ARTIC960
4-Port Selectable PMC
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.”

Before installing or removing a card, be sure to study the Connect/Disconnect sequence diagram for cables in “Safety Information” on page A-3.

First Edition (October 1997)

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Machine: ARTIC960 4-Port Selectable PMC

Warranty Period*: This feature assumes the Warranty period of the IBM host in which it is installed. For all other conditions, the Warranty period is three years.

**Contact your place of purchase for warranty service information.*

Production Status

Each Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's warranty terms apply.

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IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

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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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Contents

About This Book

This book describes the ARTIC960 4-Port Selectable PMC (hereafter referred to as the **selectable PMC card**) and provides step-by-step installation instructions. When you have finished reading this book, you should be able to:

- Install the selectable PMC card on a base adapter.
- Download diagnostic and operating system support programs
- Locate optional cable connector pin numbers and assignments
- Obtain a list of replaceable parts
- Run a wrap test on connectors and cable ends

Terminology Note

Throughout this book, any adapter that supports a PMC connection will be referred to as a *base adapter*.

Who Should Read This Book

This book is written for an experienced computer user or a person who sets up the selectable PMC card in conjunction with any adapter that supports a PCI-mezzanine card (PMC) connection.

Related Information

- Operating and installation documentation provided with any base adapter card 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://wwprodsoln.bocaraton.ibm.com/artic/pubs.html`

Chapter 1. Product Description

The ARTIC960 4-Port Selectable PMC is an optional PCI mezzanine card that can be used with ARTIC960 base adapters that support a PMC connection. The selectable PMC card complies with the Draft Standard for a Common Mezzanine Card (CMC) and the Draft Standard for a PCI Mezzanine Card (PMC).

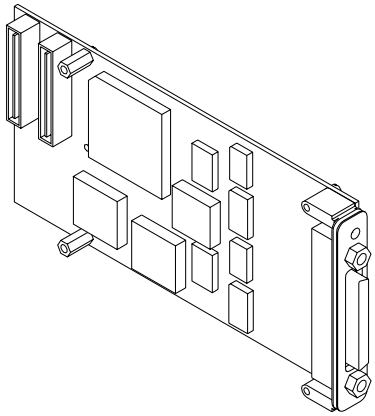


Figure 1-1. The Selectable PMC Card

IBM Order (FRU) Numbers

The following table lists the IBM order numbers (FRU numbers) associated with the selectable PMC card.

Table 1-1. ARTIC960 4-Port Selectable PMC IBM Order (FRU) Number

Description	**Order (FRU) No.**
ARTIC960 4-Port Selectable PMC	87H3413
Adapter Bracket Kit	87H3562

Features and Function

The selectable PMC card has the following features:

- One high-speed multi-channel DMA controller with PCI interface
- Two serial communication controllers
- One serial ROM for configuration data
- Four communication ports

The selectable PMC card connects to the base adapter by two 64-pin connectors. Interface signals exit the selectable PMC card through the 120-pin connector at the rear of the selectable PMC card. The base adapter and the attached selectable PMC card occupy a single 32-bit expansion slot in personal computers that are peripheral component interconnect (PCI) compliant.

Optional Cables

Optional cable assemblies are available for the selectable PMC card. See Chapter 5, “Cables and Connectors” for information.

Specifications

The following describes the physical attributes, environment, and electrical requirements for the selectable PMC card.

Size

Length: 149 mm overall (5.86 inches)
Width: 74 mm (2.91 inches)

Environment

– Air temperature:

Operating: 0 to 55°C (32 to 131°F)
Non-Operating: 0 to 60°C (32 to 140°F).

– Humidity:

Operating: 5% through 95%.
Wet Bulb Temperature: 29.4°C (85°F)

Electrical
No load on outputs, normal operating mode.

– Power Requirements

  +3.3 V dc, .5 A (maximum)
  +5 V dc, .97 A (maximum)
  +12 V dc, 67 mA (maximum)

Operating System Support Programs and Publications

To help programmers develop products for the ARTIC960Rx PCI Adapter or the ARTIC960Hx 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 these sample programs and utilities from the Web, see "Step 4. Downloading the Diagnostics and Operating System Support Programs" on page 2-7.

Other related publications can be obtained from the Web at:

`http://wwprodsoln.bocaraton.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@vnet.ibm.com**.

Chapter 2. Installation Requirements and Instructions

This chapter lists the contents of the ARTIC960 4-Port Selectable PMC package and provides instructions for installing the selectable PMC card and attaching an optional cable. The package contains the following:

- The selectable PMC card.
- This book (with Warranty Statement)
- An adapter bracket kit containing the bracket and five screws

Note: The ARTIC960 4-Port Selectable PMC 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-4.

Hardware Requirements

The selectable PMC card requires an ARTIC960 base adapter or another base adapter that supports a PMC connection.

Handling Static-Sensitive Devices

Components for your selectable PMC card can be damaged by static discharge. To prevent this damage, the card is shipped in an anti-static bag. Observe the following precautions when handling any static-sensitive device:

- Keep the device in its anti-static bag until you are ready to install it.

- Make the least possible movement with 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 an adapter. Always turn the computer off before removing an adapter from the system unit.
- *Do not touch the printed circuits, connector pins, or components.* Where possible, hold the circuit board by its edges or mounting hardware.
- Do not place the card on the system unit cover or on a metal table. The cover and metal table increase the risk of damage because they provide an electrical path from your body through the card.

Installation

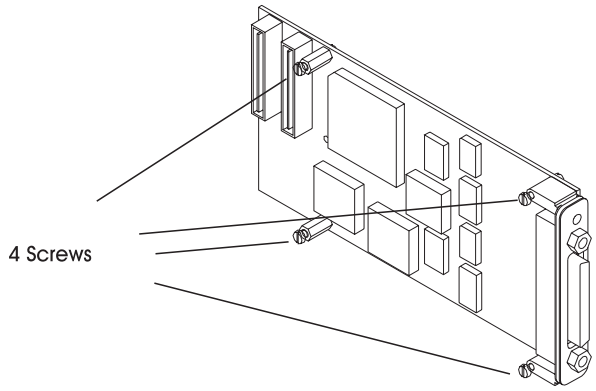
This section provides step-by-step instructions for installing the selectable PMC card on the base adapter. This section also describes how to connect an optional cable to the selectable PMC card and the base adapter.

Step 1. Installing the Selectable PMC Card

The following instructions assume that you have the base adapter out of the system unit and are ready to install the selectable PMC card.

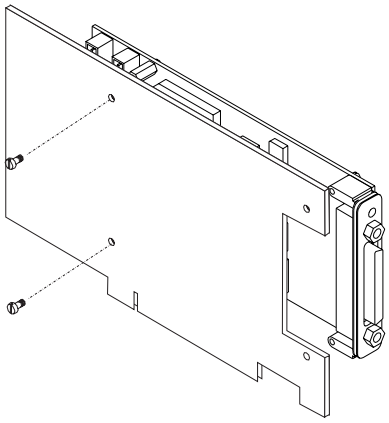
1. Place the base adapter on a clean, static-free surface with the component side up.
2. Hold the selectable PMC card (still wrapped in the anti-static bag) in one hand and touch a metal part of your system unit with the other hand. This places your body, the selectable PMC card, and the system unit at the same ground potential, preventing an accidental static discharge.

3. Remove the selectable PMC card from the anti-static bag. Be sure to hold the circuit board by the edges only. Do not touch the component pins, solder joints, or connector contacts. Take care not to damage the rubber gasket around the connector on the back of the selectable PMC card.
4. The selectable PMC card attaches to the base adapter with four screws. Locate the screws in the adapter bracket kit. The four screws will be positioned as shown.

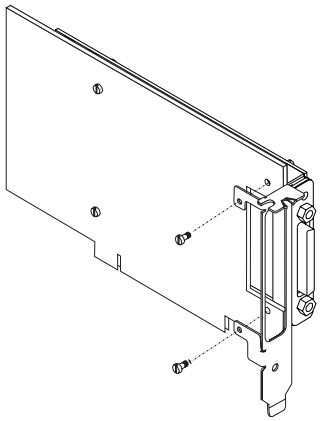


5. Position the selectable PMC card over the base adapter with the component sides of both the selectable PMC card and the base adapter facing each other.

6. Align the PMC connectors on the selectable PMC card with the PMC connectors on the base adapter, and then press them together. Turn the assembled pair over so that the base adapter is on top. Install two of the screws as shown.



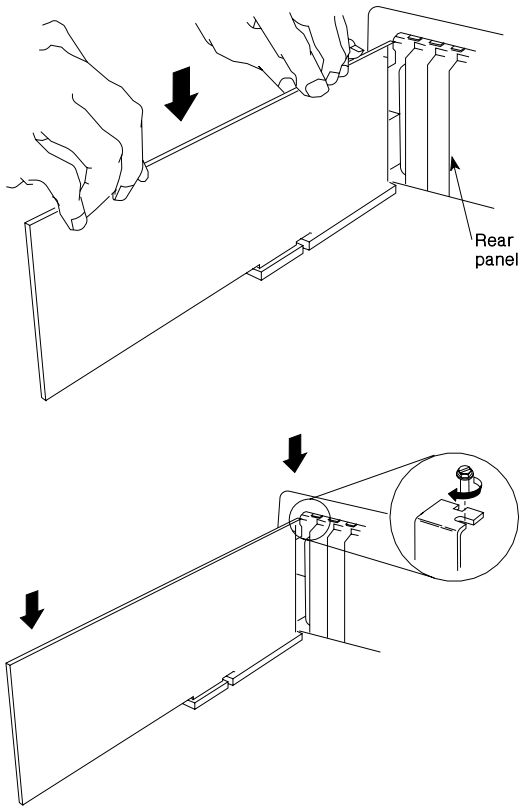
7. Taking care not to damage the rubber gasket around the connector on the selectable PMC card, align the adapter bracket as shown and install the remaining two screws.



Step 2. Installing the Base Adapter

The following describes how to install the base adapter, with the selectable PMC card, into the system unit. For more information, refer to the documentation that came with the computer or the installation documentation that came with the base adapter.

1. 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.



2. Reinstall the system unit cover and reconnect all cables to their appropriate connectors (refer to the documentation that came with your computer).

3. If you plan to connect an optional cable, skip the next step and go directly to “Step 3. Connecting an Optional Cable.”
4. Plug all power cords into electrical outlets.

Step 3. Connecting an Optional Cable

DANGER

> **Lightning protection. Do not connect or handle the cable during a lightning storm.**

The following instructions assume that you have the assembled base adapter in the system unit and are ready to attach an optional cable to the PMC card.

1. Ensure that all power cords are unplugged.
2. Align the 120-pin connector of the PMC cable with the 120-pin connector at the rear of the PMC card.
3. Firmly press the cable connector into the PMC card connector.
4. Tighten the thumbscrews on both sides of the cable connector.
5. Connect each of the four ports of the optional cable to the other device (for example, a modem). Each connector is marked with its port number.
6. Tighten the thumbscrew on each side of the cable connector.

Note: Moving the system unit with a cable attached can result in dislodging the base adapter or the selectable PMC card. Should these (or any other adapters or cards) become dislodged while power is applied, proceed as follows:

1. Turn the computer off.
2. Remove the system unit cover.
3. Loosen the expansion-slot screw of the dislodged adapter. Press down on the top edge of the adapter to reseat it. Then, re-tighten the expansion-slot screw.
4. Reinstall the system unit cover.
5. Turn the computer on.

Step 4. Downloading the Diagnostics and Operating System Support Programs

Diagnostics are included in the operating system support programs available with the purchase of this selectable PMC card. Specific operating system support programs can be obtained through the World Wide Web or the Bulletin Board System (BBS).

Downloading from the Web

Do the following:

1. Using a Web browser of your choice, type:

   `http://wwprodsoln.bocaraton.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:

   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. Choose a **Transfer Protocol** supported by your communications software.
5. View the information on-line or download the **Readme/Instruction** file.
6. Follow the instructions in this file for downloading and installing the program support and diagnostics.

Obtaining Operating System Support when the Web/BBS 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.

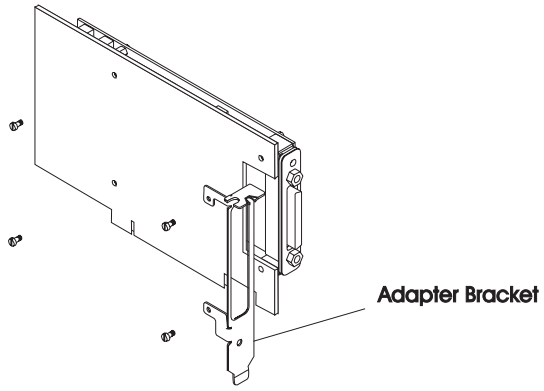
For E-mail assistance, send to:
artic@vnet.ibm.com

Chapter 3. Removing the Selectable PMC Card from a Base Adapter

To remove the selectable PMC card from a 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 selectable 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 by grasping the top edge and pulling upward.

   Be sure to hold the assembled base adapter by the edges only; do not touch the component pins or solder joints.
8. Remove the four screws on the assembled base adapter, and then remove the adapter bracket. Take care not to damage the rubber gasket around the connector on the selectable PMC card. The two devices should still be held together by the PMC connector.



9. Carefully separate the connector on the selectable 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 selectable PMC card attached to the base adapter, refer to the operating system support programs you downloaded from the Web or BBS in “Step 4. Downloading the Diagnostics and Operating System Support Programs” on page 2-7. If no problems are found, have the system unit serviced.

Chapter 4. Troubleshooting

This chapter discusses how to identify possible problems with the selectable PMC card. This chapter also describes how to:

- Run a wrap test on connectors and cable ends
- Obtain a list of wrap plug part numbers

Problem Determination

For system testing information, refer to the documentation supplied 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:

- The host computer, industrial computer, or device with which you are trying to communicate (such as a printer)
- The base adapter to which the selectable PMC card is attached
- An attached communications device, such as a modem
- The communications cable

To test the selectable PMC card attached to the base adapter, refer to the operating system support programs you downloaded from the Web or BBS in “Step 4. Downloading the Diagnostics and Operating System Support Programs” on page 2-7. If no problems are found, have the system unit serviced.

Diagnostic Wrap Plugs

Diagnostic wrap tests can be performed at the PMC connector or at a selected port of the optional cable. Use the menu prompts to select either location for wrap testing. Table 4-1 on page 4-2 lists the wrap plug part numbers to use during wrap testing.

Table 4-1. Wrap Plugs for the ARTIC960 4-Port Selectable PMC Card	
Description of the Wrap Plug	**IBM Order (FRU) Number**
120-pin connector	87H3311
25-pin wrap plug (EIA-232 (ISO 2110) or EIA-530 (ISO 2110))	87H3439
34-pin wrap plug (V.35 DTE (ISO 2593) 34-pin male block)	87H3442
34-pin wrap plug (V.35 DCE (ISO 2593) 34-pin female block)	87H3458
37-pin wrap plug (RS-449 (ISO 4902))	87H3440
15-pin wrap plug (X.21 (ISO 4903))	53G0638

During diagnostic testing of the selectable PMC card, the diagnostic program initially prompts you to make a wrap test selection, either at the 120-pin connector of the card, or at one of the ports of an optional cable.

If you want to wrap test the selectable PMC card without a cable, you must connect the 120-pin wrap plug (part number 87H3311) to the 120-pin connector of the selectable PMC card. After making this wrap plug connection, respond **Yes** to the test prompt for this interface, and the testing will proceed automatically.

If you want to wrap test one port on any of the optional cables on this selectable PMC card, you must connect the appropriate wrap plug to the desired port (0, 1, 2, or 3) of the cable. After making this wrap plug connection, respond **Yes** to the test prompt for this interface, and the testing will proceed automatically.

Chapter 5. Cables and Connectors

Optional cable assemblies are available for the selectable PMC card. Each assembly consists of four lengths of cable with a standard connector at the end and are designed to provide four ports of one electrical interface as follows:

- EIA-232 cable (ISO 2110)
- EIA-530 cable (ISO 2110)
- V.35 (V.36 compatible) DTE or DCE (ISO 2593) cable
- RS 449 (ISO 4902) cable
- X.21 (ISO 4903) cable

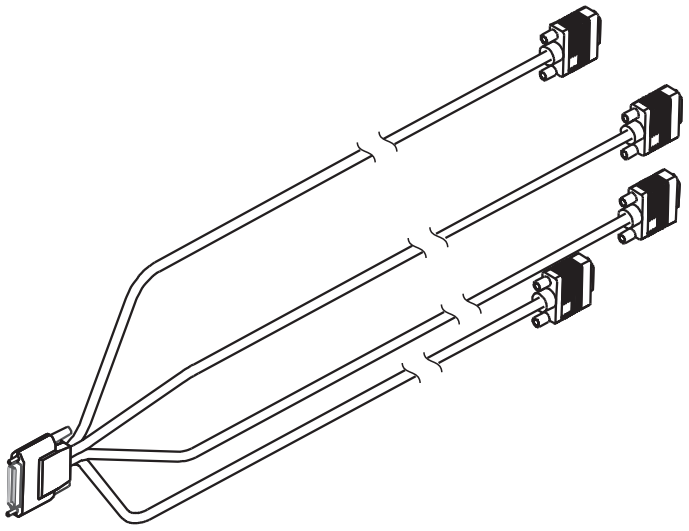


Figure 5-1. Optional Cables

Each cable has a single 120-pin, male, D-shell connector that branches into four individual cables, each of which provides access to one of four independent ports.

The following table lists the IBM order number and part number for each optional cable and the electrical interface it supports.

Table 5-1. IBM Order (FRU) Numbers and Part Numbers for Optional Cables

Electrical Interface	Connector Type	Order (FRU) Number	Part Number
EIA-232 (ISO 2110)	25-pin male D-shell	87H3405	87H3406
EIA-530 (ISO 2110)	25-pin male D-shell	87H3402	87H3403
V.35 DTE (ISO 2593)	34-pin male block	87H3399	87H3400
V.35 DCE (ISO 2593)	34-pin female block	87H3456	87H3457
RS-449 (ISO 4902)	37-pin male D-shell	87H3396	87H3397
X.21 (ISO 4903)	15-pin male D-shell	87H3408	87H3409

Port Speeds

When clocks are supplied by an external device (all interfaces except EIA-232), the selectable PMC card supports four ports running simultaneously at a maximum data rate of 2.048M bits per second (bps), duplex, and synchronous. The following table shows the maximum speed supported for each electrical interface.

Electrical Interface	Maximum Speed (per port)
EIA-232 (ISO 2110)	38.4K bps (U.S. only) 19.2K bps (EMEA only)
EIA-530 (ISO 2110)	2.048M bps
V.35 DTE (ISO 2593)	2.048K bps (US only) 64K bps (EMEA only)
V.35 DCE (ISO 2593)	2.048K bps (US only) 64K bps (EMEA only)
RS 449 (ISO 4902)	2.048M bps
X.21 (ISO 4903)	2.048M bps

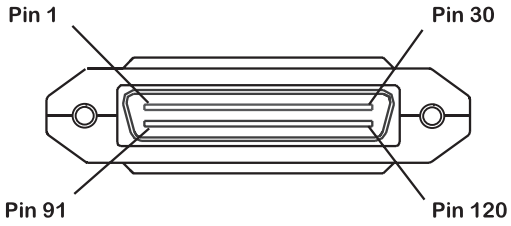
Clocks supplied by a Dual Universal Serial Communications Controller (DUSCC) on the selectable PMC card provide synchronous data rates up to 230.4K bps, duplex. In addition, an on-card clock generator can provide data rates of either 1.544M bps or 2.048M bps for each port. Selection of the clock frequency is programmable.

Connector Pin Numbers and Assignments

This section provides pin numbering and signal assignments for each of the six optional cables. For each cable, a table shows the pin assignments for the 120-pin connector and the correlation to the four port connectors. Each signal is identified as input (I) or output (O), as viewed from the PMC card.

120-Pin Connector

The individual signals for all ports connect to the selectable PMC card through the 120-pin connector at the rear of the card. The following shows a 120-pin connector.



EIA-232 Connector

The following illustration shows a 25-pin, male, D-shell connector. Table 5-2 lists the pin assignments for the EIA-232 (ISO 2110) electrical interface. The “x” in the signal name is the number of the port. The ID for the EIA-232 cable is 02h.

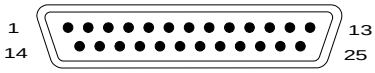


Table 5-2. EIA-232 (ISO 2110) Connector Pin Assignments

Signal Name	I/O	120-Pin Connector				25-Pin Connector
		0	1	2	3	
TXDx	O	105	45	17	77	02
RXDx	I	104	44	16	76	03
RTSx	O	114	54	06	66	04
CTSx	I	120	60	15	75	05
CDx	I	094	34	26	86	08
DTRx	O	112	52	08	68	20
DSRx	I	098	38	22	82	06
TXCLKOx	---	111	51	11	71	24
TXCLKIx	---	091	31	30	90	15
RXCLKx	---	106	46	01	61	17
GND	---	110	50	10	70	07
Shield	---	Housing				01/Housing

EIA-530 Connector

The following illustration shows a 25-pin, male, D-shell connector. Table 5-3 lists the pin assignments for the EIA-530 (ISO 2110) electrical interface. The “x” in the signal name is the number of the port. The ID for the EIA-530 cable is F7h.

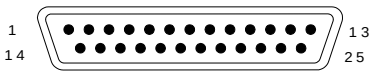


Table 5-3. EIA-530 (ISO 2110) Connector Pin Assignments

Signal Name	I/O	120-Pin Connector				25-Pin Connector
		0	1	2	3	
TXDxA	O	118	58	02	62	02
TXDxB	O	119	59	03	63	14
RTSxA	O	114	54	06	66	04
RTSxB	O	115	55	07	67	19
RXDxA	I	096	36	24	84	03
RXDxB	I	097	37	25	85	16
CTSxA	I	100	40	20	80	05
CTSxB	I	101	41	21	81	13
CDxA	I	094	34	26	86	08
CDxB	I	095	35	27	87	10
RCLKIxA	I	108	48	12	72	17
RCLKIxB	I	109	49	13	73	09
TCLKOxA	O	116	56	04	64	24
TCLKOxB	O	117	57	05	65	11
TCLKIxA	I	102	42	18	78	15
TCLKIxB	I	103	43	19	79	12
DSRxA	I	098	38	22	82	06
DSRxB	I	099	39	23	83	22
DTRxA	O	112	52	08	68	20
DTRxB	O	113	53	09	69	23
GND	---	110	50	10	70	07
Shield	---	Housing				01/Housing

V.35 DTE Connector

The following shows a 34-pin male connector. Table 5-4 lists pin assignments for the V.35 DTE (ISO 2593) electrical interface. The "x" in the signal name is the number of the port. The ID for the V.35 DTE cable is FBh.

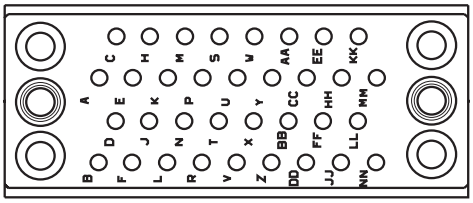


Table 5-4. V.35 DTE (ISO 2593) Connector Pin Assignments

Signal Name	I/O	120-Pin Connector				34-Pin Connector
		0	1	2	3	
TXDxA	O	118	58	02	62	P
TXDxB	O	119	59	03	63	S
RTSx	O	114	54	06	66	C
RXDxA	I	096	36	24	84	R
RXDxB	I	097	37	25	85	T
CTSx	I	120	60	15	75	D
DSRx	I	098	38	22	82	E
DTRx	O	112	52	08	68	H
CDx	I	094	34	26	86	F
RCLKIxA	I	108	48	12	72	V
RCLKIxB	I	109	49	13	73	X
TCLKOxA	O	116	56	04	64	U
TCLKOxB	O	117	57	05	65	W
TCLKIxA	I	102	42	18	78	Y
TCLKIxB	I	103	43	19	79	AA
GND	---	110	50	10	70	B
Shield	---					A

V.35 DCE Connector

The following illustration shows a 34-pin female connector. Table 5-5 lists the pin assignments for the V.35 DCE (ISO 2593) electrical interface. The “x” in the signal name is the number of the port. The ID for the V.35 DCE cable is BFh.

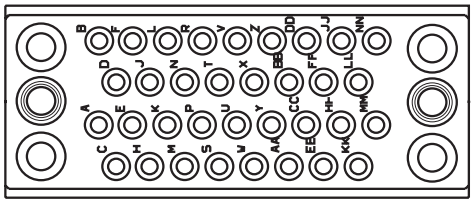


Table 5-5. V.35 DCE (ISO 2593) Connector Pin Assignments*

Signal Name	I/O	120-Pin Connector 0	1	2	3	34-Pin Connectors
TXDxA	I	096	36	24	84	P
TXDxB	I	097	37	25	85	S
RXDxA	O	118	58	02	62	R
RXDxB	O	119	59	03	63	T
TCKxA	O	116	56	04	64	Y
TCKxB	O	117	57	05	65	AA
TTExA	I	108	48	12	72	U
TTExB	I	109	49	13	73	W
RCKxA	O	116	56	04	64	V
RCKxB	O	117	57	05	65	X
RTSx	I	120	60	15	75	C
CTSx	O	114	54	06	66	D
DCDx	O	112	52	08	68	F
DSRx	O	112	52	08	68	E
DTRx	I	098	38	22	82	H
	I	94	34	26	86	H
Ground	---	110	50	10	70	B
Shield	---					A

Note:

1. TXCLKO is source for TCK and RCK.
2. DTR is source for DSR and DCD.

RS-449 Connector

The following illustration shows a 37-pin, D-shell connector. Table 5-6 lists pin assignments for the RS-449 (ISO 4902) electrical interface. The “x” in the signal name is the number of the port. The ID for the RS-449 cable is FDh.

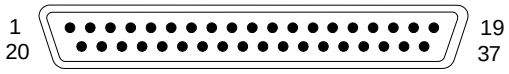


Table 5-6. RS-449 (ISO 4902) Connector Pin Assignments

Signal Name	I/O	120-Pin Connector				37-Pin Connectors
		0	1	2	3	
TXDxA	O	118	58	02	62	04
TXDxB	O	119	59	03	63	22
RXDxA	I	096	36	24	84	6
RXDxB	I	097	37	25	85	24
RTSxA	O	114	54	06	66	07
RTSxB	O	115	55	07	67	25
CTSxA	I	100	40	20	80	09
CTSxB	I	101	41	21	81	27
DSRxA	I	098	38	22	82	11
DSRxB	I	099	39	23	83	29
DTRxA	O	112	52	08	68	12
DTRxB	O	113	53	09	69	30
CDxA	I	094	34	26	86	13
CDxB	I	095	35	27	87	31
RCLKIxA	I	108	48	12	72	08
RCLKIxB	I	109	49	13	73	26
TCLKOxA	O	116	56	04	64	17
TCLKOxB	O	117	57	05	65	35
TCLKIxA	I	102	42	18	78	05
TCLKIxB	I	103	43	19	79	23
GND	---	100	50	10	70	19,20,37

X.21 Connector

The following illustration shows a 15-pin, male, D-shell connector. Table 5-7 lists the pin assignments for the X.21 (ISO 4903) electrical interface. The “x” in the signal name is the number of the port. The ID for the X.21 cable is DFh.

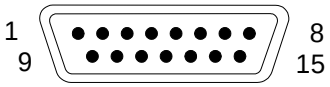


Table 5-7. X.21 (ISO 4903) Connector Pin Assignments

Signal Name	I/O	120-Pin Connector				15-Pin Connector
		0	1	2	3	
TXDxA	O	118	58	02	62	02
TXDxB	O	119	59	03	63	09
RTSxA	O	114	54	06	66	03
RTSxB	O	115	55	07	67	10
RXDxA	I	096	36	24	84	04
RXDxB	I	097	37	25	85	11
CTSxA	I	100	40	20	80	05
CTSxB	I	101	41	21	81	12
RCLKIxA	I	108	48	12	72	06
RCLKIxB	I	109	49	13	73	13
TCLKOxA	O	116	56	04	64	07
TCLKOxB	O	117	57	05	65	14
GND	---	110	50	10	70	08
Shield	---	Housing				01/Housing

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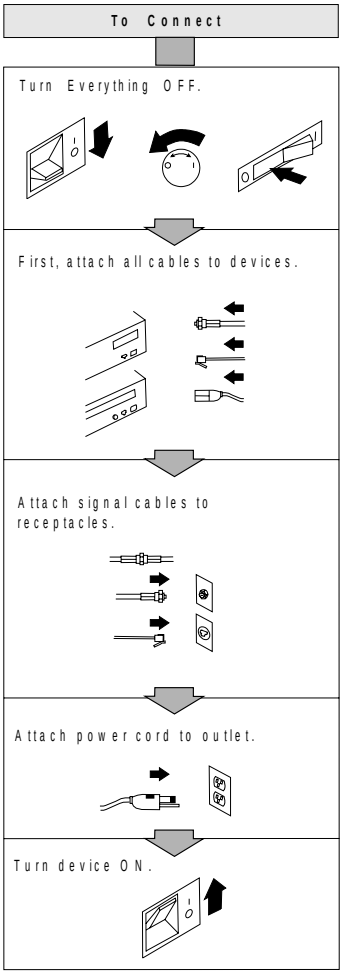
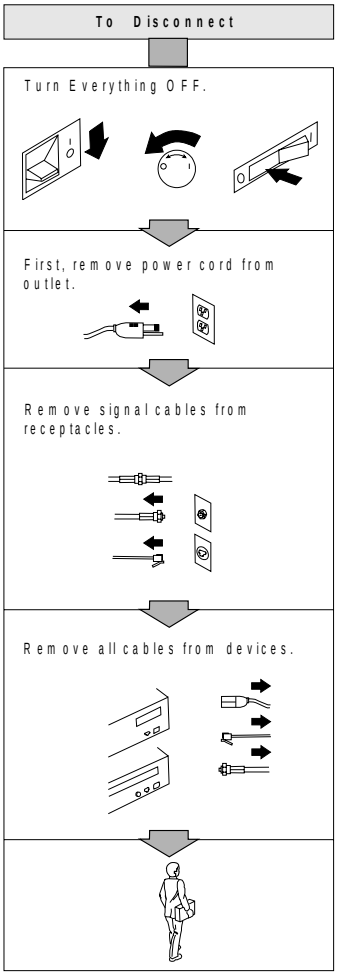


Note: In the UK, by law, the telephone cable must be connected after the power cord.



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Required Electronic Emission and Connectivity Notices

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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.

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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.

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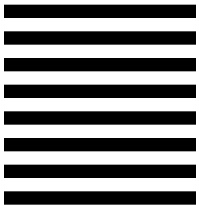

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