EZ Card 10

10 Mbps Ethernet PCI Network Cards

- **Plug and Play installation**
- **NE2000-compatible**
- **On-board socket for optional boot ROM**
- **Support for full-duplex Ethernet**

SMC®

User Guide

USER GUIDE
FOR
SMC'S EZ CARD 10
PCI NETWORK CARD

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Hauppauge, New York 11788

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ABOUT THIS GUIDE

This installation guide is for SMC's family of EZ Card™ 10 PCI network cards. The three models are as follows:

Order Number	Description
SMC1208T	twisted-pair card with RJ-45 connector
SMC1208BT	2-port combo card with RJ-45 and BNC connectors
SMC1208BTA	3-port combo card with RJ-45, BNC and AUI connectors

This guide covers the following topics:

- Product description, summary of features and specifications
- Description of important hardware features of the cards, such as LEDs and connectors
- Installation procedure

Note: Procedures for network driver installation and additional information or changes that become available after the manual is printed are in text files, which are located on the SMC Installation Diskette. You can use the DOS DIR command to locate all the available text files, and view their contents using the DOS TYPE command.

PACKAGE CONTENTS

Carefully unpack the contents of the package and check them against the checklist below.

√ One EZ Card 10 PCI Network Card

√ BNC T-Connector (combo models only)

√ One Driver Diskette

√ This User Guide

√ SMC Warranty Registration Card — please complete and return this card to SMC

Note: Network cards are sensitive to static electricity, which can damage their delicate electronic components. Dry weather conditions or walking across a carpeted floor may cause you to acquire an electrostatic charge.

To protect your device, always:

- Touch the metal chassis of your computer before you pick up the card. This grounds the electrostatic charge.
- Avoid touching any of the electrical components when handling the card. If possible, wear a grounded wrist strap or anti-static gloves.

Please inform your dealer immediately should there be any incorrect, missing or damaged parts.

If possible, retain the carton, including the original packing materials. Use them again to repack the product in case there is a need to return it for repair.

Back up your driver diskette and use the copy as the working diskette. Do this to protect the original from accidental damage.

TABLE OF CONTENTS

Chapter

Appendices

List of Figures

List of Tables

CHAPTER 1
INTRODUCTION

SMC's EZ Card 10 PCI family consists of three 32-bit Ethernet network interface cards for PCI computers: a twisted-pair card with an RJ-45 connector and two combo models. One of the combo models has two connectors: RJ-45 and BNC. The other combo model has three connectors: RJ-45, BNC and AUI. The RJ-45 connector is used for unshielded twisted-pair cable; the BNC, for thin coax cable; and the AUI, for thick coax cable.

Features

- Conforms to the Ethernet IEEE 802.3 standard
- Compatible with PCI Local Bus specification Revision 2.0 and later
- Provides 32-bit data transfer to maximize throughput and optimize CPU utilization
- Software compatible with NE2000 driver
- Supports full-duplex operation for twice the effective bandwidth in a switched network
- Automatic configuration setup using the PCI computer's BIOS setup program
- Automatic detection of twisted-pair or thin coax media type connection (2-port combo model only)
- Supports optional boot ROM for remote booting from a NetWare server
- LED indicators for monitoring network traffic

Hardware Description

The SMC EZ Card 10 PCI model shown below has two LED indicators and supports three types of network connections. Your model may support only one or two network connections.

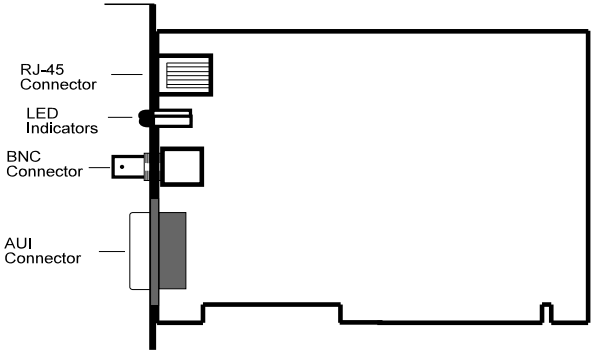

Figure 1-1. EZ Card 10 PCI Combo Model (SMC1208BTA)

LAN Connectors

The EZ Card 10 PCI models support IEEE 802.3 10BASE-T, 10BASE2 and 10BASE5 standards. These cards also support one or more of the following network connections, depending on the model chosen:

- RJ-45 connector for twisted-pair cable
- BNC connector for thin coax cable
- AUI connector for thick coax cable

On the 2-port combo model, the media type in use is automatically detected by the driver.

LED Indicators

The cards contain two LEDs for monitoring network conditions. The function of each LED is described below. Refer to the following figure for the LED location.

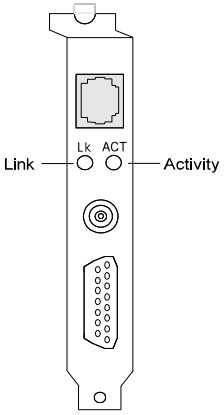

Figure 1-2. LED Indicators

Link Status (Lk)

Color: Green

Function: Twisted-pair link status indicator

When lit, this LED indicates an active connection between the network card and a 10BASE-T hub or switch.

Note: The Link Status LED does not monitor the condition of the BNC and AUI connections. When the card is configured for these connections, this LED is always lit.

Activity Status (ACT)

Color: Green

Function: Network activity indicator

This LED is unlit upon power on. It lights up to indicate the presence of network activity on the port. The rate of flashing is proportional to the amount of network traffic.

CHAPTER 2
INSTALLING THE CARD

The procedure for installing the EZ Card 10 PCI models appears below. Although instructions for installing the software drivers are not included here, some related information is provided.

1. **Power off your PC and remove its cover**.

   Please refer to your computer's Installation Manual for instructions on how to remove the cover.

2. **Select an available expansion slot and plug in the card.**

   The card provides a 32-bit bus interface. It plugs into any available PCI expansion bus slot. Remove the protector bracket from the slot you selected. Insert the card into the slot. Carefully press on the card until all the edge connectors are firmly in place inside the slot. Screw the card's steel bracket into the PC to secure the connection. Replace the PC cover.

3. **Connect your card to the network.**

   Select a cable type for your application and attach the card to the network using the appropriate connector:

   - RJ-45 for twisted-pair cable
   - BNC for thin coax cable
   - AUI for thick coax cable

4. Power on the PC.

Hardware installation has been completed. Switch on power to the PC.

Note: Your network should be configured automatically by the PCI computer's BIOS Setup Program. However, some manual configuration may be required in older PCI machines. Refer to "Configuring the Card in Older PCI Computers" in Appendix C for related information.

5. Run the Diagnostic program to check the card's hardware installation.

For related topics, see "Running the Setup Program" in Appendix C.

Caution! Be sure to run this program before installing the appropriate driver. Otherwise, your PC will hang.

6. Install the driver.

The driver diskette contains all the driver programs supported by these cards. Refer to the RELEASE.TXT file in the root directory for a listing of these programs. The drivers for different network operating systems are contained in separate subdirectories. Refer to the Readme text file in each subdirectory for instructions on driver installation.

APPENDIX A
SPECIFICATIONS

General

Network Interface
RJ-45 (UTP Cable: EIA/TIA Categories 3, 4, 5)
BNC (Coax Cable: RG-58 A/U or RG-58 C/U)
AUI (Drop Cable)

Standards Supported
IEEE 802.3 and ISO/IEC 8802-3 10BASE-T (twisted-pair), 10BASE2 (thin coax) and 10BASE5 (thick coax)

PCI Local Bus Specification
Rev. 2.0 or later

Hardware Compatibility
PCI local bus-compliant PCs

Data Bus Width
32-bit

I/O Address
Automatically determined based on configuration space

Interrupt
INT A on PCI slot pin assignment,
mapped to the BIOS IRQ setup

Operating Environment

Power Requirements

On-board 10BASE-T transceiver (RJ-45)
Stand-by: +5 V / 0.025 A
Transmit: +5 V / 0.073 A

On-board 10BASE2 transceiver (BNC)
Stand-by: +5 V / 0.300 A
Transmit: +5 V / 0.410 A

External 10BASE5 MAU (AUI)
Maximum: +12 V / 0.5 A

Temperature
0° to 55° C (32° to 131° F)

Humidity
10% to 90% (non-condensing)

Size
4.84 in. x 3.86 in. (122.91 mm x 98.18 mm)

EMC/Safety Compliances

FCC Class B
CDOC Class B
CISPR 22:1985 Class B
EN55022:1987 Class B
AS/NZS (1992)
VCCI Class B
EN55022(1988)/CISPR-22(1985)
prEN55024-2(1990)/IE801-2(1991)
prEN55024-3(1991)/IE801-3(1984)
prEN55024-4(1992)/IE801-4(1988)
EN60950
CE marking

Network Drivers

ODI drivers
NetWare 3.x, 4.x
NetWare LAN WorkPlace TCP/IP
Novell LAN Analyzer for NetWare

NDIS/2 drivers
Microsoft LAN Manager V2.x
Windows for Workgroups
IBM LAN Server
LAN Support
IBM OS/2 EE V2.0
DEC PATHWORKS
Lantastic 6.0
Sun PC-NFS
Banyan VINES
IBM TCP/IP for DOS & OS/2
Wollongong Pathway Access

NDIS/3 drivers
Microsoft Windows NT 3.51, 4.0
Windows for Workgroups
Windows 95

Packet drivers
FTP TCP/IP
NCSA TCP/IP

Unix drivers
SCO OpenServer 5.x

APPENDIX B
PIN ASSIGNMENTS

RJ-45 Connector

Pin Number	Assignment
1	Output Transmit Data +
2	Output Transmit Data -
3	Input Receive Data +
6	Input Receive Data -
4, 5, 7, 8	Reserved for other use

Table B.1. RJ-45 Connector Pin Assignments

AUI Connector

AUI Pin Assignments		
Pin	**Circuit**	**Signal Name**
3	DO-A	Data Out Circuit A
10	DO-B	Data Out Circuit B
11	DO-S	Data Out Circuit Shield
5	DI-A	Data In Circuit A
12	DI-B	Data In Circuit B
4	DI-S	Data In Circuit Shield
8	CO-S	Control Out Circuit Shield
2	CI-A	Control In Circuit A
9	CI-B	Control In Circuit B
1	CI-S	Control In Circuit Shield
6	Vc	Voltage Common
13	VP	Voltage Plus
14	VS	Voltage Shield
Shell	PG	Protective Ground (Conductive Shell)

Table B.2. AUI Connector Pin Assignments

Note: Voltage Plus (VP) and Voltage Common (Vc) use a single twisted-pair in the AUI cable.

APPENDIX C
CONFIGURATION AND DIAGNOSTICS

The driver diskette contains the Setup program (SETUP.EXE). This program allows you to:

- View the current configuration of the card
- Set up a new configuration
- Run diagnostics

These tasks are described in this chapter.

Running the Setup Program

Insert the driver diskette in your floppy drive. The SETUP program is in the \SETUP subdirectory on this diskette. Change to the appropriate subdirectory location, type the following command and press <Enter>:

```
A:\SETUP>SETUP
```

This will initiate the menu-driven SETUP program and display the Main Menu as shown below:

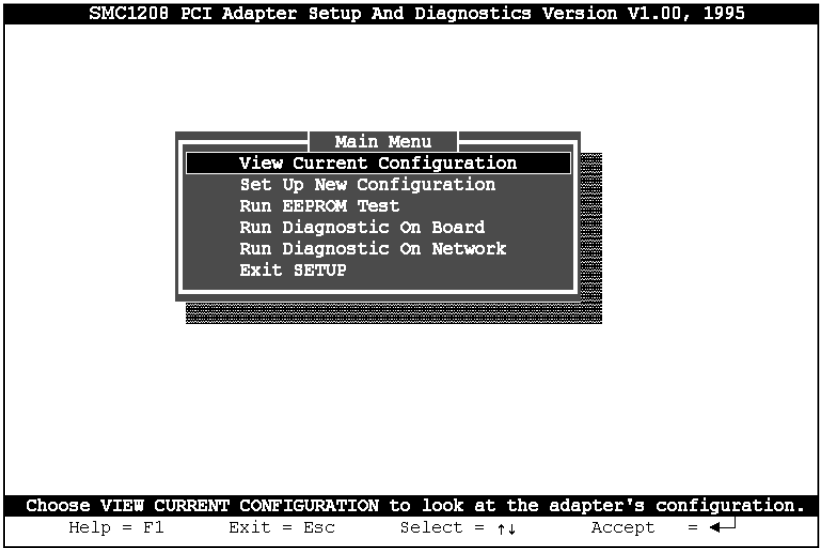

Figure C-1. Main Menu

Viewing the Current Configuration

Select this option to view the current settings for your network card, as shown below.

If you need to modify the current configuration, return to the Main Menu and select “Set Up New Configuration.”

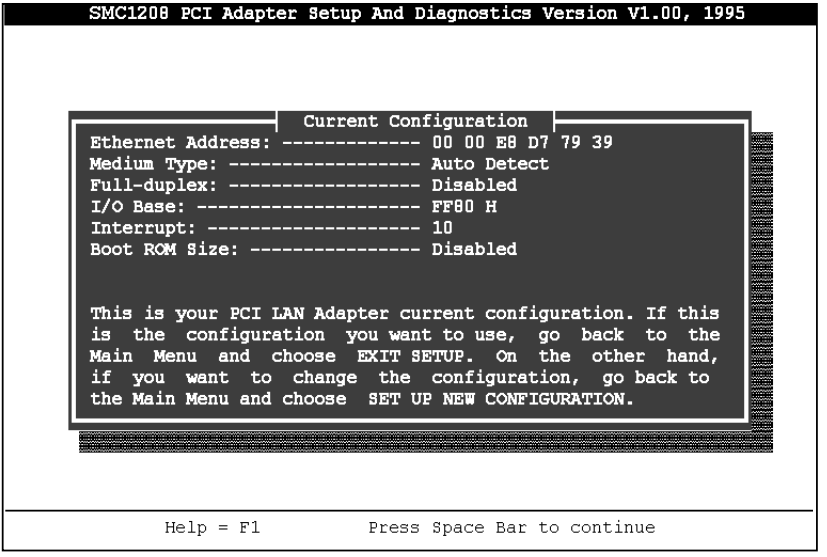

Figure C-2. Current Configuration Display

Setting Up a New Configuration

If your computer complies with PCI BIOS standards, the system will automatically allocate the necessary I/O, IRQ and boot ROM address resources to the card. Although the SETUP program will not allow you to change the resources which are allocated by the PCI BIOS, it will allow you to change the following settings to suit your requirements:

- Media type
- Full-duplex mode
- Boot ROM size

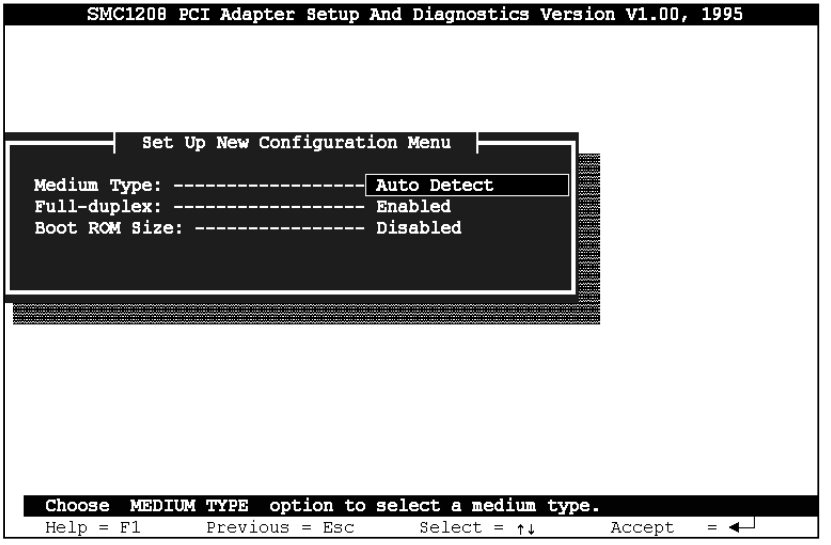

Figure C-3. Set Up New Configuration Menu

Media Type

The transceiver setting should agree with the network cabling type. The program provides two choices:

- Auto detection
- 10BASE5 (AUI)

With the first choice, the card automatically detects the connector in use — either RJ-45 or BNC. The second choice enables the AUI connector.

Full-Duplex Mode

Enable full-duplex mode only if the card is connected directly to a switch that also supports this mode. Do not enable this mode if the card is connected to a hub.

Boot ROM Size

Each card provides an empty socket for an optional 16 KB boot ROM. Once installed and enabled, the boot ROM permits the host PC to download the disk operating system (DOS) or network drivers over the network. The boot ROM function is disabled by default. After you install a boot ROM, be sure to enable this function.

Running the Diagnostics

To test the card's components and installation, the SETUP program runs three different tests on the card and corresponding cabling system as listed below:

- EEPROM Test
- Diagnostics on Board
- Diagnostics on Network

Note: Run the diagnostics before the network driver is loaded into the system. Otherwise, your system may hang.

EEPROM Test

Read tests are performed on each register in the EEPROM.

Testing the Card

This test monitors the card and corresponding cabling system. However, it does not test the network's condition.

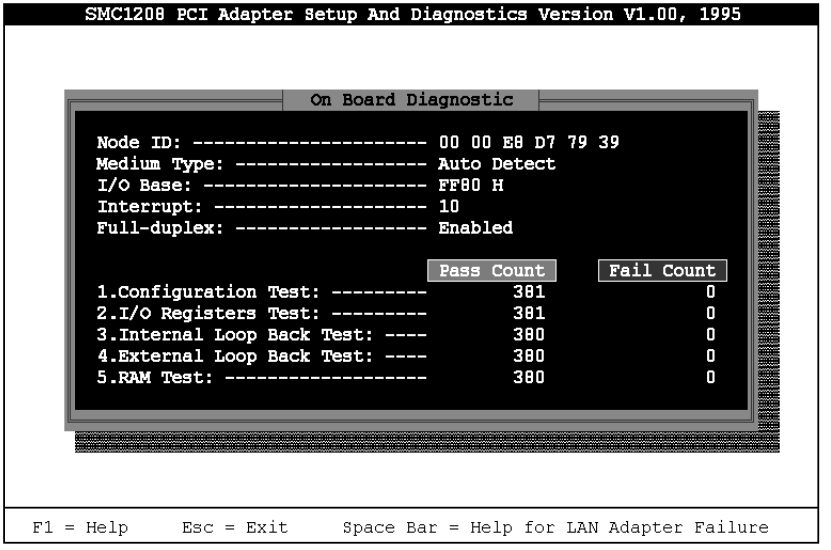

Figure C-4. On-Board Diagnostics Display

This test actually performs five separate tests:

- Configuration Test — checks the initial status of the Ethernet controller
- I/O Registers Test — checks I/O accessibility
- Internal Loop Back Test — checks the card's controller
- External Loop Back Test — checks the network link
- RAM Test — checks the condition of the on-board RAM

The screen displays the PASSED or FAILED count for each test. If a test fails, press the spacebar to display the reason for the failure and possible solutions.

Testing the Network Connection

This test verifies the card's ability to communicate with other devices on the network. At the start of the test, set up one computer as a Responder and at least one as an Initiator. The Responder displays the status of communications with each Initiator on the network, while the Initiator displays the current Responder and the status of corresponding communications.

Note: Should any of these tests fail, reboot your computer and run the diagnostics again to see if the problem persists.

Configuring the Card in Older PCI Computers

The card is configured using the host PCI computer's BIOS setup program. This is done by changing the computer's BIOS settings. The procedure to do this and the terminology used depend on the the BIOS you are using.

For example, if your computer uses the Phoenix BIOS, there is a Device Select field where you are to input the number of the PCI slot where the adapter is installed (e.g., Slot 3 Device). Select "Enabled" for the Enable Device field and assign an IRQ number (the card's IRQ setting is mapped to the BIOS IRQ setup of the host PCI computer).

Set the Trigger/Routing field to select the Trigger method by which the IRQ is assigned or routed to the PCI slot. There are three types of settings to choose from:

- **Level/Auto** — This is usually the default. Choosing this option leaves the assigned IRQ free for other uses if the installed card does not use it.
- **Level/Forced** — If you are not able get the PCI card to work properly, choose this option. This will assign the specified IRQ permanently to the card.
- **Edge/Auto** — Some PCI cards support this option. *Do not* use it with SMC's EZ Card 10 PCI models.

Notes: These PCI cards can only function with the EMM386.exe memory manager program, version 4.49 or later. You can verify the version number by entering "EMM386" at the DOS prompt.

Do not specify the HIGHSCAN option with the EMM386.exe statement in your config.sys file or your system will hang.

If you run MEMMAKER and select Custom Setup, do not specify "Aggressively scan upper memory," or it will

automatically insert the HIGHSCAN flag into the EMM386 command line. This parameter cannot be manually removed once it is installed; doing so will cause the extended memory manager to malfunction.

For problems with your BIOS setup, refer to your PC's user documentation

APPENDIX D
GLOSSARY

BNC
Connector with a half-twist locking shell typically used for thin coax cable.

Boot ROM
Read-only memory chip that allows a workstation to communicate with a file server and to read a DOS boot program from the server.

Bus Topology
Network topological arrangement where only one path exists between any two nodes, and data transmitted by any node is concurrently available to all other nodes on the same transmission medium.

Driver
Program that enables the network operating system to communicate with LAN cards.

IEEE 802.3 Standard
Standard developed by the IEEE (Institute of Electrical and Electronics Engineers) for physical and electrical connections in local area networks.

Interrupt (IRQ)
Signal that temporarily suspends a program when input or output is required and transfers control to the operating system.

LED
Light emitting diode.

Mbps
Megabits per second.

RJ-45 connector
Most common terminator for twisted-pair cable.

Star Topology
Also known as hub topology; topology where wires run between network nodes and a central wiring hub usually located in the building's wiring closet.

10BASE-T
IEEE specifications for 10 Mbps Ethernet on twisted-pair cable (100 Ω UTP). The maximum cable length for a point-to-point connection is 100 m (328 ft.) and the maximum number of nodes is 1024.

10BASE2
IEEE specifications for 10 Mbps Ethernet on thin coax cable (50 Ω RG-58). A cable segment can be up to 185 m (607 ft.) long and have a maximum of 30 nodes.

10BASE5
IEEE specifications for Ethernet on thick D-type cable.

Topology
Logical or physical arrangement of nodes on a network.

Shielded Twisted-Pair Cable (STP)
Cable composed of two insulated wires twisted together and covered by a foil or braided shielding to reduce electrical interference.

PCI Local Bus
Bus designed by Intel that can function independently of the CPU and that supports a 32-bit data path to the CPU, allowing the use of a wide range of 32-bit peripherals.

Unshielded Twisted-Pair Cable (UTP)
Cable composed of two insulated wires twisted together to reduce electrical interference.

INDEX

R

S

T

V

Limited Warranty

HARDWARE: Standard Microsystems Corporation ("SMC") warrants the EZ Card 10 PCI network cards to be free from defects in workmanship and materials, under normal use and service, for the following length of time from the date of purchase from SMC or its Authorized Reseller:

EZ Card 10 PCI Network Cards . . . . . .Limited Lifetime

If a product does not operate as warranted during the applicable warranty period, SMC shall, at its option and expense, repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or refund to customer the purchase price paid for the defective product. All products that are replaced will become the property of SMC. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

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Standard Microsystems Corporation
80 Arkay Drive
Hauppauge, NY 11788
516-273-3100

COMPLIANCES

FCC Class B

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 instructions, may cause harmful interference to radio communications. However, there is no guarantee that the 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 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

Shielded twisted-pair cable is required for Class B compliance. If unshielded twisted-pair cable is used, the unit will comply only with Class A requirements.

CDOC Class B

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Shielded twisted-pair cable is required for Class B compliance. If unshielded twisted-pair cable is used, the unit will comply only with Class A requirements.

Le présent appareil numérique n'émet pas de bruits radio-électriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dens le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Une paire torsadée blindée est nécessaire pour l'homologation de classe B. Si une paire torsadée non blindée est utilisée, le dispositif sera conforme aux normes de classe A seulement.

EC Conformity

This information technology product was found to comply with EC General Directives 89/336/EEC and 73/23/EEC.

European Headquarters:

Standard Microsystems (Europe) Limited
1st Floor, Pyramid House, Easthampstead Road
Bracknell, Berkshire RG12 1NS, United Kingdom

Compliance with the applicable regulations is dependent upon the use of shielded twisted-pair cables.

VCCI Class B

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Australia AS/NZS 3548 (1992)

SMC contact for products in Australia is:

SMC Australia Pty. Ltd., ACN 069 351 613
LVL 66 MLC Center
Martin Place
Sydney NSW 2000
Phone: 61-2-9238-2206
Fax: 61-2-9238-2220

FOR TECHNICAL SUPPORT, CALL:

From U.S.A. and Canada (8:30 AM - 8:00 PM Eastern Time)
(800) SMC-4-YOU; (516) 435-6250; (516) 434-9314 (Fax)
From Europe (8:00 AM - 5:30 PM UK Greenwich Mean Time)
44 (0) 1344-420068; 44 (0) 1344-418835 (Fax)

Bulletin Board Services (BBS)

Modem settings: 9600,8,n,1
New York: (516) 434-3162 (connect speed up to 14,400)
Germany: 49 (0) 89 92861-240
France: 33 (1) 39.73.57.00
United Kingdom: 44 (0) 1344 418838

INTERNET address is: techsupport@smc.com
Driver updates available from the Internet:
Host name info.smc.com (IP address: 170.129.51.1)
SMC Forum on CompuServe: at the prompt (!) type: GO SMC.
World Wide Web: http://www.smc.com/

FOR LITERATURE OR ADVERTISING RESPONSE, CALL:

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France:	33 (1) 30.87.42.42;	Fax 33 (1) 30.61.41.34
Europe:	44 (0) 1344 418800;	Fax 44 (0) 1344 418828
Northern Europe:	44 (0) 1344 418820;	Fax 44 (0) 1344 418826
Central Europe:	49 (0) 89 92861-0;	Fax 49 (0) 89 92861-230
Eastern Europe/Middle East:	49 (0) 89 92861-142;	Fax 49 (0) 89 9101934
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