

EZ Card 10

10 Mbps Ethernet ISA 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
ISA Network Card**

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ABOUT THIS GUIDE

This installation guide is for SMC's family of EZ Card™ 10 ISA Plug and Play Network Cards. The three models are as follows:

Order Number	Description
SMC1660T	twisted-pair card with RJ-45 connector
SMC1660BT	2-port combo card with RJ-45 and BNC connectors
SMC1660BTA	3-port combo card with RJ-45, BNC and AUI connectors

Table 1. EZ Card 10 ISA Models

This guide covers the following topics:

- Description of the hardware, such as LEDs and connectors
- Installation procedure

Note: Procedures for driver installation and additional information or changes that became available after the manual is printed are in text files in the driver diskette that comes with the package. You can use the DOS DIR command to locate all available text files and view the file 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 ISA 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 rounded 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 disk and use the copy as the working disk. Do this to protect the original from accidental damage.

QUICK START

Installing the Card

1. Power off your PC and remove its cover.
2. If you have purchased an optional boot ROM, plug the boot ROM into the socket on the card, making sure the notch on the memory device and that on the socket are in the same direction.
3. Select an available expansion slot and plug in the card.
4. Connect your card using the appropriate network connection (RJ-45, BNC or AUI).
5. Power on the PC.
6. Follow the appropriate instructions in this chapter to configure the card and load the network drivers.

Configuring the Card

Important: It is recommended that you read the RELEASE.TXT file located on the driver diskette. This file provides information about the disk's contents. The contents of the file is displayed by typing the following command at the DOS prompt:

```
TYPE RELEASE.TXT   Press <Enter>
```

To install and run the configuration program, proceed as follows:

1. Insert the driver diskette in drive A: or B:
2. Type the following command at the DOS prompt:

```
INSTALL <PATH>   Press <Enter>
```

where: **<PATH>** is the directory location where you wish to install the program.

QUICK START

The configuration program is automatically invoked once the INSTALL command is entered and the Program Menu is displayed (see Figure 1).

Note: This program may be run again by typing the following command at the DOS prompt while you are in the directory where the program is located:

SMCINST Press <Enter>

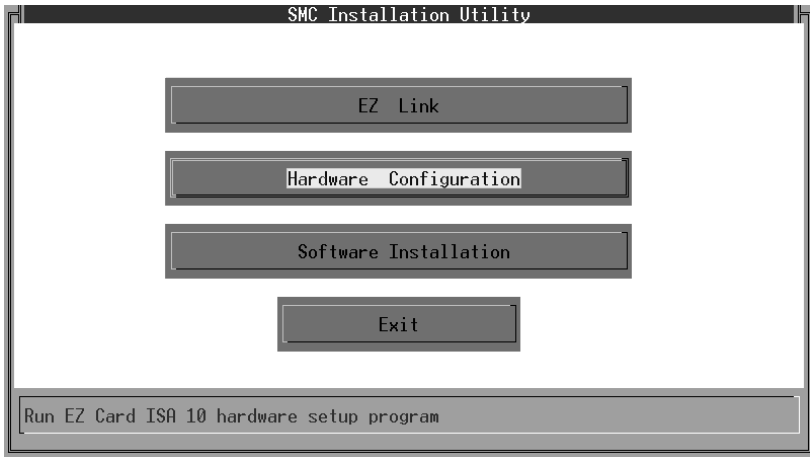


Figure 1. Program Menu

3. Select Hardware Configuration from the Program Menu to display the Main Menu (see Figure 2).
4. Select View Current Configuration from Main Menu to verify the hardware settings (see Figure 3).



Figure 2. Main Menu



Figure 3. Current Configuration Display

QUICK START

Note: If you need to modify the current configuration and you are in a Jumperless (non-Plug and Play) environment, return to the Main Menu and select Manual Setup. In a Plug and Play environment, select the Default Setup option to automatically set the parameters. Refer to Chapter 2, “Hardware Settings” for more detailed information.

5. If you have made changes to the Card Configuration, the program prompts you to save these changes.
6. Run the Diagnostics.

Select the appropriate option from the Main Menu:

- Diagnose the Adapter
- Diagnose EEPROM
- Run Diagnostics on Network

Refer to Appendix A, “Diagnostics” for a detailed explanation of the diagnostics.

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

7. Select Exit Setup to return to the Program Menu.

Software Installation

NetWare Client Operating System

The following steps will be performed if you select “Yes” from the EZ Link screen:

- the drivers and configuration files are copied
 - STARTNET.BAT and NET.CFG files are created
 - card's components and corresponding cabling system are tested
 - network drivers are loaded
 - you are logged on to the nearest Novell server, which then prompts for your password
1. Select EZ Link from the Program Menu.
 2. Select <Yes> to run EZ Link.
 - insert the driver diskette in Drive A: or B:
 - type the location where you wish the driver to reside
 - Press <OK>
 3. Select <No> to return to the Program Menu.
 4. Select Exit to quit the program.

QUICK START

Other Operating Systems (including Windows95 and NT)

1. Select the Software Installation option from the Program Menu. The Software Installation Screen is displayed (see Figure 4).

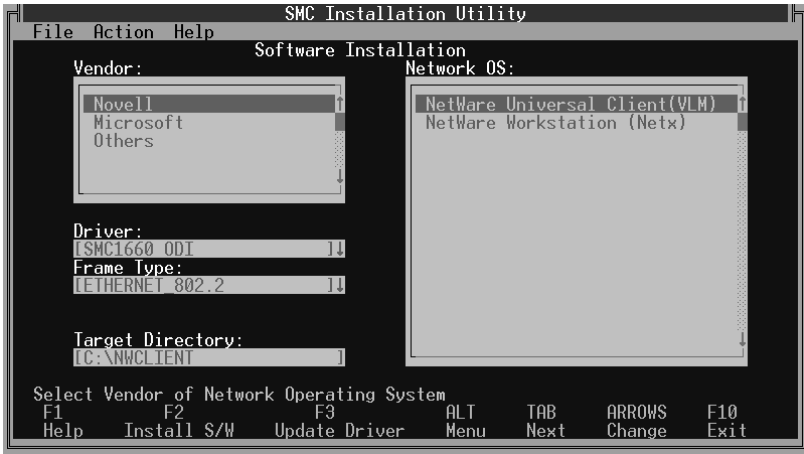


Figure 4. Software Installation Screen

Menu Bar Commands - the menu bar below the title bar contains File, Action and Help pull-down menus.

- File Menu - displays commands for opening a DOS shell or exiting to the Program Menu
- Action Menu - contains commands to install the selected software or update the specified drivers. These functions can also be performed by the <F2> and <F3> function keys
- Help Menu - provides software version and copyright information under About, while the Help command provides online assistance for the available functions.

Note: Use the tab key to go to the next field and arrow keys to move the cursor up or down within a field.

2. Select the Vendor and corresponding network operating system from the screen.

If the driver is not included in this menu, refer to the *.TXT file for a list of available drivers and instructions for installing these drivers. *.TXT files are provided in each subdirectory for last-minute changes and detailed driver installation instructions.

3. Type the target directory where the program will reside.
4. Press <F2> to install the software.
 - insert the driver diskette in drive A: or B:
 - type the location of the driver diskette
 - Press <OK>
5. Press <F10> to return to the Program Menu.
6. Select Exit to quit the program.

TABLE OF CONTENTS

Chapter

1	Hardware Description.....	1-1
	LAN Connectors	1-1
	LED Indicators.....	1-1
	Link Status.....	1-2
	Activity Status	1-2
2	Hardware Settings	2-1
	Default Setup.....	2-1
	Manual Setup.....	2-2
	Changing the Settings	2-3
	Medium Type	2-3
	Full Duplex.....	2-3
	I/O Base Address (Jumperless Environment only)	2-3
	Interrupt (Jumperless Environment only).....	2-4
	Boot ROM.....	2-4

Appendices

A	Diagnostics.....	A-1
	Diagnose the Card	A-2
	Network Diagnostics.....	A-3
B	Troubleshooting	B-1
	"Clean Boot"	B-1
	Problems and Solutions	B-2
C	Pin Assignments	C-1
	RJ-45 Connector	C-1
	AUI Connector.....	C-2

TABLE OF CONTENTS

D Specifications..... D-1

- General D-1
- Operating Environment D-2
- EMC/Safety Compliance D-2
- Network Drivers..... D-3

E Glossary..... E-1

Index

Limited Warranty

Compliances

List of Figures

Figure 1.	Program Menu.....	vi
Figure 2.	Main Menu	vii
Figure 3.	Current Configuration Display	vii
Figure 4.	Software Installation Screen	x
Figure 1-1.	LED Indicators.....	1-2
Figure 2-1.	Default Setup.....	2-1
Figure 2-2.	Manual Setup - Plug and Play Environment..	2-2
Figure 2-3.	Manual Setup - Jumperless Environment	2-2
Figure A-1	Main Menu	A-1
Figure A-2.	On-Board Diagnostics.....	A-2
Figure A-3.	EEPROM Test	A-3
Figure A-4.	On-Network Diagnostics	A-3
Figure A-5.	On-Network Diagnostics - Initiator Screen....	A-4
Figure A-6.	On-Network Diagnostics - Responder Screen	A-4

List of Tables

Table 1.	EZ Card 10 ISA Models.....	iii
Table 2.1.	Commonly Used I/O Base Addresses.....	2-3
Table 2.2.	Commonly Used IRQ Channels	2-4
Table 2.3.	Commonly Used Memory Addresses.....	2-5
Table C.1.	RJ-45 Connector Pin Assignments.....	C-1
Table C.2.	AUI Connector Pin Assignments	C-2

CHAPTER 1

HARDWARE DESCRIPTION

The SMC EZ Card 10 ISA models have two LED indicators and support from one to three types of network connections.

LAN Connectors

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

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

The cards include signal transceivers that interface with twisted-pair and thin coax connections. 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 on the next page. Refer to Figure 1-1 for the LED location.

HARDWARE DESCRIPTION

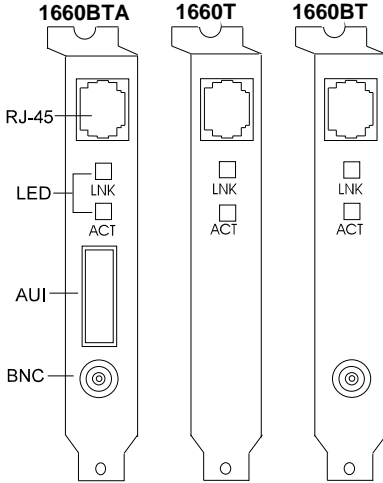


Figure 1-1. LED Indicators

Link Status (Lnk)

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

HARDWARE SETTINGS

Default Setup

The Default Setup option automatically allocates necessary I/O and IRQ resources to the card, then detects and corrects parameter settings which are in conflict with other devices installed on the host PC. If you have more than one Plug and Play card installed and you select Hardware Configuration from the Program Menu, you will be prompted to specify the card you want to configure. Select the corresponding Node ID from the Select LAN Adapter box.



Figure 2-1. Default Setup

Manual Setup

This option is used for systems without Plug and Play support or when it is necessary to change the default settings.



Figure 2-2. Manual Setup - Plug and Play Environment

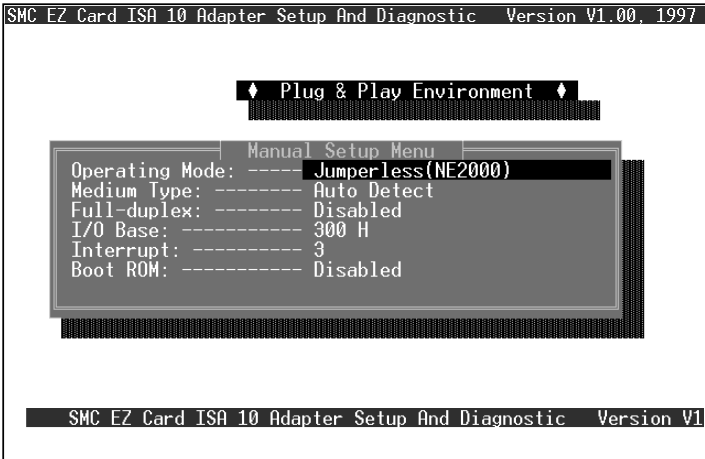


Figure 2-3. Manual Setup - Jumperless Environment

Changing the Settings

The following settings may be changed in the Plug and Play and Jumperless environments.

Medium Type

The transceiver setting depends on the type of card you are using. It should agree with the network cabling type. For combo cards, this program provides two media type selections: Auto Detect and AUI.

If you are using the RJ-45 or BNC connector, you can select "Auto Detect" to have the system automatically determine the media type (i.e., 10BASE-T or 10BASE2). If you are using an AUI connection, then specify 10BASE5 (AUI).

Full Duplex

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.

I/O Base Address (Jumperless Environment only)

Select any available address in the range 200h to 3E0h from the displayed list. The factory default is 300h. The following table represents the most commonly used I/O Base Addresses:

I/O Base Addresses	Potential Conflicting Devices and their Typical I/O Addresses
300	NE2000 default setting
320	XT Hard Disk Interface (320 to 32F)
360	LPT1: (378 to 37F) +

Table 2.1. Commonly Used I/O Base Addresses

HARDWARE SETTINGS

Interrupt (Jumperless Environment only)

Select any available hardware interrupt in the range 2 to 15 from the displayed list. The card's default interrupt setting is 3. The following table lists the XT and AT interrupt settings:

IRQ	XT	AT
2	EGA/VGA	EGA/VGA
3	COM2	COM2
4	COM1	COM1
5	Hard Disk	Parallel Printer Port
10	N.A.	Unused
11	N.A.	Unused
12	N.A.	Mouse for PS/2
15	N.A.	Unused

Table 2.2. Commonly Used IRQ Channels

Boot ROM

The card provides an empty socket for an optional 16 KB boot ROM. If your server provides boot services, the generic RPL boot ROM permits the client PC to download the disk operating system (DOS) and network drivers over the network. A boot ROM for LAN Manager, LAN Server and NetWare Server is available from your SMC dealer.

The boot ROM is disabled by default. When a boot ROM is installed on the card, you can enable the boot function by selecting a boot ROM address (i.e., C0000h, C4000h, C8000h, CC000h, D0000h, D4000h, D8000h or DC000h). Like all other card parameters, this value should be unique to your system. (You may need to temporarily disable EMM386 in your config.sys file to free-up space for the boot ROM.) The following table lists the most commonly used memory addresses used by the boot ROM. Shaded areas represent the addresses of the corresponding device.

		A0000	B0000	C0000	D0000	E0000	F0000	100,000
Mono	(B0000-B1000)		█					
CGA	(B8000-C0000)			█				
EGA	(A0000-C0000)	█	█	█				
VGA	(A0000-C8000)	█	█	█				
EXP. MEM	(D0000-E0000)					█		
XT BIOS	(F4000-100000)							█
AT BIOS (IBM)	(E0000-100000)						█	█
AT BIOS (CLONE)	(F0000-100000)							█

Table 2.3. Commonly Used Memory Addresses

APPENDIX A

DIAGNOSTICS

The installation program includes a diagnostics program for checking the card's components and the network cabling. The card may fail some tests due to various reasons – some of which may be easily remedied by the user. See Appendix B, Troubleshooting, on tips to isolate and solve common problems. Select the appropriate diagnostic from the Main Menu.



Figure A-1. Main Menu

Diagnose the Card

To test the card's components and its installation, select:

- Diagnose the Adapter
- or
- Diagnose EEPROM.

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

Note: These tests do not test the network's condition.



Figure A-2. On-Board Diagnostics

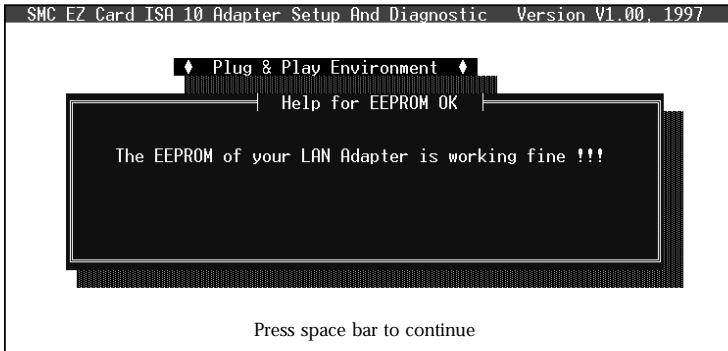


Figure A-3. EEPROM Test

Network Diagnostics

To verify your card's ability to communicate with another device on the network, select Run Diagnostics on Network from the Main Menu. Set up at least one computer as a Responder and at least one as an Initiator. In the test, one PC generates test messages across the network. Another PC receives the test messages and echoes them back to the source PC. This test displays the status of network communications.



Figure A-4. On-Network Diagnostics

DIAGNOSTICS

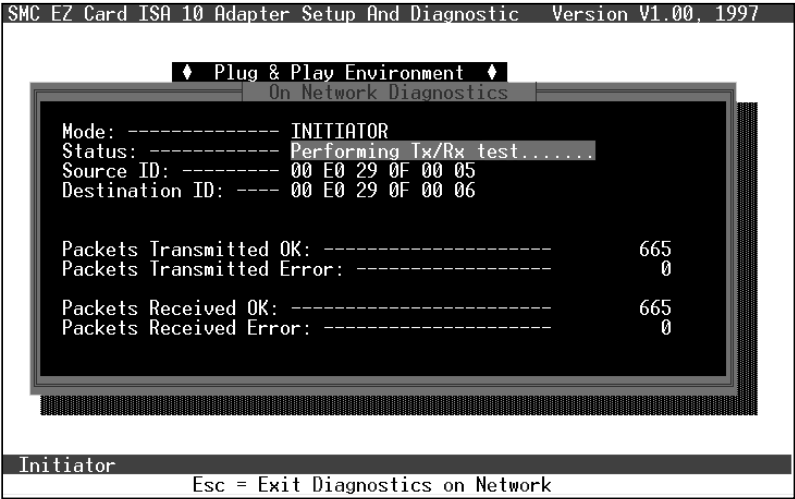


Figure A-5. On-Network Diagnostics - Initiator Screen

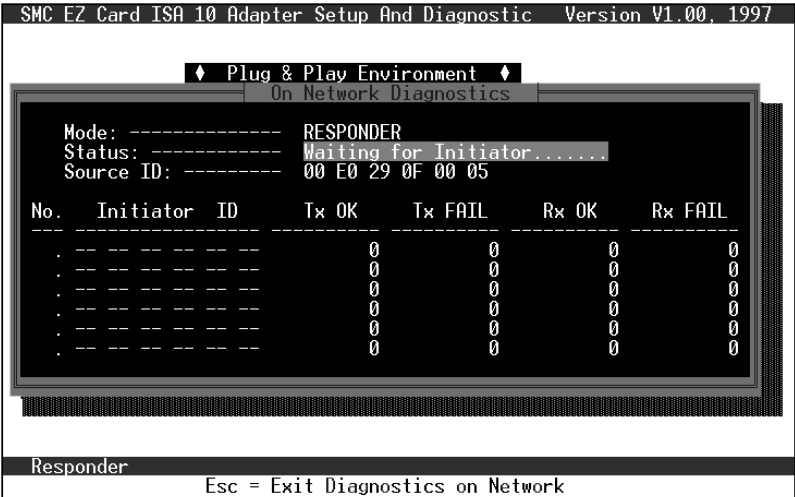


Figure A-6. On-Network Diagnostics - Responder Screen

APPENDIX B

TROUBLESHOOTING

"Clean Boot"

Many installation problems are caused by incompatible device drivers and resource conflicts. The best way to troubleshoot your installation is to boot your computer without the AUTOEXEC.BAT and CONFIG.SYS files.

Reboot your computer using the BIOS Option, such as pressing <F5>, which allows you to bypass all startup files. Otherwise, create a bootable system diskette or rename AUTOEXEC.BAT and CONFIG.SYS to other names and re-boot your computer.

You may run the Microsoft Diagnostics program, which is available from:

- DOS version 6.0 and later - by typing MSD at the DOS prompt
- Windows NT 3.x, 4.0 - by clicking on Windows NT Diagnostics icon in the Administrative Tools program group
- Windows95 - by typing MSD at the Windows95 DOS window

Problems and Solutions

The following sections offer some helpful suggestions and tips to go about resolving some of the more common problems you may encounter during the installation process.

Symptoms

1. Unshielded twisted-pair connection results in card failure; LNK (Link) LED indicator is off.
2. Running On-Board Diagnostics results in External Loopback Test failure in DOS environment.

Possible Cause

Invalid twisted-pair link

Suggestions

1. Check the RJ-45 connection for loose cabling.
2. Check for wrong RJ-45 pin assignments.
3. Reboot the system and start the On-Board Diagnostics test again.

Symptom

The PC is unable to log into the network.

Possible Causes

1. Bad cable connection.
2. Card not properly installed in computer slot.
3. Host PC's slot is defective.
4. IRQ conflict.

Suggestions

1. If you are using the RJ-45 connector, check the cabling for loose connection or wrong pin assignment.
2. Check to be sure the card is properly seated in the computer's slot; it may have been accidentally loosened.
3. Install the card in another PC, or install it in another slot. If the problem is eliminated, then the original PC's slot is defective. Contact your PC vendor for assistance.
4. If you are running Windows, use Microsoft diagnostics to resolve IRQ conflicts.

APPENDIX C

PIN ASSIGNMENTS

RJ-45 Connector

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

Table C-1. RJ-45 Connector Pin Assignments

PIN ASSIGNMENTS

AUI Connector

Pin Number	Assignment
Pin 1	Control In Shield
Pin 2	Control In A (CD +)
Pin 3	Data Out A (TX +)
Pin 4	Data In Shield
Pin 5	Data In A (RX +)
Pin 6	DC Power Common
Pin 9	Control In B (CD -)
Pin 10	Data Out B (TX-)
Pin 11	Data Out Shield
Pin 12	Data In B
Pin 13	DC Power +
Pin 14	Power Shield
Pin 7, 8, 15	No connection

Table C.2. AUI Connector Pin Assignments

APPENDIX D

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)

Hardware Compatibility

IBM PC-XT, AT, 286, 386, 486, Pentium, PS2 Model 30,
and compatible, ISA-bus computers.

I/O Base Address

0200h to 03E0h on 20h boundaries

Interrupt Channel

2(9), 3, 4, 5, 10, 11, 12,15

Generic RPL Boot ROM

Size	16/32/64 KB selectable
Address	8 choices: C0000h to DFFFFh on 16 KB boundaries

Dimensions

SMC1660BTA 157.35 mm x 101.6 mm (6.195 in. x 4 in.)
SMC1660T and SMC1660BT 157.35 mm x 62.99 mm
(6.195 in. x 2.48 in.)

SPECIFICATIONS

Operating Environment

Operating Temperature

0° to 55°C (32° to 131°F)

Humidity

10% to 90% (non-condensing)

Power Requirements

On-board 10BASE Transceiver (RJ-45)

Stand-by: +5 V / 110 mA

Transmit: +5 V / 130 mA

On-board 10BASE2 Transceiver (BNC)

Stand-by: +5 V / 420 mA

Transmit: +5 V / 470 mA

External 10BASE5 MAU (AUI)

Maximum: +12 V / 500 mA

EMC/Safety Compliance

FCC Class B

CDOC Class B

CISPR 22:1985 Class B

EN55022:1987 Class B

AS/NZS (1992)

VCCI Class B

IEC1000-4-2 4kV CD, 8kV AD

IEC1000-4-3 3V/m

IEC1000-4-4 1kV-(power line)
0.5kV-(signal line)

IEC1000-4-6 3Vrms

EN60950

CE marking

Network Drivers

NetWare ODI Drivers

NetWare 3.x, 4.x, 4.11
NetWare LAN WorkPlace TCP/IP
Novell LAN Analyzer for NetWare

NDIS 2.0 Drivers

IBM LAN Server
IBM LAN Support Program
DEC PATHWORKS
Sun PC-NFS
IBM TCP/IP for DOS & OS/2
Microsoft LAN Manager

NDIS 3.0 Drivers

Microsoft Windows for Workgroups 3.11
Windows 95
Windows NT 3.x
Windows NT 4.0

Unix Drivers

SCO OpenServer 5.x

Packet Drivers

FTP TCP/IP
NCSA TCP/IP

Boot ROM Types **Generic Boot ROM**

LAN Manager
LAN Server
NetWare servers

APPENDIX E

GLOSSARY

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 coaxial 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 specification for 10 Mbps Ethernet on thick D-type cable. A cable segment can be up to 500 meters and have a maximum of 100 nodes.

AUI (Attachment Unit Interface)

A 15-pin logical, electrical and mechanical interface specified by the IEEE 802.3 standard for connecting a PC, server or other device to an Ethernet transceiver or Media Access Unit (MAU).

BNC

Connector with a half-twist locking shell typically used for thin coaxial 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.

GLOSSARY

Broadcast

The process of sending a message to all stations on a network.

Collision

Condition in which two packets transmitted over a medium interfere with each other. Their interference makes both unintelligible. The transmitting devices have to halt transmission for a random period of time before trying to send data again. Note that collisions do not occur on full-duplex connections.

Driver

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

Frame

Group of bits that include data plus control information. Generally refers to a link layer (layer 2) protocol.

I/O Address

Input/output address; starting address for data input and output.

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

Signal that causes a momentary switch of control from program to operating system when input or output is required.

Loopback

Diagnostic test in which a signal is transmitted across a medium while sending device waits for its return.

NetWare

Novell's Network Operating System, which provides the ability to transparently share services across dissimilar platforms. Uses the NetWare Core Protocol (NCP), Internetwork Packet Exchange (IPX), and Sequential Packet Exchange (SPX) protocols.

RJ-45 Connector

Most common terminator for twisted-pair cable.

TCP/IP

Transmission Control Protocol/Internet Protocol. Protocol suite developed by the Advanced Research Projects Agency (ARPA); includes TCP as the primary transport protocol and IP as the network layer protocol.

Unshielded Twisted-Pair Cable (UTP)

Cable composed of insulated wires twisted together to reduce electrical interference.

INDEX

A

Activity Status 1-2
AUI Connector C-2

B

BIOS Option B-1
Boot ROM v, 2-4

C

Card Installation v
Clean Boot B-1

D

Default Setup 2-1
Diagnose Card A-2
Diagnose EEPROM A-2
Driver Diskette iv, v

E

EMC/Safety Co D-3

F

Full Duplex 2-3

H

Hardware Configuration vi
Hardware Description 1-1
Hardware Configuration 2-1

I

Interrupt 2-4
I/O Base Address 2-3

L

LAN Connector 1-1
LED Indicators 1-1
Link (LNK) LED 1-2
Link Status Indicator 1-2

M

Manual Setup 2-2
Medium Type 2-3
Menu Bar Commands x
MSD (Microsoft Diagnostics) B-1

N

Network Diagnostics A-3
Network Drivers D-3

O

Operating Environment D-2

P

Pin Assignments C-1
Power Requirement D-2
Problems and Solutions B-2

R

RELEASE.TXT v

INDEX

S

Specifications D-1

Standards Conformance D-2

System Configuration D-1

T

Troubleshooting B-1

W

Warranty Registration Card iv



Limited Warranty

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

EZ Card 10 ISA 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

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.

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

COMPLIANCES

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

This product conforms to the following specifications:

EMC:	EN55022(1988)/CISPR-22(1985)	Class B
	IEC1000-4-2	4kV CD, 8kV AD
	IEC1000-4-3	3V/m
	IEC1000-4-4	1kV-(power line) 0.5kV-(signal line)
	IEC1000-4-6	3Vrms

VCCI Class B

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取扱説明書に従って正しい取り扱いをして下さい。

Australia AS/NZS 3548 (1992)

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LVL 66 MLC Center
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Phone: 61-2-9238-2206
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FOR TECHNICAL SUPPORT, CALL:

From U.S.A. and Canada (8:30 AM - 8:00 PM Eastern Time)
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From Europe (8:00 AM - 5:30 PM UK Greenwich Mean Time)
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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/>

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