

DECpc AXP 150 and DEC 2000 Model 300 AXP

DEC EtherWORKS EISA Ethernet Controller User Information

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This manual describes how to install, configure, and use the DEC EtherWORKS EISA Ethernet controller in the DEC 2000 Model 300 AXP and DECpc AXP 150 systems.

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- Reorient the receiving antenna.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that the computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio /television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the US Government Printing Office, Washington, DC 20402, Stock No. 004-000-00398-5.

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

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

BENUTZERHINWEIS: Das DEC EtherWORKS EISA-Modul in Verbindung mit EISA Personalcomputersystemem entsprechen den Funkentstöransforderungen der DBP-Verfugung 523/69 und VDE0871 Grenzwertklasse B.

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Preface

Purpose of This Manual

This manual describes how to install, configure, and use the DEC™ EtherWORKS™ EISA Ethernet controller in the DEC 2000 Model 300 AXP™ and DECpc™ AXP 150 systems.

Audience

This manual is intended for anyone installing, configuring, or connecting the DEC EtherWORKS EISA Ethernet controller in the DEC 2000 Model 300 AXP or DECpc AXP 150 systems. It is written for both experienced and inexperienced users.

Structure of This Manual

This manual contains three chapters, an appendix, and an index as follows:

- Chapter 1 describes how to install the Ethernet controller in the system unit and how to use it to connect the system to a network.
- Chapter 2 describes how to configure the system after the Ethernet controller is installed.
- Chapter 3 contains troubleshooting information.
- Appendix A lists the specifications for the Ethernet controller.
- The index is a reference to the main topics in the manual.

Associated Information

The *DECpc AXP 150 and DEC 2000 Model 300 AXP Customer Technical Information* manual contains associated information.

Conventions

The following conventions are used in this manual:

Convention	Description
monospace	Text displayed on the screen is shown in monospace type.
<i>italic type</i>	Italic type emphasizes important information, indicates variables, and indicates complete titles of manuals.
<i>n.nn</i>	A period in numerals signals the decimal point indicator. For example, <i>1.75</i> equals <i>one and three-fourths</i> .
<i>n</i>	A lowercase italic <i>n</i> indicates the generic use of a number. For example, <i>19nn</i> indicates a 4-digit number in which the last 2 digits are unknown.
Note	A note contains information of special importance to the reader.
Caution	A caution contains information to prevent damage to the equipment.

1

Installing the Ethernet Controller

Introduction

This chapter describes how to install the EtherWORKS EISA Ethernet controller. It also describes how to connect the system to an Ethernet network after you have installed the Ethernet controller.

About the EtherWORKS EISA Ethernet Controller

The EtherWORKS EISA Ethernet controller is an option board that enables you to integrate an EISA-compatible computer into a network, using either ThinWire™ or 10BASE-T (Twisted-Pair) Ethernet cables.

In This Chapter

This chapter contains the following sections:

- Preparing to Install the Ethernet Controller
- Installing the Ethernet Controller
- Connecting 10BASE-T Ethernet Network Cables
- Connecting ThinWire Ethernet Network Cables
- Verifying and Completing the Network Connection

Preparing to Install the Ethernet Controller

Before You Begin

How you connect a system to a network depends on the type of network installed where the system is located. The EtherWORKS EISA Ethernet controller supports two types of network; ThinWire Ethernet networks and 10BASE-T Ethernet networks. Table 1-1 lists the steps that you must follow to prepare for the network connection.

Table 1-1 Preinstallation Procedure

Step	Action
1	Determine the type of network to which you intend connecting the system. You can do this by locating and identifying the network cable. Figure 1-1 shows a typical ThinWire Ethernet cable (❶) and a typical 10BASE-T Ethernet cable (❷). If you are unsure of the correct network type to use, ask your network coordinator.
2	You may be required to change the shunting plug position on the Ethernet controller. You must change the shunting plug position in the following circumstances: <ul style="list-style-type: none">• When you are connecting the system to a network for the first time and you intend using a ThinWire Ethernet network. (When the Ethernet controller is shipped, the shunting plug is positioned for 10BASE-T Ethernet.)• When the system is already connected to an Ethernet network and you intend changing the network type, for example, from ThinWire Ethernet to 10BASE-T Ethernet, or vice versa.

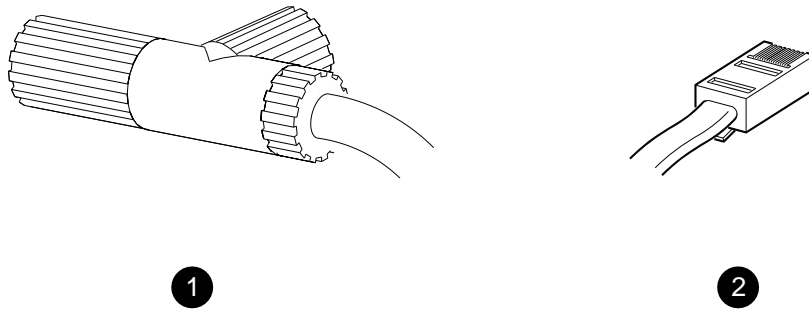
The section entitled Installing the Ethernet Controller describes how to set the shunting plug on the Ethernet controller to the correct position for the network interface that you intend using. If you are an inexperienced computer user, Digital™ recommends that you ask your network coordinator for help in performing this task.

Preparing to Install the Ethernet Controller

Typical Ethernet Cables

Figure 1-1 shows a typical ThinWire Ethernet cable and a typical 10BASE-T Ethernet cable.

Figure 1-1 ThinWire Ethernet and 10BASE-T Ethernet Cables



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Installing the Ethernet Controller

Summary

A shunting plug on the EtherWORKS EISA Ethernet controller controls whether the system unit uses the ThinWire Ethernet connector or the 10BASE-T Ethernet connector. This section describes how to change the position of the shunting plug and install the Ethernet controller. When the Ethernet controller is shipped, it uses the 10BASE-T Ethernet connector by default.

Selecting the Ethernet Network

Set the shunting plug (❶) on the Ethernet controller to the correct position for the network interface that you intend using. Figure 1-2 shows the 10BASE-T (❷) and ThinWire (❸) positions.

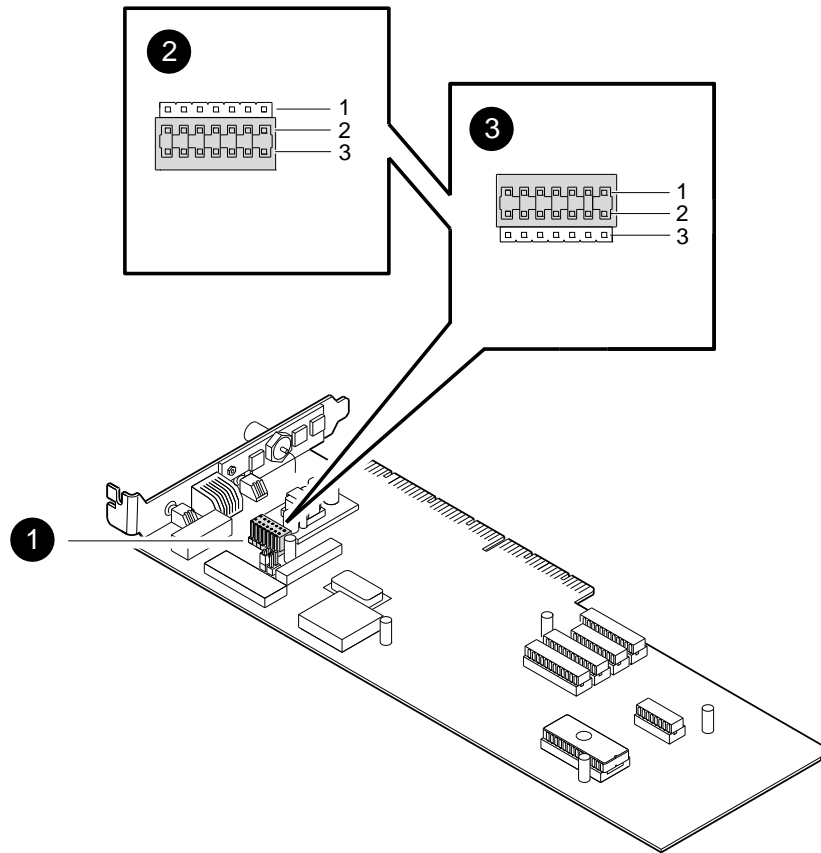
Installation Procedure

See the *DECpc AXP 150 and DEC 2000 Model 300 AXP Customer Technical Information* manual for information on opening the system unit and installing an option board.

Network Selection Illustration

Figure 1-2 shows the shunting plug positions for 10BASE-T and ThinWire Ethernet networks.

Figure 1-2 Selecting the Ethernet Network



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Connecting 10BASE-T Ethernet Network Cables

Summary This section describes how to connect 10BASE-T Ethernet cables to the system unit. 10BASE-T Ethernet cables are sometimes referred to as Twisted-Pair cables.

Connection Procedure Table 1–2 lists the steps that you must follow to connect a 10BASE-T Ethernet cable to the system unit.

Table 1–2 Connecting a 10BASE-T Ethernet Cable to the System Unit

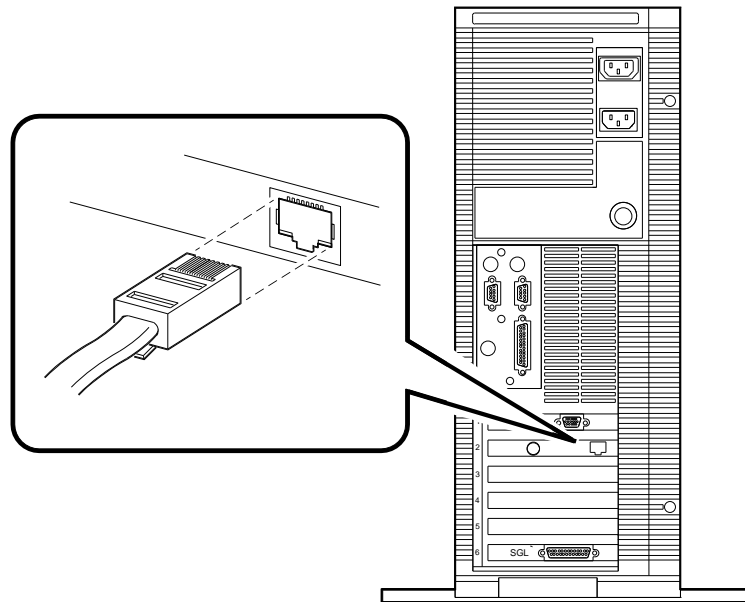
Step	Action
1	Determine how and where to connect the system in the network. If you are unsure, ask the network coordinator.
2	Shut down the operating system, following the instructions in the operating system documentation.
3	Set the on/off switch on all peripherals and on the system unit to the off position.
4	Connect the 10BASE-T Ethernet cable to the system unit as shown in Figure 1–3.

Connecting 10BASE-T Ethernet Network Cables

Connection Illustration

Figure 1–3 shows how to connect a 10BASE-T Ethernet cable to the system unit.

Figure 1–3 Connecting a 10BASE-T Ethernet Cable



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Connecting ThinWire Ethernet Network Cables

Summary This section describes how to connect ThinWire Ethernet cables to the system unit.

Important Information

Caution

Disconnecting Ethernet cables and terminators from the T-connectors on active Ethernet networks disrupts local network communications.

Connection Procedure

Table 1–3 lists the steps that you must follow to connect a ThinWire Ethernet cable to the system unit.

Table 1–3 Connecting a ThinWire Cable to the System Unit

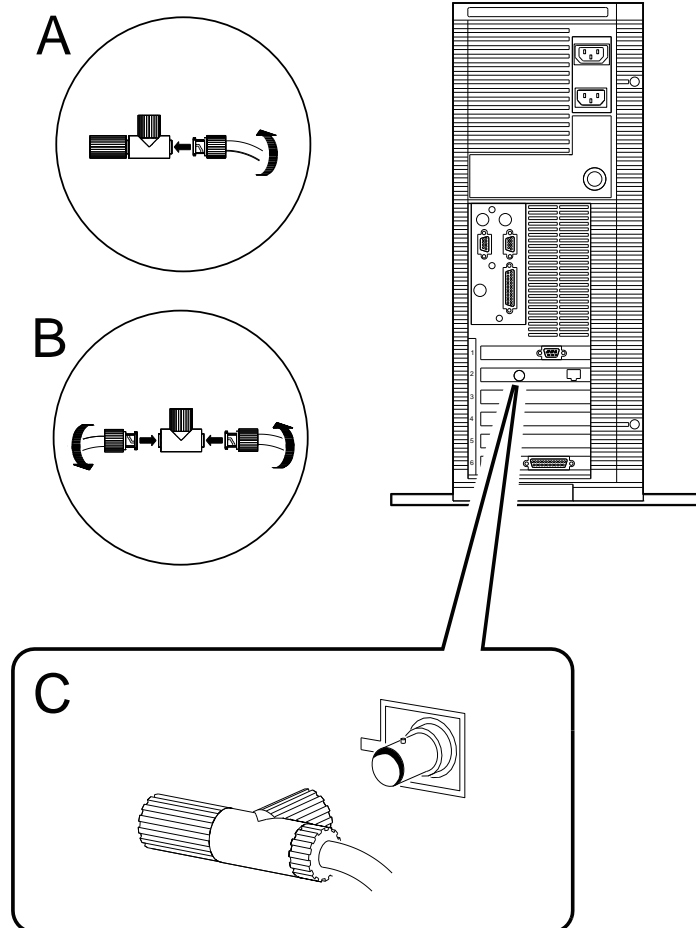
Step	Action
1	Determine how and where to connect the system in the network. If you are unsure, ask the network coordinator.
2	Shut down the operating system, following the instructions in the operating system documentation.
3	Set the on/off switch on all peripherals and on the system unit to the off position.
4	If necessary, connect a ThinWire Ethernet cable to one or both sides of a T-connector, depending on the position of the system in the network. See Figure 1–4, A and B.
5	Connect the T-connector to the system unit as shown in Figure 1–4, C.

Connecting ThinWire Ethernet Network Cables

Connection Illustration

Figure 1-4 shows how to connect a ThinWire Ethernet cable to the system unit.

Figure 1-4 Connecting a ThinWire Ethernet Cable



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Verifying and Completing the Network Connection

Summary This section describes how to verify and complete the network connection.

Test Procedure After you have completed connecting the Ethernet cable to the system unit, you must test the connections. Table 1–4 lists the steps that you must follow to test the Ethernet connection.

Table 1–4 Testing the Ethernet Connection

Step	Action
1	Set the on/off switches on all the peripherals and on the system unit to the on position.
2	Examine the power-up test display to determine whether the Ethernet (NI) device has passed or failed. See Example 1–1 (❶) and Example 1–2 (❷) for examples of successful and unsuccessful power-up test displays.
3	See the <i>DECpc AXP 150 and DEC 2000 Model 300 AXP Customer Technical Information</i> manual for information on troubleshooting if the Ethernet device shows an error.

Contact the Network Coordinator When you have completed connecting the Ethernet cable to the system unit, your network coordinator must configure it as part of the network.

Verifying and Completing the Network Connection

Unsuccessful Ethernet Power-Up Test Display

Example 1–1 shows an unsuccessful power-up test display in the Windows NT™ firmware and indicates an Ethernet device error.

Example 1–1 Unsuccessful Ethernet Power-Up Test Display

```
This 1MB Flash contains BASE LEVEL n.n Jensen Console Code

Jensen Alpha PC - Rom Version nn
Digital Equipment Corporation
System conducting power up tests
Press SPACEBAR to abort Memory Test
-----
Testing MEM .... passed 32MB
Testing NVR .... passed
Testing SCC .... passed
Testing IT .... passed
Testing KBD .... passed
Testing LPT .... passed
Testing VGA .... passed
Testing NI .... failed 2000 0182 ❶
Testing SCSI .... passed
-----
System power up tests detected error(s).
See your system documentation for more information.
```

Successful Ethernet Power-Up Test Display

Example 1–2 shows a successful power-up test display in the Windows NT firmware and indicates the system unit Ethernet ID.

Example 1–2 Successful Ethernet Power-Up Test Display

```
.
.
.
.
Testing KBD .... passed
Testing LPT .... passed
Testing VGA .... passed
Testing NI .... passed 09-01-2B-2F-3D-D4 ❷
Testing SCSI .... passed
-----
System power up OK.
```


2

Configuring the Ethernet Controller

- Introduction** This chapter describes how to configure a system after you have installed the EtherWORKS EISA Ethernet controller.
- In This Chapter** This chapter contains the following section:
- EISA Configuration Utility (ECU)

EISA Configuration Utility (ECU)

Running the ECU

To configure the Ethernet controller within the system or to change the configuration settings, you must run the ECU. See the *DECpc AXP 150 and DEC 2000 Model 300 AXP Customer Technical Information* manual for information on running the ECU.

Changing the Configuration

You can use the ECU to change the configuration of the Ethernet controller. Table 2-1 shows the functions and the corresponding choice of settings that are available for the EtherWORKS EISA Ethernet controller.

Table 2-1 Configuration Settings

Function	Choice of Settings
Network Interrupt	IRQ 5 IRQ 9 IRQ 10 IRQ 11
Network Controller Buffer	Address = 0D0000H—0DFFFF (64K) Address = 0E0000H—0EFFFF (64K) Address = 0C0000H—0CFFFF (64K) Address = 0D8000H—0DFFFF (32K) Address = 0C8000H—0CFFFF (32K) Address = 0E8000H—0EFFFF (32K)
Remote Boot	Disable Enable
Remote Boot Time-Out	30 seconds 2.5 minutes
Network Interface	ThinWire Twisted-Pair

Default Configuration

Table 2-2 shows the default configuration settings for the EtherWORKS EISA Ethernet controller.

Table 2-2 Default Configuration

Function	Default Setting
Network Interrupt	IRQ 5
Network Controller Buffer	Address = 0D0000H—0DFFFF (64K)
Remote Boot	Disable
Remote Boot Time-Out	30 seconds
Network Interface	Twisted-Pair

3

Troubleshooting

Introduction

This chapter describes problems that you may encounter with the EtherWORKS EISA Ethernet controller. It lists possible causes and solutions for the problems.

In This Chapter

This chapter contains the following sections:

- Network Problems
- Ethernet Controller LED Activity

Network Problems

Summary

This section describes some of the problems that can occur with the Ethernet controller. It suggests possible causes for the problems and actions that you can take to correct them.

Identifying and Solving Problems

Table 3–1 describes how to identify and solve problems by interpreting correctly the symptoms that are occurring.

Table 3–1 Troubleshooting Table

Symptom	Possible Cause	Recommended Action
The Ethernet controller device name does not appear in the power-up self-test display.	The Ethernet controller is not seated firmly.	Remove the Ethernet controller and reinsert it <i>firmly</i> in the option slot.
	The Ethernet controller is not correctly configured or the configuration conflicts with another installed option board.	Use the ECU to check the configuration and if necessary, reconfigure the Ethernet controller to resolve the conflict.
The system does not remote boot.	The Ethernet controller is not configured for remote boot.	Check the ECU set up.
	The default remote boot time-out could be insufficient for a busy network.	Check the ECU set up.
	The Ethernet address is not registered for this address node.	Register the Ethernet address of the Ethernet controller. If the problem persists, contact your system administrator.

(continued on next page)

Table 3–1 (Cont.) Troubleshooting Table

Symptom	Possible Cause	Recommended Action
The system is on, but the network does not start.	The network interface or remote boot is set incorrectly.	Check that the shunting plug on the Ethernet controller is in the correct position. Use the ECU to check the remote boot set up.
	The network cables or terminators are loose.	Check and secure all cables and terminators.
	A conflict exists with another option board in the system, for example: <ul style="list-style-type: none"> • The IRQ settings are incorrect • The I/O address or the memory address range is incorrect 	Check the ECU set up.
The system is on and displays an Ethernet (NI) problem in the power-up self-test display during system startup.	The Ethernet address is not registered for this address node.	Register the Ethernet address of the Ethernet controller. If the problem persists, contact your system administrator.
	The Ethernet cable is not properly connected to the selected Ethernet port.	Make sure that the Ethernet cable is properly connected to the Ethernet port.
	The selected Ethernet port is not terminated.	Make sure that the T-connector has either an Ethernet cable or a terminator connected to each side or make sure that the 10BASE-T terminator is connected to the 10BASE-T Ethernet port.

(continued on next page)

Network Problems

Table 3–1 (Cont.) Troubleshooting Table

Symptom	Possible Cause	Recommended Action
	The Ethernet network is not terminated or connected correctly.	Make sure that all connections on the network are connected or terminated correctly.
	The incorrect Ethernet type is selected.	Check that the shunting plug on the Ethernet controller is in the correct position. See Chapter 1 for more information on selecting the Ethernet type using the shunting plug.
	The Ethernet controller is faulty.	See the <i>DECpc AXP 150 and DEC 2000 Model 300 AXP Customer Technical Information</i> for information on testing an option board. If the NI device fails, contact your Digital service representative.
	The error code could be a system error code.	See the <i>DECpc AXP 150 and DEC 2000 Model 300 AXP Customer Technical Information</i> for more information. If the problem persists, contact your system administrator.

Ethernet Controller LED Activity

- Summary** The Ethernet controller has two light emitting diodes (LEDs) that indicate the operating status of the controller. This section describes the different states of the LEDs and their indications.
- LED Activities** Table 3–2 and Table 3–3 describe the usual states of the LEDs and the cause of each state. If the LED activity differs from that described in the tables, see Table 3–1 for troubleshooting information.

Table 3–2 LED Activity in the Windows NT Firmware

State	Cause
Amber LED on.	During the system power-up self-test, the amber LED comes on at the Ethernet (NI) test and remains on until you switch to the Windows NT firmware.
Amber LED off.	The amber LED goes off when you switch to the Windows NT firmware.
Amber LED flashing.	If you are using a ThinWire Ethernet connection, the amber LED flashes when there is network traffic present.
Green LED flashing.	If you are using a 10BASE-T Ethernet connection, the green LED flashes when there is network traffic present.

Table 3–3 LED Activity in the OpenVMS and OSF/1 Console

State	Cause
Amber LED on.	During the system power-up self-test, the amber LED comes on at the Ethernet (NI) test and remains on.

A

Specifications

Introduction

This chapter lists the specifications for the EtherWORKS EISA Ethernet controller.

In This Appendix

This appendix contains the following sections:

- Ethernet Controller Specification
- 10BASE-T Ethernet Port Pin Specification

Ethernet Controller Specification

Ethernet Controller Specification Summary

Table A-1 lists the physical specifications for the Ethernet controller.

Table A-1 Specification Table

I/O Address Assignments

I/O	0ZC00-0ZC0F 0ZC80-0ZC84
-----	----------------------------

Power Requirements

10BASE-T	12 Watts (maximum)
ThinWire	15.6 Watts (maximum)
DC Amps @ +5V	2.4 Amps (maximum)
DC Amps @ +12V	0.30 Amps (maximum)

PC Operating Environment

Temperature (at sea level)	15° - 32°C (59° - 90°F)
Relative humidity	8% to 80% (non-condensing)
Radiated emissions	FCC Class B
Radiated emissions	VDE Class B

EISA Identification

DEC EtherWORKS EISA Ethernet Controller	DEC4220
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10BASE-T Ethernet Port Pin Specification

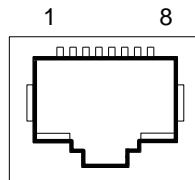
Summary

This section lists the pin specifications for the 10BASE-T Ethernet port.

10BASE-T Ethernet Port Illustration

Figure A-1 shows the pin numbers on the 10BASE-T Ethernet port.

Figure A-1 10BASE-T Ethernet Port



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10BASE-T Ethernet Port Pin Specification

Table A-2 describes the functions of the pins on the 10BASE-T Ethernet port.

Table A-2 10BASE-T Ethernet Port Pin Specification

Pin	Function
1	Transmit
2	Transmit, active low
3	Receive
4	Not used
5	Not used
6	Receive, active low
7	Not used
8	Not used

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