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SWITCHES | WIRELESS | ROUTERS | ADAPTERS | HUBS

32 bit PCI   Copper Gigabit Adapter
10/100/1000 Mbps Gigabit Ethernet **GA302T**

DATA
1000
100
10
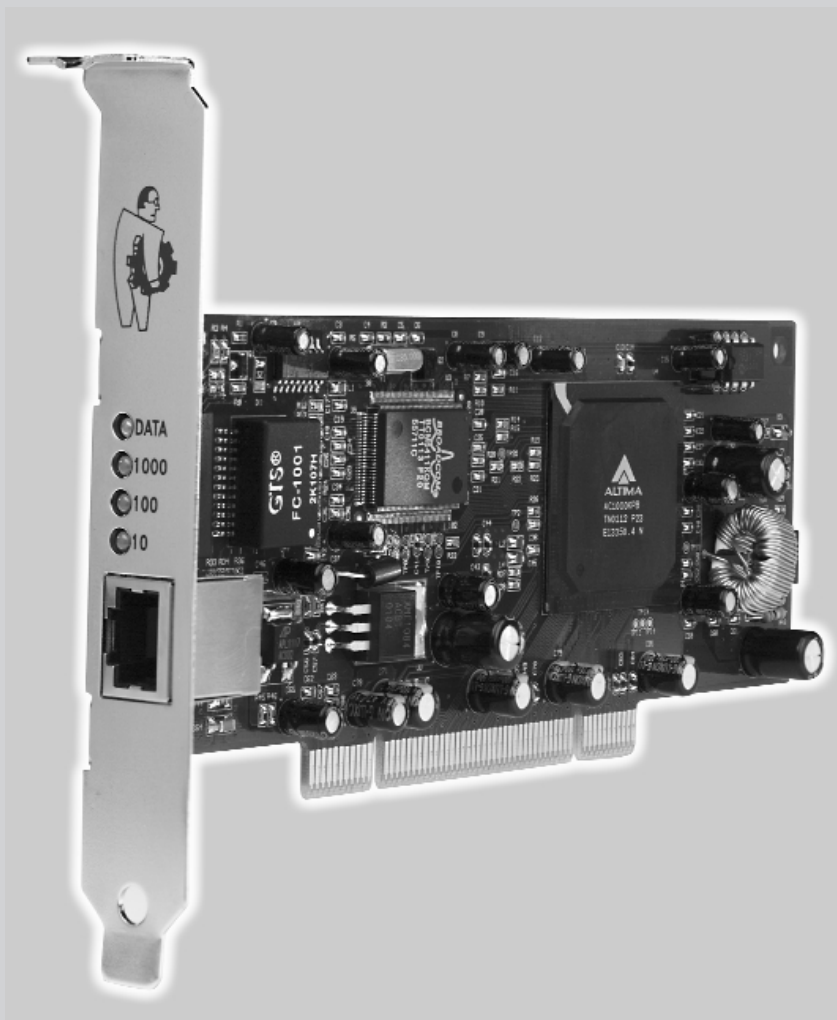
Reference Guide

Trademarks

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Statement of Conditions

In the interest of improving internal design, operational function, and/or reliability, NETGEAR reserves the right to make changes to the products described in this document without notice.

NETGEAR does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

Certificate of the Manufacturer/Importer

It is hereby certified that the NETGEAR Model GA302T Gigabit Adapters have been suppressed in accordance with the conditions set out in the BMPT-AmtsblVfg 243/1991 and Vfg 46/1992. The operation of some equipment (for example, test transmitters) in accordance with the regulations may, however, be subject to certain restrictions. Please refer to the notes in the operating instructions.

Federal Office for Telecommunications Approvals has been notified of the placing of this equipment on the market and has been granted the right to test the series for compliance with the regulations.

VCCI Statement

This equipment is in the Class B category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential areas.

When used near a radio or TV receiver, it may become the cause of radio interference.

Read instructions for correct handling.

Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice

⊖ **Note:** Modifications to this device change it from the original state it was in when tested and may alter the device so that it no longer complies with FCC testing limitations for Class B digital devices. According to FCC regulations, the user could be prohibited from operating this equipment if it is modified.

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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 B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, 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 this 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 receiver.

  • Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

  • Consult the dealer or an experienced radio/TV technician for help.

EN 55 022 Statement

This is to certify that the NETGEAR Model GA302T Gigabit Adapter are shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class B (CISPR 22).

Compliance is dependent upon the use of shielded data cables.

Canadian Department of Communications Radio Interference Regulations

These digital apparatus (NETGEAR Model GA302T Gigabit Adapter) do not exceed the Class B limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Règlement sur le brouillage radioélectrique du ministère des Communications

Ces appareils numériques (NETGEAR Model GA302T Gigabit Adapter) respectent les limites de bruits radioélectriques visant les appareils numériques de classe B prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

Customer Support

For assistance with installing and configuring your NETGEAR system or with questions or problems following installation:

• Check the NETGEAR Web page at http://www.NETGEAR.com.

• Call Technical Support at the phone number listed on the Support Information Card that shipped with your switch.

• Email Technical Support at support@NETGEAR.com.

Defective or damaged merchandise can be returned to your point-of-purchase representative.

Internet/World Wide Web

NETGEAR maintains a World Wide Web home page that you can access at the universal resource locator (URL) http://www.NETGEAR.com. A connection to the Internet and a Web browser such as Internet Explorer or Netscape are required.

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CHAPTER 1: INTRODUCTION

Congratulations on your purchase of the NETGEAR® GA302T Copper Gigabit Adapter. Designed especially for high-performance systems, such as servers and high-end workstations, it offers 2 gigabits per second (Gbps) of aggregate bandwidth and optimized performance while minimizing network overhead on the host system. This guide describes the installation and use of the GA302T for operation within a Microsoft® Windows® XP, Windows® 2000, Windows® Me, Windows® 98 or Windows® NT 4.0 environment.

This chapter provides information about the features of the GA302T. It connects your PCI-compliant workstation to a Gigabit Ethernet network, incorporating a new technology that transfers data at a rate of 1 Gbps or 1000 megabits per second (Mbps) over standard Category 5 cables.

Benefits

Performance is optimized and network overhead on the host system is minimized with the use of the GA302T Copper Gigabit Adapter.

The GA302T has demonstrated interoperability with all major Gigabit Ethernet equipment on the market that is compliant with IEEE 802.3ab standards and should work with most non-compliant Gigabit Ethernet products. In addition, because the GA302T uses standard Ethernet frame and Media Access Control (MAC) formats, it provides full compatibility with Fast Ethernet network equipment through network switches from a variety of vendors, including NETGEAR®.

The GA302T is 802.1p-compliant for frame priority tagging. Using it with 802.1p-compliant switches or routers, it offers a range of traffic prioritization of Layer 2 frames, providing a higher Quality of Service on high-speed local area networks.

Features

The key features of the GA302T Copper Gigabit Adapter are:

- Full-duplex operation (2,000 Mbps: 1,000 Mbps each way) with DMA (Direct Memory Access) Gigabit Ethernet interface (IEEE 802.3ab)

- RJ-45 connector for Category 5 unshielded twisted pair (UTP) cable

- Interoperability with existing Fast Ethernet equipment compliance with the following standards and protocols:

  - IEEE 802.3ab Gigabit Ethernet

  - IEEE 802.3u Fast Ethernet

  - IEEE 802.3 Ethernet

  - IEEE 802.3u Auto Negotiation

- Standard Ethernet frame size (up to 1,518 bytes)

- 33/66 MHz, 32/64-bit PCI bus master (Local Bus Revision 2.2 compliant) with adaptive DMA channels

- Two independent DMA channels for simultaneous read and write operations; as a bus master, the network card requests access to the PCI bus instead of waiting to be polled

- Software driver support for Windows XP, Windows 2000, Windows Me, Windows 98 and Windows NT 4.0.

- Universal dual-voltage signaling (3.3 V and 5 V)

CHAPTER 2: HARDWARE INSTALLATION —————

This chapter provides information about the package contents, system requirements, and installation of the NETGEAR GA302T Copper Gigabit Adapter.

Package Contents

The product package contains:

• GA302T Copper Gigabit Adapter

• GA302T Copper Gigabit Adapter Driver and Documentation CD

• GA302T Copper Gigabit Adapter Installation Guide

• Warranty & Registration Card

• Support Information Card

Call your reseller or customer support in your area if there are any wrong, missing, or damaged parts. Refer to the Support Information Card for the telephone number of customer support in your area.

Keep the Support Information Card, along with the original packing materials. Use the packing materials to repack the GA302T Copper Gigabit Adapter if you need to return it for repair.

To qualify for product updates and product warranty registrations, fill out the registration information within 30 days of purchase. For priority service, register online on the NETGEAR Web page at:

http://www.NETGEAR.com

You can also fill out and return the Warranty & Registration Card that is included in your product package.

Requirements

Before installing the GA302T Copper Gigabit Adapter, verify that your system meets the operating system and hardware requirements outlined in Table 2-1.

Table 2-1. Software and Hardware Requirements

System	Requirements
Windows XP	
Hardware	A Pentium-based workstation that meets Windows XP software requirements One open 32-bit or 64-bit PCI slot. Minimum 64 MB memory
Operating System	Windows XP
Software (loaded during driver installation)	GA302T Copper Gigabit Adapter driver software, version 1.0 (or higher) for Windows, which is included on the *GA302T Copper Gigabit Adapter Driver and Documentation CD* in the \ directory. The necessary files are: • GA302nd5.sys (network device driver file) • Netga302.inf (information used by installation program)
Windows 2000	
Hardware	A Pentium-based workstation or server that meets Windows 2000 software requirements One open 32-bit or 64-bit PCI slot Minimum 64 MB memory
Operating System	Windows 2000 Professional, Windows 2000 Server, or Windows 2000 Advanced Server
Software (loaded during driver installation)	GA302T Copper Gigabit Adapter driver software, version 1.0 (or higher) for Windows 2000, which is included on the *GA302T Copper Gigabit Adapter Driver and Documentation CD* in the \ directory. The necessary files are: • GA302nd5.sys (network device driver file) • Netga302.inf (information used by installation program)

Table 2-1. Software and Hardware Requirements (continued)

System	Requirements
Windows Me	
Hardware	A Pentium-based workstation that meets Windows Me software requirements One open 32-bit or 64-bit PCI slot
Operating System	Windows Me
Software (loaded during driver installation)	GA302T Copper Gigabit Adapter driver software for Windows Me, which is included on the *GA302T Copper Gigabit Adapter Driver and Documentation CD* in the \ directory. The necessary files are: • GA302nd5.sys (network device driver file) • Netga302.inf (information used by installation program)
Windows 98SE (2nd edition)	
Hardware	A Pentium-based workstation that meets Windows98SE software requirements One open 32-bit or 64-bit PCI slot
Operating System	Windows 98SE
Software (loaded during driver installation)	GA302T Copper Gigabit Adapter driver software, version 1.0 (or higher) for Windows, which is included on the *GA302T Copper Gigabit Adapter Driver and Documentation CD* in the \ directory. The necessary files are: • GA302nd4.sys (network device driver file) • Netga302.inf (information used by installation program)

Table 2-1. Software and Hardware Requirements (continued)

System	Requirements
Windows NT 4.0	
Hardware	A Pentium-based workstation or server that meets Windows NT 4.0 software requirements One open 32-bit or 64-bit PCI slot Minimum 64 MB memory
Operating System	Windows NT 4.0 with Service Pack 5 or above. To download the latest Service Pack, go to the following Microsoft Web page and search for the latest service pack: http://www.microsoft.com/downloads/search.asp
Software (loaded during driver installation)	GA302T Copper Gigabit Adapter driver software, version 1.0 (or higher) for Windows NT, which is included on the *GA302T Copper Gigabit Adapter Driver and Documentation CD* in the \Winnt directory. The necessary files are: • GA302nd4.sys (network device driver file) • Oemsetup.inf (information used by installation program; this file is in the root directory)

Hardware Description

As illustrated in Figure 2-1, the GA302T Copper Gigabit Adapter has an RJ-45 connector port and three port LEDs.
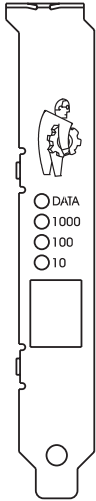

Figure 2-1. Front Panel of Model GA302T Gigabit Adapter

The front panel of the GA302T has four LEDs: one for each port speed option (10 Mbps,100 Mbps, and 1000 Mbps) to indicate which link is active, and one LED for data transfer status. Once the hardware and its driver software are properly installed on your system, the LEDs indicate the conditions described in Table 2-2.

Table 2-2. GA302T LEDs

Label	Activity	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
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
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
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

Preparing to Install Your GA302T Copper Gigabit Adapter

Follow the instructions provided in this section for installing the GA302T Copper Gigabit Adapter in your server or workstation. For additional information about performing these tasks on your particular system, refer to the manuals included with your system hardware.

Before installing your Gigabit Adapter:

1. Make sure that your system meets the hardware and software requirements provided in Table 2-1.

2. Make sure that your system uses the latest BIOS.

3. Turn off the power to your PC.

   If you are running Windows, close all applications and click Start from the desktop menu, select Shut Down, and then select Shut down the computer.

hardware installation   2-6

> ⚠ **Danger:** You are installing the card in a machine that operates with voltages that can be dangerous. Follow the steps after this warning to protect yourself and to prevent damage to the PC components.

4. Protect yourself, the card, and your server by taking these precautions:

   - Shut down the server software and turn off the power to your server.

   - Use only insulated or non-conducting tools.

   - Hold the Gigabit Adapter by the edges and place it on an antistatic surface only.

   - Check the card for visible signs of damage, particularly to the connector on the edge of the card. Never attempt to install a damaged card.

Installing Your GA302T Copper Gigabit Adapter

To install your GA302T Copper Gigabit Adapter:

1. Remove the PC cover.

2. Choose an available 32-bit or 64-bit PCI expansion slot (PCI slots are usually the shorter slots) and remove the corresponding back plate from the PC chassis.

⊖ **Note:** The connector dock in a 64-bit PCI slot is longer than in a 32-bit PCI slot. When installed in a 64-bit PCI slot, part of the PCI slot remains open. This situation is normal.

3. Insert the card into the PCI expansion slot.

⊖ **Note:** To avoid damaging any components on the card, handle it by the edges, using your thumbs to push it securely into the PCI slot. Do not use excessive force, but make sure the card is fully inserted into the slot to prevent the PC operating system from freezing at startup.

4. Fasten the card to the rear of the computer chassis by tightening the screw that is on the PC.

5. Replace the PC cover and reconnect the power cord to the PC.

Connecting the Network Cables

The GA302T has one RJ-45 connector used for attaching the system to an Ethernet copper-wire segment. The card will automatically negotiate the fastest connection speed and duplex possible. If a specific speed or duplex is desired, the card can be placed into one of the supported modes: 1000 Mbps full duplex; 100 Mbps full duplex, 100 Mbps half duplex; 10Mbps full duplex, 10Mbps half duplex.

1. Prepare an appropriate cable.

   Table 2-3 lists the cable characteristics for connecting to 10/100/1000BASE-T ports.

Table 2-3. GA302T (10/100/1000BASE-T) Cable Characteristics

Port Type	Connector	Media	Maximum Distance
10/100/1000BASE-T	RJ-45	CAT 5 UTP/CAT 5e UTP	325 feet (100 meters)

⊖ **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.

2. Connect one end of the cable to the GA302T Copper Gigabit Adapter.

3. Connect the other end of the cable to an RJ-45 Ethernet network port.

4. Turn on power to the PC and then to the connected device.

5. Verify that one of the two link speed LEDs is on, indicating that there is a good link to the card.

⊖ **Note:** See Table 2-2 for a description of port LED operation. See Chapters 3 through 7 for driver installation and configuration instructions.

CHAPTER 3: WINDOWS XP DRIVER SOFTWARE ──────

This chapter provides information about the Microsoft Windows XP driver software.

This chapter also describes how to:

• Install the driver software in the Windows XP environment

• Move the card to a different slot

• Remove the driver software

⊖ **Note:** The GA302T Copper Gigabit Adapter must be physically installed in your server or workstation prior to installing the driver software. See Chapter 2 "Hardware Installation" for details.

Installing the Driver Software

When the Windows XP system first boots up after installing a new hardware device, such as a GA302T Copper Gigabit 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 GA302T Copper Gigabit Adapter can be used with your Windows XP system. You must have Network Administrator privileges to install the driver software.

**To install software for Windows XP, perform the following procedure.**

1. When you boot up he Windows XP system after installing the GA302ᴛ Gigabit
   Adapter, a Found New Hardware Wizard dialog box is displayed. Select "Install
   from a list or specific location (Advanced)" and then click Next.
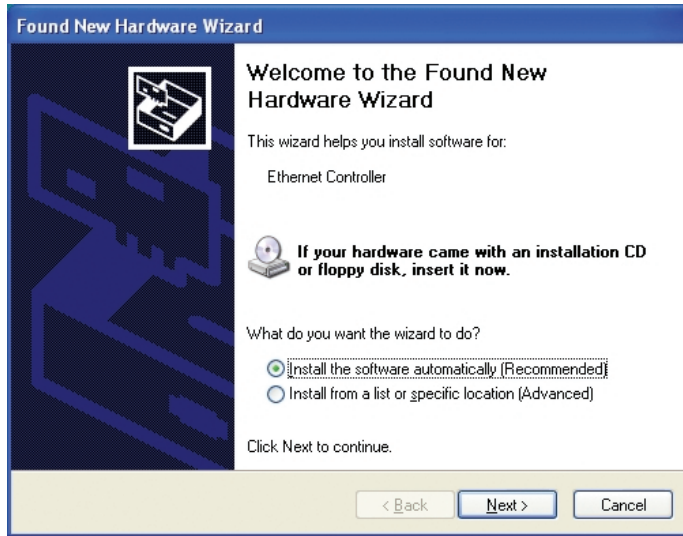
2. Insert the GA302ᴛ driver CD into your CD-ROM drive.

3. The choose your search and installation options dialog box will appear. Click on "Search for the best driver in these locations", uncheck "Search removable media (floppy, CD-ROM...)", check "Include this location in the search", type in "D:\ " in the drop down box.   Click Next.

(Note: Windows XP drivers are found at D:\ assuming that D:\ is the drive letter for the CD-ROM drive).
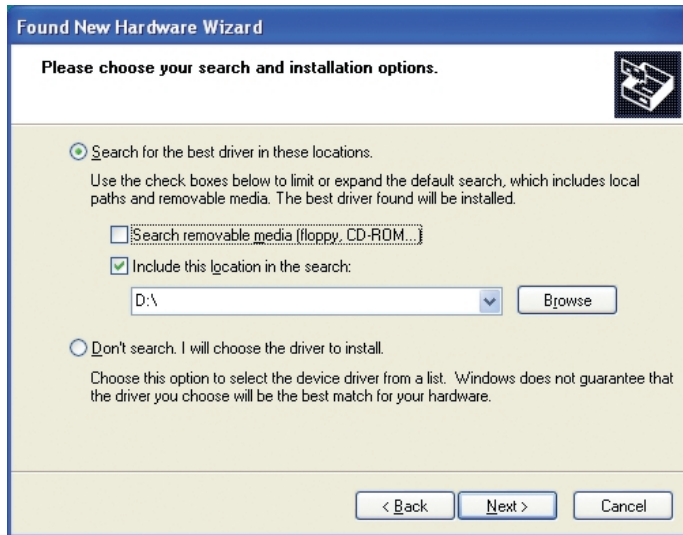
4. The driver is copied onto your system, and XP will probably ask for the original Windows XP CD-ROM. Point Windows XP to the proper location (e.g. D:\i386)
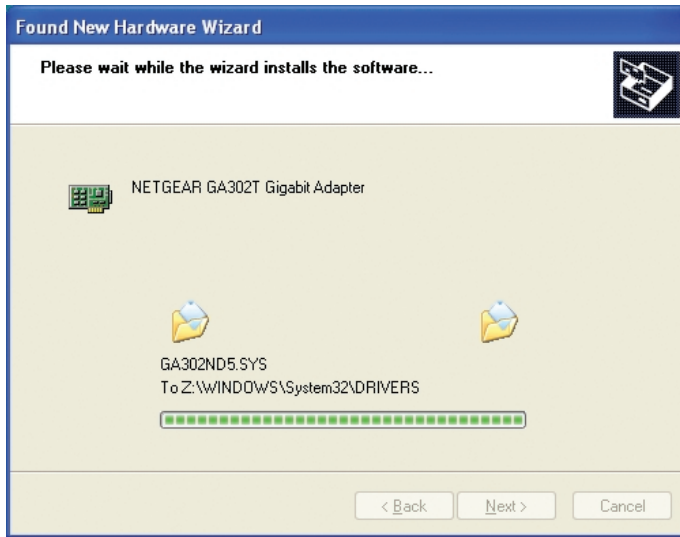
5. The Completing the Found New Hardware Wizard dialog box appears with the following adaptor name: NETGEAR GA302T Gigabit Adaptor. Click Finish.
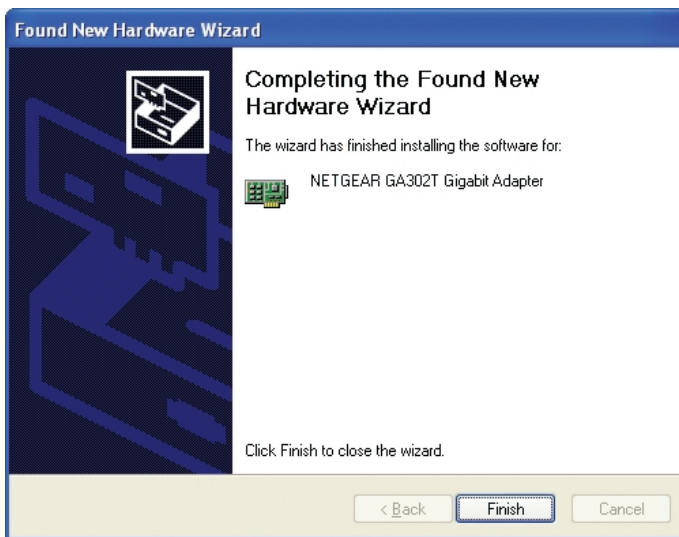
6. Remove the GA302T driver CD from the CD-ROM drive.

The GA302T Windows XP drivers installation is complete.

Table 3-1. Refer to the following table for help to configure optional adapter properties.

Properties:	Description:
802.1p QOS	The 802.1p Quality of service (QOS) is an OSI layer 2 standard for prioritizing network traffic at the data link sublayer. Tag is recognized by 802.1p aware switches and routers.
Checksum Offload	Supports hardware offload of checksum in the transmit and receive directions. When enabled, this option allows the card to verify the TCP/IP checksum of incoming (Rx) and/or outgoing (Tx) packets. This improves the TCP/IP transmit/receive per formance by offloading this operation from the CPU.
Speed & Duplex	A performance option that allows you to choose how the card transmits and receive packets over the network.

Moving the Network Card to a Different Slot

Windows XP automatically detects the installation and removal of hardware. To move a GA302T Copper Gigabit Adapter to a different slot in the same system, you need to do the following:

1. Shut down the system and remove the card from the PCI slot.

2. Install the card in its new PCI slot (see "Installing Your Gigabit Adapter" on page 2-7).

3. When the system is powered on, reinstall the driver software (see "Installing the Driver Software" on page 5-1).

Removing the Driver Software

Under Windows XP, the driver software is automatically uninstalled when its hardware is removed. To remove a card, do the following:

1. Shut down the system and remove the card from the PCI slot.

2. When the system is powered on, the driver will be automatically uninstalled.

CHAPTER 4: WINDOWS 2000 DRIVER SOFTWARE ───

This chapter provides information about the Microsoft Windows 2000 driver software.

This chapter also describes how to:

• Install the driver software in the Windows 2000 environment

• Move the card to a different slot

• Remove the driver software

⊖ **Note:** The GA302T Copper Gigabit Adapter must be physically installed in your server or workstation prior to installing the driver software. See Chapter 2 ''Hardware Installation'' for details.

Installing the Driver Software

When the Windows 2000 system first boots up after installing a new hardware device, such as a GA302T Copper Gigabit 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 GA302T Copper Gigabit Adapter can be used with your Windows 2000 system. You must have Network Administrator privileges to install the driver software.

To install software for Windows 2000, perform the following procedure.

1. When you boot up the Windows 2000 system after installing the GA302T Copper Gigabit Adapter. A Found New Hardware Wizard dialog box will appear, indicating that Windows 2000 has found the adapter. Click Next.
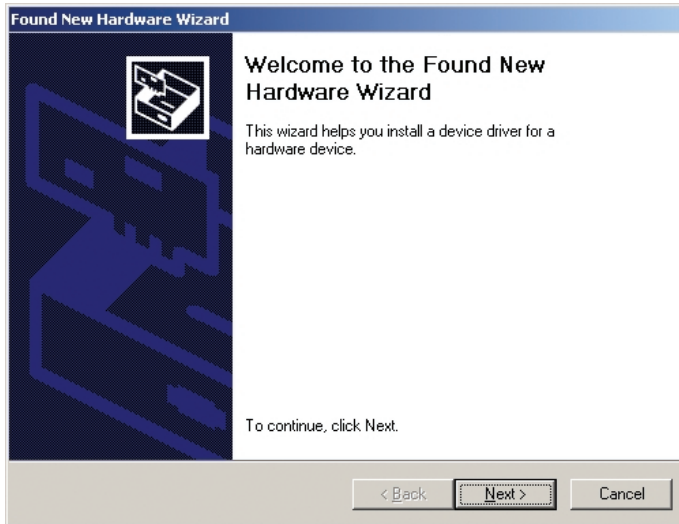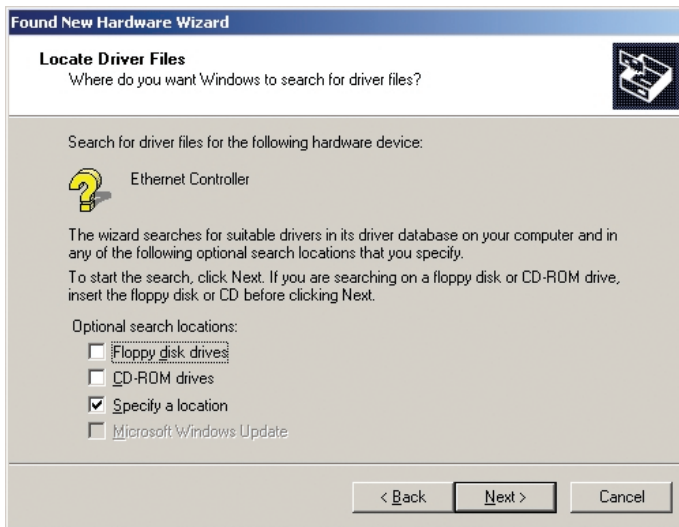

2. Insert the GA302т driver CD into your CD-ROM drive.

3. The install hardware device drivers dialog box will appear. Select "Search for a suitable driver for your device (Recommended)". Click Next.
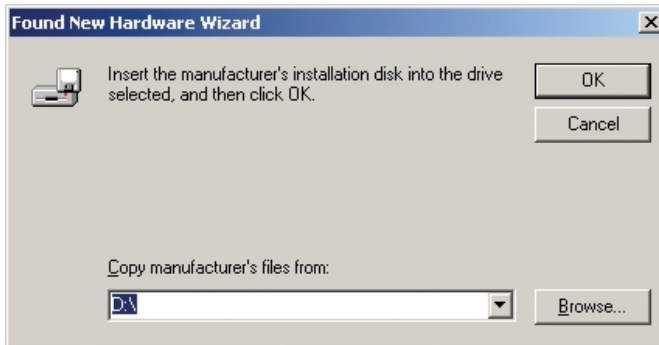

4. The Locate Driver Files dialog box will appear. Select "Specify a location". Click Next.
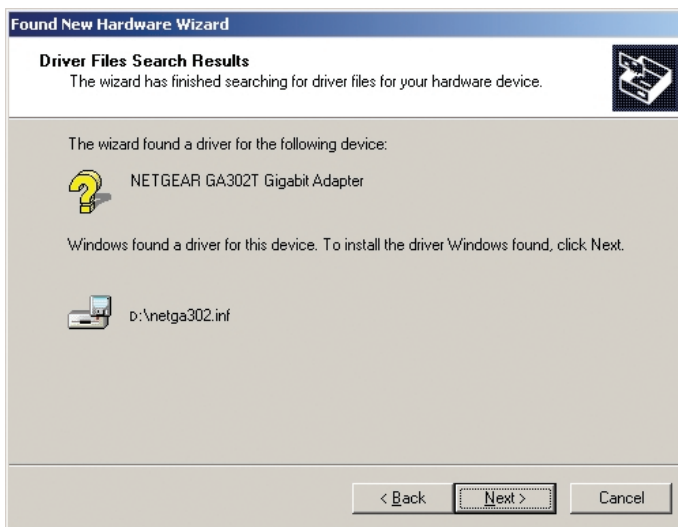
5. When the Found New Hardware Wizard dialog box appears, insert the GA302T driver CD into your CD-ROM drive. In the "Copy manufactures files from" field, type "D:\" and click OK.

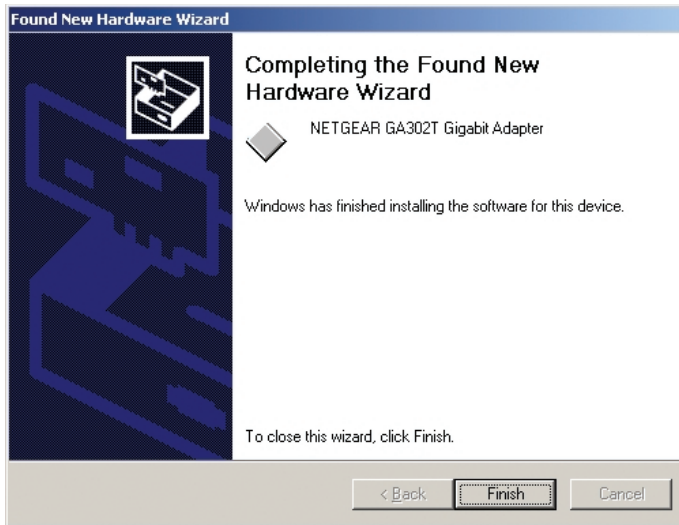(Note: Windows 2000 drivers are found at D:\ , assuming that D: is the drive letter for the CD-ROM drive)

6. The Driver File Search Results dialog box will appear. Click Next.

Windows 2000 driver software   4-4

7. The Completing the Found New Hardware Wizard dialog box appears with the following adapter name: Netgear GA302T Gigabit Adapter. Click Finish.

8. Remove the GA302T driver CD from the CD-ROM drive.

The GA302T Windows 2000 driver installation is complete.

Table 4-1. Refer to the following table for help to configure optional adapter properties.

Properties:	Description:
802.1p QOS	The 802.1p Quality of service (QOS) is an OSI layer 2 standard for prioritizing network traffic at the data link sublayer. Tag is recognized by 802.1p aware switches and routers.
Checksum Offload	Supports hardware offload of checksum in the transmit and receive directions. When enabled, this option allows the card to verify the TCP/IP checksum of incoming (Rx) and/or outgoing (Tx) packets. This improves the TCP/IP transmit/receive performance by offloading this operation from the CPU.
Speed & Duplex	A performance option that allows you to choose how the card transmits and receive packets over the network..

Moving the Network Card to a Different Slot

Windows 2000 automatically detects the installation and removal of hardware. To move a GA302T Copper Gigabit Adapter to a different slot in the same system, you need to do the following:

1. Shut down the system and remove the card from the PCI slot.

2. Install the card in its new PCI slot (see "Installing Your Gigabit Adapter" on page 2-7).

3. When the system is powered on, reinstall the driver software (see "Installing the Driver Software" on page 5-1).

Removing the Driver Software

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

1. Shut down the system and remove the card from the PCI slot.

2. When the system is powered on, the driver will be automatically uninstalled.

CHAPTER 5: WINDOWS ME DRIVER SOFTWARE ——

This chapter provides information about the Microsoft Windows Me driver software.

This chapter also describes how to:

• Install the driver software in the Windows Me environment

• Move the card to a different slot

Installing the Driver Software

A network driver must be installed before the card can be used with your Windows Me system.

⊖ **Note:** The Gigabit Adapter must be physically installed in your system prior to installing the driver software. See Chapter 2 ''Hardware Installation,'' for details.

When the Windows Me System first boots up after installing a new hardware device, such as a GA302T Copper Gigabit Adapter, the system automatically detects the new hardware and prompts you to install the driver software for the device.

To install software for Windows Me, perform the following procedure.

1. Windows Me will automatically detect the new PCI Ethernet controller hardware and opens a Found New Hardware Wizard dialog box. Click Next.
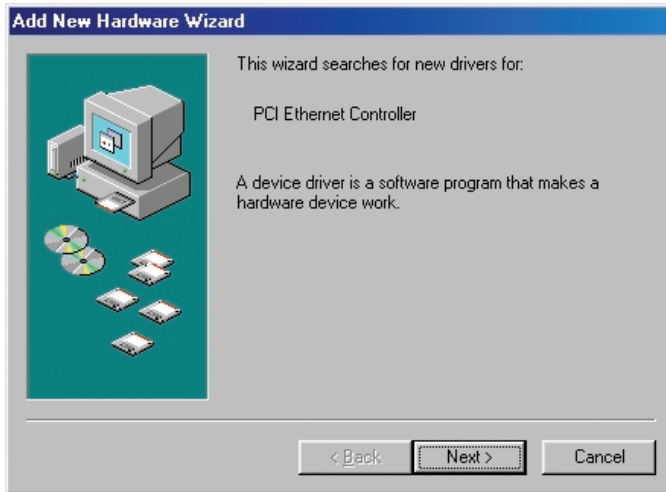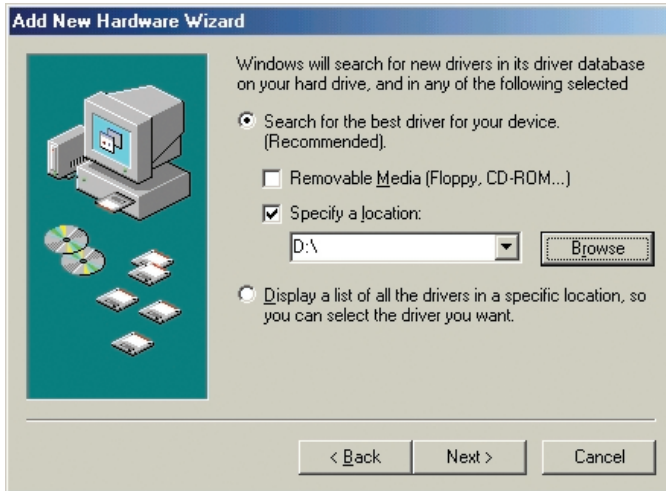
2. When the following dialog box opens, select "Search for the best driver for your device (Recommended)". Click Next.

3. Insert the GA302ᴛ driver CD into your CD-ROM drive.

4. In the next dialog box, check the "Specify a location" box and type in " D:\ " in the drop down box.

(Note: Windows Me drivers are found at D:\, assuming that D:\ is the drive letter for the CD-ROM drive).

5. The next window will open saying that Windows is now ready to install the Netgear GA302ᴛ driver. Click Next.

6. The driver is copied onto your system, and Windows Me will probably ask for the original Windows Me CD-ROM. Point Windows Me to the proper location(e.g. D:\win9x).The next Windows appears with the following adapter name: NETGEAR GA302ᴛ Gigabit Adapter. Click Finish.

7. Once the driver is installed, Windows Me will ask if you want to restart your PC. Remove the GA302т driver CD from the CD-ROM drive and click Yes to reboot.

The GA302т Windows Me installation is complete.

Table 5-1. Refer to the following table for help to configure optional adapter properties.

Properties:	Description:
802.1p QOS	The 802.1p Quality of service (QOS) is an OSI layer 2 standard for prioritizing network traffic at the data link sublayer. Tag is recognized by 802.1p aware switches and routers.
Checksum Offload	Supports hardware offload of checksum in the transmit and receive directions. When enabled, this option allows the card to verify the TCP/IP checksum of incoming (Rx) and/or outgoing (Tx) packets. This improves the TCP/IP transmit/receive performance by offloading this operation from the CPU.
Speed & Duplex	A performance option that allows you to choose how the card transmits and receive packets over the network.

Moving the Network Card to a Different Slot

Windows Me automatically detects the installation and removal of hardware. To move a GA302T Copper Gigabit Adapter to a different slot in the same system:

1. Shut down the system and remove the card from the PCI slot.

2. Install the card in its new PCI slot (see ''Installing Your Copper Gigabit Adapter'' on page 2-7).

3. When the system is powered on, reinstall the driver software (see ''Installing the Driver Software'' on page 3-1).

CHAPTER 6: WINDOWS 98 DRIVER SOFTWARE ——

This chapter provides information about the Microsoft Windows 98 driver software.

This chapter also describes how to:

• Install the driver software in the Windows 98 environment

• Move the card to a different slot

Installing the Driver Software

A network driver must be installed before the card can be used with your Windows 98 system.

⊖   **Note:** The Gigabit Adapter must be physically installed in your system prior to installing the driver software. See Chapter 2 ''Hardware Installation,'' for details.

When the Windows 98 System first boots up after installing a new hardware device, such as a GA302T Copper Gigabit Adapter, the system automatically detects the new hardware and prompts you to install the driver software for the device.

To install software for Windows 98, perform the following procedure.

1. Windows 98 will automatically detect the new PCI Ethernet controller hardware and opens a Found New Hardware Wizard dialog box. Click Next.
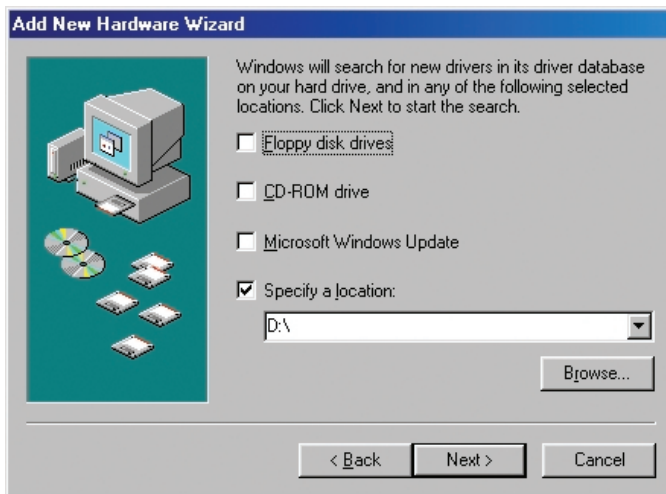

2. When the following dialog box opens, select "Search for the best driver for your device (Recommended)". Click Next.

3. When the next dialog box opens, insert the GA302T driver CD into your CD-ROM drive, check the "Specify a location" box and enter "D:\ " in the drop down box. Click Next.

(Note: Windows 98 drivers are found at D:\ , assuming that D: is the drive letter for the CD-ROM drive).

4. When Windows returns its search results in the following dialog box, click next to start install the GA302T adapter driver.

Add New Hardware Wizard

Windows driver file search for the device:

NETGEAR GA302T Gigabit Adapter

Windows is now ready to install the best driver for this device. Click Back to select a different driver, or click Next to continue.

Location of driver:

D:\NETGA302.INF

< Back   Next >   Cancel

5. The driver is copied onto your system, and Windows 98 will probably ask for the original Windows 98 CD-ROM. Point Windows 98 to the proper location(e.g. D:\win98). The next Windows appears with the following adapter name: NETGEAR GA302T Gigabit Adapter. Click Finish.

6. Once the driver is installed, Windows 98 will ask if you want to restart your PC. Remove the GA302T driver CD from the CD-ROM drive and click Yes to reboot.

The GA302T Windows 98 driver installation is complete.

Table 6-1. Refer to the following table for help to configure optional adapter properties.

Properties:	Description:
802.1p QOS	The 802.1p Quality of service (QOS) is an OSI layer 2 standard for prioritizing network traffic at the data link sublayer. Tag is recognized by 802.1p aware switches and routers.
Checksum Offload	Supports hardware offload of checksum in the transmit and receive directions. When enabled, this option allows the card to verify the TCP/IP checksum of incoming (Rx) and/or outgoing (Tx) packets. This improves the TCP/IP transmit/receive performance by offloading this operation from the CPU.
Speed & Duplex	A performance option that allows you to choose how the card transmits and receive packets over the network.

Moving the Network Card to a Different Slot

Windows 98 automatically detects the installation and removal of hardware. To move a GA302T Copper Gigabit Adapter to a different slot in the same system:

1. Shut down the system and remove the card from the PCI slot.

2. Install the card in its new PCI slot (see "Installing Your Copper Gigabit Adapter" on page 2-7).

3. When the system is powered on, reinstall the driver software (see "Installing the Driver Software" on page 3-1).

CHAPTER 7: WINDOWS NT 4.0 DRIVER SOFTWARE ────────

This chapter provides information about the Microsoft Windows NT 4.0 driver software.

This chapter also gives directions for performing the following procedures:

• Installing the driver software

• Updating or reinstalling the driver software

• Moving the network card and removing the driver software

Installing the Driver Software

Your GA302T Copper Gigabit Adapter must be physically installed in the
server before installing the software driver. If you are installing more than one GA302T
Copper Gigabit Adapter, you must perform the following procedure for each card.

To install the driver software if you are operating in a Windows NT 4.0 environment:

1. Start your Windows NT 4.0 system and log in.

   You must have Network Administrator privileges to install the driver software.
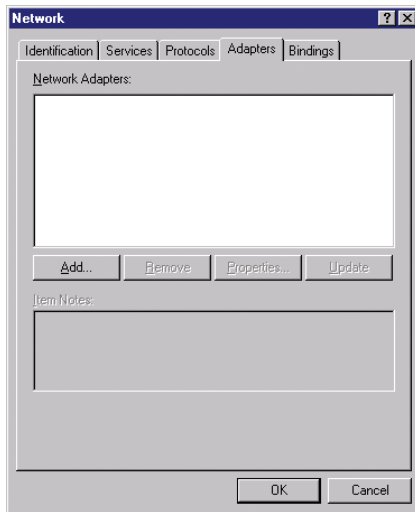
2. On the Windows taskbar, click the Start button, point to Settings, and then click
   Control Panel.

   The Control Panel window opens, displaying a group of icons including the Network
   icon. Double-click on the network icon.
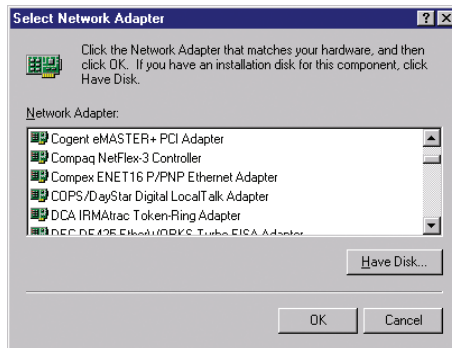

   Network

3. The network dialog box opens, which displays a list of installed components. Click on the adapter tab, and then click the Add button.
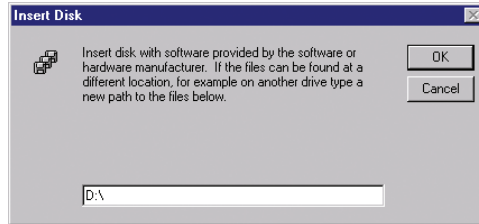

4. The select network adapter dialog box opens, click the Have Disk button.

5. The insert dialog box opens, insert the GA302T driver CD into your CD-ROM drive Type "D:\ " into the dialog box and click OK.

(Note: Windows NT 4.0 drivers are found at D:\, assuming that D: is the drive letter for the CD-ROM drive).


6. The select OEM Option dialog box opens, high light the NETGEAR GA302T Gigabit Adapter and click OK.
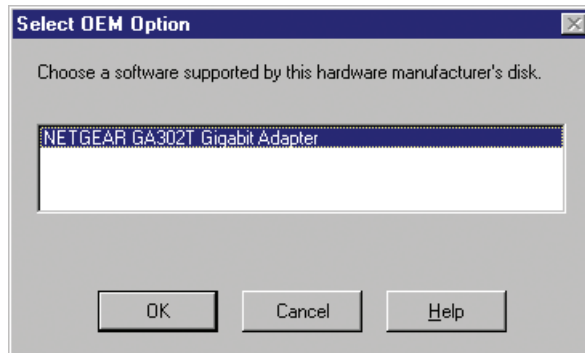
7. The driver is copied onto your system, and NT 4.0 will probably ask for the original Windows NT 4.0 CD-ROM. Point Windows NT 4.0 to the proper location (e.g. D:\i386). Adapter property dialog box opens, click Continue to accept the default parameters.
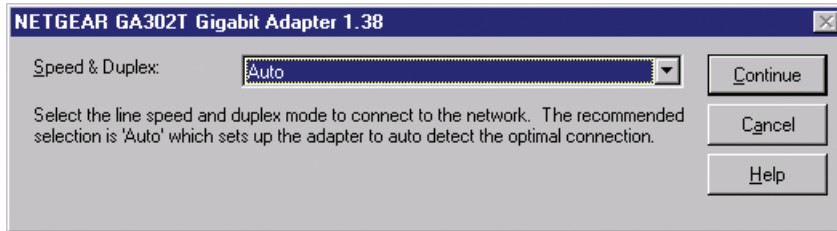
8. If other cards in your system use TCP/IP bindings, the Microsoft TCP/IP properties dialog box will open. Set any necessary TCP/IP configurations and click Close.
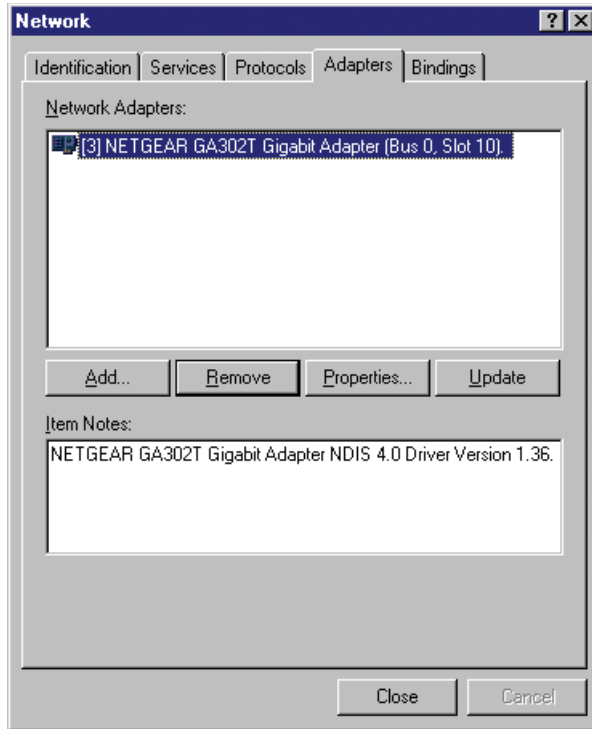
9. When prompted to restart your computer, remove your driver CD from the CD-ROM drive and click OK.

The GA302T Windows NT 4.0 driver installation is complete.

Table 7-1. Refer to the following table for help to configure optional adapter property.

Speed & Duplex	A performance option that allows you to choose how the card transmits and receive packets over the network.

Updating the Driver Software

To replace old driver software with a newer version:

1. Start your Windows NT 4.0 system and log in.

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

2. On the Windows taskbar, click the Start button, point to Settings, and then click Control Panel.

    The Control Panel window opens.

3. Double-click the Network icon.

4. Click on the Adapters tab.

    Any previously installed software drivers are listed in the Network Adapters list.

5. Click on the adapter that you want to update.

6. Click Update.

    The Select Network Adapter dialog box opens.

7. When prompted, insert the *GA302T Copper Gigabit Ethernet Card Driver and Documentation CD* into the CD-ROM drive in your PC.

8. Type the path that matches the CD-ROM drive on your system, and then click OK.

    For example, enter the following path:

    ```
    E:\
    ```

    In this example, the letter E: is the CD-ROM drive.

9. Click Close in the Network Dialog box when the copying process is complete.

10. When prompted to restart your computer, click Yes.

The system restarts using the new driver and the default configuration settings.

Moving the Network Card to a Different Slot

Before moving your GA302T Copper Gigabit Adapter to a different slot in the same system, you must first remove the card driver software. After removing the driver software, you can move the card to a different slot and reinstall the driver software.

To remove the driver software:

1. Start your Windows NT 4.0 system and log in.

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

2. On the Windows taskbar, click the Start button, point to Settings, and then click Control Panel.

    The Control Panel window opens.

3. Double-click the Network icon.

    The Network dialog box opens.

4. Click on the Adapter tab.

    Any previously installed driver is listed in the Network Adapters list.

5. Click on the network card you want to remove, and then click Remove.

    Repeat step 5 for each network card that you want to remove.

6. Click Close.

7. When prompted to restart your computer, click No.

8. Shut down your computer.

Install the network card in a new slot by following the instructions in ''Installing Your Copper Gigabit Adapter'' on page 2-7, and then install the network drivers by following the instructions in ''Installing the Driver Software'' on page 4-1.

CHAPTER 8: TROUBLESHOOTING

This chapter provides troubleshooting information for the NETGEAR GA302T Copper Gigabit Adapter.

Checking the Port LEDs

GA302T Copper Gigabit Adapter

The front panel of the GA302T has four LEDs: one for each port speed option (10Mbps, 100 Mbps and 1000Mbps) to indicate which link is active, and one LED for data transfer status (see Figure 2-1 on page 2-5).

Before the port LEDs can provide troubleshooting information, the card must be connected to the network (see Chapter 2), and the network drivers for your particular operating system must be installed (see Chapter 3 through Chapter 7).

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

2. Verify that the card status LEDs operate as described in the Table 8-1.

Table 8-1. GA302T (10/100/1000BASE-T) Port LED Activity

Label	Activity	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
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
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
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

Using a Troubleshooting Checklist

If you need to test the network card further, check the following items:

- Inspect all cables and connections. Check the length and rating of the cable. Make sure that the cable segment is compliant with the requirements shown in Table 2-3 on page 2-8.

- Connect the network card to a different network port and run the tests again. If successful, the original network port may be defective or improperly configured.

- Check the network card installation by reviewing Chapter 2, "Hardware Installation." Make sure that the network card 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 card is installed. Table 8-2 shows several possible PCI BIOS parameters. (These parameters may not all be available on every system.)

Table 8-2. PCI BIOS Parameters

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

- Try inserting the network card in another slot. If the new position works, the original slot in your system may be defective.

- Replace the failed network card with one that is known to work properly. If the second card works in the slot where the first one failed, the original card is probably defective.

- Install the network card in another functioning system and run the tests again. If the card passed the tests in the new system, the original system may be defective.

- Remove all other network cards from the system and run the tests again. If the card passes the tests, the other cards might be causing conflict.

APPENDIX A: SPECIFICATIONS

This appendix provides specifications for the NETGEAR GA302T Copper Gigabit Adapter.

Cable Specifications GA302T (10/100/1000BASE-T)

Port Type	Connector	Media	Maximum Distance
10/100/1000BASE-T	RJ-45	CAT 5 UTP/CAT 5e UTP	325 feet (100 meters)

⊖ **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.

Technical Specifications

General Specifications	NETGEAR GA302T Copper Gigabit Adapter
Standards Compatibility	IEEE 802.3ab 1000BASE-T Gigabit Ethernet IEEE 802.3u 100BASE-TX Fast Ethernet IEEE 802.3 10BASE-T Ethernet IEEE 802.3u Auto Negotiation
GA302T Network Connection	RJ-45 connector for Category 5 UTP cable Full-duplex 2000 Mbps (1000 Mbps each way) Gigabit Ethernet
Host Connection	64-bit, 66/33 MHz PCI slot 32-bit, 33 MHz PCI slot PCI rev 2.2 compliant
DC Operating Voltage	+5V +/- 5%
Power Consumption	3.1 watts, maximum
Dimensions	6.41 x 2.63 in. (16.3 x 6.7 cm)
Weight	3.7 oz. (100 g)

General Specifications	NETGEAR GA302T Copper Gigabit Adapter
Operating Temperature	0° to 55° C
Storage Temperature	-10° to 70° C
Operating Humidity	10% to 90% noncondensing
Agency Compliance	FCC Class B, CE mark, VCCI, C-Tick

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