

SMART COM PCMCIA

ENW-3500-F

10/100Mbps Ethernet PC Card

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FCC Warning

FCC Class B ID KA2FEPC65001

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

Shielded interface cables must be used in order to comply with emission limits.

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

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

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

Reversion:

User's Manual for PC card, model: **ENW-3500-F**

Part No.: EM3500F

Rev: 1.01 (July, 1998)

Table of Contents

1. INTRODUCTION	1
General Description	1
About Fast Ethernet	2
About Auto-negotiation	3
LED Indicators.....	5
Summary of Features.....	6
2. HARDWARE INSTALLATION	9
Unpack and Inspect	9
Hardware Installation.....	10
Remove the PC Card	14
Connect the Network Cable	16
Connecting for Fast Ethernet.....	16
Connecting for 10Mbps Ethernet.....	17
3. SOFTWARE CONFIGURATION AND INSTALLATION	19
A. ENW-3500-F SPECIFICATIONS	21

Introduction

Thank you for choosing ENW-3500-F, the value leader among PC-Card Fast Ethernet adapters. This chapter provides a general description of ENW-3500-F Series features, with a summary of features at the end of the chapter. Installation instructions are given in Chapter 2.

General Description

The ENW-3500-F Series Fast Ethernet PC Card is a credit-card sized Fast-Ethernet adapter for connecting a notebook PC to an IEEE 802.3 or 802.3u Ethernet network. The notebook PC must be equipped with a Type II or Type III PC Card slot.

NOTE: *The terms "PC Card" and "PC Card slot" are used throughout this manual to refer to those objects as defined in the **Personal Computer Memory Card Industry Association (PCMCIA)** standards.*

The ENW-3500-F automatically detects the parameters of its Ethernet environment, and automatically negotiates and determines its own speed and duplex settings as required for maximum performance in its environment.

Inside its compact PC-Card package, the ENW-3500-F holds an Ethernet controller, network processing interface, 64 Kb RAM data buffer, a 68-pin PC Card Standard front-end plug which connects to the notebook PC, and a 15-pin back-end receptacle for connecting the media coupler. The ENW-3500-F requires no pre-installation setup -- simply insert its front end into the notebook PC's PC-Card slot.

The ENW-3500-F is supplied with a media coupler which plugs into the back end (15-pin receptacle) of the ENW-3500-F. The other end of the media coupler has a RJ-45 receptacle which receives the network cable. The media coupler features LED indications for linkage and activity states, and for the speed and duplex settings.

About Fast Ethernet

Fast Ethernet is a network technology specified by IEEE Standard 802.3u. It extends the traditional 10Mbps (10 megabit / sec) Ethernet technology to achieve 100Mbps (100 megabit/sec) transmission and reception. Because Fast Ethernet retains the traditional Ethernet CSMA/CD (Carrier Sense, Multiple Access, Collision Detect) protocol, it remains wholly compatible with 10Mbps Ethernet while providing a tenfold increase in network capacity.

The Fast Ethernet standard specifies three subtypes, corresponding to three media types:

100Base-TX (using two twisted pairs in EIA 568 Category 5 UTP or STP cable)

100Base-T4 (using four twisted pairs in a Category 3, Category 4, or Category 5 UTP cable)

100Base-FX (using two fiber-optic strands).

ENW-3500-F Series Fast Ethernet PC Cards offer half-duplex 100Base-TX operation (in Category 5 twisted-pair cable environments). These products do not support 100Base-T4 or 100Base-FX operation. To provide for traditional 10Mbps Ethernet operation in twisted-pair cable environments, the ENW-3500-F series also offers 10Mbps Ethernet operation, in full-duplex and half-duplex modes. Selection of the best operation mode in any given installation is automatically governed by auto-negotiation.

About Auto-negotiation

The basic idea of auto-negotiation can be understood by reflecting for a moment on the familiar process of making a dialup connection between two modems. You have probably heard some gravelly-sounding exchanges between your local modem and a modem at the other end of a telephone line. (These exchanges are ordinarily played out through a speaker in your local modem). As irritating as those few seconds of noise may be, they do let you know that your modem and the remote modem are on the job, preparing for your intended communication with the remote computer.

The preparatory work of the two modems during those few seconds before you see the "Connect" message is to *negotiate* the best data communication scheme which is supported by both modems, and which is suitable for the quality of the telephone-line connection between them. The parameters to be settled between the two modems include best baud rate, compression method, and error correction method. When the two modems have tested the phone-line quality and have

switched to the combination of parameters which will provide the best data communication, then you are given the "Connect" message which signals the end of the inter-modem negotiation and the beginning of your intended communication with the remote computer.

Auto-negotiation between devices within an Ethernet LAN is similar in concept, but much briefer. The two devices involved in the auto-negotiation will be your ENW-3500-F Series PC Card and the hub or switch through which it is connected into the LAN. (Switches ordinarily provide auto-negotiation functionality; hubs usually do not.) The parameters to be negotiated between the ENW-3500-F and its supporting hub or switch include speed (100Mbps = Fast Ethernet, or 10Mbps = traditional Ethernet) and duplex mode (half-duplex or full-duplex).

Startup communication between the two devices occurs when both devices are operating, the cable connection between them is good, and the connected notebook PC's network software is loaded. As soon as those conditions are satisfied, the preparatory process of auto-negotiation between the ENW-3500-F and its supporting device begins and proceeds automatically.

If the supporting hub or switch has auto-negotiation functionality, then it and the ENW-3500-F exchange a series of messages in which each device signals its capabilities and listens for corresponding information about the other. The auto-negotiation process requires only a few milliseconds, and the two devices select the best communication parameters supported by both devices.

If the supporting device does not have auto-negotiation functionality, then its monotone (single capability) message

will be recognized by the ENW-3500-F auto-negotiation facility, and the ENW-3500-F will simply switch to the one of its own capabilities which matches that of the supporting device.

Once the auto-negotiation is completed, then the line is ready, and it will provide an optimal data channel between the ENW-3500-F and the supporting device. The line will remain ready without further auto-negotiation action until the linkage is broken. Auto-negotiation then reoccurs at any time that the linkage is restored, again making the line ready for optimal data communications.

LED Indicators

The media coupler features three LED indicators:

1. 10/100 Indicator

Steady green indicates Fast Ethernet selected.

Dark indicates 10Mbps Ethernet selected.

2. Half /Full Indicator

Steady green indicates Full-Duplex selected.

Dark indicates Half-Duplex selected.

3. Ln/Act Indicator

Steady green indicates that there is good linkage to the network ("Linkage" state, quiescent).

Flashing green indicates that the ENW-3500-F is transmitting or receiving ("Activity" state). In 10Mbps mode, flashing will be regular and periodic. In 100Mbps

mode, flashing may be irregular, with longer dark periods during heavy traffic activity.

Summary of Features

Features of Model ENW-3500-F Fast Ethernet PC Card:

- 100Mbps and 10Mbps data rates in compliance with IEEE 802.3 Ethernet standards 100Base-TX and 10Base-T
- Complies with PCMCIA V2.x, JEIDA V4.x, and 16-Bit PC Card Standards
- PC Card Standard 68-pin front-end connector
- 15-pin back-end connector for media coupler
- Built-in 64KB RAM data buffer
- Full-Duplex capable in 10Mbps mode
- Autonegotiation per IEEE 802.3u specification
- No manual setup switches -- fully automatic configuration
- Low power consumption (2 watts max.)
- Electronics miniaturization by VLSI and surface-mount fabrication technologies
- Laser-welded stainless steel case
- RJ-45 connector with auto-detection of network speed

- **Software support:**

- Install Program

- Diagnostic Program

- NDIS 2.0 for Banyan

- NDIS 2.0 for IBM Lan Support/Services

- NDIS 2.0 for IBM Wrap Server, Lan Server, and
Communication Manager 1.x

- NDIS 2.0 for MicroSoft Lan Manager for DOS

- NDIS 2.0 for MicroSoft Network Client 3.0 for DOS

- NDIS 2.0 for WIN/TCP PathWay Access

- SUN PC-NFS V5.0

- NetWare Client32 for Windows 95

- NetWare Client32 for DOS/Windows 3.1

- NetWare Server 3.12

- NetWare Server 4.x

- NetWare DOS ODI

- NetWare Lite

- Personal NetWare

- Windows 95

- Windows 95 OSR2

- Windows NT 3.51

- Windows NT 4.0

- Packet Driver for NCSA

- Packet Driver for FTP PC/TCP

- Packet Driver for IPX

- Packet Driver for Winsock

2

Hardware Installation

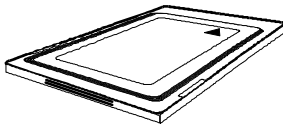
Unpack and Inspect

NOTE: *Under ordinary circumstances, the ENW-3500-F Series Fast Ethernet PC Card will not be affected by static charge as may be received through your body during handling of the unit. In special circumstances where you may carry an extraordinarily high static charge, it is good practice to reduce the charge by touching a ground before handling the ENW-3500-F.*

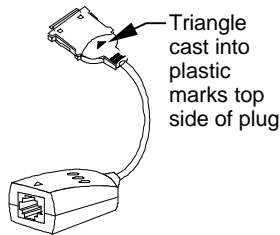
Open the shipping carton and carefully remove all items. In addition to this User's Guide, ascertain that you have:

- One ENW-3500-F Series Fast Ethernet PC Card
- One plastic storage bag for the PC Card
- One media coupler

- One ENW-3500-F Series Fast Ethernet PC Card Driver diskette



ENW-3500-F
Fast Ethernet PC Card



Media Coupler

In the event that any item is missing, or if you find any mismatch or damage, promptly contact your dealer for correction.

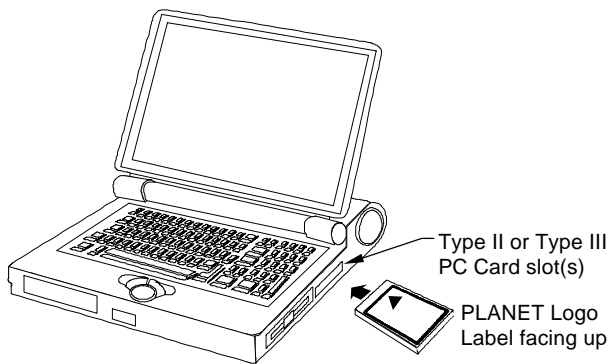
Hardware Installation

Follow these four steps to install the ENW-3500-F:

Step 1 Insert the ENW-3500-F

Under the PCMCIA standard and the corresponding Japanese JEIDA standard, PC Cards may safely be "hot swapped" -- it is not necessary to switch the computer's power off before installing or removing the ENW-3500-F, or any other PC Card.

Find/select an open Type II or Type III PC Card slot on your notebook computer's side or rear panel. Hold the ENW-3500-F with the colorful splash label upward. Insert the front end of the PC Card into the PC Card slot, and slide the PC Card all the way into the slot until it reaches a firm-stop.

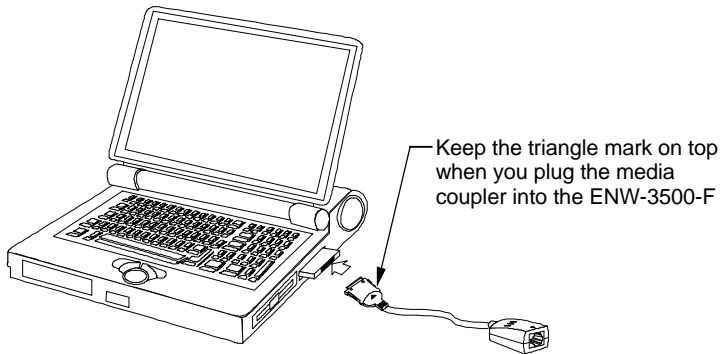


NOTE: Many notebook PCs feature a stacked pair of PC card slots, logically (but not physically) designated as Slot 1 and Slot 2. It is most usual for the lower one of the two slots in the stack to be designated Slot 1, but there are exceptions. In the subsequent procedure for ENW-3500-F software installation, it may be necessary for you to know whether your ENW-3500-F is installed in Slot 1 or Slot 2. Under Windows 95, you can check by opening the Control Panel / PC Card display. Under DOS it is also possible to make a software check, but it is more difficult. If you are unable to determine the ENW-3500-F's slot number in advance, then you can make a trial-and-error determination later, according to instructions given in the Software Installation section of this chapter.

Step 2 Attach the Media Coupler

The back-end receptacle of the ENW-3500-F remains accessible (approximately flush with the case of the computer) when the ENW-3500-F is properly seated in its PC Card slot. Taking care to keep the top side of the media coupler plug up, insert the plug into the ENW-3500-F's receptacle

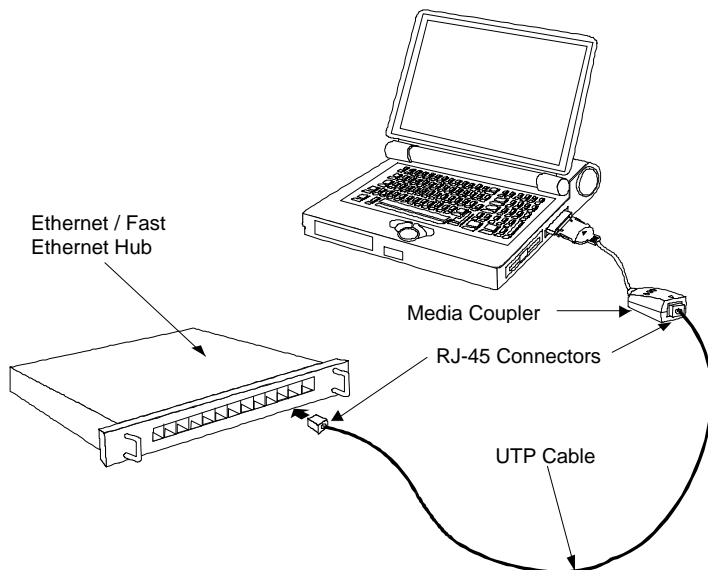
until it is firmly seated and latched. (The top-side of the plug is labeled with a triangle molded into the plastic.)



NOTE: When the media coupler plug is firmly seated, it is held in place by small latching hooks at either side of the plug. To avoid damage when detaching the plug from the ENW-3500-F, it is necessary to depress the latch wings of the plug. See the following section, "Remove Ethernet PC Card."

Step 3 Connect to the Network Medium

Make the network connection by running a UTP cable from the supporting hub to your media coupler. Simply plug one end (RJ-45 connector) of the cable into an available hub port, and plug the other end (RJ-45 connector) into the RJ-45 socket of the media coupler.



UTP cable connecting media coupler to the supporting hub

Step 4 Confirm Connection (Ln/Act Indicator)

When the power of the notebook/computer is ON, the ENW-3500-F is firmly seated in the slot connector, and the media adapter plug is firmly engaged (and latched) in the back-end receptacle of the ENW-3500-F, the media adapter has a good cable connection to the supporting hub, and the supporting hub is power on and functioning properly, then the media coupler Ln/Act LED glows steady green ("linkage" state).

If the Ln/Act LED remains dark without apparent cause, then the most likely fault is poor engagement of the 68-pin front-end plug. Review the following section titled "Remove

the ENW-3500-F," then remove the ENW-3500-F from its slot. Repeat the procedures of the above Step 1, "Insert the ENW-3500-F," taking care to ensure that the ENW-3500-F is right side up and front-end first, and that it seats firmly in a suitable PC Card slot of your notebook. Repeat procedures of Steps 2 and 3 as necessary get the Ln/Act LED confirmation.

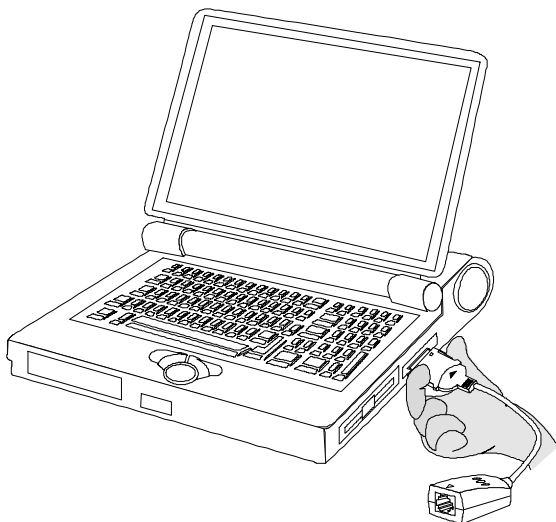
NOTE: *You might need to wait a few seconds following notebook powerup, or following insertion of a PC Card, for the software processing to be completed. The Ln/Act indicator will remain dark until the software processing is completed.*

Remove the PC Card

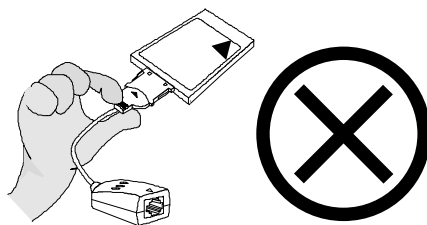
Follow these two steps to remove the ENW-3500-F its slot:

Step 1 *Disconnect the Media Coupler Plug from the ENW-3500-F*

Unplug the media coupler from the ENW-3500-F before ejecting the ENW-3500-F from the PC Card slot. The media coupler plug is held in place by small latching hooks at either side of the plug. To remove the media coupler plug from the ENW-3500-F, it is necessary to unlatch the hooks by depressing the two small latch wings of the plug. Use thumb and forefinger to squeeze the latch-wings into the plug body and gently pull the plug out of its receptacle.



Depress clip wings while unplugging the connector



Don't pull the connector without depressing the clip wings

WARNING: Pulling the coupler plug out of its receptacle without depressing the clip wings will cause damage to the plug.

Step 2 Eject the ENW-3500-F from the Computer

Firmly press the computer's PC Card Eject button to disengage the ENW-3500-F from the slot connector. The ENW-3500-F will then protrude from the PC Card slot. Grip its protruding end between your fingers and withdraw it from the PC Card slot.

Connect the Network Cable

Category 5 UTP cable is good enough to qualify under both the Fast Ethernet cabling rules and the traditional Ethernet cabling rules. The maximum individual cable run between any station and its supporting hub or switch is 100m. The maximum individual cable run joining two hubs is 10m in general, but is 100m when both hubs qualify as Ethernet Class 2 Repeaters (*all* Ether models of Ethernet hubs do qualify). But these cable runs may need to be shorter than the given individual maximum lengths, because their lengths are also restricted by the rule that the maximum *aggregated* cable run between any two stations is 205m.

Connecting for Fast Ethernet

Category 5 UTP cable is required for Fast Ethernet operation. The maximum cable run between the ENW-3500-F and the supporting hub is 300 ft. The cable must be "Straight" (not a "Crossover" cable), with a RJ-45 plug at each end. Make the network connection by plugging one end of the cable into the RJ-45 receptacle of the media-coupler, and the other end into a port of the supporting hub.

Connecting for 10Mbps Ethernet

Category 3, Category 4, and Category 5 UTP cable, as well as EIA/TIA - 568 100-ohm STP cable, all qualify under traditional Ethernet cabling rules. The maximum cable run between the ENW-3500-F and the supporting hub is 300 ft. The cable must be "Straight" (not a "Crossover" cable) with RJ-45 plug at each end. Make the network connection by plugging one end of the cable into the RJ-45 receptacle of the ENW-3500-F, and the other end into a port of the supporting hub.

Software Configuration and Installation

Configuration of the ENW-3500-F is automatic; the notebook PC automatically detects the available resources and allocates to the ENW-3500-F the resources it requires. Exceptions are with older notebooks PC that are equipped with PC Card slot hardware but which have no Socket Services nor Card Services software. To provide for these exceptions, the ENW-3500-F Series software diskette includes programs that interface with such hardware and allow you to specify the necessary configuration parameters. For further information see the Readme.txt file on the diskette.

NOTE REGARDING DOS OS: *Before installing the ENW-3500-F Series software for operation under DOS with expanded memory support (EMM386.EXE loaded and activated), it is necessary to exclude the address range D000 - D7FF. Check the CONFIG.SYS file to ascertain that the DEVICE command which loads EMM386.EXE includes the NOEMS switch and range data in accordance with this example,*

DEVICE=C:\DOS\EMM386.EXE NOEMS X=D000-D7FF

For normal software installation follow these steps:

1. Insert the ENW-3500-F Series software diskette into the computer's diskette drive.
2. Enter the INSTALL command. If the diskette is drive A, for example, type:

A:\INSTALL.BAT

then the Return/Enter key.

3. Follow onscreen instructions.
4. When the INSTALL run is completed, restart the computer.

For additional help on software installation, consult the Readme.txt file on the ENW-3500-F Series software diskette.

A

ENW-3500-F Specifications

Network Type:

- Ethernet 100Base-TX
Ethernet IEEE 802.3u standard for 100Mbps baseband CSMA/CD local area network
- Ethernet 10BASE-T
Ethernet IEEE 802.3 standard for 10Mbps baseband CSMA/CD local area network

Jumperless Hardware

Autonegotiation functionality

Media interface: RJ-45

EMI Certifications:

FCC Class B

VCCI Class 2

CISPR B

Canada ICES-003, Class B

CE Certification

Host interface: ISA Bus (Bus Master)

I/O base address assigned by Plug and Play system

Interrupt Number Assigned by Plug and Play system

Physical Dimensions: 85.6 × 54.0 × 5.0 mm

Environment:

Storage: -20° to 80°C, (4° to 176° F)

Operating: 0° to 55° C, (32° to 131° F)

Humidity: 10% to 90% non-condensing

Power Consumption: 2.0W

PCB Construction: 2 layers

Device Drivers*

- NDIS 2.0 for Banyan
- NDIS 2.0 for IBM Lan Support/Services
- NDIS 2.0 for IBM Wrap Server, Lan Server, and Communication Manager 1.x
- NDIS 2.0 for MicroSoft Lan Manager for DOS
- NDIS 2.0 for MicroSoft Network Client 3.0 for DOS
- NDIS 2.0 for WIN/TCP PathWay Access
- SUN PC-NFS V5.0
- NetWare Client32 for Windows 95
- NetWare Client32 for DOS/Windows 3.1
- NetWare Server 3.12
- NetWare Server 4.x
- NetWare DOS ODI
- NetWare Lite
- Personal NetWare
- Windows 95
- Windows 95 OSR2
- Windows NT 3.51
- Windows NT 4.0
- Packet Driver for NCSA
- Packet Driver for FTP PC/TCP
- Packet Driver for IPX
- Packet Driver for Winsock

EM3500F

