

# Gigabit Ethernet Network Adapters

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**AT-2916T**

**AT-2971SX**

**AT-2971T**

## Installation Guide

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# Electrical Safety and Emissions Standards

This product meets the following standards.

## Federal Communications Commission Interference Statement

### Declaration of Conformity

Manufacturer Name: Allied Telesis, Inc.

Declares that the product: **Gigabit Ethernet Adapters**

Model Numbers: **AT-2916T, AT-2971T, AT-2971SX**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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 or television reception. 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 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 help.

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

- (1) This device must not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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

### IMPORTANT NOTE:

#### FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IEEE802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

## Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

## European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment

This Allied Telesis RoHS-compliant product conforms to the European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment. Allied Telesis ensures RoHS conformance by requiring supplier Declarations of Conformity, monitoring incoming materials, and maintaining manufacturing process controls.

RFI Emissions

FCC Class B, EN55022 Class B, VCCI Class B, C-TICK, CE

Immunity

EN55024


Electrical Safety      EN60950 (TUV), UL 60950 (cUL<sub>US</sub>)



Laser Safety      EN60825

## Translated Safety Statements

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**Important:** The  indicates that a translation of the safety statement is available in a PDF document titled “Translated Safety Statements” (613-000405) on the Allied Telesis website at [www.alliedtelesis.com](http://www.alliedtelesis.com).

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# Preface

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This guide contains instructions on how to install the AT-29xx Series Gigabit Ethernet network adapters.

The Preface contains the following sections:



- “Safety Symbols Used in this Document” on page 10
- “Where to Find Web-based Guides” on page 11
- “Contacting Allied Telesis” on page 12

## Safety Symbols Used in this Document

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This document uses the safety symbols defined in Table 1.

Table 1. Safety Symbols

Symbol	Meaning	Description
	Caution	Performing or omitting a specific action may result in equipment damage or loss of data.
	Warning	Performing or omitting a specific action may result in electrical shock.

## Where to Find Web-based Guides

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The installation and user guides for all Allied Telesis products are available in portable document format (PDF) on our web site at **[www.alliedtelesis.com](http://www.alliedtelesis.com)**. You can view the documents online or download them onto a local workstation or server.

## Contacting Allied Telesis

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This section provides Allied Telesis contact information for technical support as well as sales and corporate information.

### Online Support

You can request technical support online by accessing the Allied Telesis Knowledge Base: [www.alliedtelesis.com/support/kb.aspx](http://www.alliedtelesis.com/support/kb.aspx). You can use the Knowledge Base to submit questions to our technical support staff and review answers to previously asked questions.

### Email and Telephone Support

For Technical Support via email or telephone, refer to the Support & Services section of the Allied Telesis web site: [www.alliedtelesis.com](http://www.alliedtelesis.com). Select your country from the list displayed on the website. then select the appropriate menu tab.

### Warranty

For hardware warranty information, refer to the Allied Telesis web site: [www.alliedtelesis.com/support/warranty](http://www.alliedtelesis.com/support/warranty).

### Returning Products

Products for return or repair must first be assigned a return materials authorization (RMA) number. A product sent to Allied Telesis without an RMA number will be returned to the sender at the sender's expense.

To obtain an RMA number, contact the Allied Telesis Technical Support group at our web site: [www.alliedtelesis.com/support/rma](http://www.alliedtelesis.com/support/rma). Select your country from the list displayed on the website. Then select the appropriate menu tab.

### Sales or Corporate Information

You can contact Allied Telesis for sales or corporate information through our web site: [www.alliedtelesis.com](http://www.alliedtelesis.com). To find the contact information for your country, select Contact Us -> Worldwide Contacts.

### Management Software Updates

New releases of management software for our managed products are available from either of the following Internet sites:

- Allied Telesis web site: [www.alliedtelesis.com](http://www.alliedtelesis.com)
- Allied Telesis FTP server: <ftp://ftp.alliedtelesis.com>

If you prefer to download new software from the Allied Telesis FTP server from your workstation's command prompt, you will need FTP client software and you must log in to the server. Enter "anonymous" for the user name and your email address for the password.

## Chapter 1

# Introduction to the AT-29xx Series Gigabit Ethernet Network Adapters

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This chapter provides an introduction to the Allied Telesis AT-29xx Series Gigabit Ethernet network adapters and contains the following sections:

- “Functional Description” on page 14
- “Features” on page 15
- “LEDs” on page 16

## Functional Description

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The AT-29xx Series Gigabit Ethernet network adapters target the increased congestion experienced at the backbone and server in today's networks and it provides a future upgrade path for high-end workstations that require more bandwidth than Fast Ethernet can provide.

The adapter connects a PCI compliant server or workstation to a Gigabit Ethernet network. The adapter incorporates a technology that transfers data at a maximum rate of 2Gbps—20 times the rate of Fast Ethernet adapters.

The AT-29xxSX Series of Gigabit Ethernet adapters includes the following models:

- AT-2916T
- AT-2971SX
- AT-2971T

The AT-2916T adapter is a 33/66Mhz 32-bit interface (PCI) card. The AT-2971SX and AT-2971T adapters are 33-133Mhz 32-bit and 64-bit interface (PCI) cards.

### Contents of Your Shipment

Included with your adapter are the following items:

- Antistatic bag (used for protecting the adapter when stored or shipped). Keep the adapter in its packaging until ready for installation.
- Low-profile bracket

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. See "Returning Products" on page 12.

The documentation for these adapters is available in portable document format (PDF) on our web site at [www.alliedtelesis.com](http://www.alliedtelesis.com). You can view the documents online or download them onto a local workstation or server.

## Features

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Following is a list of the AT-29xx Series Gigabit Ethernet network adapters features for all of the supported operating systems:

- TCP, UDP, and IP checksum calculation
- Jumbo frames (9 KB)
- TCP segmentation (large send off-load)
- PXE support
- Advanced power management/wake on LAN
- Flow Control (IEEE 802.3X)
- Trunking
- Redundant switch failover
- Hot-plug
- Parity checking
- On-board sensors
- VLAN support
- Layer 2 Priority Encoding (802.1P)
- Integrated 96 KB Frame Buffer Memory

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**Note**

Novell NetWare 5.1 does not support Jumbo Frames.

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- Load balancing on Windows Server 2003, Windows XP, Windows Vista, both 32- and 64-bit versions

## LEDs

Each adapter has a set of LEDs as shown in the following illustrations and tables:

- “AT-2916T,” next
- “AT-2971SX” on page 17
- “AT-2971T” on page 18

**AT-2916T** The AT-2916T Gigabit Ethernet adapter has one copper port and five LEDs, as shown in Figure 1 and described in Table 1.

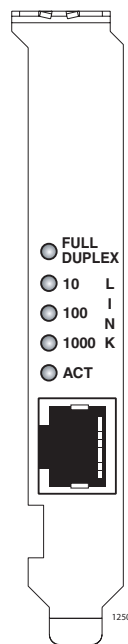


Figure 1. AT-2916T Gigabit Ethernet Adapter

Table 1. AT-2916T LEDs

LED	Color	State	Description
FULL DUPLEX	Green	On	Full-duplex.
		Off	Half-duplex
10	Green	On	A valid link has been established at 10 Mbps.
		Off	No valid link at 10 Mbps.



Table 1. AT-2916T LEDs (Continued)

LED	Color	State	Description
100	Green	On	A valid link has been established at 100 Mbps.
		Off	No valid link at 100 Mbps.
1000	Green	On	A valid link has been established at 1000 Mbps.
		Off	No valid link at 1000 Mbps.
ACT	Green	On	The adapter is receiving or transmitting data.
		Off	The adapter is not receiving or transmitting data.

**AT-2971SX** The AT-2971SX Gigabit Ethernet adapter has one fiber port and two LEDs, as shown in Figure 2 and described in Table 2.

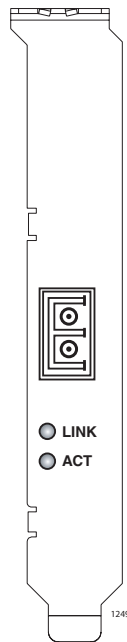


Figure 2. AT-2971SX Gigabit Ethernet Adapter

Table 2. AT-2971SX LEDs

LED	Color	State	Description
1000/LINK	Green	On	A valid link has been established at 1000 Mbps.
		Off	No valid link at 1000 Mbps.
ACT	Green	On	The adapter is receiving or transmitting data.
		Off	The adapter is not receiving or transmitting data.

**AT-2971T** The AT-2971T Gigabit Ethernet adapter has one copper port and four LEDs, as shown in Figure 3 and described in Table 3.

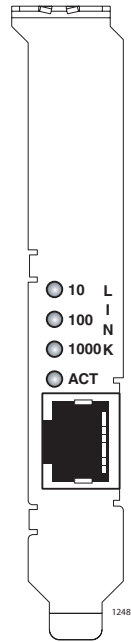


Figure 3. AT-2971T Gigabit Ethernet Adapter

Table 3. AT-2971T LEDs

LED	Color	State	Description
10	Green	On	A valid link has been established at 10 Mbps.

Table 3. AT-2971T LEDs (Continued)

<b>LED</b>	<b>Color</b>	<b>State</b>	<b>Description</b>
		Off	No valid link at 10 Mbps.
100	Green	On	A valid link has been established at 100 Mbps.
		Off	No valid link at 100 Mbps.
1000	Green	On	A valid link has been established at 1000 Mbps.
		Off	No valid link at 1000 Mbps.
ACT	Green	On	The adapter is receiving or transmitting data.
		Off	The adapter is not receiving or transmitting data.



## Chapter 2

# Installing the Hardware

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This chapter contains the following sections:

- “Reviewing Safety Precautions” on page 22
- “Pre-Installation Checklist” on page 24
- “Installing a Network Adapter Card” on page 25
- “Connecting the Network Cables” on page 29


## Reviewing Safety Precautions

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Please review the following safety precautions before you begin to install the network adapter card.

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### Note

The  indicates that a translation of the safety statement is available in a PDF document titled “Translated Safety Statements” (613-000405) on the Allied Telesis website at [www.alliedtelesis.com](http://www.alliedtelesis.com).

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### Warning


This is a “Class 1 LED product”.  L1

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### Warning


Do not stare into the laser beam.  L2

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### Warning


**Warning:** Do not look directly at the fiber optic cable ends or inspect the cable ends with an optical lens.  E29

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### Warning


Do not work on this equipment or cables during periods of lightning activity.  E2

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### Warning

Operating Temperature: This product is designed for a maximum ambient temperature of 40 degrees C.  E7

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### Note

All Countries: Install this product in accordance with local and National Electric Codes.  E8

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### Warning

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.

- 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 antistatic devices and an antistatic mat is strongly recommended.  E39
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## Pre-Installation Checklist

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1. Check that your system has an appropriate open PCI slot.
2. Verify that your system is using the latest BIOS.
3. If your system is active, shut it down.
4. When system shut down is complete, power OFF and unplug your system.
5. Holding the adapter card by the edges, remove it from its shipping package and place it on an antistatic surface.
6. 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 Allied Telesis. See "Contacting Allied Telesis" on page 12.



## Installing a Network Adapter Card

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

To install the network adapter card, perform the following procedure:

1. Review the “Pre-Installation Checklist” on page 24 and “Reviewing Safety Precautions” on page 22.

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.



### Warning

High voltage inside the system presents a safety hazard. Make sure the power is off before removing the cover.

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2. Remove the system cover and select any appropriate empty PCI slot. See Figure 4.

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

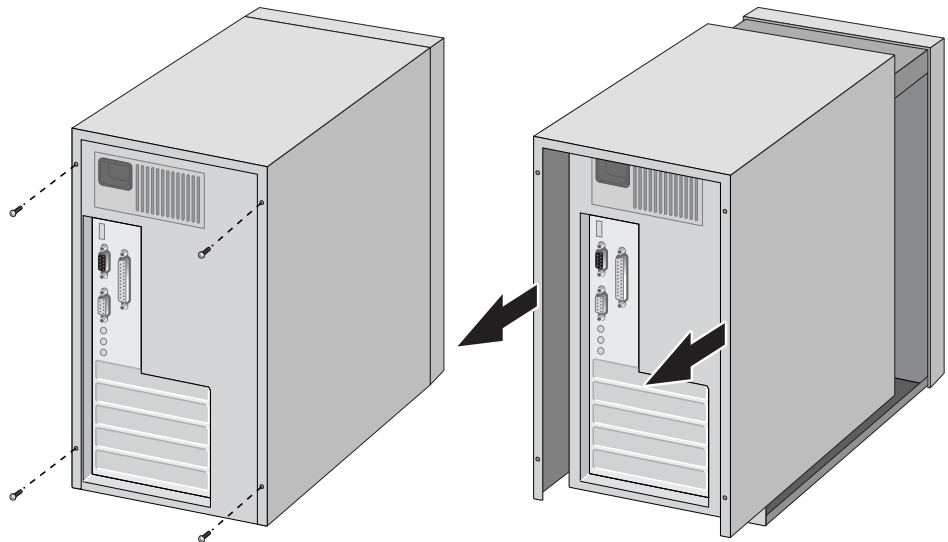


Figure 4. Removing the PC Cover

3. Select an empty, non-shared PCI slot and remove the faceplate.

Keep the faceplate in a safe place. You may need it for future use. See Figure 5.

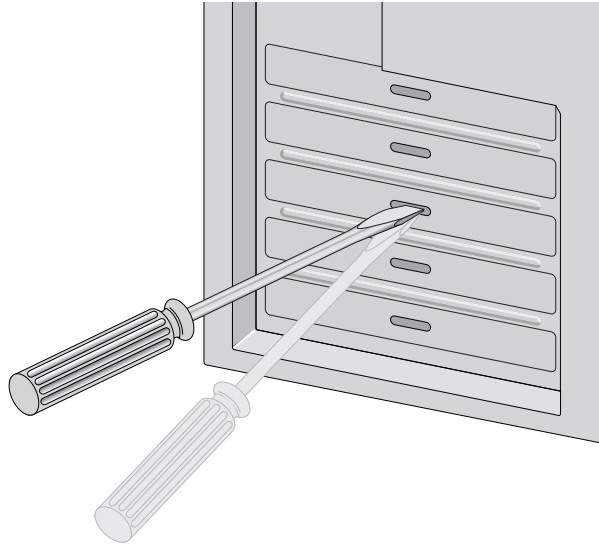


Figure 5. Removing the Faceplate From PCI Slot

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**Note**

If you cannot locate or know how to find an appropriate PCI slot, refer to the documentation that came with your system.

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4. Remove the network adapter card from the shipping package and store the packaging material in a safe location.



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**Caution**

Wear a grounding device and observe electrostatic discharge precautions when installing the network adapter card in a system. Failure to observe this caution could result in damage to the card.

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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 appropriate PCI slot.

Make sure the card is securely seated. See Figure 6.

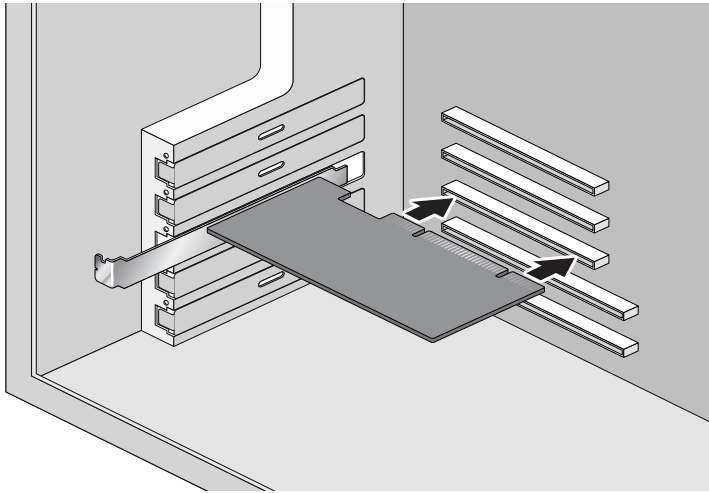


Figure 6. Inserting the Network Adapter Card

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**Note**

The connector dock in a 32-bit PCI slot is shorter than in a 64-bit PCI slot. Although the AT-29xx series adapter is designed to fit in either slot type, when installed in a 32-bit PCI slot, part of the adapter's connector edge remains undocked. This is part of normal operation.

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**Caution**

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

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6. Secure the network adapter card to the chassis with a Phillips-head screw (not provided) as shown in Figure 7.

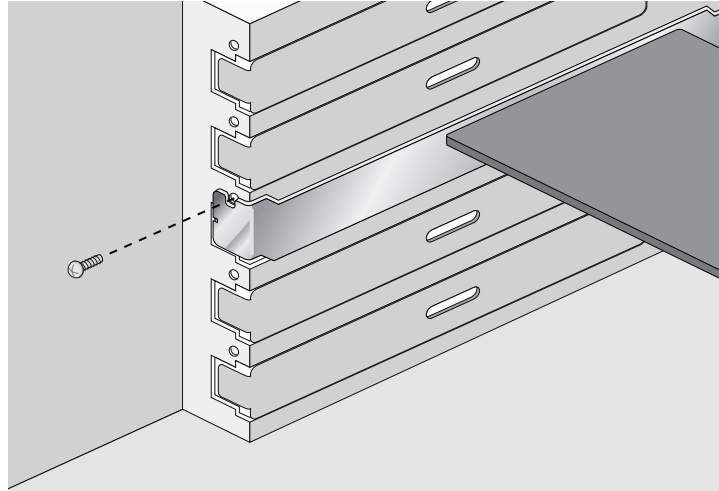


Figure 7. Securing the Adapter Card

7. Replace the system's cover and secure it with the screws removed in Step 2.
8. Disconnect any personal antistatic devices.
9. Power the system on.

Once the system returns to proper operation, the adapter hardware is fully installed. Next, connect the network cables. See "Connecting the Network Cables" on page 29.

## Connecting the Network Cables

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All the fiber Gigabit Ethernet network adapters have two fiber optic connectors for attaching the system to a compatible link partner, or an IEEE 802.3z compliant gigabit switch. After connecting the system to the network and power is supplied, the adapter performs auto-negotiation and attempts to establish the connection at 1000 Mbps full-duplex only.

To connect a network cable to the adapter, perform the following procedure:

1. Prepare a fiber optic cable according to the specifications in Table 4.

Table 4. 1000BASE-SX Fiber Optic Cable Specifications

Port Type	Connector	Media	Maximum Distance
1000BASE-SX	Fiber Optic	50 $\mu$ m multimode	550 meters (1,804 feet)
1000BASE-SX	Fiber Optic	62.5 $\mu$ m multimode	275 meters (853 feet)



### Warning

The fiber optic ports contain a Class 1 laser device. When the ports are disconnected, always cover them with the provided plug. Exposed ports may cause skin or eye damage.

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2. Connect one end of the cable to the adapter.
3. Connect the other end of the cable to the appropriate Ethernet network port or fiber optic port.

### Note

After the cable is properly connected at both ends, the adapter port LEDs should be functional. See “LEDs” on page 16 for a description of LED operation for each adapter model. For driver installation and configuration instructions, refer to the software configuration for a specific driver.

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# Appendix A

# Specifications

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## Physical Specifications

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Dimensions:	AT-2916T : 11.99 cm x 5.29 cm (4.72 in. x 2.08 in.) AT-2971T : 16.76 cm x 5.73 cm (6.6 in. x 2.26in.) AT-2971SX : 16.76 cm x 6.44 cm (6.6 in. x 2.54 in.)
Weight:	AT-2916T : 65 g (.14 lbs.) AT-2971T : 72 g (.16 lbs.) AT-2971SX : 92 g (.20 lbs.)

## Environmental Specifications

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Operating Temperature:	0°C to 50°C (+32°F to +122°F)
Storage Temperature:	-20°C to +70°C (-4°F to +158°F)
Operating Humidity:	30% to 80% (noncondensing)
Storage Humidity:	10% to 95% (noncondensing)
Maximum Operating Altitude:	10,000
Maximum Storage Altitude	35,000 ft.

## Power Specifications

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Operating Voltage:	3.3V
Power Consumption:	AT-2916T : 3.22 Watts, @ +3.3V AT-2971T : 3 Watts, 0.9A @ +3.3V AT-2971SX : 3 Watts, 0.9A @ +3.3V

## Performance Specifications

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PCI clock:	33/66 MHz max
PCI-X clock:	66 to 133 MHz
PCI or PCI-X Data/Address:	AT-2916T      32-bit
	AT-2971T      32-bit and 64-bit
	AT-2971SX     32-bit and 64-bit

## Operating Specifications

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Output Optical Power:	-9.5 dBm minimum to -4 dBm maximum
Input Optical Power:	-18 dBm to 0 dBm maximum
Receive Sensitivity:	-12.5 dBm with 62.5 um fiber or -13.5 dBm with 50 um fiber