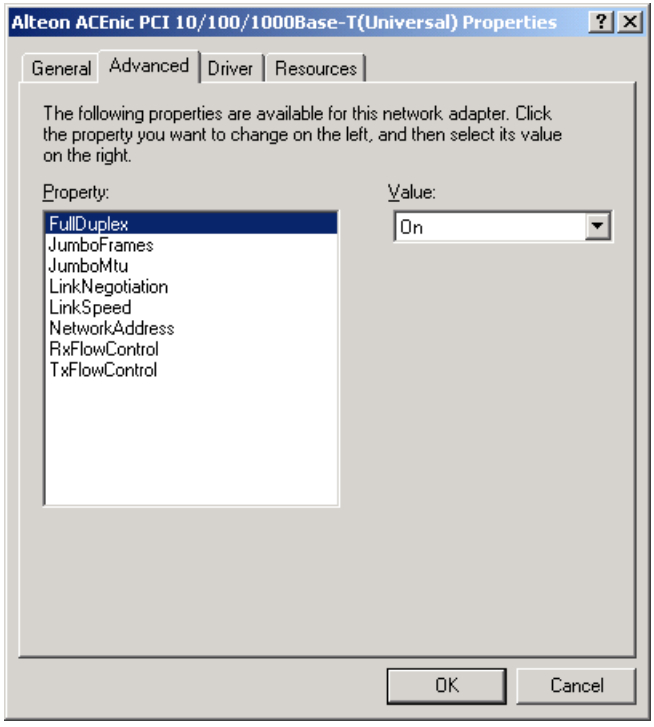
4. **Double-click the ACEnic adapter you want to configure.**

   The ACEnic Properties window is displayed, showing the General tab:



5. **Click the “Advanced” tab.**

   A window showing the list of configurable properties (and default values) for the adapter is displayed:



6. **Change the operating parameters as desired.**

   To change adapter operating parameters listed under the Advanced tab, click on the options listed under “Property” and then use the window under “Value:” to change the default or assigned value.

The following options should be displayed:

- Link Negotiation:
  - When on (default), 802.3-1999 compliant Gigabit Ethernet link negotiation is enabled. All ACEnic adapters use link negotiation by default.
  - When off, link negotiation is disabled and only link signal detection is used. Use this setting when connecting to Ethernet equipment that does not support link negotiation, or if there is a problem establishing a link between the adapter and the connecting device. For the Base-SX/LX adapter, the link will be set for full-duplex at 1Gbps; unless otherwise specified. The default signaling speed for the 10/100/1000Base-T adapter is 1Gbps.

    When link negotiation is disabled, be sure that the connecting device uses the same duplex and speed settings.

NOTE – When link negotiation is on, the user-configured link speed and duplex settings are ignored in favor of automatically determined settings.

- Full Duplex

  When link negotiation is off, this parameter sets the duplex mode. You can select either half-duplex or full-duplex operation.
  - When Full Duplex is on (default), full-duplex signaling is enabled.
  - When Full Duplex is off, half-duplex operation is used.
- Link Speed

  When link negotiation is off, this parameter sets the port link speed. You can select link speed to be either 10Mbps, 100Mbps, or 1Gbps.
- Network Address
  - Enter the Network Address (also known as the Media Access Controller (MAC) address) for the adapter. The allowed range is 0060CF000000 through 0060CFFFFFFF.

- Rx Flow Control:
  - When Rx flow control is on (default) and link negotiation is enabled, the adapter will negotiate 802.3x receive flow control with the device at the other end of the link, if the card negotiates to full duplex. If the other device supports 802.3x flow control, Rx flow control will be enabled.
  - When Rx flow control is on and link negotiation is off, you must turn on Full Duplex in order for Rx flow control to work properly. Rx flow control will not function under half duplex operation.
  - When Rx flow control is off, or when full duplex is off, receive flow control is disabled.
- Tx Flow Control:
  - When Tx flow control is on and link negotiation is enabled, the adapter will negotiate 802.3x receive flow control with the device at the other end of the link. If the other device supports 802.3x flow control, Tx flow control will be enabled.
  - When Tx flow control is on and link negotiation is off, you must turn on Full Duplex in order for Tx flow control to work properly. Tx flow control will not function under half duplex operation.
  - When Tx flow control is off (default), or when full duplex is off, transmit flow control is off.
- Jumbo Frames:
  - When on, Jumbo Frames (up to 9,000 bytes) will be supported by the adapter. This setting can reduce host CPU overhead and increase bandwidth when sending to other devices that support Jumbo Frames. When attached to an Alteon WebSystems switch, Jumbo Frames will be sent only between end-stations that have ACEnic adapters. When sending to standard Ethernet devices, the switch will automatically fragment the Jumbo Frames traffic into standard Ethernet frames.
  - When off (default), only standard-sized Ethernet frames will be sent. Use this setting when connecting to Gigabit Ethernet equipment that does not support Jumbo Frames.

7. **When all desired configuration is complete, click the "OK" button to accept the settings.**

8. **If prompted to restart your computer, click the "Yes" button.**

   While it is not necessary to reboot the system for new adapter properties to take effect, rebooting is recommended to reinitialize all registers.

9. **Verify that the adapter port LEDs operate as described in Table 2 "1000Base-SX and 1000Base-LX ACEnic Port LED Activity" on page 12, or Table 3 "10/100/1000Base-T ACEnic Port LED Activity" on page 13.**

Moving the Adapter to a Different Slot

Windows 2000 automatically detects the installation and removal of hardware. To move an ACEnic adapter to a different slot in the same system, you need to do the following:

- Shut down the system and remove the adapter card from the PCI slot.
- Install the adapter card in its new PCI slot (see "ACEnic Adapter Installation" on page 17).
- When the system is powered on, reinstall the driver software (see "Installing the Driver Software" on page 21).

Removing the Driver Software

Under Windows 2000, the driver software is automatically uninstalled when its hardware is removed. To remove an adapter, do the following:

- Shut down the system and remove the adapter card from the PCI slot.
- When the system is powered on, the driver will be automatically uninstalled.

CHAPTER 4

Troubleshooting

This chapter describes techniques for obtaining troubleshooting information regarding your ACEnic adapter and correcting some types of problems. The following topics are covered:

- Instructions for performing detailed hardware diagnostics on the adapter
- Behavior of the adapter's status LEDs
- How to resolve some common networking problems
- How to reach Alteon customer service and support

Hardware Diagnostic Utility

ALTDIAG Internal/External Loopback Test (MS-DOS)

`ALTDIAG`, an MS-DOS based diagnostic utility, is included on the CD-ROM. This utility is used for verifying that the adapter hardware is functional. It performs internal and external loopback tests and provides resulting pass/fail information. Perform the `ALTDIAG` tests any time you wish to rule out or identify possible adapter hardware problems.

To use the `ALTDIAG` utility, follow this procedure:

1. **Boot your system in clean MS-DOS mode rather than Windows 2000.**

NOTE – `ALTDIAG` ***cannot*** be used from the Windows 2000 "Start | Run" command or from "Start | Programs | MS-DOS Prompt." To use `ALTDIAG`, you ***must*** boot your computer in clean MS-DOS mode, with no other plug-ins, add-ons, or resident programs installed.

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2. **Disconnect the network cables on all adapters being tested.**

   The loopback tests will not perform properly if the adapter is left connected to other devices.

3. **Connect a Cat. 5 UTP loopback cable to the adapter's RJ-45 jack.**

   A loopback cable can be constructed by connecting the following pins back to the single connector:

Category 5 Loopback Cable	
Pin 1	Pin 3
Pin 2	Pin 6
Pin 4	Pin 7
Pin 5	Pin 8

4. **Place the CD-ROM into your system's CD-ROM drive.**

5. **From the MS-DOS prompt, enter the following commands to access the proper directory:**

```
>e:
>cd \dosdiags
```

   Where "**e:**" is the designation of the CD-ROM drive on your system.

NOTE – If you acquired the diagnostic software on a floppy disk or from the Alteon WebSystems support website, specify the path to where the files reside on your system.

6. **From the MS-DOS prompt, enter the following command to run diagnostics:**

```
e:>dos4gw altdiag [-c card_number] [-l c:log_filename]
```

   If more than one ACEnic adapter is installed in your system, the optional `-c` parameter can be used for specifying the adapter card to be tested. Cards are numbered starting with 0. By default, `ALTDIAG` tests only the first card (number 0) detected in the system.

   The optional `-l` (letter L for "log") parameter is used for defining a file in which to log the test results. A text copy of the `ALTDIAG` test results will be placed in the specified file on the specified drive.

   Example: To test the second card in a system and store the test results in `log.txt` in the current directory on the C: drive, the following command could be used:

```
e:>dos4gw altdiag -c 1 -l c:log.txt
```

7. **Review the test results.**

The test result from the previous example could look like this:

```
Log file created by Development and Diagnostic Test Program v2.3.1
on: Thu Apr  6 10:20:46 2000
-------------------------------------------
Development and Diagnostic Test Program ( ) v2.3.1

PCI bios found. v0.16.
  HW Mech #1 supported
  Number of PCI buses: 1
ALTEON #0 found in PCI bus 0.
1 Alteon card(s) detected
Current card set to bus 0 Alteon #0.
internal Loopback Test
pkts:0  secs:0pkts:32  secs:1pkts:144  secs:2pkts:256
secs:3pkts:352  secs:4pkts:480  secs:5pkts:576  secs:6pkts:704
secs:7pkts:800  secs:8pkts:912  secs:9  1000 packets transmitted
sucessfully
  1000 packets received sucessfully
     0 errors detected
external Loopback Test
pkts:0  secs:0pkts:96  secs:1pkts:208  secs:2pkts:320
secs:3pkts:432  secs:4pkts:544  secs:5pkts:656  secs:6pkts:768
secs:7pkts:880  secs:8pkts:992  secs:9  1000 packets transmitted
sucessfully
  1000 packets received sucessfully
     0 errors detected
>
```

Both the internal and external loopback example tests show 1000 packets successfully received with 0 errors detected, indicating that the adapter hardware is functioning properly.

If the adapter does not perform as expected, try reinstalling the adapter card or moving it to a different slot or to a different system, then run the `ALTDIAG` tests again. If the card still fails, contact Alteon WebSystems Customer Support.

Checking the Port LEDs

1000Base-SX/LX adapter

Two port LEDs are located on the faceplate of the ACEnic adapter: one to indicate link status and one for data transfer status (see Figure 2 on page 12). Before the port LEDs can provide troubleshooting information, the adapter must be connected to the network (see Chapter 2), and the network drivers for your particular operating system must be installed (see Chapter 3).

1. **Verify that the adapter driver software has been installed and that the adapter is connected to a network.**

2. **Verify that the adapter status LEDs operate as described in the following table:**

Table 7 1000Base-SX/LX Port LED Activity

LED	State	Description
Data	Blinking	Data detected on the port.
	On	Data detected on the port.
	Off	No data detected on the port.
Link	Blinking slowly	Port has been disabled by software.
	On	Good link.
	Off	No link; possible bad cable, bad connector, or configuration mismatch.

10/100/1000Base-T adapter

The faceplate of the ACEnic 10/100/1000Base-T adapter has four LEDs: one for each port speed option (10Mbps, 100Mbps, and 1Gbps), to indicate which link is active, and one LED for data transfer status (see Figure 3 on page 13).

Before the port LEDs can provide troubleshooting information, the adapter must be connected to the network (see Chapter 2), and the network drivers for your particular operating system must be installed (see Chapter 3).

1. **Verify that the adapter driver software has been installed and that the adapter is connected to a network.**

   Verify that the adapter status LEDs operate as described in the following table:

   Table 8 10/100/1000Base-T ACEnic Port LED Activity

LED	State	Description
Data	Blinking	Brief bursts of data detected on the port.
	On	Streams of data detected on the port.
	Off	No data detected on the port.
10	On	Good 10 Mbps Ethernet link
	Off	No 10 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch.
100	On	Good 100 Mbps Fast Ethernet link.
	Off	No 100 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch.
1000	On	Good 1000 Mbps (Gigabit) Ethernet link.
	Off	No 1000 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch.

2. **If all four LEDs remain lit simultaneously, the adapter driver software is either missing or improperly installed.**

Troubleshooting Checklist

CAUTION—Before opening the cabinet of your system for removing or inserting the adapter, please review all precautions outlined under "Safety Precautions" on page 16.

The following checklist provides recommended actions to take to resolve problems installing the ACEnic adapter or running it in your system.

- Inspect all cables and connections. Verify that the cable connections at the ACEnic adapter and the switch are attached properly. Make sure that the cable length and rating are compliant with the requirements listed in "Connecting the Network Cables" on page 18.
- Connect the adapter to a different network port and run the tests again. If the test results reflect that the adapter is functioning properly, the original network port may be defective or improperly configured.
- Check the adapter installation by reviewing Chapter 2. Make sure that the adapter board is properly seated in a PCI slot. Check for specific hardware problems, such as obvious damage to board components or the PCI edge connector.
- Check the configuration settings and change them if they conflict with another device.
- Make sure that your system is using the latest BIOS.
- Try inserting the adapter in another slot. If the new position works, the original slot in your system may be defective.
- Replace the failed adapter with one that is known to work properly. If the second adapter works in the slot where the first one failed, the original adapter is probably defective.
- Install the adapter in another functioning system and run the tests again. If the adapter passed the tests in the new system, the original system may be defective.
- Remove all other adapters from the system and run the tests again. If the adapter passes the tests, the other adapters may be causing contention.

Alteon WebSystems Support Information

For product support information, software updates, and release notes, see "Contacting Alteon WebSystems" on page 7.

APPENDIX A

Specifications

1000Base-SX and 1000Base-LX Cable Characteristics

	Medium Diameter	Frequency	Cable Type	Operating Range
SX	62.5 Microns	Shortwave (850 nanometers)	Multimode fiber	2 to 275 meters (6.5 to 902 feet)
	50 Microns	Shortwave (850 nanometers)	Multimode fiber	2 to 550 meters (6.5 to 1804 feet) (in compliance with IEEE 802.3-1999)
LX	62.5 Microns	Longwave (1300 nanometers)	Multimode fiber	2 to 550 meters (6.5 to 1804 feet)
	50 Microns	Longwave (1300 nanometers)	Multimode fiber	2 to 550 meters (6.5 to 1804 feet)
	9 Microns	Longwave (1300 nanometers)	Single mode fiber	2 to 5,000 meters (6.5 to 16,404 feet)

10/100/1000Base-T Cable Characteristics

Port Type	Connector	Media	Maximum Distance
10Base-T	RJ-45	Cat. 3, 4, or 5 UTP	100 meters (325 feet)
100/1000Base-T	RJ-45	Cat. 5 UTP	100 meters (325 feet)

NOTE – 1000Base-T signaling requires four twisted pairs of Category 5 balanced cabling, as specified in ISO/IEC 11801:1995 and ANSI/EIA/TIA-568-A (1995) and tested for additional performance using testing procedures defined in TIA/EIA TSB95.

Performance Specifications

Feature	Specification
PCI clock	66 MHz max
PCI Data/Address	32-bit and 64-bit
PCI data burst transfer rate	132 MB/second (32-bit bus) 264 MB/second (64-bit bus) 528 MB/second (64-bit bus at 66 MHz)
PCI modes	Master/slave
10/100/1000Base-T	10/100/1000 Mbps (full duplex)

Physical Characteristics

Dimension	Measurement
Length	17.3 cm (6.8 in.)
Width	10.7 cm (4.2 in.)

Power Requirements

Specification	Measurement
Operating voltage	+5 V ± 5%
Power consumption	14 Watts 2.8A @ +5VDC

Environmental Specifications

Condition	Operating Specification	Storage Specification
Temperature	0°C to 55°C (+32°F to +131°F)	-40°C to +85°C (-40°F to +185°F)
Relative humidity	5% to 85% (non-condensing) 40°C (104°F), 16 hour dwells at extremes	5% to 95% (non-condensing) 10°C/hour
Altitude	Up to 3,048 meters (10,000 ft.)	Up to 10670 meters (35,000 ft.)
Shock	10g, 1/2 sine wave, 11 msec	60g, 1/2 sine wave, 11 msec
Vibration, peak to peak displacement	0.0127 cm. (0.005 in.) max (5 to 32 Hz)	0.2540 cm. (0.1 in.) max (5 to 17 Hz)
Vibration, peak acceleration	0.25g (5 to 500 Hz) (Sweep Rate = 1 octave/min.)	0.25g (5 to 500 Hz) (Sweep Rate = 1 octave/min.)