# Installation Manual

# Plug and Play
# MultiPacket Accelerator™
# (MPX²) Adapters

ACCTON

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# Plug and Play MultiPacket Accelerator™ (MPX²) Adapters

ACCTON

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EN166xR01
E0996-R01
150010-101

# Package Contents

Carefully open the package and verify the contents against the checklist below:

### EtherCombo-16, or EtherDuo-16

- ☑ EtherCombo-16 (Model No. EN1660) or EtherDuo-16 (Model No. EN1666)
- ☑ BNC T-type Connector
- ☑ Driver Diskette
- ☑ Installation Manual

### EtherPair-16

- ☑ EtherPair-16 (Model No. EN1661)
- ☑ Driver Diskette
- ☑ Installation Manual

Fill in the **Owner Registration Card** and mail it to Accton Technology Corporation.

# Quick Installation Guide

*Using 1Step™ for DOS Workstations*

1Step is designed to simplify the process of installing your Accton® PnP MPX² adapter for NetWare® or other network operating systems. Here's how to quickly install and configure your Accton PnP MPX² adapter for both NetWare and non-NetWare users.

1. Power off your PC and remove its cover.
2. Install the Accton PnP MPX² adapter into an empty slot in your PC.
3. Replace the cover and turn on the power switch.
4. After system boot up, insert the Driver Diskette into drive A.

## 1Step for NetWare

The Driver Diskette contains special DOS commands you need to configure the adapter, install the appropriate NetWare driver and log on to your NetWare server. Listed below are the commands:

*Special DOS Commands*

| DOS Command | Description |
|---|---|
| **INSTALL <Enter>** | Copies 1STEP.EXE and related files to your hard disk. This choice is required for non-NetWare network operating systems (optional for NetWare). |
| **1STEP <Enter>** | After using INSTALL, 1STEP runs the Accton integrated hardware configuration and software installation program. |
| **StartNet.bat** | Novell recommends that you use the DOS ODI driver on all NetWare products. To connect to the NetWare server run startnet from DOS and press <Enter> |

Note: Important! If your system does not support Plug and Play, switch to Jumperless Operating Mode under the Manual Setup menu and enter the appropriate values for your configuration.

# 1Step for Non-NetWare Operating Systems

1Step is Accton's integrated adapter configuration and software installation program.

To install and run 1Step, type these commands at your DOS prompt:

```
A:\>INSTALL <Enter>
```

## Short-Cut Keystrokes

1. To install the software, select the appropriate network operating system using the "Software Installation" command button.

*Installation Dialog Box*


2. To exit 1Step, press the "Exit" command button.
3. Press <Enter> to select a setting.
4. Use ↑ or ↓ to move the cursor up or down.
5. Press <ESC> to quit.

# About this Manual

This is an installation guide for Accton's Plug and Play MultiPacket Accelerator™ (PnP MPX²) adapters. It provides information on how to install and set up the following adapters:

- EtherCombo-16 (EN1660)
- EtherPair-16 (EN1661)
- EtherDuo-16 (EN1666)

Read through the manual before installing the adapter to help avoid common problems such as address and interrupt conflicts. All information provided refers to the above products, except when stated.

Note: Driver software installation procedures plus additional information and changes that were unavailable when this manual was published are included in the Driver diskette as text files. Use the DOS DIR command to list the text files (e.g., a:\>dir *.txt). Use the DOS Type or Edit command to view these files.

# Contents

## List of Figures



## List of Tables

# Chapter 1
# Introduction

Plug and Play is a design philosophy based on a set of open specifications for PC architecture. The ultimate goal of Plug and Play is to design enough intelligence into the PC itself to handle installation and configuration tasks without user intervention.

A Plug and Play system has a number of unique characteristics. First, any installation is simple and fail-safe. Installation of common hardware devices is automatic: plug in the device, turn on the system, and it works. With a Plug and Play system, the user can insert and remove devices, or connect to or disconnect from a docking station or network, without restarting the system or fiddling with configuration parameters.

The system determines the optimal configuration, and applications automatically adjust to take full advantage of the new configuration. Users do not need to modify expansion card jumper settings, or even modify operating system configuration files. The benefits to both users and the computer industry are substantial, as ease-of-use for PCs is enhanced and support costs are substantially lowered.

Accton's Plug and Play MultiPacket Accelerator™ Adapters are 16-bit network interface cards that support industry standard Plug and Play specifications. By incorporating a single-chip Ethernet controller that features our MultiPacket Accelerator™ ($MPX^2$), this adapter series combines both hardware and software fine-tuning algorithms to deliver high performance operation. The $MPX^2$ technology accelerates the following tasks:

- Adapter card installation and configuration
- Software installation and configuration
- Adapter and software conflict management and resource tuning
- Problem prevention, tracking and troubleshooting
- Data transmission and reception

Right out of the box, Accton's integrated hardware and software installation process can automatically set up the network interface for a workstation.

# Hardware Description

The Accton PnP MPX$^2$ Ethernet Adapter Series includes 3 adapters (i.e., the EN166x family). They have the same features, varying only in media-type, Standards Conformance, Power Requirement, and LED indicators on the adapter. Table 1.1 lists their differences.

*Table 1.1 Features of MPX$^2$ Ethernet Adapter Series*

| Description | EN1660 EtherCombo-16 | EN1661 EtherPair-16 | EN1666 EtherDuo-16 |
|---|---|---|---|
| On-board LAN connectors | RJ-45, BNC, AUI | RJ-45 | RJ-45, BNC |
| On-board transceivers | RJ-45, BNC | RJ-45 | RJ-45, BNC |
| Power Requirement (Max.) | UTP: +5V/130mA<br>BNC: +5V/470mA<br>AUI: +12V/500mA | UTP: +5V/130mA | UTP: +5V/130mA<br>BNC: +5V/470mA |
| Standards Conformance | 10BASE-T, 10BASE2, 10BASE5 | 10BASE-T | 10BASE-T, 10BASE2 |
| LED Indicators | Link (LNK), Activity (ACT) | Link (LNK), Activity (ACT) | Link (LNK), Activity (ACT) |

# LED Indicators

Status LEDs are located on the rear of each adapter.

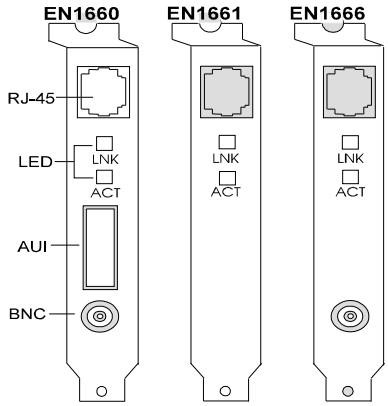



*Figure 1.1 Status LED Indicators for EN1660, EN1661 and EN1666 Adapters*

## Link Status Indicator

The Link (**LNK**) LED indicates that a valid 10BASE-T link beat is established. This LED is always lit (green) when the unit is in normal operational mode; otherwise check the RJ-45 connection.

## Activity Indicator

The Activity (**ACT**) LED indicates network signals traversing the Adapter. A steady (green) light indicates heavy network traffic, while a blinking light indicates light or intermittent network activity.

# 1Step™ for DOS Workstations

This package includes the menu-driven 1Step™ Installation Program for configuring each adapter, running diagnostics, and installing software drivers. This version of the program supports NetWare and NDIS driver installation. Refer to the chapter on *Using 1Step™* for more information.

# Chapter 2
# Hardware Installation

The adapter can be installed in any available 8-bit or 16-bit expansion slot in computers based the ISA bus. However, 16-bit memory access performs best. This chapter lists the steps for installing the adapter in your computer. It also includes information about boot ROM installation, running diagnostics, installing software drivers, and the RELEASE.TXT file.

## Adapter Installation

1. **Install an optional boot ROM on the adapter, if necessary.**

   The boot ROM is available from your dealer. See the section on Boot ROM Installation for more information. Otherwise, skip this step.

2. **Turn off the computer's power switch and remove cables that are connected to the main system unit.**

3. **Remove the computer's cover.**

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

4. **Select an empty computer slot and remove its slot cover bracket.**
5. **Plug the adapter into the selected expansion slot.**

   Press the adapter firmly into the slot, making sure it is seated properly.
6. **Fasten the holding screws to make sure the adapter is properly seated in the expansion slot.**
7. **Replace the computer's cover and reconnect all devices and cables removed in Step 2.**
8. **Connect the adapter to the network using thin, thick or twisted-pair cabling, depending on your adapter type and cabling requirement.**
9. **Power on the computer.**
10. **Install 1Step™.**

    Insert the Driver Diskette in the floppy drive of the host PC (e.g., A:). Type the following at the DOS prompt, press <Enter>, and follow the screen instructions to complete the process. Indicate the <path> or the directory location where you wish to install 1Step.

    A :> INSTALL <PATH>  Press <Enter>
11. **Run 1Step™.**

    When the installation process is complete, 1Step is automatically invoked for you. However, to rerun the program after quitting it, simply type the following at the DOS prompt while in the appropriate directory.

    C:>1 STEP  Press <Enter>

13. **Select Hardware Configuration.**

    If your system supports Plug and Play, use Default Setup to automatically allocate necessary I/O and IRQ resources to the adapter. Otherwise use Manual Setup to specify these parameters.

14. **Select from the Main Menu to automatically configure the adapter if your computer supports *Plug and Play.***

    This option automatically detects and corrects parameter settings which are in conflict with other devices installed on the host PC. If your computer does not support Plug and Play, or you want to specify your own settings and are sure they do not conflict with other devices, then skip to step 15.

15. **Select *Manual Setup* from the Main Menu to configure the adapter with your own settings.**

    If the default settings are correct, skip this step. This step is necessary for systems without Plug & Play support.

    Choose a suitable configuration, specifying *Medium Type* (10BASE-T, 10BASE5 or 10BASE2), *Full-duplex* (enabled or disabled), *Boot ROM* (disabled or set at a 16KB address block from C000h~DC00h), *I/O Base Address* (200h~3E0h), and *Hardware Interrupt* (2~15).

16. **Save the selected adapter configuration.**

    If you have made changes to the Adapter Configuration the program prompts you to save these changes.

**17. Diagnose the adapter, if necessary.**

To test the adapter's components and its installation, select *Diagnose the Adapter* or *Diagnose EEPROM* from the Main Menu to run diagnostics.

*TIP* Run diagnostics before loading the software driver. Otherwise, your system may hang.

**18. Run diagnostics over the network.**

To verify your adapter's ability to communicate with another device on the nework, 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. This test displays the status of nework communications

**19. Select the adapter's software installation.**

From the *Software Installation* block, select the network operating system's vendor and the associated package, the driver and frame type (if requested), and then identify the directory where the drivers will be downloaded.

Follow the screen instructions to complete the process. If you are using NetWare, a batch file for running the driver you've selected is automatically created for you (startnet.bat). Run this file to start your NetWare system.

This version of 1Step™ supports a variety of drivers, including NetWare, NDIS and ODI. If you can't find the driver you want to use, check the RELEASE.TXT file in the root directory of the same diskette for a complete list of all the drivers this adapter supports.

# Boot ROM Installation (Optional)

A socket for installing an optional boot ROM is provided on-board which allows the adapter to be used for diskless operation. The boot ROM permits the host PC to load the operating system over the network. A boot ROM is available from your Accton dealer.

1. Plug the boot ROM into the socket, making sure the notch on the memory device and that on the socket are in the same direction.
2. Enable the adapter's boot ROM function using 1Step by selecting the appropriate ROM Address setting. For more information, see the chapter on Using 1Step™.

# Running Diagnostics

When hardware installation is complete, run diagnostics to check the adapter and the network cabling. Do so by selecting the *Diagnose Adapter* or *Diagnose EEPROM* from the Main Menu under Hardware Configuration in the 1Step™ program. 1Step™ is located in the root directory of the Driver Diskette that comes with the adapter package. For more information, see the chapter on Using 1Step™.

# RELEASE.TXT File

The Driver Diskette contains a RELEASE.TXT file in the root directory which provides information about the disk's contents. Use the DOS *TYPE* command to check the contents of this file.

# Chapter 3
# Using 1Step™

1Step is designed to simplify the PnP MPX² adapter's hardware installation. The current version of 1Step performs driver installation for NetWare. For operating systems other than NetWare, 1Step copies the installation files to your system's hard drive and displays instructions on how to install the drivers. This chapter describes how to use 1Step for adapter hardware configuration and software driver installation.

## Getting Started

Install the 1Step Installation Program in your hard disk drive. Insert the Driver Diskette that comes with the package into the host PC's floppy disk drive. At the DOS prompt, type the following and press <Enter>:

```
A:> install     <PATH>
```

<PATH> is the drive and subdirectory location where you want to install 1Step and other files necessary to complete the driver installation process. If the subdirectory name does not exist, it is created for you automatically.

When installation is complete, it automatically runs 1Step for you.

# Quick Installation with 1Step™

1. Type the following command at the DOS prompt, then press <Enter > to display the main screen for 1Step:

   **1STEP** `Press <Enter>`

2. Open the Hardware Configuration menu. If you have more than one PnP MPX² adapter installed, identify the one you wish to configure by selecting the corresponding MAC address from the LAN Adapter list box.

   Note: If you have another adapter type installed in your system, you may need to remove it while installing the PnP MPX² adapter.

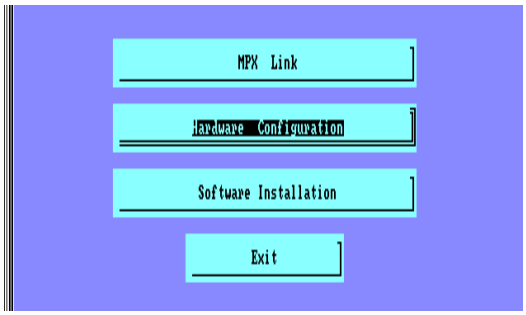
3. Select `View Current Configuration` from the Main Menu and verify the hardware settings.
4. Select `Default Setup` if your computer supports Plug and Play.

   Otherwise select `Manual Setup` if your computer does not support Plug and Play or you need to change the default settings.

5. Save the configuration selected in step 4.
6. Let 1Step reboot the system if you selected Default Setup or enabled the boot ROM.
7. Run diagnostics on the adapter and EEPROM.
8. Run diagnostics on the network.
9. Exit `SETUP` to return to 1Step's main screen.
10. Select Exit to return to DOS.

# MPX Link

After you have finished installing the network interface card, you can use this function to automatically log onto the Novell NetWare network. The current I/O Base Address and IRQ setting in the adapter card will be used.




To have 1Step copy the appropriate drivers onto your hard disk, create the necessary configuration files, initialize the network drivers, and log onto the nearest NetWare server, follow these steps:

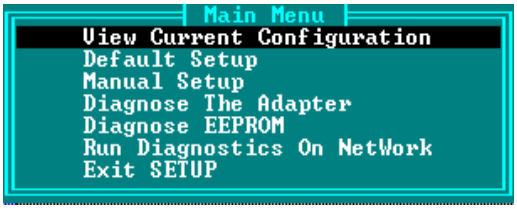
1. Start the 1Step program.
2. Click on the MPX Link button.
3. Load the MPX$^2$ Driver diskette into the floppy drive and press `OK`. 1Step copies all the necessary Accton drivers and files into the NWClient directory.
4. Load the NetWare Universal Client diskette into the floppy drive and press `OK`. 1Step copies the necessary NetWare drivers and configuration files into the NWClient directory.

5. Let 1Step create your startnet.bat file and then net.cfg file if you don't already have a valid configuration defined for these files.
6. 1Step then loads the network drivers and attaches to the nearest server, which prompts for your password.

# Hardware Configuration

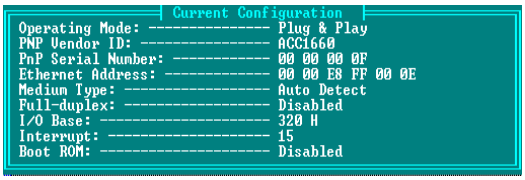
If more than one PnP MPX$^2$ adapter is installed in your system, the Hardware Configuration module will prompt you to specify the card you want to configure.

The Main Menu for 1Step is displayed below.




## View Current Configuration

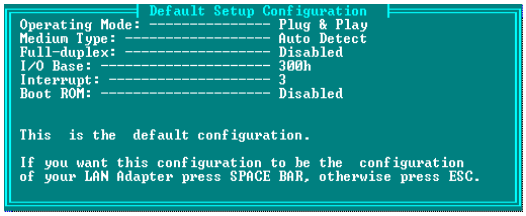
Select this option to view the current adapter settings as shown below:



If you need to modify the current configuration, return to the Main Menu and select *Manual Setup.* Note that the PnP MPX$^2$ Vendor ID and Serial Number make up the PnP MPX$^2$ Serial Identifier used to distinguish this adapter card from all other cards in the system.

## Default Setup

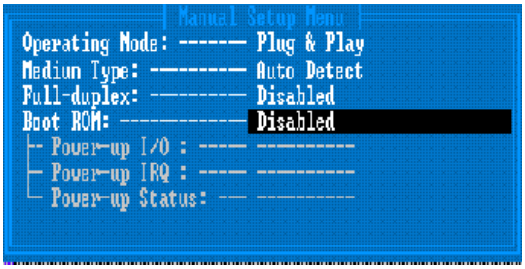
If your computer complies with Plug and Play standards, the system will automatically allocate necessary I/O and IRQ resources to the adapter. 1Step will display the adapter configuration generated by the Plug and Play system, prompt for your confirmation, and ask your permission to reboot the system. If any of the selections are not suitable, press <*ESC*> to abort the new configuration and then use Manual Setup to adjust the required parameters.




## Manual Setup

If your system does not support Plug and Play or you wish to override the default settings, then use Manual Setup to select the appropriate configuration for your adapter. Remember to save the changes to store them permanently in the EEPROM.

The installation menu displayed depends on the operating mode; i.e., Plug and Play or Jumperless.




*Plug and Play Installation Menu*


*Jumperless Installation Menu*

***Medium Type*** - The transceiver setting depends on the type of adapter you are using. It should agree with the network cabling type (see *Table 3.1* on the following page). This program provides 3 choices for selecting media type; i.e., Auto Detect, 10BASE-T with Link Test disabled, and 10BASE5 (AUI).

If you are using an RJ-45 or BNC connection, you can select "Auto Detect" to have the system automatically determine media type (i.e., 10BASE-T or 10BASE2). However, if you are using an RJ-45 connection to an older hub that does not support link test functions, then select "10BASE-T with Link Test disabled". If you are using an AUI connection then specify 10BASE5.

*Table 3.1 Adapters and Transceiver Settings*

| Adapter | Possible Transceiver Setting |
|---|---|
| EN1660 | RJ-45,BNC,AUI |
| EN1661 | RJ-45 |
| EN1666 | RJ-45,BNC |

***Full-Duplex*** - If the server you are attached to and all interconnecting devices (e.g., switching hubs) support this mode, then enable full-duplex.
***Boot ROM*** - The adapter provides an empty socket for installing an optional 16 KB Boot ROM. If your server provides boot services, the Boot ROM permits the client PC to download the disk operating system (DOS) and network drivers over the network. A boot ROM is available from your adapter dealer. Refer to the section on Boot ROM Installation in Chapter 2 for more information about hardware installation.

The Boot ROM is disabled by default. When a boot ROM is installed on the adapter, 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 adapter 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.)

***I/O Base Address*** - Select any available address (200h~3E0h) from the displayed list. The factory default is 300h.

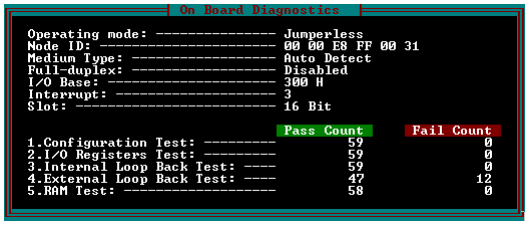
***Interrupt*** - Select any of the available hardware interrupts (2~15) from the displayed list. The adapter's default interrupt setting is 3.

## Diagnose Adapter

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

To test the adapter's components and its installation, select *Diagnose the Adapter* from the Main Menu to run diagnostics. This test monitors the adapter and corresponding cabling system. However, it does not test the network's condition.

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




The adapter test checks the following items -

- Configuration Test checks the initial status of the Ethernet Controller
- I/O Test checks I/O accessibility
- Internal Loopback Test checks adapter's controller
- External Loopback Test checks the network link
- RAM Test checks the condition of onboard RAM

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

## Diagnose EEPROM

To test the adapter's onboard EEPROM, select *Diagnose EEPROM* from the Main Menu to run Read/Write tests on each register in the EEPROM.

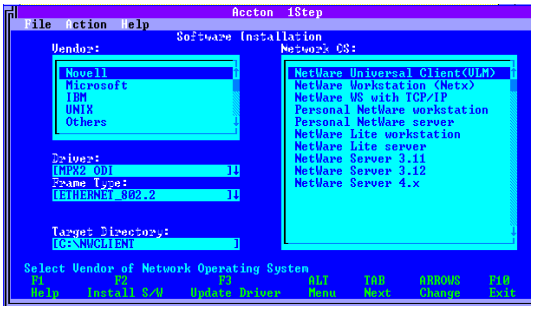
## Run Diagnostics on Network

To thoroughly verify your adapter'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. 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.

# Software Installation

Select the appropriate software vendor, Network Operating System, Driver and Frame Type (for Novell software), and the directory in which the drivers are to be stored. Then press <F2> to install the network environment you've selected, or <F3> just to update the specified drivers. For NetWare users, a batch file for easily loading the NetWare driver from DOS during start up will automatically be created (startnet.bat). Simply execute the batch file to run the driver and load NetWare automatically.

The Software Installation menu is shown in the following figure. Note that the Driver and Frame Type options are only displayed for Novell software




***Selecting the Network OS*** - Accton's PnP MPX$^2$ Ethernet adapters provide extensive driver support. The version of 1Step that comes with this package supports installation for various drivers, including NetWare, NDIS and ODI. If your network operating system runs under DOS, use 1Step to install the corresponding driver. For any NOS other than these, 1Step provides instructions on how to install the required drivers, referring you to the appropriate subdirectories.

If the driver you need 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.

Press <F1> to activate on-line help under the Software Installation menu. Then select the driver you need to install. The corresponding *.TXT file containing driver installation instructions will be displayed.

***Selecting the Driver*** *(Novell only)* **-** The adapter provides support for NetWare drivers. Install the driver you need depending on your NOS.

***Selecting Frame Type*** *(Novell only)* **-** Select the Frame Type required for your adapter from the choices provided. Selections include Ethernet_802.3, Ethernet_II, Ethernet_802.2 and Ethernet_SNAP. The factory default frame type is Ethernet_802.3 for NetWare 3.x and Ethernet 802.2 for NetWare 4.0.

***Identifying the Driver's Directory Location*** **-** Enter the directory path in the box labeled Target Directory to indicate the location for the NetWare drivers. When you select Install Software from the Action Menu, 1Step searches this path to find the files it needs.

***Menu Bar Commands*** **-** The menu bar below the title bar contains *File*, *Action* and *Help* menus. Selecting any of these opens a pull-down menu containing a list of commands. Use the mouse or keyboard to make a selection. Then follow screen instructions to complete the operation.

- File Menu - displays commands for opening a DOS Shell or exiting to 1Step's main screen.
- 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 on-line assistance for the functions available in 1Step.

# Appendix A
# Troubleshooting

1Step includes a diagnostics program for checking the adapter's components and the network cabling. The adapter may fail some tests due to various reasons – some of which may be easily remedied by the user. This section provides tips to isolate and solve common problems.

If the problems remain unsolved, contact your dealer or Accton Technology Corporation's Technical Support Section. Write a problem description, including what problems occurred, when they occurred, duration of the problems, the product number, serial number, hardware, software and DOS version that you're using.

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 - by double-clicking NT Diagnostics icon in the Administrative Tools program group.
- Windows95 - by typing `MSD` at the Windows95 DOS window.

Then select Report ALL and send this report to Accton by Fax. In your report, indicate your:

a. Network Operating System and version number
b. Software driver type and version number
c. Make and brand of computer

Refer to the Product Support Services section of this manual for contact information.

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.

### "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 (described on the first page) or rename AUTOEXEC.BAT and CONFIG.SYS to other names and re-boot your computer.

## Symptoms

1. Unshielded twisted-pair connection results in adapter failure; LNK (Link) LED indicator is off.
2. Running *Test Adapter* routine results in External Loopback Test failure.

### 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 *Test Adapter* routine again.

## Symptom

Adapter failure; unable to log into the network.

### Possible Causes

1. Bad cable connection.
2. Adapter not properly installed in computer slot.
3. Host PC's slot defective.

### Suggestions

1. Check cabling for loose connection or wrong pin assignment if you're using the RJ-45 connection.
2. Check if the adapter is properly seated in the computer's slot; it may have been accidentally loosened.
3. Install the adapter 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.

## Symptom

1. Adapter fails to respond after loading driver

### Possible Cause

Incorrect adapter configuration mode set

### Suggestions

1. Check if your PC supports the Plug and Play platform (PC using PnP BIOS, Configuration Manager program or Win95 operating system).
2. If your PC does not support Plug and Play, run 1Step and set adapter configuration to Jumperless mode.
3. Reboot your PC and run the test again.

## Appendix B

# Pin Assignments

## RJ-45 Connector

*Table B.1 RJ-45 Pin Assignments*

| 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 |

## 15-pin D-type Connector

*Table B.2 D-Type Connector Pin Assignments*

| 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 (RX -) |
| Pin 13 | DC Power + |
| Pin 14 | Power Shield |
| Pin 7, 8, 15 | No connection |

# Appendix C
# Specifications

## System Configuration

Transmission Technique : Baseband
Topology : Star/Bus
Access Method : CSMA/CD
Transmission Rate : 10Mbps
End User Devices Supported : IBM PC-XT, AT, 286, 386, 486, Pentinum, PS/2 Model 30, & 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
Boot ROM Size : 16/32/64 KB selectable
Boot ROM Address : 8 choices, C0000h to DFFFFh on 16 KB boundaries
Dimensions : 6.195" x 4" (EN1660)
6.195" x2.48"(N1661& EN1666)

*Table C.1 Media Supported/Standards Conformance*

| Product Name | EtherCombo-16 | EtherPair-16 | EtherDuo-16 |
|---|---|---|---|
| Model No. | Model No. | EN1661 | EN1666 |
| Standards Conformance | IEEE802.3<br>10BASE-T<br>10BASE2<br>10BASE5 | 10BASE-T | 10BASE-T<br>10BASE2 |
| Media | UTP, RG-58 A/U<br>AUI, thick cable | UTP | UTP, RG-58 A/U |
| Connectors | RJ-45, BNC,AUI | RJ-45 | RJ-45,**B**NC |

## Operating Environment

Temperature : 0° to 55°C (Std. Operating)

Humidity : 10% to 90% (Noncondensing)

Environment Tests : ESD (IEC801.2), RS (IEC801.3), EFT/Burst (IEC801.4), Vibration, Shock, Drop Tests

*Table C.2 Power Requirements*

| | UTP Transceiver | BNC Transceiver | AUI External Transceiver |
|---|---|---|---|
| **EN1660** | +5V/110mA (Stand-by), 130mA(Transmit) | +5V/420mA (Stand-by), 470mA(Transmit) | +12V/500mA (Max.) |
| **EN1661** | +5V/110 mA (Stand-by), 130mA(Transmit) | | |
| **EN1666** | +5V/110mA (Stand-by), 130mA(Transmit) | +5V/420mA (Stand-by), 470mA(Transmit) | |

## Hardware Certification

EMI : FCC Part 15, Class B , CISPR 22 Class B, VCCI Class 2

Safety : UL, CSA, CE Mark

## Network Software Drivers

**NetWare ODI Drivers**

NetWare 2.x, 3.x, 4.x, 4.11 (Green River), NetWare LAN WorkPlace TCP/IP, Novell LAN Analyzer for NetWare, Novell Personal NetWare

**NDIS 2.0 Drivers**
IBM LAN Server, IBM LAN Support Program, IBM OS/2 EE V2.0, DEC PATHWORKS, Sun PC-NFS, Banyan VINES, IBM TCP/IP for DOS & OS/2, Wollongong Pathway Access, Microsoft LAN Manager

**NDIS 3.0 Drivers**
Microsoft Windows for Workgroups 3.11, Windows NT3.x, Windows 95

**Unix Drivers**
SCO Unix, UnixWare, Solaris Unix

**Packet Drivers**
FTP TCP/IP, NCSA TCP/IP, Accton LanSoft

# I/O Base Address

**List of commonly used I/O Base Addresses**

*Table C.3 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) + |

# IRQ Channels

**List of commonly used IRQ Channels**

*Table C.4 IRQ Channels*

| 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 |

# Memory Addresses

**List of commonly used Memory Addresses**

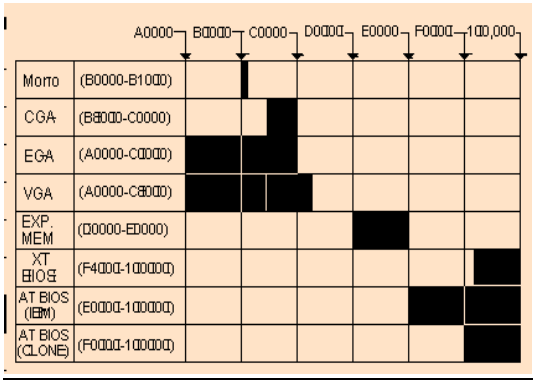



*Figure C.1 Memory Addresses*

Shaded areas represent the addresses of the corresponding device

# Appendix D
# Regulatory Standards Conformance

## EMI Certification

### FCC Class B Certification

Accton Technology Corporation
Model Number: EN1660R01
FCC ID: HED1660ENR01LCT
Model Numbers: EN1661R01, EN1666R01
FCC ID: HED1666ENR01LCT

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

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

Warning! 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 the instructions, may cause harmful interference to radio communications. 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 or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from the one which the receiver is connected to.
- Consult the dealer or an experienced radio/TV technician for help.

You are hereby cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

### The Interference Handbook

This booklet is available from the U.S. Government Printing Office. Washington, D.C. 20402. Stock No. 004-000-00345-4.

*Note:* In order to maintain compliance with the limits of a Class B digital device, Accton requires that you use a quality interface cable when connecting to this device. Changes or modifications not expressly approved by Accton could void the user's authority to operate this equipment. Suggested cable types are:

- Thin Ethernet (50 ohm) for BNC connections:RG-58A/U
- Twisted-pair for RJ-45 connections: 10BASE-T

### This product also complies with CISPR22 Class B.

### VCCI Class2 Compliance

電波障害自主規制にっいて

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で、住宅地域での電波障害防止を目的とした情報処理装置等、電波障害自主規制協議会(VCCI)基準に適合しております。
しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。
取扱説明書に従って正しい取り扱いをして下さい。

This product also complies with CISPR22 Class B.

## EN55022 Declaration of Conformance

This is to certify that the Accton Ethernet Adapter is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN55022:1987 Class B (CISPR 22:1985/BS 6527:1988).

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

## CE Mark Declaration of Conformance

This is to certify that the Accton Ethernet Adapter complies with ISO/IEC Guide 22 and EN45014. This product conforms to the following specifications:

| | | |
|---|---|---|
| EMC: | EN55022(1988)/CISPR-22(1985) | Class B |
| | prEN55024-2(1990)/IE801-2(1191) | 4kV CD, 8kV AD |
| | prEN55024-3(1991)/IE801-3(1184) | 3V/m |
| | prEN55024-4(1992)/IE801-4(1188) | 1kV-(power line)<br>0.5kV-(signal line) |
| | IEC801-6 | 3Vrms |

This product complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

# Appendix E
# Product Support Services

## Product Registration

Fill in the **Owner Registration Card** and mail it to Accton Technology Corporation. Accton will keep your record and inform you of any new Accton product developments.

## Problem Report

If problems occur during product operation, please check the adapter configuration settings, cables, connectors, network terminators, hardware compatibility and other network components.

Write a description of the problem, including what problems occurred, when they occurred, duration of the problems, the product number, serial number, hardware, software and the DOS version that you are using. Then contact your dealer or Accton Technology Corporation for assistance.

## Hardware Repair Service

You must get an RMA (Return Materials Authorization) number before returning any hardware for repair. To obtain this number please inform Accton of your company name, address, product name and model number, contact person, telephone number, and a problem description list. If your unit is under repair warranty you must also give your purchase date. The RMA form is in the /Support directory of the driver diskette.

Carefully pack your hardware. If possible, use the original carton. Mark the RMA number on the carton and send it to your dealer. After repair, Accton will inform you of the date of delivery and the exact amount due. Please send the

payment by T/T (Telegram Transfer), and Accton will send you the fixed component after receiving payment. With or without warranty, if the hardware is found to be free of defect, you will only be charged for testing and handling cost.

## Software Update and Upgrade Service

Accton constantly improves its software products by adding enhancements and new features. Minor software updates are free of charge. If greater changes have been made to the software, Accton offers software upgrade services at a specially reduced price.

## Bulletin Board Service (BBS)

- In countries other than the U.S, call 886-3-577-0654 to reach Accton Taiwan's modem line. Modems with 14400 through 2400 baud are supported. Choose 8 data bits, 1 stop bit and none parity. Standard VT100 terminal emulation is supported
- In the United States, call 408-452-8828 to reach the Accton USA's modem line. Modems with 14400 through 2400 baud are supported. Choose 8 data bits, 1 stop bit and none parity. Standard VT100 terminal emulation is supported

## Interactive Fast Fax (U.S.A. Office)

Printed technical documentation can be FAX'ed to your FAX machine, 24-hours a day.

- Call 408-452-8811o reach Accton's interactive Fast FAX service. You will need a Touch-Tone phone and a FAX machine (or equivalent). Choose document 911 for a listing of technical bulletins

## Technical Support

Your dealer or installer is the person who understands your network and Accton products. If neither is available to help you, Accton technical support engineers are available by FAX, mail or phone.

- Send your technical questions by FAX to:
  Accton Taiwan: 886-3-577-0267
  Accton USA: 408-452-8988
- Forward your technical questions by email to support@accton.com.tw
- Mail your technical questions to:
  For all countries except North and South America
  Accton Technology Corporation
  Attn: Technical Support
  No. 1 Creation Road III
  Science-based Industrial Park
  Hsinchu 300, Taiwan, R.O.C.
  For North and South America
  Accton USA
  Attn: Technical Support
  1962 Zanker Road,
  San Jose, CA 95112, U.S.A.
- During local business hours, call:
  Accton Taiwan
  Monday-Friday 886-3-577-0270
  8 am to 6 pm
  Accton USA
  Monday - Friday 408-452-8900 or
  800-926-9288
  (7 am - 5 pm Pacific time)
- To obtain software upgrades connect via ftp to ftp.accton.com.tw

# Limited Lifetime Warranty

## Limited Warranty

Accton warrants to the original owner that the product delivered in this package will be free from defects in material and workmanship for the lifetime of the product. This warranty does not cover the product if it is damaged in the process of being installed. Accton recommends that you have the company from whom you purchased this product install it.

THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESSED, IMPLIED OR STATUTORY, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY WARRANTY ARISING OUT OF ANY PROPOSAL, SPECIFICATION OR SAMPLE, ACCTON SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, ACCTON NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY OTHER LIABILITY.

## Customer Remedies

If the product is found to be defective within the first two years from the later of date of purchase or date of manufacture, Accton's entire liability and your exclusive remedy for any breach of warranty, shall be, at its option, to repair or replace the product at no charge except as set forth below. If the product is found to be defective after two years from the later of date of purchase or date of manufacture, Accton will charge a process and handling fee, provided that you deliver the product along with a return material authorization (RMA) number either to the company from whom you purchased it or to Accton. Accton warrants the repaired or replaced product to be free from defects in material and workmanship for the remainder of the original product's warranty period.

## Return Process

Before you may return any Accton product to Accton, you must request an RMA number by calling, FAXing or writing Accton's Service Department at the number listed below. If you ship the product, you must assume the risk of damage or lost in transit. You must use the original

container (or the equivalent) and pay the shipping charge. Accton may replace or repair the product with either new or reconditioned product, and the returned product becomes Accton's property.

This warranty does not cover replacement of products damaged by abuse, accident, misuse, neglect, alteration, repair, disaster, improper installation or improper testing.

ACCTON SHALL NOT BE HELD LIABLE FOR ANY LOSS OF PROFITS, LOSS OF USE, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES CAUSED BY THE USE OF THIS PRODUCT OR INABILITY TO USE IT, EVEN IF THE COMPANY OR ACCTON HAS BEEN ADVISED OF SUCH LIABILITY OR OTHER SPECIAL CLAIMS.

If you purchased this product in the USA, be aware that some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may have other rights which vary from state to state. All parts or components contained in this product are covered by Accton's limited lifetime warranty for this product. The product may contain fully tested, recycled parts, warranted as if new.

## For warranty information:

**All territories except America:**

Accton Technology Corporation, International Headquarters
No. 1, Creation Rd. III, Science-based Industrial Park, Hsinchu 300, Taiwan, R.O.C.
Phone: 886-3-577-0270
Fax: 886-3-577-0267
BBS: 886-3-577-0654

**North and South America:**

Accton Technology Corporation, USA Headquarters
1962 Zanker Road, San Jose, CA 95112
Phone: 408-452-8900
Fax: 408-452-8988
BBS: 408-452-8828

# Accton Offices

## Accton Technology Corporation

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No. 1 Creation Rd. III,
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886-3-577-5541
BBS: 886-3-577-0654

Taipei:
Phone: 886-2-577-1220 to 9
Fax: 886-2-577-0816

***Accton USA,***
1962 Zanker Road, San Jose, CA 95112, USA
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408-452-8080
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BBS: 408-452-8828
Fast Fax: 408-452-8811

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44-1753-680109
Fax: 44-1753-689010

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Unit 23, No.27 Doomben Ave.,
Eastwood, N.S.W. 2122, Australia
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Fax: 612-8581723

***Accton Deutschland,***
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65623 Hahnstatten, Germany
Phone: 49-64-30-22-17
Fax: 49-64-30-22-70

***Accton Japan,***
Kano Bldg. 7F, 1-25-1 Nishi-Gotanda,
Shinagawa-ku, 141 Tokyo, Japan
Phone: 81-3-3495-1351
Fax: 81-3-3495-1352

## Ordering Information

Adapters

- EtherCombo-16 (EN1660) - RJ-45, BNC & AUI ports
- EtherPair-16 (EN1661) -RJ-45 port
- EtherDuo-16 ( EN1666) - RJ-45 & BNC ports

Transceivers

- TransCoax-II (EN2009) - AUI to BNC transceiver
- TransPair-II (EN2032) - AUI to 10BASE-T transceiver
- TransOptic-III (EN2031 - AUI to ST Fiber Optic transceiver

# Glossary

*10BASE-T*
IEEE's specifications for running 10 Mbps Ethernet using twisted-pair cable (100Ω STP or UTP). The maximum length of cable for a point-to-point connection is 100 meters, and the maximum number of nodes is 1024.

*10BASE2*
IEEE's specifications for running 10 Mbps Ethernet using thin coaxial cable (50Ω RG-58). A cable segment can be up to 185 meters long and have a maximum of 30 nodes.

*10BASE5*
IEEE's specifications for running 10 Mbps Ethernet using thick coaxial cable (50Ω RG-8). A cable segment can be up to 500 meters long and have a maximum of 100 nodes.

*1Step*
Specialized program used with MPX² Ethernet Adapters for quick adapter hardware/software installation and diagnostics.

*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 tranceiver or Media Access Unit (MAU).

*BNC*
A 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 to read a DOS boot program from the server.

*Broadcast*
A “broadcast” refers to the process of sending a message to all stations on a network.

*Collision*
A condition in which two packets transmitted over a medium interfere with each other. Their interference makes both unintelligible.

*CSMA/CD*
(Carrier sense multiple access with collision detection). Medium access control technique for bus-tree topologies.

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

*Ethernet*
A network communication system developed and standardized by DEC, Intel and Xerox, using baseband transmission, CSMA/CD access, logical bus topology, and coaxial cable. The successor IEEE 802.3 standard provides for integration into the OSI model and extends the physical layer and media with repeaters and implementations that operate on fiber optics, broadband, and twisted-pair.

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

*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.

*MPX² Technology*
Ethernet technology developed by Accton for accelerating adapter installation, configuration and throughput, fine tuning adapter hardware and software performance, easing problem prevention and troubleshooting.

*MPX² Ethernet Adapters*
Ethernet adapters which use Accton's MPX$^2$ Technology. (see MPX$^2$ Technology).

*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 unshielded twisted-pair wiring.

*Shielded Twisted-Pair*
Cable composed of two insulated wires twisted together and covered by a foil or braided shielding designed to reduce noise pick up or radiation. Sometimes referred to as screened twisted-pair (ScTP), its impedance is 100Φ and has the same pin assignment as UTP. This cable should not be confused with the older 150Φ cable type designed by IBM.

*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 composed of two insulated wires twisted together to reduce electrical interference; used in common telephone cord.

# Index

EN166xR01
E0996-R01
150010-101