Installation and User's Guide

ACEnic™ Adapter

For Windows NT

Part Number: 050005, Revision F, May 1999

Alteon WebSystems
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Regulatory Compliance

FCC Class A Notice: 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 interference. 2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Do not make mechanical or electrical modifications to the equipment.

VCCI Class 1. The equipment is Type 1 Data Processing Equipment and is intended for use in commercial and industrial districts. It has been tested and found to comply with VCCI technical requirements for the purpose of protection against electronic interference. When used in residential districts or their peripheral areas, radio, and TV receiver units may be subject to radio interference. The operation should be done in accordance with 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 guide describes how to install and use your Alteon WebSystems ACEnic adapter in a Windows NT operating environment. The procedures in this manual assume that you are a system or network administrator experienced in installing similar hardware.

How This Book Is Organized

This book is organized as follows:

Chapter 1, "About the ACEnic Adapter," describes the features of the ACEnic adapter, and lists the hardware and software requirements for its installation and use.

Chapter 2, "Installing the ACEnic Hardware," tells you how to physically install the adapter in your system.

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

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 document 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 workstation.

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.alteon.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

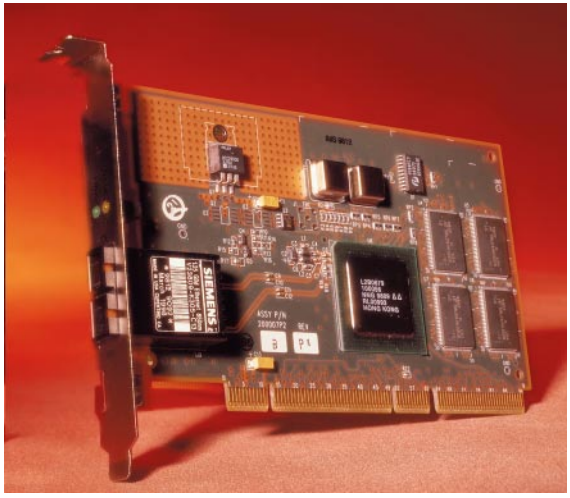

Figure 1 Alteon WebSystems ACEnic Gigibit Ethernet Adapter

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 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.
- ACEnic Gigibit Ethernet Adapter 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 802.3-1998)
- Duplex SC fiber-optic connector
- Interoperability with existing Ethernet and Fast Ethernet equipment
- Standard Ethernet frame size (up to 1,518 bytes)
- Jumbo Frames support (optional 9,000 byte frames for server-to-server traffic)
- 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 2.1 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 802.3-1998)
- 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.

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. Jumbo Frames are automatically fragmented into standard Ethernet frames when sending to all other standard Ethernet devices.

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 2.1, 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

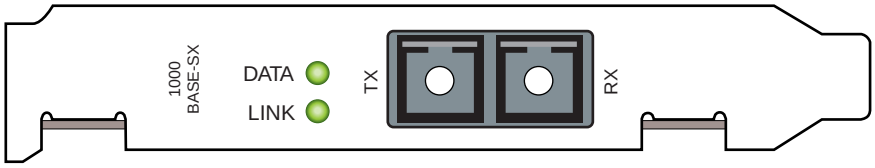

Figure 2 ACEnic adapter faceplate

The faceplate of the ACEnic adapter has one 1000Base-SX fiber-optic connector for connecting the adapter to a Gigabit Ethernet segment. There are also 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 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, missing or improperly installed driver software, or configuration mismatch.

CHAPTER 2

Installing the ACEnic Hardware

The following instructions apply to installing the ACEnic adapter in most servers. Refer to the manuals that were supplied with your server 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 3 System Requirements

Category	Requirements
Hardware	
PCI	■ Pentium-based server that meets Windows NT 4.0 software requirements ■ One open 32-bit or 64-bit PCI slot ■ 64MB RAM (minimum)
Firmware	OpenBoot™ PROM version 3.0 or greater.
Software	
Operating System	Microsoft Windows NT 4.0 (server or workstation) with Service Pack 5 (or the latest service pack)
Adapter Software	ACEnic adapter driver software, version 1.10 (or higher) for Windows NT. See the CD-ROM for these files in both the `\nt\alpha` and `\nt\x86` directories: ■ `Altndis.sys` (network device driver file) ■ `Altdlg.dll` (information used by installation program) ■ `Oemsetup.inf` (information used by installation program)

Safety Precautions

CAUTION—The adapter is being installed in a server that operates with voltages that can be lethal. Before you remove the cover of your server, 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.
- 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.
- Verify that the server is powered OFF before accessing internal components.

Pre-Installation Checklist

1. **Check that your server meets the hardware and software requirements listed in Table 2 on page 13.**
2. **Verify that your system is using the latest BIOS.**
3. **Review the information in the `readme` file on the ACEnic CD-ROM for important information not available at the time this manual was printed.**

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 NT is currently up and running, close all applications and select "Start | Shutdown | Shut down the computer."

5. **When system shutdown is complete, power OFF your system.**
6. **Holding the adapter card by the edges, remove it from its shipping package it 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.

PCI Adapter Installation

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

1. **Observe all precautions and pre-installation instructions on page 14.**

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

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

   If you do not know how to identify a PCI slot, refer to your server 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 server.**

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 server 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 server chassis.

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

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

8. **Power the server on.**

   Once the server returns to proper operation, the adapter hardware is fully installed. You must next connect the network cables (see page 16) and install the adapter driver software (see Chapter 3).

Connecting the Network Cables

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 ports:

   Table 4 1000BASE-SX Link Characteristics

Description	62.5 Micron	50 Micron
	Shortwave (850 nanometer multimode fiber)	
Operating Range	2 to 260 meters	2 to 550 meters (in compliance with IEEE 802.3z)

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

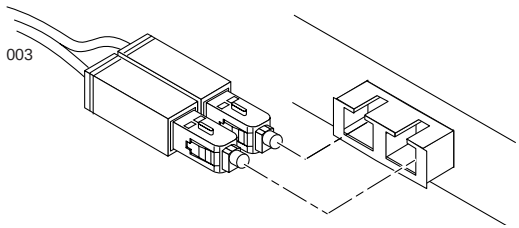


Figure 3 Connecting the network cable to the adapter

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 until the adapter driver software is installed. See Table 2 on page 12 for a description of adapter port LED operation. See Chapter 3 for driver installation and configuration instructions.

CHAPTER 3

The ACEnic Driver Software

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

- Install the driver software in the Windows NT environment
- Change the driver configuration once installed
- Update or reinstall the driver software
- Move or remove the driver software

Installing the Driver Software

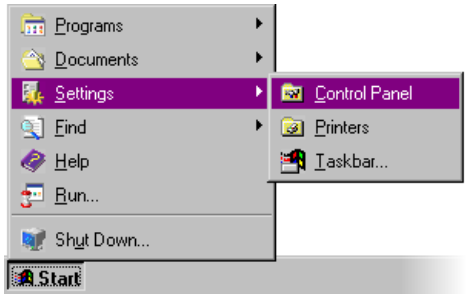
NOTE – The ACEnic adapter must be physically installed in your server or workstation prior to installing the driver software. See Chapter 2, "Installing the ACEnic Hardware," for details.

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

1. **Verify that the Windows NT server is upgraded with Service Pack 5 (or latest service pack).**
2. **Start your Windows NT system and log in.**

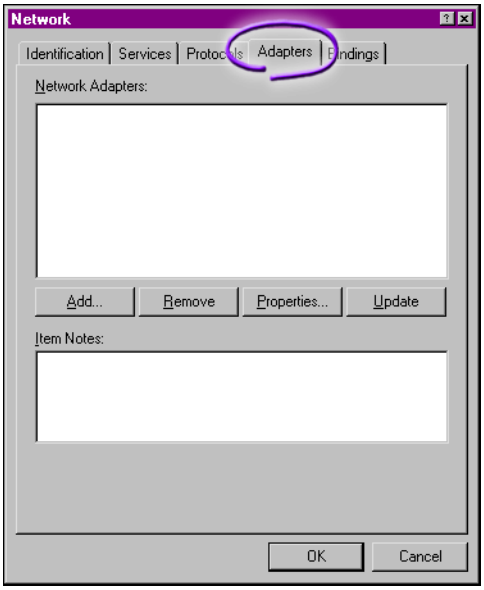
NOTE – You must have Network Administrator privileges to install the driver software.

3. **Open the Control Panel:**

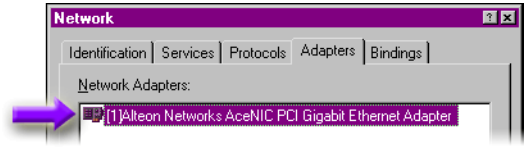


4. **In the Control Panel window, double-click on the Network icon:**

5. **When the Network window opens, select the "Adapters" tab:**



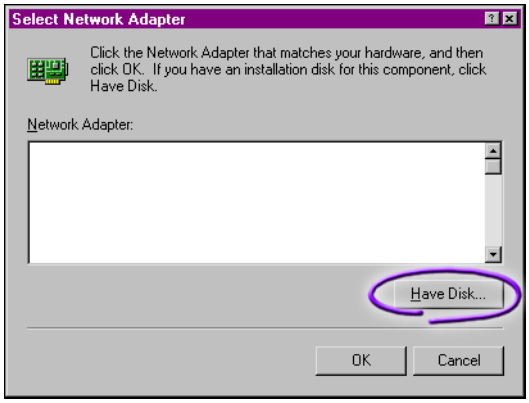
NOTE – Any previously installed ACEnic driver software is listed under Network Adapters:



Before installing the drivers for any new adapter, you must update any old versions. See "Updating the Driver Software" on page 23 for the procedure.

6. **Click on "Add."**

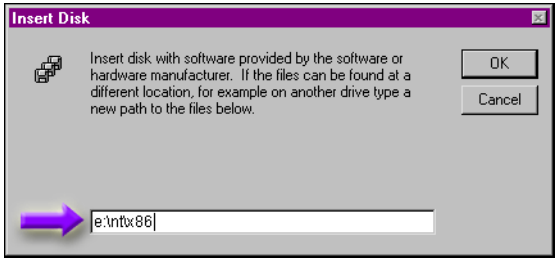
7. **When the Select Network Adapter window opens, click on “Have Disk:”**



8. **When prompted, insert the ACEnic adapter driver software CD-ROM into your system’s CD-ROM drive, type the path to the driver that matches your system, and select “OK.”**

   - For the Intel x86 driver, enter the following path: *e:*`\nt\x86`
   - For the DEC Alpha driver, enter the following path: *e:*`\nt\alpha`

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



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

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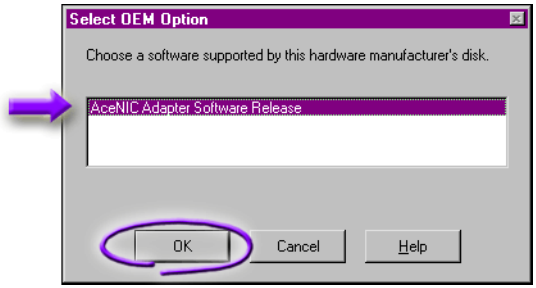
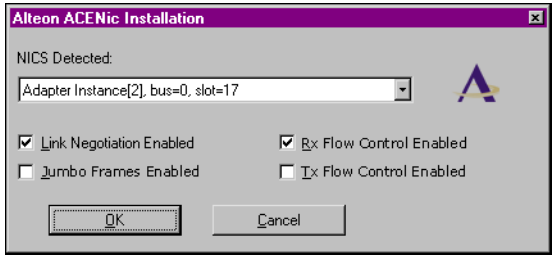
9. **In the Select OEM Option window, "ACEnic Adapter Software Release" will be highlighted. Click on "OK:"**



10. **The Alteon ACEnic Installation window will open:**



11. **Make any required parameter changes and select "OK" to accept the information.**

Each parameter is described below.

- NIC Detected:
  - Adapter Instance: To distinguish each ACEnic adapter installed in the system, each is assigned a unique instance number. Typically, the first adapter detected is instance 1, the next is instance 2, and so on.
  - Bus: This shows which PCI bus the adapter is operating on. This number is typically 0 for systems with up to four PCI slots on their bus. The number may be higher for servers with more than four PCI slots.
  - Slot: Shows the PCI slot number where the ACEnic adapter is installed.
- Link Negotiation:
  - When checked (default), 802.3z compliant Gigabit Ethernet Link Negotiation is used. All Alteon WebSystems Gigabit Ethernet adapters and switches use Link Negotiation by default.

- When unchecked, Link Negotiation is disabled and only link signal detection is used. Use this setting when connecting to Gigabit Ethernet equipment that does not support Link Negotiation, or if there is a problem establishing a link between the adapter and the connecting device. The link will be set for full-duplex at 1000 Mbps. Be sure that the connecting device uses the same duplex and speed settings.

- Jumbo Frames:
  - When checked, Jumbo Frames (up to 9,000 bytes) will be supported by the ACEnic 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 unchecked (default), Jumbo Frames are disabled, and only standard Ethernet frames will be sent. Use this setting when connecting to Gigabit Ethernet equipment that does not support Jumbo Frames.
- Rx Flow Control:
  - When checked (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 802.3x flow control is supported by the other device, it will be enabled.
  - When unchecked, or link negotiation is disabled, Rx flow control is disabled.
- Tx Flow Control:
  - When checked, and link negotiation is enabled, the adapter will negotiate 802.3x transmit flow control with the device at the other end of the link. If 802.3x flow control is supported by the other device, it will be enabled.
  - When unchecked (default), or link negotiation is disabled, Tx flow control is disabled.

NOTE – If other adapters in your system use TCP/IP bindings, the TCP/IP Properties window will open.

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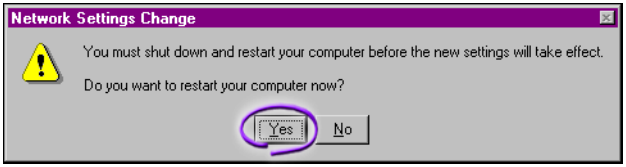
12. **Perform any necessary TCP/IP configuration and click on “OK” when finished**

    For help in configuring TCP/IP protocol, consult your Microsoft Windows NT 4.0 documentation.

13. **In the Network window, click on “Close.”**

14. **When prompted to restart your computer, click on "Yes:"**



The system will restart using the new driver and configuration settings.

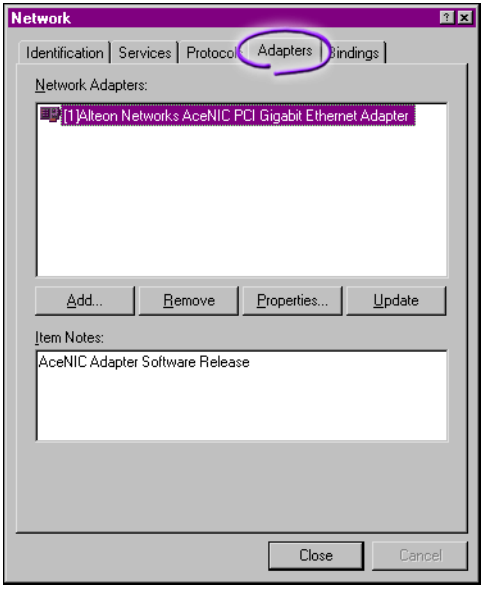
Changing Configuration Parameters

The following adapter parameters are user-configurable:

- Link negotiation
- Jumbo Frames support
- Rx flow control
- Tx flow control

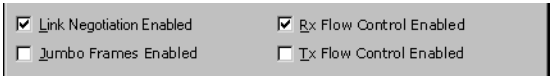
Use this procedure to change the adapter settings at any time:

1. **Open the Control Panel and double-click on the Network icon.**
2. **When the Network window opens, select the "Adapters" tab:**



3. **Select the ACEnic PCI Gigabit Ethernet Adapter and click on “Properties.”**

4. **In the ACEnic Properties window, click on the parameter boxes to disable (uncheck) or enable (check) the parameter.**



5. **Click on “OK” to accept the settings.**

Updating the Driver Software

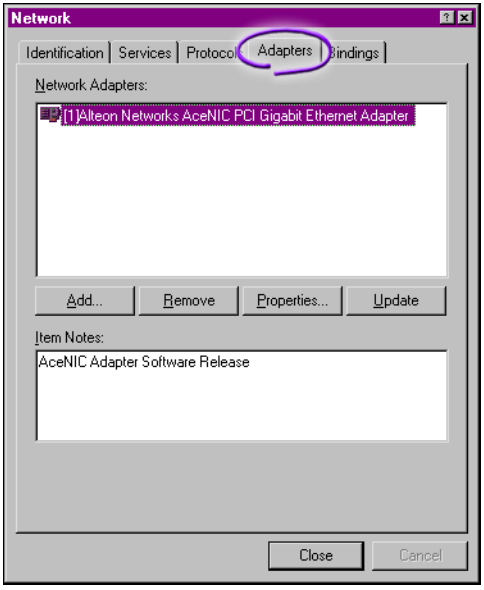
Use the following procedure to replace old driver software with a newer version.

1. **Start your Windows NT system and log in.**

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

2. **Open the Control Panel and double-click on the Network icon.**

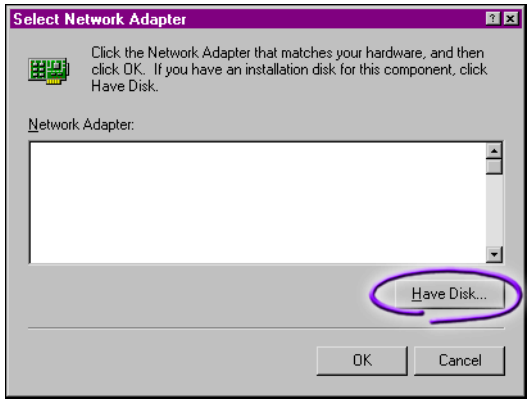
3. **When the Network window opens, select the “Adapters” tab:**



Any previously installed ACEnic driver software is listed under Network Adapters.

4. **Select an Alteon WebSystems ACEnic Adapter and click on “Update.”**

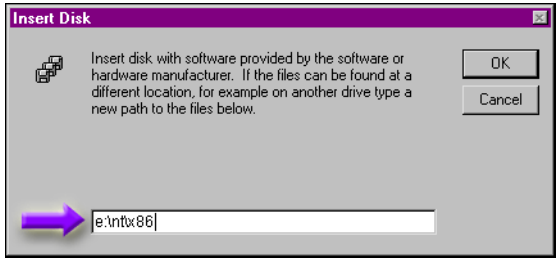
5. **When the Select Network Adapter window opens, click on "Have Disk:"**



6. **When prompted, insert the ACEnic CD-ROM into your system's CD-ROM drive, type the path to the driver that matches your system, and select "OK."**

   - For the Intel x86 driver, enter the following path: *e:*`\nt\x86`
   - For the DEC Alpha driver, enter the following path: *e:*`\nt\alpha`

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



   The system will then copy the appropriate adapter files from the CD-ROM.

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

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7. **When the copying process is complete, click on "Close" in the Network window.**

8. **When prompted to restart your computer, click on "Yes."**

   The system will restart using the new driver and configuration settings.

Moving the Adapter to a Different Slot

Before moving an ACEnic adapter to a different slot in the same system, first remove the adapter driver software (see “Removing the Driver Software” on page 25). Once the driver has been removed, you need to do the following:

- Move the adapter card (and cable) to an available PCI slot.
- Reinstall the driver software, as described on page 17.

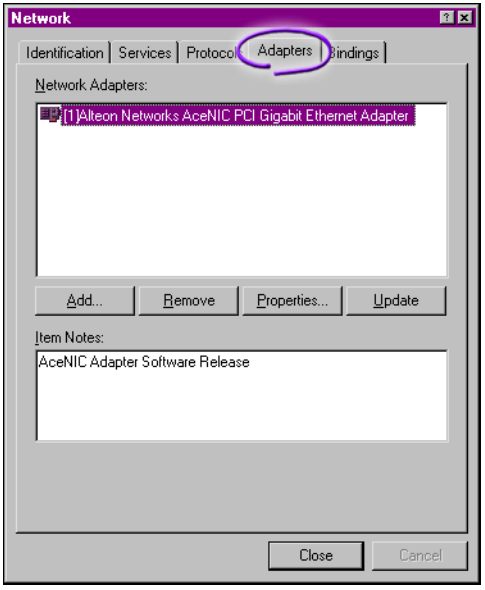
Removing the Driver Software

Before physically removing an adapter from your system, first remove the adapter driver software.

1. **Start your Windows NT system and log in.**

NOTE – You must have Network Administrator privileges to remove the driver software.

2. **Open the Control Panel and double-click on the Network icon.**
3. **When the Network window opens, select the “Adapters” tab:**



Any previously installed ACEnic adapter will be listed under Network Adapters.

4. **Individually select each ACEnic adapter you wish to remove and click on “Remove.”**
5. **Once the appropriate adapters have been removed, click on “Close.”**
6. **When prompted to restart your computer, click on “Yes.”**

CHAPTER 4

Troubleshooting

Hardware Diagnostic Utility

ALTDIAG, an MS-DOS based diagnostic utility, is included on the ACEnic 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 NT.**

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

---

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 loopback cable between the adapter's RX port and its TX port.**

NOTE – The external loopback test requires a loopback cable connecting the adapter's RX port to its TX port. If a loopback cable is not used, the external loopback test will fail.

---

4. **Place the ACEnic 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 \diags
```

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:**

```
>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` 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:

```
>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 v1.02
on: Thu Aug 20 15:28:34 1998
-------------------------------------------
Development and Diagnostic Test Program (ALTDIAG) v1.02

PCI bios found. v0.16.
  HW Mech #1 supported
  Number of PCI buses: 1
Alteon #0 found in PCI bus 0.
Alteon #1 found in PCI bus 0.
2 Alteon card(s) detected
Current card set to bus 0 Alteon #1.
internal Loopback Test
pkts:0  secs:0pkts:48  secs:1pkts:144  secs:2pkts:240
secs:3pkts:320  secs:4pkts:416  secs:5pkts:512  secs:6pkts:592
secs:7pkts:688  secs:8pkts:784  secs:9pkts:864  secs:10pkts:960
secs:11  1000 packets transmitted
  1000 packets received sucessfully
     0 errors detected
external Loopback Test
pkts:0  secs:0pkts:96  secs:1pkts:192  secs:2pkts:288
secs:3pkts:368  secs:4pkts:464  secs:5pkts:544  secs:6pkts:640
secs:7pkts:736  secs:8pkts:816  secs:9pkts:912  secs:10  1000 pack-
ets transmitted successfully
  1000 packets received successfully
     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

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. **Check to see that the adapter status LEDs operate as described in the following table:**

Table 5 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.

Troubleshooting Checklist

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

CAUTION—Before opening the cabinet of your system for removing or inserting the adapter, please review all precautions outlined under “Safety Precautions” on page 14.

- Inspect all cables and connections. Verify that the fiber-optic cable connections at the ACEnic adapter and Alteon WebSystems switch are attached properly. Check the length and rating of the fiber-optic cable. Make sure that the cable segment is compliant with the requirements listed in Table 4 on page 16.
- 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 broken traces or loose/broken solder connections.
- Check the configuration settings and change them if they are in conflict with another device.
- Make sure that your system is using the latest BIOS.
- Check the PCI BIOS parameters for proper configuration of the slot where the adapter is installed. The following table shows several possible PCI BIOS parameters (these may not all be available on every system):

Table 6 PCI BIOS Parameters

Parameter	Setting
Bus-Master	Enabled
Interrupt number	Set to any IRQ with does not conflict with another device
Interrupt type	Level
Latency timer	Recommended range is between 20 and 255. This is typically set to 64

- 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.

APPENDIX A

Specifications

1000BASE-SX Link Characteristics

Description	62.5 Micron	50 Micron
	Shortwave (850 nanometer multi-mode fiber)	
Operating Range	2 to 260 meters	2 to 550 meters (in compliance with IEEE 802.3-1998)

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
1000Base-SX	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	7.5 Watts 1.5A @ +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, 16 hour dwells at extremes	5% to 95% (non-condensing) 10°C/hour
Altitude	Up to 10,000 ft.	Up to 35,000 ft.
Shock	10g, 1/2 sine wave, 11 msec	60g, 1/2 sine wave, 11 msec
Vibration, peak to peak displacement	0.005 in. max (5 to 32 Hz)	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.)