



**ARTIC960Rx
PCI Adapter
Guide to Operations**



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Important

Before using this information and the product it supports, be sure to read all the information in Appendix A, "Notices" on page A-1.

Before installing or removing an adapter, be sure to study the Connect/Disconnect sequence diagram for cables in "Safety Information" on page A-2.

First Edition (June 1998)

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 - b. Secure all programs, data, and funds contained in a Machine, and
 - c. Inform IBM or your reseller of changes in a Machine's location.

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About This Book

This book describes the IBM ARTIC960Rx PCI Adapter and provides step-by-step installation instructions. After you have finished reading this book, you should be able to:

- Install the adapter
- Attach or remove a PMC card
- Troubleshoot possible problems
- Download system support programs, publications, and utility programs that support the development of adapter applications

Terminology Note

Throughout this book, the ARTIC960Rx PCI Adapter is referred to as the *base adapter*.

Who Should Read This Book

This book is written for an experienced computer user or a person who sets up, uses, or programs the base adapter.

Related Information

- Operating and installation documentation provided with any base adapter you are using.
- Operating and installation documentation provided with your computer.
- Reference, service, and diagnostics documentation available for your computer.
- Other related publications can be obtained from the Web at:
<http://wwprodso1n.bocaratn.ibm.com/artic/pubs.html>

Chapter 1. Product Description

The ARTIC960Rx PCI Adapter is a short, 32-bit, PCI adapter that supports attaching a PCI mezzanine card (PMC card). With the PMC card, the adapter provides high-function control of I/O operations and serves to off-load input/output tasks from the system microprocessor.

There are two versions of the ARTIC960Rx PCI Adapter: one with a voltage regulator and one without a voltage regulator. The PCI connector on both versions is keyed for 3.3-volt and 5-volt operation (the microprocessor on the base adapter operates at 3.3 volts). And both use 3.3-volt signaling levels to the PMC connector.

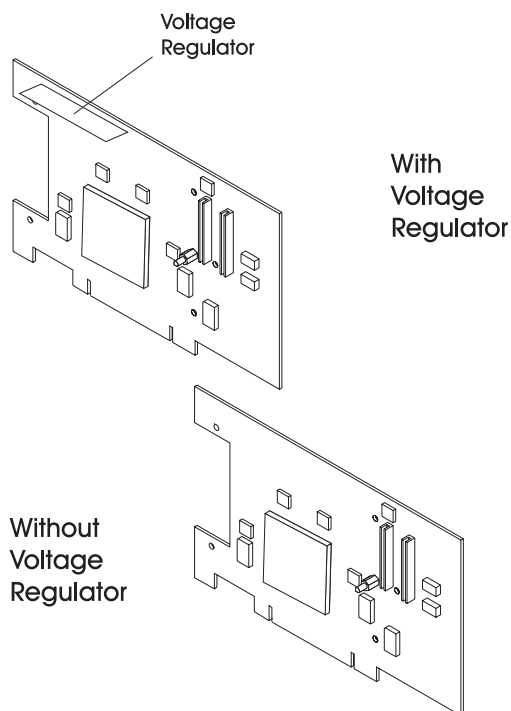


Figure 1-1. PCI Base Adapter

ARTIC960Rx PCI Adapter with Voltage Regulator

The ARTIC960Rx PCI Adapter with the voltage regulator has 4 MB of extended data-out (EDO) memory. This adapter can operate in a computer that does not provide 3.3 volts at the system bus. The voltage regulator converts the 5-volt input to the 3.3 volts required by the adapter and the PMC card attached to the adapter.

Note: You can install any single or single-extended PMC card that supports 3.3-volt signaling on this adapter; however, the voltage regulator might interfere with a PMC card that is not standard size.

ARTIC960Rx PCI Adapter without Voltage Regulator

The ARTIC960Rx PCI Adapter without the voltage regulator has 8 MB of EDO memory. This adapter can operate only in computers that supply 3.3 volts to the PCI connector.

You can install any single or single-extended PMC card that supports 3.3-volt signaling on this adapter.

IBM Part Numbers

The following table lists the part numbers for the field-replaceable units (FRUs) associated with the ARTIC960Rx PCI Adapter.

Description	Part Number
ARTIC960Rx PCI Adapter with voltage regulator—4 MB of memory	87H3545
ARTIC960Rx PCI Adapter without voltage regulator—8 MB of memory	87H3426
Adapter bracket kit	87H3562

Features and Function

The base adapter has the following standard features:

32-bit Intel 80960RP microprocessor

The Intel 80960RP microprocessor operates off the clock input from the system bus (supports up to 33 MHz). It includes two on-board memory subsystems:

- Extended-data-output (EDO) dynamic random-access memory (DRAM), and
- Read-only memory (ROM)

These memory subsystems are used by the adapter microprocessor only. Memory on the adapter cannot be accessed from the system bus.

4 MB or 8 MB EDO DRAM

The microprocessor on the base adapter uses this area for its instructions and data.

Sector-erasable ROM

The ROM subsystem uses sector-erasable, read-only flash memory. It contains the power-on self-test (POST) and bootstrap-loader code for the on-board microprocessor.

PMC Connector

The PMC connector provides a 32-bit PCI interface for attaching a single, or single-extended PCI mezzanine card (PMC card). A PMC card provides a high-function, application-specific interface that expands the capability of a base adapter, such as the ARTIC960Rx PCI Adapter. Attaching a PMC card provides support for high-speed communications, such as a T1 or broadband network. A PMC card has the protocol chips and electrical-interface drivers, receivers, terminators, and connectors that apply to that specific interface.

Specifications

The following describes the physical attributes, environmental conditions, and electrical requirements for the adapter.

Size

Length: 174.6 millimeters (6.9 inches)

Depth: 106.7 millimeters (4.2 inches)

Environment

- Air Temperature:

Operating: 1°C through 52°C (33.8°F through 125.6°F)

Non-Operating: -40°C through 60°C (-40.°F through 140°F)

- Humidity:

Operating: 5% through 95%.

Wet Bulb Temperature: 29°C (84.2°F)

Electrical

- Power Requirements

Voltage	With Regulator	Without Regulator
+3.3 V dc	0 A (maximum)	240 mA (maximum)
+5 V dc	600 mA (maximum)	570 mA (maximum)
+12 V dc	0 A (see note)	0 A (see note)
-12 V dc	0 A (see note)	0 A (see note)

Note: The ARTIC960Rx PCI Adapter does not use +12 or -12 volts; however, it does route these voltages to the PMC connector.

Operating System Support Programs and Publications

To help programmers develop products for the ARTIC960Rx PCI Adapter, a set of operating system packages containing the drivers and utilities to support a particular operating system is available on the World Wide Web (Web). To download from the Web, see "Step 3: Downloading the Diagnostics and Operating System Support Programs" on page 2-8.

Other related publications can be obtained from the Web at:

<http://wwprodso1n.bocaron.ibm.com/artic/pubs.html>

Obtaining Publications when Web Support Is Unavailable

If you do not have access to the Web, you can obtain these publications from the no-fee Developer's Assistance Program (DAP).

By telephone, call **1-800-426-3333** and ask for **ARTIC 160**.

By E-mail, send to **artic@us.ibm.com**.

Chapter 2. Installation Requirements and Instructions

Each ARTIC960Rx PCI Adapter package includes the following:

- The base adapter
- This book (with Warranty Statement)
- An adapter bracket kit containing a bracket and screws

Note: The ARTIC960Rx PCI Adapter is a Class A device.

The Federal Communications Commission (FCC) classification for this product might differ from the FCC classification for your system unit. Use the classification that is highest. For example, if the FCC classification for your system unit is Class B and a card that you install is Class A, the classification of your system unit would change to Class A. For more information, see "Required Electronic Emission and Connectivity Notices" on page A-3.

Hardware Requirements

The ARTIC960Rx PCI Adapter requires a 32-bit, PCI slot. It can be installed in any PCI-compliant computer. However, the ARTIC960Rx PCI Adapter without a voltage regulator must be installed in a computer that provides 3.3 volts at the PCI connector.

Attention: The ARTIC960Rx PCI Adapter is not supported in PCI slots using a spread-spectrum clock, such as the following IBM RISC System/6000®: E20, E30, F30, and F3L.

Handling Static-Sensitive Devices

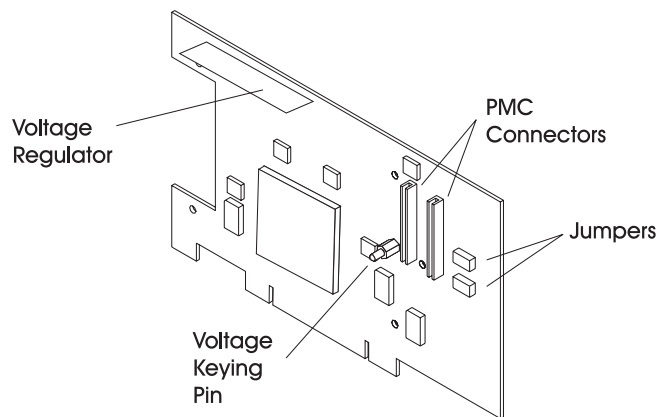
Components for your adapter can be damaged by static discharges. To prevent this damage, your base adapter is wrapped in an anti-static bag. Observe the following precautions when handling the base adapter.

- Keep the adapter in its anti-static bag until you are ready to install it.
- Make the least possible movement of your body to minimize the electrostatic charges created by contact with clothing fibers, carpet, and furniture.
- If possible, keep one hand on the computer chassis when you are inserting or removing the adapter. Always turn the computer off before removing an adapter from the system unit.
- *Do not touch the printed circuit.* Where possible, hold the adapter by its plastic end pieces or by its edges, but do *not* touch the metal edge connectors.
- Do not place the adapter on the machine cover or on a metal table. Machine covers and metal tables increase the risk of damage because they make a discharge path from your body through the adapter.

Component Locations

The following shows some component locations on the ARTIC960Rx PCI Adapter.

Note: The voltage regulator is not present on all ARTIC960Rx PCI Adapters.



Installation

The following instructions assume that you have the base adapter out of the system unit and are ready to install the PMC card. Use these steps, as appropriate for your computer, to install the base adapter and a PMC card.

Note: For some system installations, the base adapter and the PMC card are pre-assembled.

Before you begin

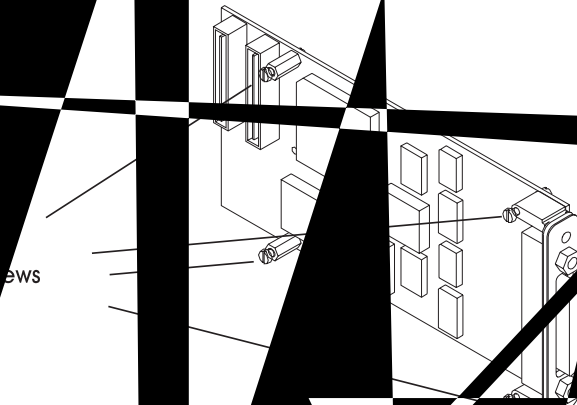
On the base adapter:

1. Verify that the jumpers are connected as follows:
 - Jumper P04 is connected across pins 2,3
 - Jumper P05 is connected across pins 1,2
2. Verify that the voltage keying pin is located next to the two PMC connectors. **Do not move the keying pin. It is intended to ensure the attachment of a 3.3-volt-compatible PMC card.**

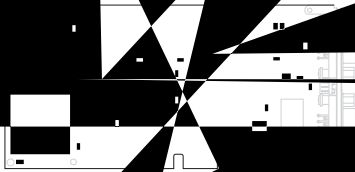
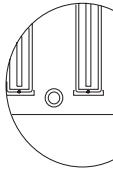
See "Component Locations" on page 2-3 for jumper, voltage keying pin, and connector locations.

PMC card

Select a typical PMC card. If your card manufacturer refers to the installation instructions that apply to your card, refer to those instructions. The screws are placed as shown. The screws are included in the hardware kit with some PMC cards.



The PMC card must have a voltage rating of 5V or less. The two connectors. This is a 5V card. The card is a 5V-compatible card.

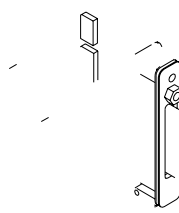


3. Align the connector on the PMC card with the PMC connector on the base adapter.

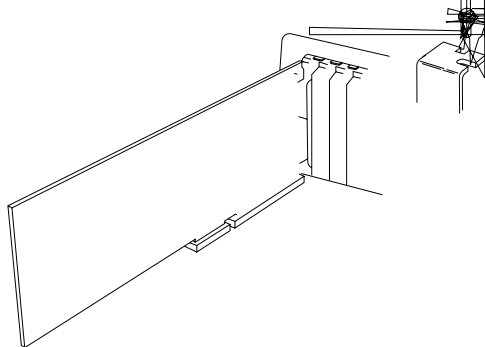
Attention: When the base adapter and the PMC card are properly aligned, the top of the voltage keying pin on the base adapter will fit into the voltage key opening on the PMC card.

4. Firmly press the PMC card and the base adapter connectors together.
5. Attach the cards through the standoffs using two of the screws. If your PMC card has a rubber gasket around the connector on the back of the card, take care not to damage it. Attach the adapter bracket using the remaining two screws. If your PMC card differs from the illustration or uses different hardware, refer to the installation instructions that came with your card.

Step 2: Installing the Base Adapter1. Turn the computer off.2. Unplu



5. Locate an available 32-bit PCI expansion slot in your system unit that supports the appropriate length of the base adapter.
6. Remove the expansion-slot screw, and then remove the expansion-slot cover.
7. Grasping the base adapter by the top edge, firmly press the base adapter into the connector at the rear panel of the system unit. Then, secure the adapter bracket to the slot using the screw provided.



8. Before tightening the expansion-slot screw, make sure adjacent expansion-slot screws do not interfere with the adapter bracket. Then tighten the expansion-slot screw to lock the base adapter in place.
9. If you have other adapters (or options) to install, do so now. Refer to the installation instructions provided with your computer for more information.
10. Reinstall the system unit cover and reconnect all cables to their appropriate connectors (refer to the documentation that came with your computer).
11. Plug all power cords into electrical outlets.

Step 3: Downloading the Diagnostics and Operating System Support Programs

IBM provides adapter support for some operating system environments. The adapter diagnostic program and the support programs for your specific operating system can be obtained through the World Wide Web or a Bulletin Board System (BBS).

Downloading from the Web

Do the following.

1. Using a Web browser of your choice, type:
`http://wwprodso1n.bocaron.ibm.com/artic/file_rep.html`
2. Select the operating-system support you want.
3. Download the **Program** file.
4. Download the **Installation/file creation instructions** file, and follow the steps for installing and configuring the product support.

Downloading from the BBS

Do the following.

1. Check that your modem settings are as follows:

Data Bit	8
Parity Bit	N
Stop Bit	1

2. Dial the U.S.A. number **561-443-0134**.
3. Select the operating system support you want.
4. Select a **Transfer Protocol** supported by your communications software.
5. View on-line or download the **Readme/Instruction** file.
6. Follow the instructions in the Readme file for downloading and installing the program support that comes with the diagnostics.

Obtaining Operating System Software when Web/BBS Support Is Unavailable

For those who are unable to retrieve the files from either the Web or BBS, support is provided by telephone or E-mail.

For telephone assistance (U.S.A. ONLY), call:

1-800-426-3333 and ask for ARTIC 160.

For E-mail assistance, send to:

artic@us.ibm.com

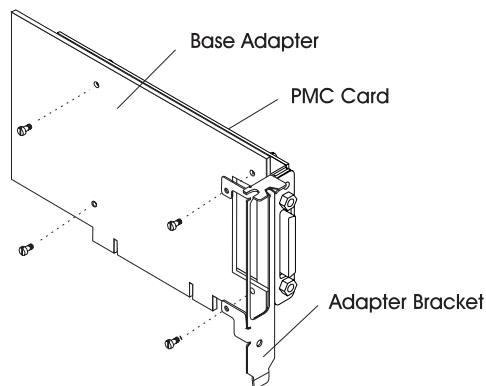
Chapter 3. Removing a PMC Card from the Base Adapter

To remove a PMC card from the base adapter:

1. Turn the computer off.
2. Unplug the power cords from the electrical outlets.
3. Disconnect all cables from the rear of the system unit.
4. Remove the system unit cover.
5. Locate the assembled base adapter containing the PMC card and record its slot number.
6. Remove the expansion-slot screw that locks the assembled base adapter in place.
7. Remove the assembled base adapter from the system unit by grasping the top edge of the card and the connector bracket, and pulling upward.

Note: Be sure to hold the assembled base adapter by the edges only; do not touch the component pins or solder joints.

8. Remove the screws on the assembled base adapter, and, if necessary, remove the adapter bracket. If the PMC card has a rubber gasket around the connector on the back of the card, take care not to damage it. (The two cards are still held together by the PMC connector.)



9. Carefully separate the connector on the PMC card from the connector on the base adapter using a gentle rocking motion.
10. Reinstall just the base adapter into the same slot recorded in Step 5 of this procedure.
11. Reinstall the system unit cover.
12. Reconnect all cables previously removed from the system unit.
13. Plug all power cords into electrical outlets.
14. Turn the computer on.
15. Run diagnostics if necessary.

To test the base adapter, refer to the operating system support programs you downloaded from the Web or BBS in “Step 3: Downloading the Diagnostics and Operating System Support Programs” on page 2-8. If no problems are found, have the system unit serviced.

Chapter 4. Troubleshooting

This chapter discusses how to troubleshoot possible problems with the base adapter.

Problem Determination Procedures

For system testing information, refer to the documentation that came with your computer.

If you performed the diagnostic tests because of a suspected communications problem and have successfully completed the tests without an error message, additional testing may be required on the following:

- Host computer or device with which you are trying to communicate (such as a printer)
- An attached communications device, such as a modem
- Communications cable

To test the base adapter, or a PMC card attached to the base adapter, refer to the operating system support programs you downloaded from the Web or BBS (see “Step 3: Downloading the Diagnostics and Operating System Support Programs” on page 2-8).

If you cannot isolate the problem, have the system unit serviced.

Appendix A. Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM licensed program or other IBM product in this publication is not intended to state or imply that only IBM's program or other product can be used. Any functionally equivalent product, program, or service that does not infringe on any of IBM's intellectual property rights or other legally protectible rights can be used instead of the IBM product, program, or service. Evaluation and verification of operation in conjunction with other products, programs, or services, except those expressly designated by IBM, are the user's responsibility.

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Safety Information

 **DANGER:** Electrical current from power, telephone, and communications cables is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving, or opening the covers of this product or attached devices.

To Connect	To Disconnect
Turn Everything OFF.	Turn Everything OFF.
First, attach all cables to devices. 	First, remove power cord from outlet.
Attach signal cables to receptacles.	Remove signal cables from receptacles.
Attach power cord to outlet. 	Remove all cables from devices.
	

By law, the telephone
must be disconnected after the power

Note: In the UK, by law, the power
cord must be disconnected after the
telephone line cable.

Required Electronic Emission and Connectivity Notices

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not 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.

Industry Canada Compliance Statement

This Class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union (EU) Electromagnetic Compatibility Directive

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.

IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

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

Attention: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

Germany

Zulassungsbescheinigung laut Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Der Aussteller der Konformitätserklärung ist die:

International Business Machines
ARTIC Hardware Development
1798 N.W. 40th Street
Boca Raton FL 33431
U.S.A.

Informationen in Hinsicht EMVG Paragraph 3, Abs. 2:

Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse A.

EN 55022 Klasse A Geräte bedürfen folgender Hinweise:

Nach dem EMVG:

"Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministeriums für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind."
(Auszug aus dem EMVG, Paragraph 3, Abs. 4)

Dieses Genehmigungsverfahren ist nach Paragraph 9 EMVG in Verbindung mit der entsprechenden Kostenverordnung (Amtsblatt 14/93) kostenpflichtig.

Nach der EN 55022:

"Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen."

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen, sind die Geräte wie in den Handbüchern angegeben zu installieren und zu betreiben.

Japan

Japanese Voluntary Control Council for Interference (VCCI) Statement

Attention: This product is a Class 1 Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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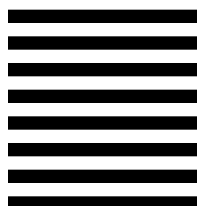
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