Advanced PCI Ethernet Adapter

Installation Guide

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Chapter 1
Introduction

1 . 1 . Overview

This installation guide tells you how to install the PCI Ethernet adapter.

The Ethernet adapter board is designed for PC/AT compatible computers with PCI local bus. This product connects to a local area network(LAN)using either 10Base-2 coaxial cable or 10Base-T unshielded twisted pair wire and telephone-type modular.

The Ethernet adapter offers a simple solution to implement a PCI local bus NE2000 compatible adapter with full-duplex function. The full-duplex function enables simultaneously transmission and reception on the twisted-pair cable link to a full-duplex Ethernet switching HUB. This feature not only increases the channel bandwidth from 10 to 20 Mbps but also avoids the performance degrading problem due to the channel contention characteristics of the Ethernet CSMA/CD protocol.

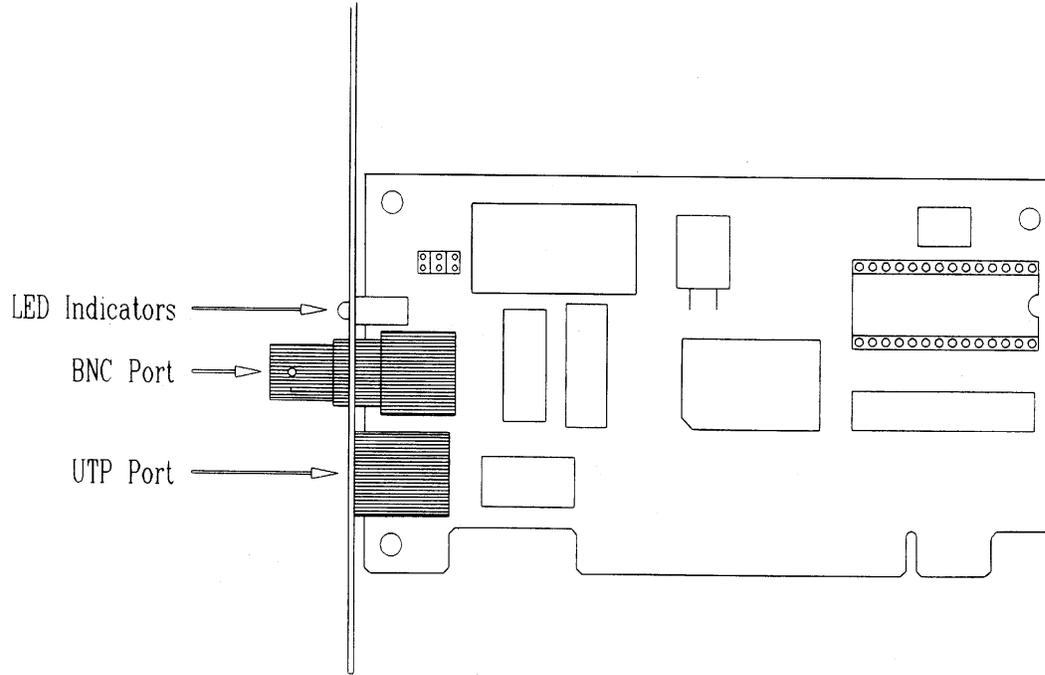LED Indicators

BNC Port

UTP Port

Figure 1. Ethernet Adapter Board

1. 2. Features

- Complies with IEEE 802.3 10Base-2 (Thin) and 10Base-T standard.

- Software compatible with Novell NE2000 driver.

- Hardware configuration setting by software.

- Supports standard segment(185 meters) and extension segment (300 meters) for 10Base-2 (Thin Ethernet).

- Supports Full-Duplex Ethernet function to double channel bandwidth with switching HUB.

- Supports 8K, 16K and 32K Boot ROM size.

- Supports on board 16KB buffer RAM.

- Supports signal polarity detection and correction for UTP port.

- Supports on board 50-Ohm terminator for Thin cable.

- Provides drivers for most popular network software.

1 . 3. Specifications

- Configuration   Software setting

- Interface   BNC(Thin) and RJ-45 Phone Jack(UTP)

- ROM Size   8KB, 16KB and 32KB

- Physical   130mm x 70mm
  Dimension

- Ambient   Operating   0℃ ~ 50℃
  Temperature   Storage   -20℃ ~ 70℃

- Relative   Operating   10% ~ 90% (non-condensing)
  Humidity   Storage   5% ~ 95% (non-condensing)

- Power   + 5VDC 0.7Amps max
  Requirement

1 . 4. Interpreting LED Indicators

The Ethernet adapter board supports two LEDs to indicate
the condition and troubleshooting of network

TX/RX LED:

Blinks when the adapter submits a packet to the network or
receive the carrier from the network.   There is an external
TX/RX LED connector,   labeled as "J2", on the upper left
conner of the adapter. The external TX/RX LED will syn-
chronize with the on board TX/RX LED.

Link LED:

The LED is used for UTP connections. Lights when the link
pulse is detected on UTP port.   If it is off or blinking, you
should determine whether this indication is normal or is the
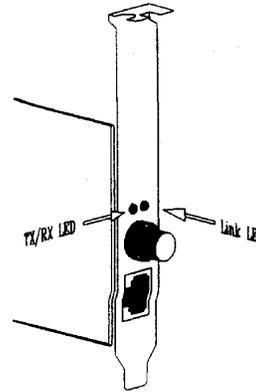result of some problems in the connection.

Figure 2. LED Indicators

Chapter 2

Configuring the Adapter

This chapter shows you how to configure the adapter. Most configurations of the adapter are set by software. The Thin Ethernet cable segment length and on board terminator are set by jumper.

2 . 1.Jumpers Setting

2 . 1. 1. Setting Thin Ethernet Segment Length

This adapter   Thin Ethernet cable segment can be set on standard length (185meters) or extended length (300meters). If you require more detailed information, refer to the chapter 4 of this manual.

The jumper is labeled "JP1" that is used to set the segment length of Thin Ethernet.

300M	185M
3 2 1	3 2 1
○ ○ ○	○ ○ ○
JP1	JP1

Table 1. Thin cable Length Setting

2 . 1. 2. Setting On Board Terminator

This adapter supports a 50 Ohm on board terminator. If you can not get the external terminator when you install a network, then you can use the on board terminator to eliminate the external terminator. The jumper is labeled "JP2" that is used to set the on board terminator.

Table 2. On Board Terminator Setting

2 . 2. Software Configuration Setting

On the LAN driver diskette you can find the setup program
"RSET8029R.EXE", through the setup program you can change the medium type and boot ROM size, diagnostic board functions.

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Chapter 3
Installing a Boot ROM

A socket is provided on the adapter for installing a boot ROOM device for a diskless system to boot over the network. Boot ROMs are available from your dealer.

To install a boot ROM , you must insert the boot ROM into the ROM socket and configure the ROM type, ROM range and ROM base address.

3 . 1. Insert the Boot ROM

Position the boot ROM over the ROM socket. The semi-circular notch on one side of the ROM should be oriented towards a similar notch on the socket (refer Figure3)

Gently press the boot ROM all the way down into the socket. Be careful not to bend any pins of the boot ROM
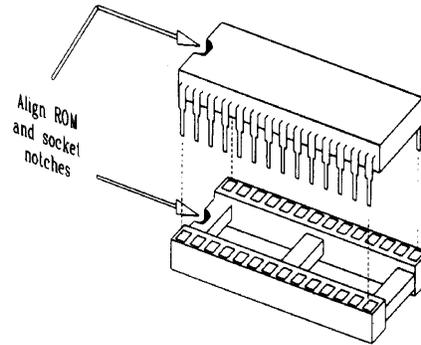
Figure 3. Inserting the ROM Device

3 . 2. ROM Type

The Ethernet adapter supports 8K, 16K and 32K bytes Boot-ROM.Those are 27x64(8KB),27x128(16KB) and 27x256(32KB) can be used.

Chapter   4
Network Interconnection

This chapter is designed to tell you, how to connect your adapter to Thin Ethernet cable   or   Unshielded Twisted Pair cable.

4 . 1. Thin Ethernet

The BNC port is used to attach a thin Ethernet segment. Below sections tell you how to make connection.

4 . 1. 1. Connecting to Thin Ethernet Cable

1. Attach a BNC-T connector to the BNC network port at the rear of the computer.

2. Attach one end of the coaxial cable to an open end of the T-connector on the first computer. Align the notches in the cable-end with the posts on the T-connector, push the cable in, and twist about one-quarter turn. A viod server bending or kinking of the cable. Attach the other end of the cable to an open end of the T-connector at the rear of the second computer. Continue making connections to the rest of the computers. Do not exceed 300 meters of interconnection cable without using a signal repeater to attach another network segment.

3. When all computers have been connected , attach a 50 Ohm cable terminator at each end of every segment.
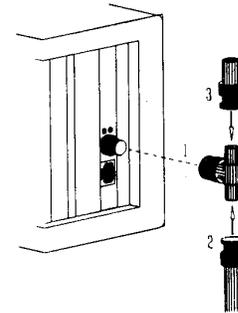

Figure 4. Attaching the T-Connector, Cable & Terminator

4 . 1. 2. Thin Ethernet Segment

A Thin Ethernet cable segment is the length of the cable between repeaters. The Ethernet adapter will function with 185- or 300-meter cable segments by jumper setting (refer to chapter 2). The maximum length you choose, however, must be used for all cable segments in the network.

If your network uses standard 185-meter cable segments, all Thin Ethernet cable segments in the network can be up to 185 meters long. Five standard length cable segments maybe connected in line using commercially available repeaters. The total network span with five standard length segments is 925 meters. No more than four repeaters can be on the signal path from one node to any other node. The standard 185-meter segment length is recommended because it allows you to use common IEEE standard Thin Ethernet components.

If your network uses extended 300-meter cable segments, all Thin Ethernet cable segments in the network can be up to 300 meters long. Three 300-meter length cable segments may be connected in line using commercially available repeaters.

The total network span with three extended length segments is 900 meters. No more than two repeaters can be on the signal path from one node to any other node. If you are using extended length segments, all repeaters and transceivers must be designed for 300-meter-operation. In addition, all LAN adapter boards (other than this adapter) must be configured to the extended segment length, if a configuration choice is required.

Note that you cannot use Ethernet adapters to extend 185-meter segments to 300-meter cable segments unless all LAN adapters and repeaters used in the network are capable of operation on the extended segment length.

Characteristics	Standard Length Segment	Extended Length Segment
Standard	IEEE 802.3 10BASE2	IEEE 802.3 10BASE2
Data Rate	10 Mbits per second	10 Mbits per second
Segment Length	185m	300m
Maximum number of segments between nodes	3 coax* + 2 repeater links	3 coax* ; no repeater links
Maximum number of repeaters between nodes	4 when using 2 repeater links	2
Network Span	925m	900m
Maximum number of nodes per segment	30	100
Maximum number of nodes per network	1024	1024
Minimum space between nodes	0.5m	0.5m
Cable Type	RG58 A/U or C/U,50Ohm,single shield, BNC connectors	RG58 A/U or C/U,50Ohm,single shield, BNC connectors

* A coax segment contains nodes while a repeater link segment does not. A repeater link segment is used for extending the distance between coax segments.

Table 3. Thin Ethernet Network Characteristics

4 . 2. Unshielded Twisted Pair Ethernet

The RJ-45 phone jack of the adapter is a twisted-pair(10Base-T)network port. The following are required to interconnect the network computers to a 10Base-T Ethernet network:

- A twisted-pair cable for each computer.

- A local concentrator (or HUB) for interconnecting computers or a wall jack wired for 10Base-T twisted-pair cable that leads to a concentrator in a wiring closet.

- Insert the plug at one end of the cable into the RJ-45 UTP port. Attach the other end of the cable to an input port of a concentrator.

4 . 2. 1. Using Existing Phone cable

The existing phone wiring in your building can be used for network interconnection if the wiring meets the cable standard and wall jacks to be used are wired correctly.   Before starting the installation ,verify that any wire to be used for network interconnection meets the requirements described in   Appendix B of this manual.

The existing telephone wiring may consist of a separate eight-conductor, twisted-pair cable(such as the cable supplied with the adapter) routed to each wall jack or it may consist if   dozens of   twisted - pair conductors in a cable bundle.   If a cable bundle is used,   the conductor for each phone line has   been separated from the bundle and attached to the wall jack

In either case, the arrangement of twisted-pairs at the wall jack in a typical telephone installation is usually not acceptable for network signal transmissions. The two Twisted - pair pairs required for network signals must be wired to the wall jack in the following arrangement:

- Pair 1- -attach to pins 1 and 2

- Pair 2- -attach to pins 3 and 6

The twisted - wire pairs for telephone signals are attached to the remaining pins. Determine which conductors are twisted together,   record the wire colors for each pair and note the pin to which each wire is attached.

Network interconnections are usually made in a wiring closet.   You must be able to identify and separate the conductors which are carrying network signals   from the conductors that are used for telephone operation.

4 . 2. 2. Interface Cable Wiring

The twisted-pair cable provided an eight-pin plug at each end that mates with the twisted-pair port on the adapter and with a RJ-45 wall jack. If you are marking your own interface cables to use as dedicated network wiring or as extension cables, refer to Figure 5 for wiring information.
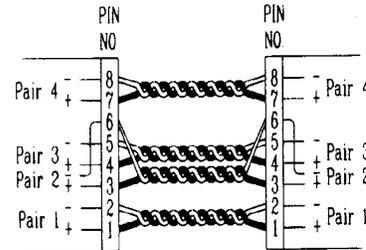

Figure 5. Interface Cable Wiring

The Table5 shows you the UTP Network   characteristics.

Standard	IEEE 802.3 10Base T
Data Rate	10Mbits per second
Maximum length of connecting cable between a computer and Concentrator	100m
Maximum number of(computers) nodes per network	1024
Coaxial cable type	AT&T D-inside wire(DIW & PDS), IBM Type 3

Table 4 Unshielded Twisted Pair Network Characteristics

Appendix   A
Network Components and Setup

LAN adapter:

A LAN adapter is the interface between the computer and the network cable. The Ethernet adapter has two types of network ports.

UTP Port   The UTP port is used for 10Base-T
                    unshielded twisted pair connection.

BNC Port   The BNC port is used for thin Ethernet
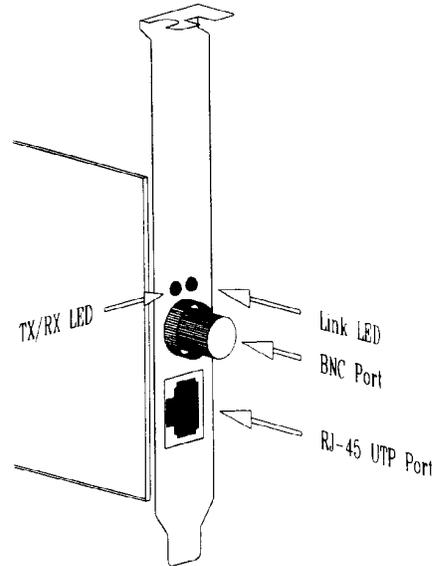   network connection.

Figure 6. Ethernet Adapter Network Ports

Thin Ethernet Cable and Components:

BNC T-Connector   Used to attach the Ethernet adapter to thin Ethernet cable.

Terminator   A terminator with 50-Ohm nominal impedance must be installed at each end of every cable segment. A thin Ethernet terminator has a BNC coaxial connector.

Thin Ethernet cable   RG-58 A/U or RG-58 C/U coaxial cable

Repeater   A repeater is used to connect cable segments together. The repeater recovers and transmits data signals as they pass from one segment to another.

UTP Ethernet Cable and Components:

Concentrator   A HUB is used to connect the UTP Ethernet to make a network.
(HUB)

UTP Cable   Two pairs unshielded twisted-pair cable with 22,24 or 26 gauge solide wires. Maximun attenuation are 11.5dB/100 meters at 10Mhz and 7.2dB/100 meters at 5Mhz.

RJ-45 Plug   The plug is mounted on cable in order to connect with the UTP port of the adapter Figure 7 shows the plug and phone jack of adapter pin functions for you.
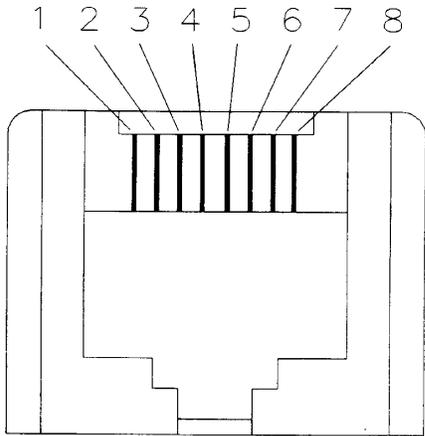
Pin	OUT Jack Assignments
1	Outgoing Data 1(+)
2	Outgoing Data 2(-)
3	Incoming Data 1(+)
4	(No Connection)
5	(No Connection)
6	Incoming Data 2(-)
7	(No connection)
8	(No Connection)

Figure 7. UTP Port and Plug Pin Functions