IBM

Token-Ring PCI Adapter Installation and User's Guide

Second Edition (October 1997)

Contents

Safety Information

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

Handling the Token-Ring PCI Adapter

Attention: Static electricity can damage your equipment. Leave the Token-Ring PCI Adapter in its static-protective bag until you are ready to install it in your system unit.

Electrostatic Discharge Protection

Take the following precautions whenever you handle the Token-Ring PCI Adapter or other static-sensitive devices:

- Use an anti-static wrist strap if you have one.

- Limit your movement. Movement can cause static electricity to build up around you.

- With the adapter still in its anti-static bag, touch it to an unpainted metal part of the system unit, such as an expansion slot.

- Hold the adapter carefully by its edges. Avoid touching solder joints, pins, or other printed circuitry.

- Do not place the adapter on the system unit cover or on a metal table. If you must set it aside, put it back into its anti-static bag. Before you pick it up again, touch the bag and metal frame of the system unit at the same time.

- Be very careful when you handle the adapter during cold weather, as low humidity and heating increase static electricity.

About This Book

This book provides information about the Token-Ring PCI Adapter, and how to install and connect it to a token-ring network. Use this book along with your specific system unit and operating system documentation.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

Related Publications

Refer to your system unit and operating system documentation for information specific to your hardware and software configuration.

Trademarks and Acknowledgments

AIX is a registered trademark of International Business Machines Corporation

Chapter 1. Overview

The Token-Ring PCI Adapter is a high-performance, token-ring local area network (LAN) adapter designed to operate with system units that support the Peripheral Component Interconnect (PCI) bus interface. The adapter supports operation at either 4Mbps or 16Mbps over unshielded twisted-pair (UTP) or shielded twisted-pair (STP) media. It is particularly well-suited for servers and high-end workstations, especially for network workstations running I/O-intensive applications. The Token-Ring PCI Adapter uses the IEEE-802.5 standard for communications.

The Token-Ring PCI Adapter provides the following features:

- Automatic ring speed selection determines and sets the ring speed to either 4Mbps or 16Mbps, simplifying installation and network down time.

- Type 8-T adapter (Figure 1-1) supports UTP with on-board filters and STP media with a single RJ-45 connector.

- Type 9-O adapter (Figure 1-2 on page 1-2) supports UTP with on-board filters with an RJ-45 connector and STP media with a 9-pin D-shell connector.

- External status light-emitting diodes (LEDs) provide visual indication of adapter and ring status without disrupting operation

- Full-duplex operation.
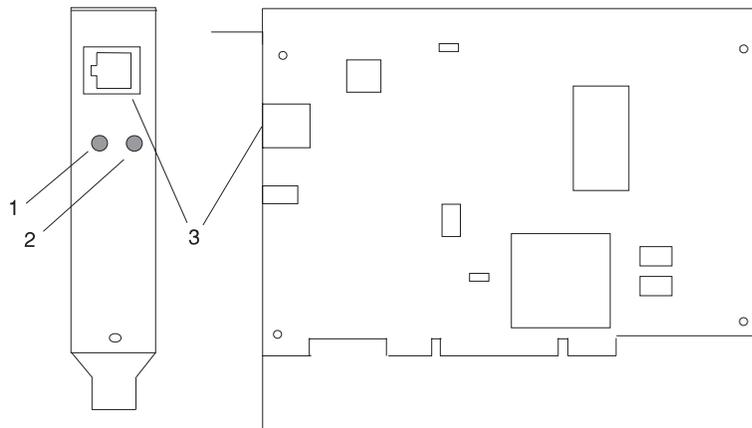
Figure   1-1. Token-Ring PCI Adapter Type 8-T

1   Amber LED
2   Green LED
3   RJ-45 Connector
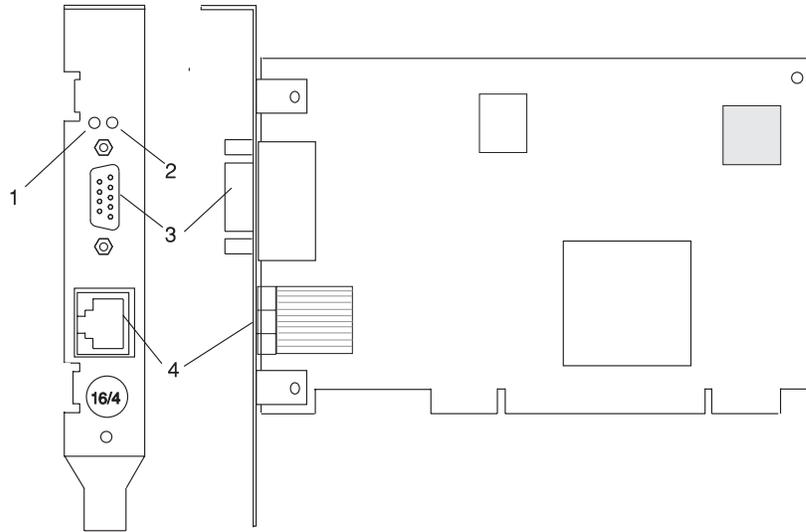
Figure   1-2. Token-Ring PCI Adapter Type 9-O

1   Amber LED
2   Green LED
3   9-Pin D-Shell
4   RJ-45 Connector

Chapter 2. Preparing to Install the Adapter

This chapter covers the things you need to do before you install your Token-Ring
PCI Adapter. Preparing to install the adapter involves the following tasks:

- Verifying your hardware requirements
- Verifying your software requirements
- Making sure your package is complete
- Gathering tools and documentation

Verifying Your Hardware Requirements

The Token-Ring PCI Adapter requires one or more cables to attach the adapter to a
token-ring network. Refer to Table A-1 on page A-1 to determine which cables you
should use for your particular hardware configuration.

Verifying Your Software Requirements

The Token-Ring PCI Adapter is supported on several operating systems, including
AIX 4.1.5 or later. Please ensure that your operating system supports this adapter
before you install it. Contact your support representative for assistance.

Important: If you are installing your operating system at this time, install the adapter
before you install the operating system (see Chapter 4, "Installing the Adapter" on
page 4-1 for instructions). If you are installing only the device driver for this adapter,
install the device driver before you install the adapter (see Chapter 3, "Installing the
Device Driver" on page 3-1 for instructions).

Checking Your Package

Check that your package contains the following items:

__   The Token-Ring PCI Adapter
__   An RJ-45 STP/D-shell conversion cable (Type 8-T cards only)

Important: Be sure to retain your proof of purchase as it might be required to
receive warranty service.

Gathering Tools and Documentation

To install the adapter, you need the following items:

__   A flat-blade screwdriver
__   Your system unit documentation, including any service documentation
__   Your operating system documentation

Chapter 3. Installing the Device Driver

This chapter provides instructions for installing the device driver for the Token-Ring PCI Adapter on an AIX system. The device driver is provided in AIX and other operating systems that support the adapter. It is also available on separate media.

If your *installed* operating system supports the Token-Ring PCI Adapter, the device driver is already installed and you can install the adapter. Go to Chapter 4, "Installing the Adapter" on page 4-1 for instructions. If you must install the device driver on a system other than AIX, refer to your system documentation for instructions.

To install the device driver on an AIX system:

1. At the system prompt, log in as a root user.

2. Insert the device driver media into the appropriate media device.

3. To start SMIT, type:

   ```
   smit devinst
   ```

   at the prompt, then press Enter. The Install Additional Device Software panel displays. The **INPUT device/directory for software** option is highlighted for selection.

4. Press F4 to display a list of input devices from which you can select. The cursor is already positioned on the input device entry field.

5. Either type the name of the input device in the entry field or select the appropriate device, then press Enter. The Install Additional Device Software panel displays the device you selected in the **INPUT device/directory for software** field. The **SOFTWARE to install** option is highlighted.

6. Press F4 to display a list of the device packages you can install.

7. To display a Find dialog box, type:

   ```
   /
   ```

   in the field where the cursor is positioned.

8. Type the name of the device driver package required for your specific adapter, then press Enter.

   For the Type 9-O adapter:

   ```
   devices.pci.14103e00
   ```

   For the Type 8-T adapter:

   ```
   devices.pci.14101800
   ```

9. Press F7 to select the device package name, then press Enter. The Install Additional Device Software panel displays the completed required fields.

10. Press Enter. The **ARE YOU SURE** list displays.

11. Press Enter. The COMMAND STATUS panel displays. The term `RUNNING` is highlighted, indicating that the software is being installed.

12. When `RUNNING` changes to `OK`, scroll down to the bottom of the panel and locate the Installation Summary. If the installation was successful, `SUCCESS` appears at the bottom of the panel in the Result column of the Installation Summary.

13. Remove the device driver software media from the media device.

14. Press F10 to exit SMIT.

15. To shut down and restart your system, type:

    `shutdown -Fr`

    then press Enter.

Chapter 4. Installing the Adapter

This chapter takes you through the steps of installing your Token-Ring PCI Adapter, which involves the following tasks:

- Installing the adapter in your system unit
- Verifying installation
- Running adapter diagnostics

Installing the Token-Ring PCI Adapter

> **Attention**
>
> Be sure to read the "Electrostatic Discharge Protection" on page vii and Chapter 2, "Preparing to Install the Adapter" on page 2-1 before you begin the installation process.

To install the adapter:

___ 1. Follow your operating system instructions for shutting down your system, then turn off the power to your system unit. On an AIX system, type:

```
shutdown -F
```

at the system prompt, then press Enter. When `halt completed` displays, turn the system unit power off and unplug the power cord from the wall outlet.

___ 2. Following the instructions provided in your system unit documentation, remove the covers of your system unit.

___ 3. Install the adapter in an available expansion slot in your system unit. See the instructions in your system unit documentation for installing PCI adapters.

___ 4. Follow the directions provided in your system unit documentation to reinstall the covers of your system unit.

___ 5. Plug the power cord back into the wall outlet.

___ 6. Turn the power on to your system unit so that the operating system can update the system configuration.

Verifying the Installation

See the instructions provided in your system unit documentation for verifying the successful installation of the drive. To verify the installation on an AIX system, type:

```
lsdev -Cs pci
```

at the system prompt, then press Enter. A list of PCI devices displays. An *Available* status indicates that the adapter is installed and ready to use.

Running Adapter Diagnostics

Adapter diagnostics are included in the device driver software. Refer to your operating system documentation for information about running diagnostics.

Chapter 5. Connecting to a Network

Refer to your local procedures for information about connecting this adapter to your network.

Connecting the Adapter Cable to Adapter Type 8-T

1. Connect the adapter cable to the adapter connector as illustrated in Figure 5-1. See Appendix A, "Adapter Cables" on page A-1, for detailed descriptions of the compatible cables.

2. Connect the other end of the adapter cable to the network.

Figure   5-1. Connecting an Adapter Cable to Adapter Type 8-T

1   RJ-45 STP/D-Sheet Conversion Cable
2   Token-Ring Network PC Adapter Cable
3   Token-Ring UTP Cable with RJ-45 Connectors
4   Token-Ring RJ-45 STP Adapter Cable

Connecting the Adapter Cable to Adapter Type 9-O

1. Connect the adapter cable to the adapter connector as illustrated in Figure 5-2 on page 5-2. See Appendix A, "Adapter Cables" on page A-1, for detailed descriptions of the compatible cables.

2. Connect the other end of the adapter cable to the network.
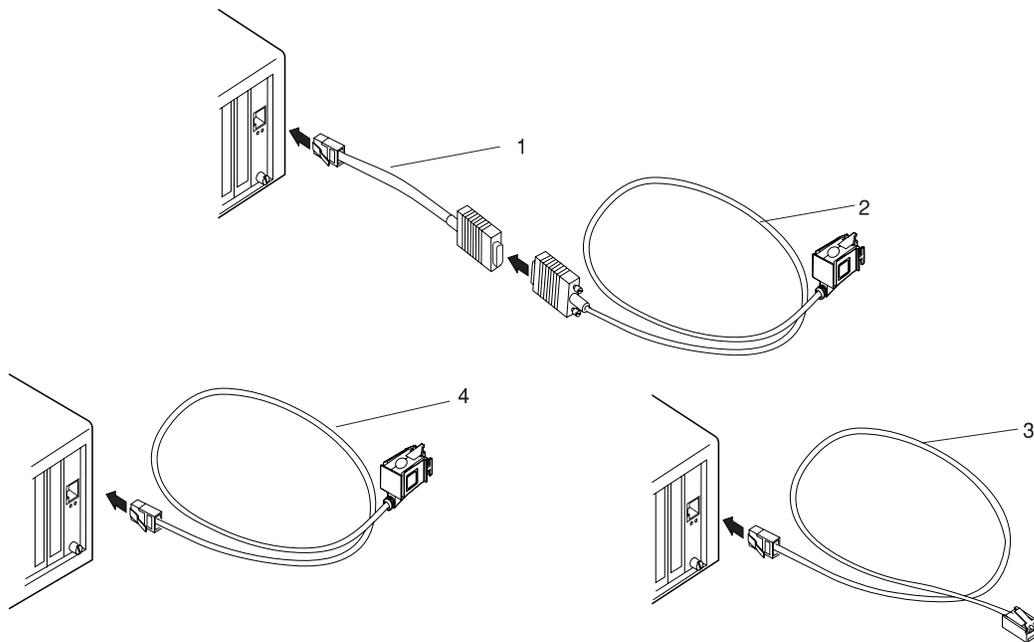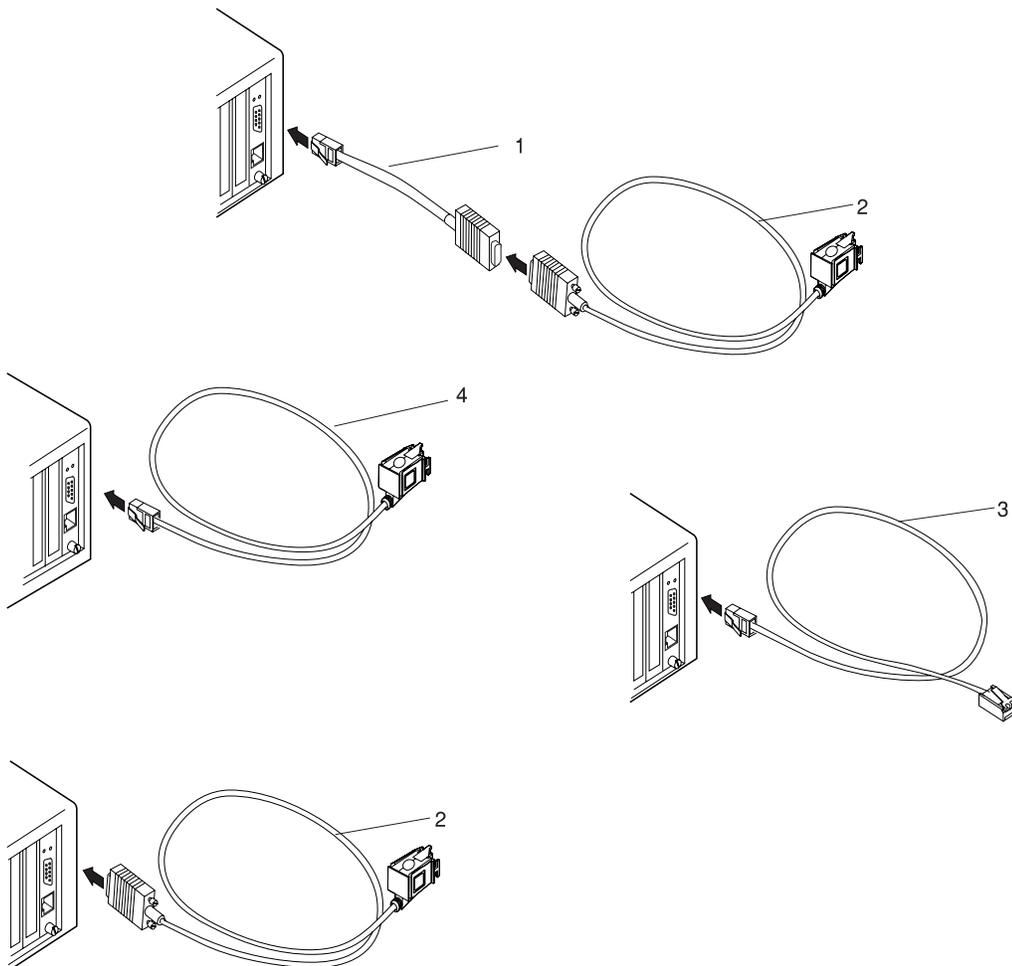

Figure 5-2. Connecting an Adapter Cable to Adapter Type 9-O

1   RJ-45 STP/D-Sheet Conversion Cable
2   Token-Ring Network PC Adapter Cable
3   Token-Ring UTP Cable with RJ-45 Connectors
4   Token-Ring RJ-45 STP Adapter Cable

Understanding the Adapter Labels

Figure 5-3 illustrates the two labels on the bracket of the Token-Ring PCI Adapter.
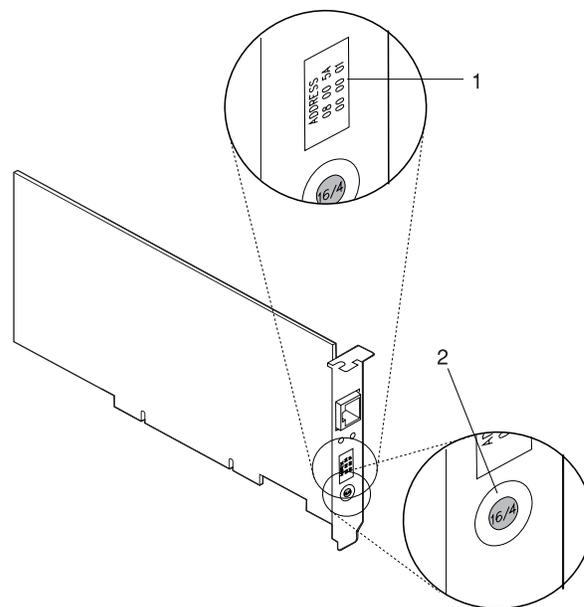
Figure   5-3. The Token-Ring PCI Adapter Labels

1   Universally Administered Address Label
2   Green Dot Label

The *green dot label* indicates that the adapter can communicate at 4Mbps or 16Mbps over a token ring. The *universally administered address label* contains the adapter's universally administered address. This is the media access control (MAC) address that was encoded in the adapter memory at the factory. The 12-digit hexadecimal address is recorded on the label in 2-digit increments from left to right, starting on the first row. In the illustration, the universally administered address is X'0800 5A00 0001' in non-canonical format, with the most significant bit (MSB) first.

The universally administered address is unique and is used by network software to distinguish the adapter from others on the network. If you would prefer the adapter to be known on the network by a locally administered address, you must configure the adapter's device driver or protocol driver to use a locally administered address.

Understanding the Adapter LEDs

Figure 5-4 and Table 5-1 on page 5-5 describe the light-emitting diodes (LEDs).
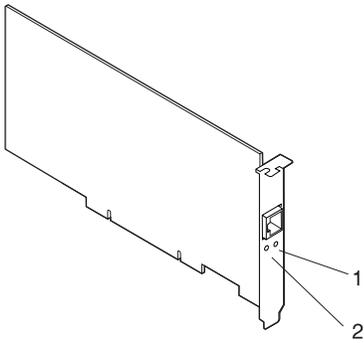
Figure   5-4. The Token-Ring PCI Adapter LEDs

1   Green LED
2   Amber LED

The Token-Ring PCI Adapter LEDs provide information useful for monitoring the status of the adapter and for problem solving. If the green LED is on and the amber LED is off, the adapter is operating correctly. If the amber LED is blinking and the green LED is steady, the adapter has detected a potential problem. In Table 5-1, the first four LED states indicate the sequence that will be displayed when the computer is started and the adapter reaches the open state successfully. Some of those states may be too brief to observe. The last three LED states listed in the table indicate problems.

Table 5-1. *Explanation of the Adapter LED States*		
Amber	**Green**	**Explanation**
Blinking	Blinking	The adapter is waiting for initialization.
Off	Off	The adapter initialization is in progress, or the computer is powered off.
Off	Blinking	The adapter did not detect any problems during its self-diagnostic tests and is waiting to open. If this LED state occurs after the adapter is open, this state indicates that the adapter has closed.
Off	On	The adapter is open and operating correctly.
On	Off	The adapter self-diagnostic tests failed or there is a problem with the adapter.
Blinking	Off	The adapter is closed. One of the following conditions exists: • The adapter open failed. • The adapter detected a wire fault. • The adapter failed the auto-removal test.
Blinking	On	The adapter has detected beaconing or a hard error.
On	On	The adapter has failed.

The following definitions are of terms referred to in the table:

Auto-removal A state in which a token-ring adapter removes itself from the network to perform self-tests to determine whether it is the cause of a hard error. If the tests are successful, the adapter will reattach itself to the network.

Beaconing A state that a token-ring adapter enters after it detects a hard error. The adapter reports the error condition to the other devices on the network. Beaconing can result in the adapter removing itself from the network (auto-removal) to determine whether it is the cause of the hard error.

Hard error An error condition on a network that requires removing the source of the error or reconfiguring the network before the network can resume reliable operation.

Initialization An action during which the adapter is prepared for use after its computer is booted. During initialization, the adapter runs its self-diagnostic tests.

Open A state in which the adapter has established connection with other devices on the ring.

Wire fault An error condition caused by a break or a short-circuit in the cable segment that connects the adapter to its access unit.

Appendix A. Adapter Cables

The Token-Ring PCI Adapter requires one or more of the cables described in Table A-1 below and illustrated in Figure A-1 on page A-2. The table also describes the connectors at each end of the cable. The network end of the cable must be compatible with the network faceplate or other device to which you are connecting the adapter.

Note: The Token-Ring RJ-45 Shielded Twisted Pair (STP) Adapter Cable or the Token-Ring Unshielded Twisted Pair (UTP) Cable are the recommended cables. The RJ-45 STP/D-Shell Conversion Cable is used in conjunction with the Token-Ring Network PC Adapter Cable.

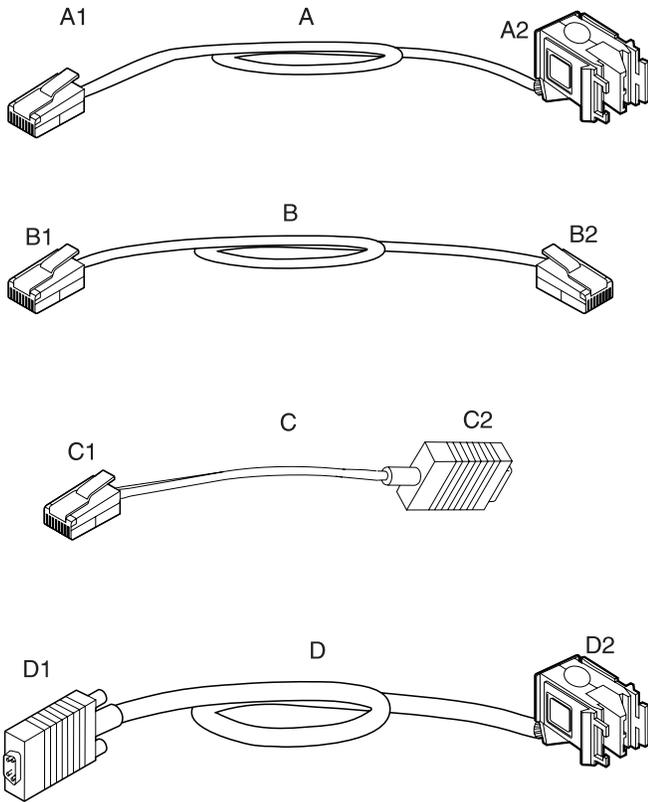| Table A-1. STP and UTP Cables		
Cable	**Description**	**Length**
Token-Ring RJ-45 STP Adapter cable	• Connector at adapter end (A1) is an 8-position RJ-45 modular plug • Connector at network end (A2) is a Cabling System Data Connector or equivalent	2.4 meter/8 ft.
Token-ring UTP cable	Two twisted pairs of UTP cabling. • Connector at adapter end (B1) is an 8-position RJ-45 modular plug • Connector at network end (B2) is an 8-position RJ-45 modular plug or 6-position RJ-11 modular plug	N/A
RJ-45 STP/D-Shell Conversion Cable	Supplied for use with Token-Ring Network PC Adapter cables or equivalent. • Connector at adapter end (C1) is 8-position RJ-45 modular plug • Connector at network end is a 9-position D, female	0.25 meter/8 feet
Token-Ring Network PC Adapter Cable or equivalent token-ring STP cable	• Connector at adapter end is a 9-position D, male • Connector at network end is Cabling System Data Connector or equivalent	N/A

Figure   A-1. STP and UTP Adapter Cables

Notes:

1. C and D must be used together when connected to the RF-45 connector.

2. Configuration A and configuration C used with D comply with Class B emission limits. Configuration B complies with Class A emission limits.

Appendix B. Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Federal Communications Commission (FCC) Statement

Note: The Token-Ring PCI adapter 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 an authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized dealers. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's 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 may cause undesired operation.

Responsible Party:

  International Business Machines Corporation
  New Orchard Road
  Armonk, New York 10504
  Telephone: (919) 543-2193

FC Tested to Comply
With FCC Standards

FOR HOME OR OFFICE USE

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to

maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe B est conform à la norme NMB-003 du Canada.

Canadian Department of Communications Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

VCCI Statement

> この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
> 取扱説明書に従って正しい取り扱いをして下さい。

The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class B Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). This product is aimed to be used in a domestic environment. When used near a radio or TV receiver, it may become the cause of radio interference. Read the instructions for correct handling.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG–Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

Reader's Comments — We'd Like to Hear From You

Token-Ring PCI Adapter Installation and User's Guide

Order Number: 93H9807

Overall how satisfied are you with the information in this book?

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Overall Satisfaction	□	□	□	□	□

How satisfied are you that the information in this book is:

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Accurate	□	□	□	□	□
Complete	□	□	□	□	□
Easy to find	□	□	□	□	□
Easy to understand	□	□	□	□	□
Well organized	□	□	□	□	□
Applicable to your tasks	□	□	□	□	□

Please tell us how we can improve this book:

Thank you for your response. May we contact you? □ Yes □ No

When you send comments to us, you grant us a nonexclusive right to use or distribute your comments in any way we believe appropriate without incurring any obligation to you.
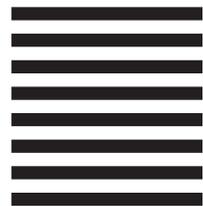
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