



Intel® PRO/1000 T  
IP Storage Adapter

*Bringing Gigabit Ethernet to Network Storage*

**Quick Installation Guide**

## Additional Information

### Online User Configuration Guide

The *User Configuration Guide* is located on the *Intel® PRO/1000 T IP Storage Adapter* CD. Use your web browser to view or print topics from the *User Configuration Guide*, which contains more comprehensive configuration and troubleshooting information.

### Online Services

You can download software updates, troubleshooting tips, installation notes, and the latest documentation from <http://support.intel.com>

### Late-Breaking News

The *Late-Breaking News* document provides useful information about adapter compatibility, as well as special installation release notes that were not available at the time this guide was created.

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## How to Use This Guide

The Intel® PRO/1000 T IP Storage Adapter allows companies to build cost-effective Storage Area Networks (SANs) using standard LAN/ Ethernet infrastructure. It uses the new, open iSCSI standard to transmit SCSI storage data over Ethernet networks, dramatically lowering the total cost of ownership for storage networks while still offering increased reliability, availability, scalability, and manageability of stored data.

The Intel PRO/1000 T IP Storage Adapter contains field upgradeable firmware designed to support both past and future versions of the iSCSI specification. To locate the most appropriate firmware for your solution, visit the Intel website. See the **Upgrading the Firmware** section of the online *Intel® PRO/1000 T IP Storage Adapter User Configuration Guide* for information on upgrading your firmware.

This guide provides information on how to install the Intel® PRO/1000 T IP Storage Adapter, how to install Windows\* and Linux drivers, and basic adapter configuration information to get you started. For complete details about using the adapter, refer to the online *Intel® PRO/1000 T IP Storage Adapter User Configuration Guide*.

## Getting Started

To get started using the Intel® PRO/1000 T IP Storage Adapter:

1. Insert the adapter.
2. Install the driver and software.
3. Configure the software.
4. Connect to a target.

## System Requirements

Before you can install the Intel® PRO/1000 T IP Storage Adapter, your system must meet the following configuration requirements:

- One available 32- or 64-bit bus master PCI or PCI-X slot.
- A minimum 64 MB of RAM must be available.
- Microsoft\* Windows\* 2000 Server Family (Service Pack 2 with hot fixes Q302895 and Q248720 or Service Pack 3), Windows\* XP Professional, or RedHat\* Linux version 7.2 (2.4.7 kernel) must be running on your system.

**NOTE:** For information about the hot fixes, go to <http://support.microsoft.com> and search on Q302895 or Q248720 in the knowledge base. Call Microsoft\* IT Support at 1-800-936-4900 and reference the hot fix numbers to receive a copy of the driver.

- Category 5, twisted pair cabling must be used when running at 100/1000 Mbps (for best results at 1000 Mbps, use CAT 5e cabling).
- An 802.3ab-compliant gigabit Ethernet switch is recommended for achieving the maximum 1000 Mbps speed.

## Inserting the Adapter

You can insert a maximum of three adapters into your system to connect to multiple targets and increase throughput performance. To insert the Intel® PRO/1000 T IP Storage Adapter into your computer, follow these steps:

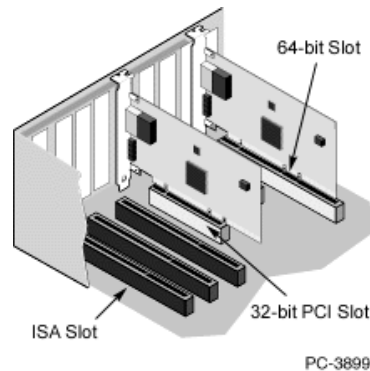
1. If your computer is not a Hot Plug system, turn it off and unplug it before you remove the cover. If your computer is a Hot Plug system, see your server's documentation for information about removing the cover.



**CAUTION:** Failing to power down the system and remove the power cord **BEFORE** removing the cover could physically endanger you or damage the adapter or computer.

2. Remove the cover bracket from a 32- or 64-bit PCI or PCI-X bus master slot.
3. In a 32-bit PCI or PCI-X slot, the end of the edge connector will be exposed and not connected. Make sure the exposed end does not contact any conducting part of the motherboard.

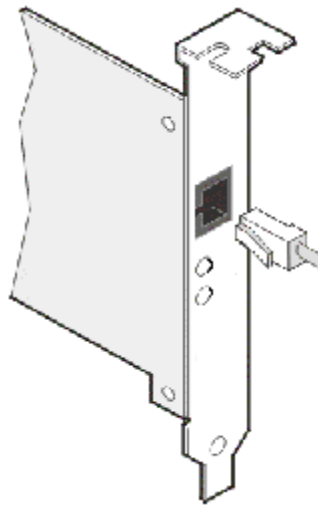
**NOTE:** The HBAs illustrated in the figure below are for illustration purposes only. The actual Intel® PRO/1000 T IP Storage Adapter is longer and has more onboard components than those depicted in the illustration.



4. Secure the adapter in the slot.
5. Repeat steps 2 to 4 for each adapter you want to install.
6. Replace the computer cover and plug in the power cord and network cable(s).

### **Attaching the Network Cable**

To attach the Intel® PRO/1000 T IP Storage Adapter to an RJ-45 connector, insert the Category 5 twisted pair RJ-45 network cable into the adapter connector, as shown in the figure below.



### **1000BASE-T or 100BASE-TX Connections**

To attach the Intel® PRO/1000 T IP Storage Adapter to a 1000BASE-T or 100BASE-TX network, you must use a Category 5, twisted-pair cable (four twisted-pair wiring). If you plan to run the adapter at 1000 Mbps, it must be connected to a compatible 1000BASE-TX switch. For 100 Mbps, it can be connected to a 10/100BASE-TX switch.

**NOTE:** Some compatible switches do not support all three speeds on a single port. Check your switch documentation for details.

### **10BASE-T Connections**

To attach the Intel® PRO/1000 T IP Storage Adapter to a 10BASE-T network, use Category 3, 4, or 5 twisted-pair wiring. Residential environments require a Category 5 cable.

Follow the steps in *Installing and Updating the Driver and Application* to establish a link with your gigabit Ethernet switch.

## Installing the Software

You can install the software in a Microsoft\* Windows\* 2000, XP or RedHat\* Linux Version 7.2 environment.

### Installing the Software in Windows\* 2000

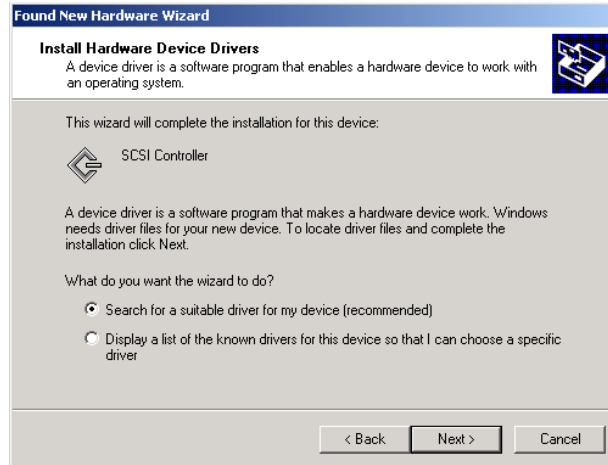
When you install or reinstall the Intel® PRO/1000 T IP Storage Adapter driver, the control panel applet is also installed. This software allows you to configure your adapter and targets. If you have uninstalled the driver and want to reinstall it, you must restart your computer before following the installation steps below. Once you have installed the Intel® PRO/1000 T IP Storage Adapter in your computer, connected the cable, plugged in the power cord, and powered on your computer, the Found New Hardware window will appear on your screen.

To install the driver and software, follow these steps:

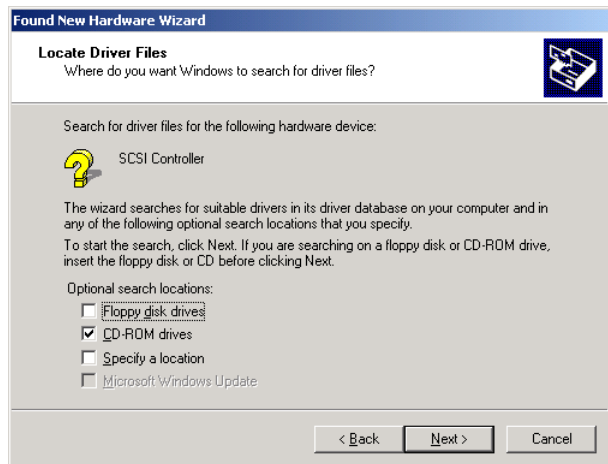
1. Turn on the computer with the adapter installed.
2. In the Found New Hardware Wizard window, click **Next**.



3. Select “Search for a suitable driver for my device” and click **Next**.

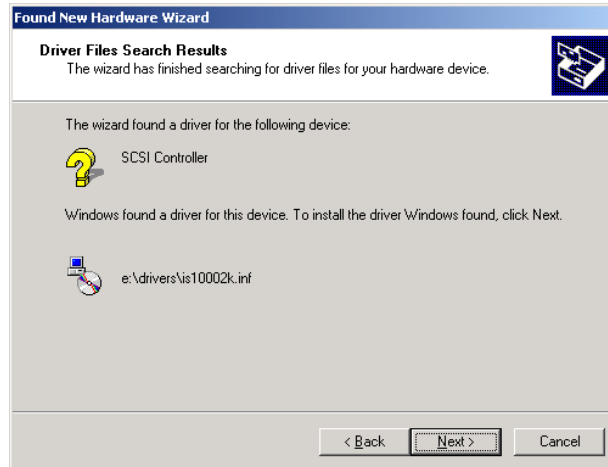


4. Specify the location of the **is10002K.inf** file, which is in the Drivers directory on the Intel CD, insert the CD and click **Next**. This file supports Windows\* 2000 and XP.



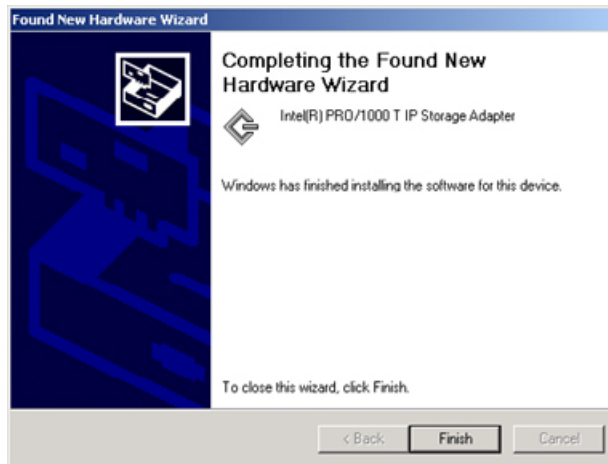


- Once the wizard locates the driver, click **Next** to install it.

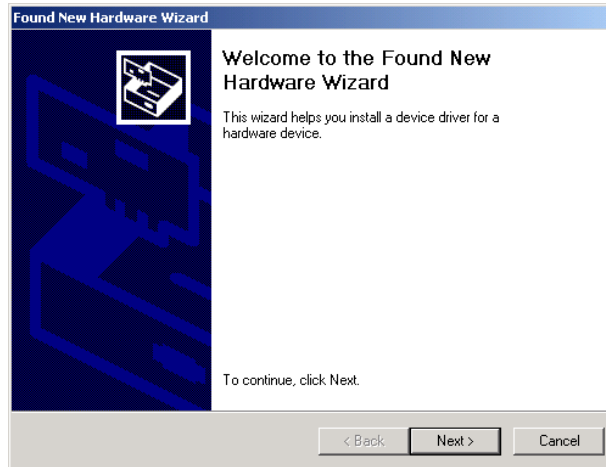


**NOTE:** There may be a 5-20 second delay while the driver is being installed.

- Click **Finish**.



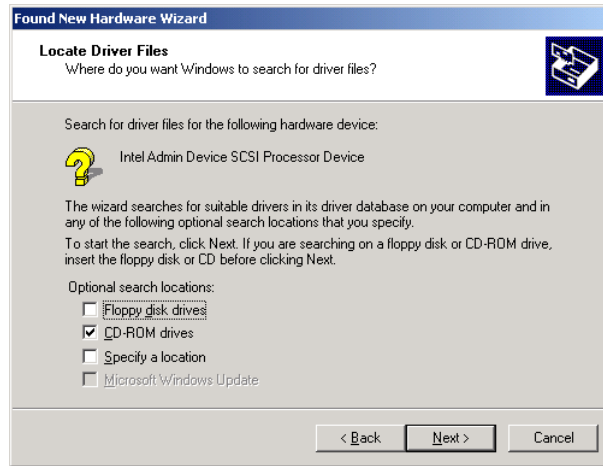
7. When the Found New Hardware Wizard appears again, click **Next**.



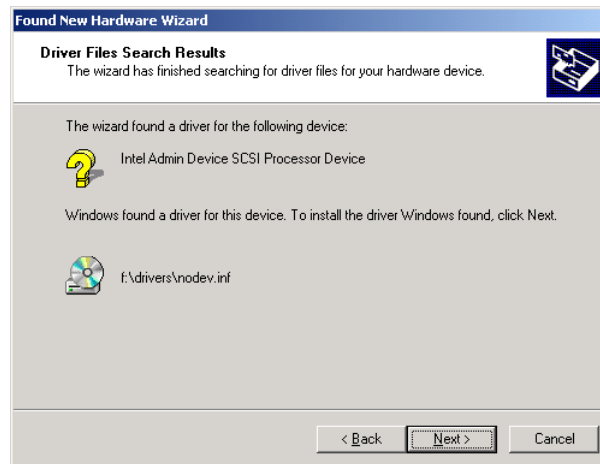
8. Select "Search for a suitable driver for my device" and click **Next**.



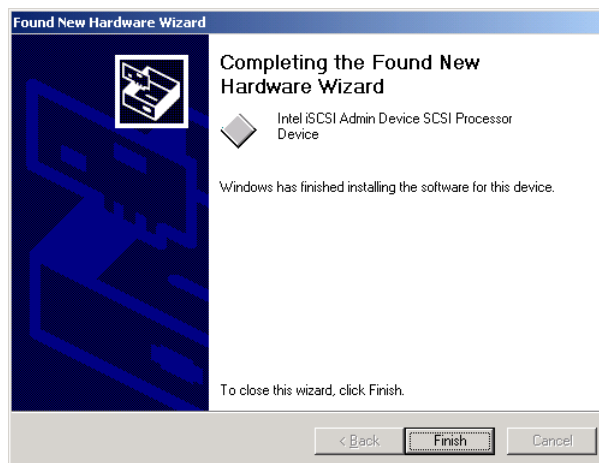
- Specify the location of the **nodev.inf** file, which is in the Drivers directory on the Intel CD, and click **Next**.



- Once the wizard locates the driver, click **Next** to install it.



11. Click **Finish**.



### **Installing the Software in Windows\* XP**

When you install or reinstall the Intel® PRO/1000 T IP Storage Adapter driver, the control panel applet is also installed. This software allows you to configure your adapter and targets. If you have uninstalled the driver and want to reinstall it, you must restart your computer before following the installation steps below. Once you have installed an Intel® PRO/1000 T IP Storage Adapter in your computer, connected the cable, plugged in the power cord, and powered on your computer, the Found New Hardware window will appear on your screen. This screen will appear each time you add another adapter to your system.

To install the driver and application, follow these steps:

1. Turn on the computer with the adapter installed.

2. In the Found New Hardware Wizard window, select *Install the Software Automatically* and click **Next**.

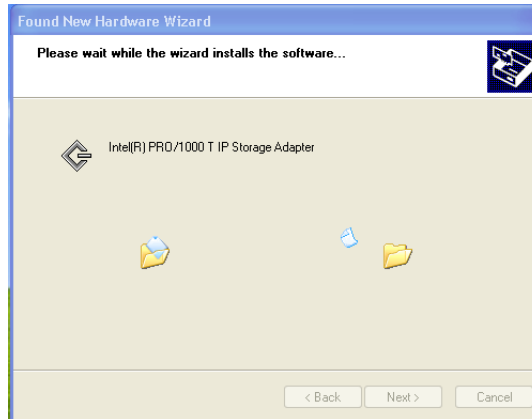


3. When the Hardware Installation window appears, click **Continue Anyway**.

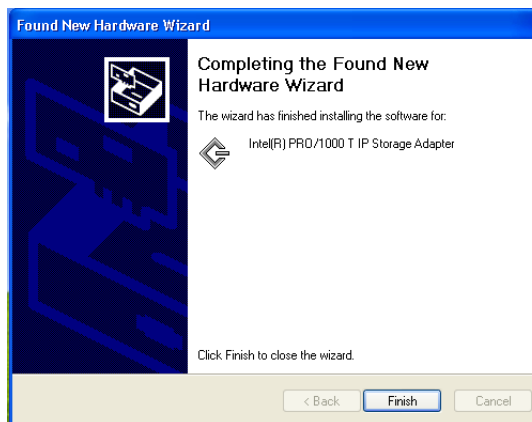


4. Wait for the installation process to complete.

**NOTE:** There may be a 5-20 second delay while the driver is being installed.



5. When the Found New Hardware Wizard window appears, click **Finish**.



## Installing the Software in Linux

To install the software in RedHat\* Linux Version 7.2 using the RPM utility, follow these steps:

1. Locate the RPM package **is1000-1.1-#.i386.rpm** (# represents the RPM version number) for a single or multiple processor host.
2. Install the package:

```
# rpm -i [ ... ]/RedHat72/is1000-1.1-#.i386.rpm (# represents the RPM version number)
```

**NOTE:** The installation process will install support for a single and multiple processor systems, but at boot-up, the **SYS V** script will determine which kernel is booting and load the appropriate module.

## Configuring the Software

The Intel® PRO/1000 T IP Storage Adapter software can be used in a Windows\* (2000 or XP) or RedHat\* Linux environment.

**NOTE:** If you already have one adapter installed and configured in your system and you would like to install another adapter, remove all the targets in PROSet before installing the new adapter. Otherwise, PROSet indicates that both adapters are connected to the same target and multiple connections to the same target can occur.

**NOTE:** The Intel PRO/1000 T IP Storage Adapter allows you to connect to a maximum of eight iSCSI targets at a time.

## Linux

RedHat\* Linux Version 7.2 configuration information is located in the **Readme.txt** file in the **RedHat72** directory on the Intel CD.

## Windows\*

While configuring the software, you can press the **F1** (Help) key for information about the components of each window. At any time during configuration, you can click **Apply** to apply and save the changes you have made, **OK** to apply, save and exit the configuration tool, or **Cancel** to cancel the changes you made since the last time you clicked **Apply**.

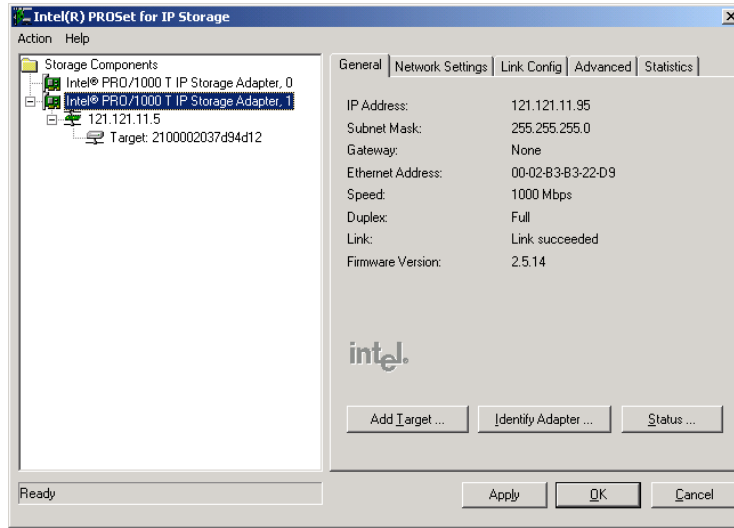
From the Control Panel, double-click Intel® PROSet for IP Storage.



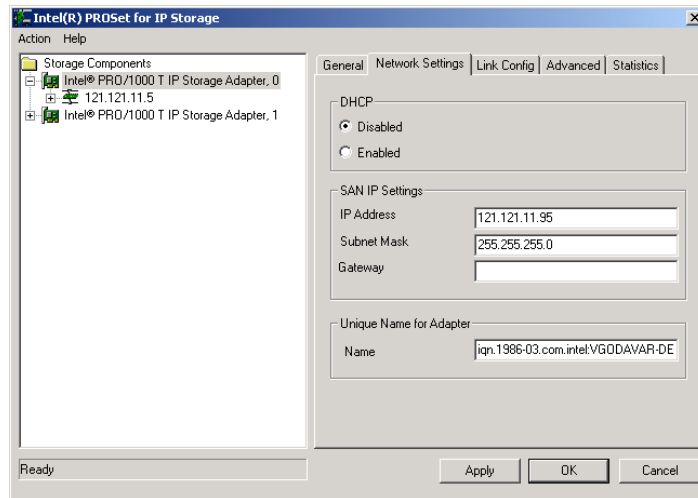
**NOTE:**When using PROSet for the first time, you must accept the copyright agreement and configure your SAN IP settings.



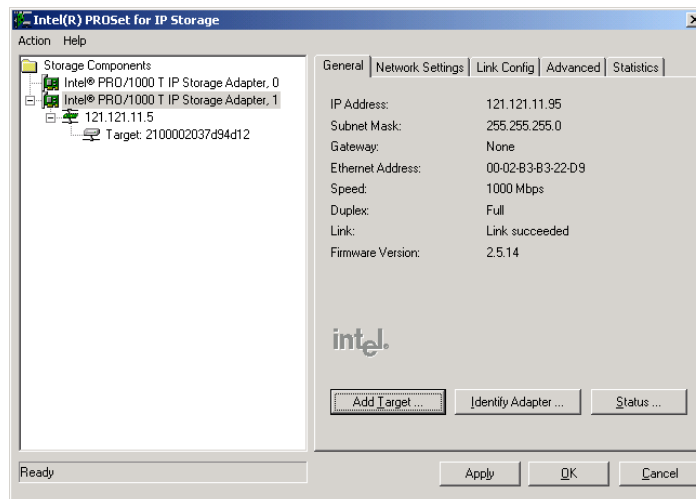
- The Intel® PROSet for IP Storage window contains five configuration tabs. The left side of the window displays the component tree, which is an expanded view of all the connected storage components (adapters, targets, and routers). If you have more than one adapter installed, each adapter is indicated in the tree and numbered as (0), (1), (2), etc.



4. **Identify the Adapter.** Click the Network Settings tab to enable or disable DHCP, enter SAN IP settings (gateway is optional if the target and initiator are in the same subnet) and create a separate initiator name for each adapter. When you are done, click **Apply** to continue to the next tab.



5. **Add Target.** Go back to the General tab, select the adapter to which you want to add a target and click **Add Target**. You can connect to a maximum of eight targets and the adapters must connect to different targets. Connecting multiple adapters (from the same machine or a different machine) can result in an unwanted consequence, such as data loss, target disconnection, system crash (Windows) or an inability to mount the drives (Linux). A dialog box will appear that allows you to describe where and how you want to connect to a new target (router). Enter the new target's IP address and port. If you want to enable CHAP security, see the *Intel PRO/1000 T IP Storage Adapter User Configuration Guide* for details.



**NOTE:** The adapter software guarantees the ability to connect to as many as eight targets whose names each consist of a maximum 256 characters. However, some network configurations may allow the adapter to connect to more than eight targets.

## Basic Troubleshooting

If you cannot link to your switch, try the following suggestions:

- Check the LED lights on the adapter. If the LINK light is not on, check all connections to the adapter and link partner. Make sure the link partner is not set to match the adapter (preferably set to auto negotiation enabled) and the driver is loaded.
- Make sure the cable is installed properly. The network cable must be securely attached at all connections. If the cable is attached, but the problem persists, try a different cable.
- Check the *Troubleshooting* section of the *User Configuration Guide* for more information. If an issue continues or is not addressed here, see the *Late-breaking News* document on the *Intel® PRO/1000 T IP Storage Adapter* CD or check out the Intel support Web site at <http://support.intel.com>.

## Adapter Specifications

<b>CONNECTIONS</b>
IEEE standard/network topology: 10Base-T, 100Base-T, 1000Base-T
Wiring/Connections: CAT-5, 4 pair (1000Base-T)/RJ-45
<b>HOST BUS ADAPTER PRODUCT FEATURES</b>
<ul style="list-style-type: none"> <li>• Plug and Play Specification support</li> <li>• Auto-negotiation, full duplex capable</li> <li>• Power Management (Network Device Class, Power Management Reference Specification 1.0a)</li> <li>• 32 MB of external SDRAM for context memory</li> <li>• 4 MB Flash</li> <li>• Single ported adapter</li> <li>• Standard PCI form factor</li> <li>• Field upgradeable firmware and software via Flash</li> </ul>
PCI v2.2 buses supported: 64/66, 64/33, 32/66, and 32/33
<b>NETWORK MANAGEMENT</b>
<ul style="list-style-type: none"> <li>• SNMP manageable</li> </ul>
<b>OPERATING SYSTEMS SUPPORT</b>
Microsoft* Windows* 2000 Server Family (Service Pack 2 with hot fixes Q302895 and Q248720 or Service Pack 3). Microsoft* Windows* XP Professional (32-bit). RedHat* Linux Version 7.2 (2.4.7 kernel).
<b>TECHNICAL FEATURES</b>
Data rate(s) supported per port: 10/100/1000 Mbps
External Memory: 32 MB ECC SDRAM; 4 MB Flash
IEEE Support: 802.2, 802.3z, and 802.3ab
Data transfer mode: Bus-master DMA
Controller or processor: Intel® XScale™ 80200
Typical power consumption: 7.8 - 8 Watts
Data path width: 32-bit and 64-bit PCI
MAC on-board memory: 64 KB
Interrupt levels: INTA
IETF Support: iSCSI draft standard 0.6+ (visit <a href="http://www.ietf.org">http://www.ietf.org</a> to download latest standards). See <i>Late Breaking News</i> for instructions on downloading firmware to support later versions of the iSCSI specification.
MAC: Intel® 82544EI
I/O Companion Chip: Intel® 80312
Operating Temperature/Humidity: 0-55 degrees C; 85% at 55 degrees C
Hardware Certifications: FCC B, CE, UL 1950, CSA 950, BSMI, VCCI Class 2
<b>INTEL BACKING</b>
Limited lifetime warranty; 90-day money-back guarantee (U.S./Canada only)

## Intel Automated Customer Support

You can reach Intel's automated support services 24 hours a day, every day, at no charge. The services contain the most up-to-date information about Intel products. You can access installation instructions, troubleshooting information, and general product information.

### **User Configuration Guide on Your Product CD-ROM**

For more information about adapter configuration or other topics, see the online *User Configuration Guide*. To view the guide, insert the Intel CD in your drive and wait for the Autorun to display. Click the **User Configuration Guide** button to view the guide. Note that a web browser is required to view the guide.

### **Web and Internet Sites**

Support:	<a href="http://support.intel.com">http://support.intel.com</a>
Network Products:	<a href="http://www.intel.com/network">http://www.intel.com/network</a>
Corporate:	<a href="http://www.intel.com">http://www.intel.com</a>

### **Customer Support Technicians**

US and Canada: 1-916-377-7000 (7:00 - 17:00 M-F PST)  
Worldwide access: Intel has technical support centers worldwide. Many of the centers are staffed by technicians who speak the local languages. For a list of all Intel support centers, the telephone numbers, and the times they are open, visit

<http://www.intel.com/support/9089.htm>

### **Product Warranty**

This product is covered by a Limited Lifetime Warranty, which is described in the online *User Configuration Guide*.

### **Regulatory Notices**

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### **Software License Agreement**

Software included with this product is protected by a specific Software License Agreement, provided in the online *User Configuration Guide*. By using this software you agree to the provisions in the Software License Agreement.



