



INDUSTRIAL COMPUTER SOURCE[®]

Model PC104ENET Product Manual

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INDUSTRIAL COMPUTER SOURCE[®]

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FORWARD

This product manual provides information to install, operate and or program the referenced product(s) manufactured or distributed by Industrial Computer Source. The following pages contain information regarding the warranty and repair policies.

Technical assistance is available at: **1-800-480-0044**.

Manual Errors, Omissions and Bugs: A "Bug Sheet" is included as the last page of this manual. Please use the "Bug Sheet" if you experience any problems with the manual that requires correction.

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A thirty day money-back guarantee is provided on all **standard** products sold. **Special order products** are covered by our Limited Warranty, *however they may not be returned for refund or credit.*

Refunds

In order to receive a full refund on a product purchase price, the product must not have been damaged by the customer or by the common carrier chosen by the customer to return the goods, and the product must be returned complete (meaning all manuals, software, cables, etc.) within 30 days of receipt and in as-new and resalable condition. The **Return Procedure** must be followed to assure prompt refund.

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Product returned *after* 30 days, and *before* 90 days, of the purchase will be subject to a **minimum** 20% restocking charge and any charges for damaged or missing parts.

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One year limited warranty on all products sold with the exception of the "Performance Series" I/O products, which are warranted to the original purchaser, for as long as they own the product, subject to all other conditions below, including those regarding neglect, misuse and acts of God. Within one year of purchase, Industrial Computer Source will repair or replace, at our option, any defective product. At any time after one year, we will repair or replace, at our option, any defective "Performance Series" I/O product sold. This does not include products damaged in shipment, or damaged through customer neglect or misuse. Industrial Computer Source will service the warranty for all standard catalog products for the first year from the date of shipment. After the first year, for products not manufactured by Industrial Computer Source, the remainder of the manufacturer's warranty, if any, will be serviced by the manufacturer directly.

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Shipments not in compliance with this Guarantee and Limited Warranty Return Policy will not be accepted by Industrial Computer Source.

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For any Limited Warranty or Guarantee return, please contact Industrial Computer Source's Customer Service at **1-800-480-0044** and obtain a Return Material Authorization (RMA) Number. All product(s) returned to Industrial Computer Source for service or credit **must** be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items **must** be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty **must** include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing date of purchase.

To reduce risk of damage, returns of product must be in an Industrial Computer Source shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Industrial Computer Source Customer Service at a nominal cost.

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Some *Sales Items* and *Customized Systems* are **not** subject to the guarantee and limited warranty. However in these instances, any deviations will be disclosed prior to sales and noted in the original invoice. ***Industrial Computer Source reserves the right to refuse returns or credits on software or special order items.***

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Chapter 1: Introduction

The PC104ENET is a high-performance 16-bit Ethernet interface module that attaches to the PC/104 connector on your CPU card or PC/104 CPU module. The module automatically senses whether it is connected to an 8-bit or 16-bit PC/104 system. The PC104ENET fully complies with IEEE 802.3 10 Mbps CSMA/CD standards and is 100% Novell NE2000 compatible.

The module includes a built-in 10BASE-T transceiver and RJ-25 connector. An AUI connector supports external transceivers (MAU) for 10BASE-2, 10BASE-5, 10BASE-FOIRL, etc. Two diagnostic LED's indicate the operating status of the module and the network.

The PC104ENET comes with drivers for a wide variety of networks and operating systems. An optional boot ROM lets you boot a remote PC/104 station automatically from a server, making hard or floppy disks unnecessary.

Block Diagram

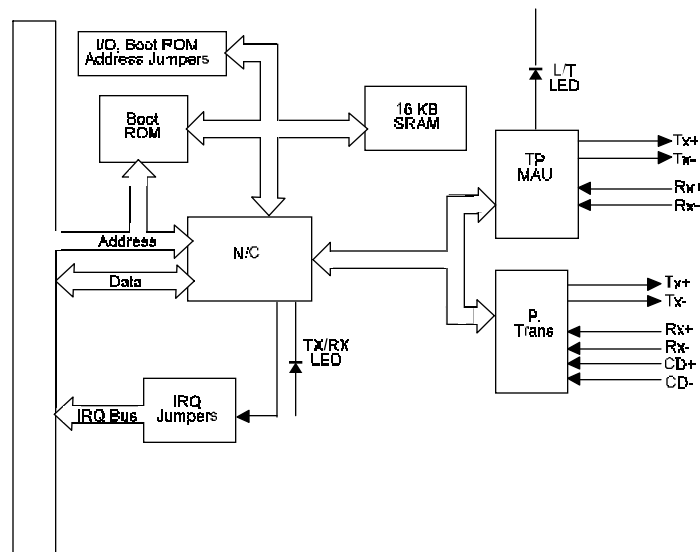


Figure 1: PC104ENET PC/104 Ethernet Module

Features

PC104ENET PC/104 Ethernet Module

- Conforms to IEEE 802.3 Ethernet standards, CSMA/CD protocol for 10 Mbps data transfer
- Hardware and software compatible with Novell NE2000 adapter
- Automatically detects 8-bit or 16-bit data bus
- Remote boot ROM socket for diskless operation
- Wide range of configurations (jumper selected, settings printed on PCB)
- Built-in 10BASE-T transceiver for unshielded twisted pair cabling up to 100 m
- AUI connector supports external MAUs such as 10BASE-2, 10BASE-5 thick cable or 10BASE-FOIRL fiber optic cable
- Two diagnostic LEDs indicate network status
- On-board 16K memory for high-performance multi-package buffer
- Software drivers for most popular network environments

Chapter 2: Specifications

PC104ENET PC/104 Ethernet Module

Hardware

PC/104 form-factor

90 x 96 mm (3.6" x 3.8")

I/O Address

300,320,340 or 360H

Interrupt Levels

IRQ2,3,4,5,6,7,10,11 or 12

Boot ROM Address

C0000,C8000,D0000 or D8000H

Data Bus

8-bit or 16-bit, auto-sensing

Connectors

16-bit PC/104 stackthrough connector RJ45 connector for 10BASE-T, 16-pin insulation displacement connector for AUI

Software Support

Netware 286/386 3.x 4.x

Novell Personal NetWare

Microsoft LAN manager

DECnet PathWorks

3Com 3+Open

Banyan VINES

IBM LAN

FTP PC/TCP

Windows for Workgroups

Programs compatible with ODI,NDIS and packet drivers

Standards

PC/104 8-bit and 16-bit compatible

Built-in IEEE 802.3 10 Mbps CSMA/CD 10BASE-T transceiver

10Base-2, 10BASE-5 and 10BASE-FDRL by external transceiver

General

Power

+5 V 400 mA max.

Temperature

0 C to 70°C (operating)

-15 to 80°C (storage)

Humidity

10% to 90% (operating)

10% to 90% (storage)

Chapter 3: Installation

Initial Inspection

Your package should contain the following items. If they are missing, damaged or fail to meet specifications, contact your representative immediately.

PC104ENET PC/104 Ethernet Module

- This manual
- PC104ENET board
- 3.5", 1.44 diskette with drivers

Locating components

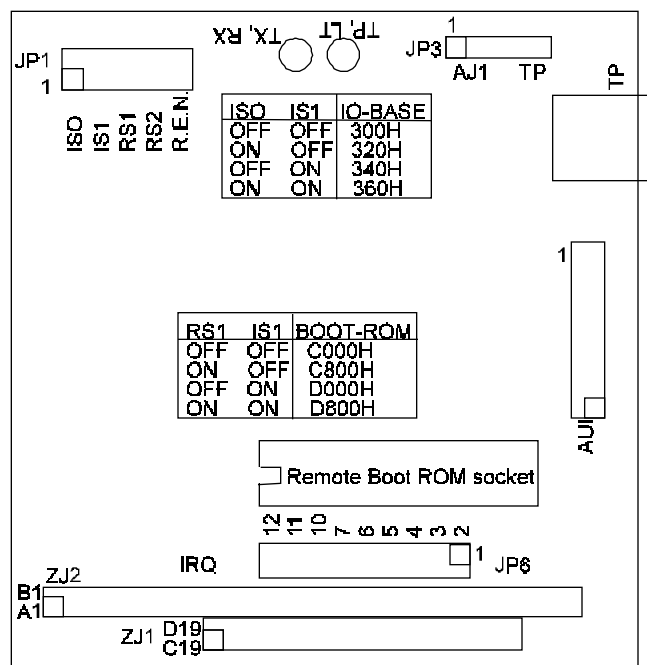


Figure 2: Locating Components

Configuration

I/O base address

Set the IS0 and IS1 pins on jumper JP1 according to the following chart:

Module base address - JP1

IS0	IS1	Module base address
OFF	OFF	300H
ON	OFF	320H
OFF	ON	340H
ON	ON	360H

OFF = pins open

ON = pins closed

Remote Boot ROM

A boot ROM allows you to boot the workstation directly from the server, avoiding the need for local hard or floppy disks. Install the boot ROM as shown below. Make sure that you align the notch of the ROM chip with the notch on the socket.

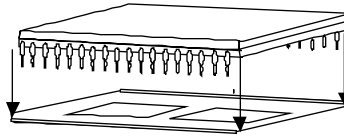


Figure 3: Remote Boot ROM

Short the R.EN pins on JP1 to enable the boot ROM. The ROM will take up 8 KB of memory. Pins RS1 and RS2 on JP1 select the ROM's memory address. See the following chart:

Boot ROM address - JP1

RS1	RS2	ROM base address
OFF	OFF	C000H
ON	OFF	C800H
OFF	ON	D000H
ON	ON	D800H

OFF = pins open

ON = pins closed

You will need to configure your server as a boot server and generate a boot image file. Refer to your operating system's manuals for more information.

Internal/external transceiver (JP3)

If you use the module's built-in 10BASE-T transceiver, set JP3 to TP. If you use the PC104ENET daughterboard or another external MAU, set JP3 to AUI.

Hardware Installation

The following instructions tell how to install the PC104ENET module on a CPU card. The process is similar with PC/104 CPU modules - see the figure on the other page. Make sure that you have properly configured the module's jumpers and attached a boot ROM if necessary.

WARNING!

Turn on your PC power supply whenever you install or remove the PC104ENET or connect and disconnect cables.

1. Turn the PC's power on. Turn the power off to any peripheral devices such as printers and monitors.
2. Disconnect the power cord and any other cables from the back of the computer.
3. Remove the system unit cover (see the user's guide for your chassis if necessary).
4. Remove the CPU card from the chassis (if necessary) to gain access to the card's PC/104 connector.
5. Screw the brass spacer (included with the module) into the threaded hole on the CPU card. Do not tighten too much, or the threads may be damaged.
6. Carefully align the connector pins of the PC104ENET (ZJ1 and ZJ2) with the PC/104 connector. Slide the module into the connector. The module pins may not slide all the way into the connector; do not push too hard or the module may be damaged. If the CPU card has only a 8-bit bus, make sure that the pins on connector ZJ1 do not touch anything.
7. Secure the module of the CPU card to the threaded hole in the CPU card using the included screw.
8. Attach the flat-cable connector from the PC104ENET 10BASE-2 transceiver daughterboard (or other external MAU) to the module's AUI connector. Attach the connector so that the red or blue wire on the flat cable matches pin 1 (printed on the board).
9. Reinstall the CPU card and replace the system unit cover. Reconnect the cables you removed in step 2. Turn the power on.

This completes the hardware installation. Install the software drivers according to the instructions for your operating system.

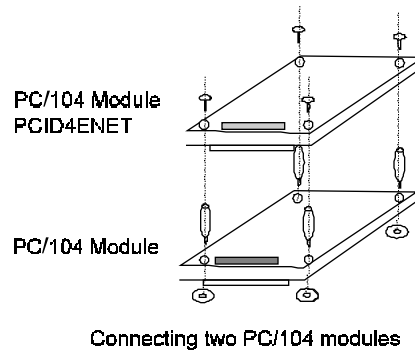


Figure 4: Connecting two PC/104 modules

Appendix A: Ethernet Connection Specifications

The following table shows the network specification for each Ethernet type:

Ethernet Type	Data Transfer Rate	Topology	Cable Type	Segment Length
10BASE-2	10 Mbps	Bus	50 Ohm Ethernet Thin (RG-58)	185 m (607 ft) max.
10BASE-5	10 Mbps	Bus	50 Ohm Ethernet Thick (RG-11)	500 m (1640 ft) max.
10BASE-T	10 Mbps	Star	100 Ohm unshielded twisted pair	100 m (328 ft) max.

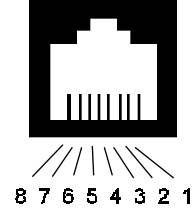
Table 1: Ethernet Connection

Appendix B: Pin Assignments

16-pin AUI connector

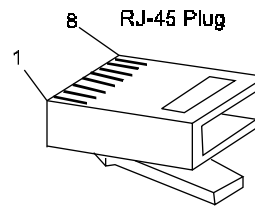
AUI + 5V	1	8	GND
	2	10	
GND	3	11	GND
AUI + 12V	4	12	RX+
RX-	5	13	GND
GND	6	14	TX+
TX-	7	15	CD+
CD-	8	16	GND

RJ-45 Jack



RJ-45 connector

Pin	Signal	Description
1	TD+	Data transmission positive
2	TD-	Data transmission negative
3	RD+	Data reception positive
6	RD-	Data reception negative



Appendix C: LED Indicators

The module's two LED indicators show the status of the communication link and traffic.

LED	On	Flashing	Off
TP.LT	Link OK	Traffic on TP	Link failure
TX.RX	-	Traffic	No traffic

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BUG REPORT

While we have tried to assure this manual is error free, it is a fact of life that works of man have errors. We request you to detail any errors you find on this BUG REPORT and return it to us. We will correct the errors/problems and send you a new manual as soon as available. Please return to:



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Please list the page numbers and errors found. Thank you!

