

**4-Port Multi-Protocol Communications C
ontroller, ISA
Installation Guide**

Note

Before using this information and the product it supports, be sure to read the general information under "Product Warranties and Notices" included with your system unit.

Second Edition (November 1996)

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Contents

Safety Information	v
About This Book	vii
ISO 9000	vii
Related Publications	vii
Chapter 1. Overview	1-1
Handling the Adapter	1-1
Chapter 2. Hardware Configuration and Installation	2-1
Configuring the Adapter	2-3
Diagnostics	2-9
Chapter 3. Installing, Configuring, and Verifying Software	3-1
Software Installation	3-1
Configuring the 4-Port Multi-Protocol Communications Controller, ISA	3-2
Add a 4-Port Multi-Protocol Communications Controller, ISA Failed	3-3
Verifying Device Driver Installation	3-4
Appendix A. Configuration Table	A-1
Appendix B. Using the Isresource Command	B-1
Appendix C. Setting the Interrupt Level	C-1
Setting the Memory Size	C-2
Setting the Card I/O Base Address	C-2
Setting the Edge-Connector (ED)	C-3
Setting the Bus-Width (BW)	C-4
Appendix D. Configuring More Than One 4-Port Multi-Protocol Adapter Adapter	D-1
Appendix E. Connector Information	E-1
Appendix F. Specifications for the 4-Port Multi-Protocol Communications Controller, ISA	F-1
Appendix G. Communications Statements	G-1
Federal Communications Commission (FCC) Statement	G-1
European Union (EU) Statement	G-1
International Electrotechnical Commission (IEC) Statement	G-2

United Kingdom Telecommunications Safety Requirements	G-2
Avis de conformité aux normes du ministère des Communications du Canada	G-2
Canadian Department of Communications Compliance Statement	G-2
VCCI Statement	G-3
Radio Protection for Germany	G-4

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.

About This Book

This book, when used with your system unit documentation, will help you install the 4-Port Multi-Protocol Communications Controller, ISA. It provides information needed for installing and configuring the necessary software device drivers and also addresses verifying that installation and configuration were successfully completed.

ISO 9000

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

Related Publications

This book refers to the documentation that came with your computer.

Chapter 1. Overview

The 4-Port Multi-Protocol Adapter, with supporting software, enables the attachment of an ISA-bus-compatible (AT-bus) system to a packet-switched network. The 4-Port Multi-Protocol Adapter has its own microprocessor and memory.

Handling the Adapter

Attention: Static electricity can damage your equipment. Leave the adapter in its static-protective bag until you are ready to configure or install it in your computer.

Chapter 2. Hardware Configuration and Installation

This section provides information for configuring and installing the 4-Port Multi-Protocol Adapter.

Hardware Requirements

- Selectable Interface Board/A, consisting of:
 - Port 0: RS-232-C, RS-422-A, X.21, or V.35
 - Port 1: RS-232-C
 - Port 2: RS-232-C or asynchronous RS-422-A
 - Port 3: RS-232-C.

Note: All ports can support asynchronous or synchronous communication, except for RS-422-A operation on port 2 of the Selectable Interface Board/A, which is asynchronous data only.

- Selectable Cable to support the Selectable Interface Board/A. This cable is 3.1 meters (10 feet) long. It has a 78-pin connector on one end and a molded distribution block on the other end containing six 25-pin connectors and three 15-pin connectors.

Note: The maximum cable lengths that are supported for the various communications protocols are:

Table 2-1. Cable Lengths

Protocol	Length (meters)	Length (feet)
RS-232	15.2	50
V.35	15.2	50
RS-422	122	400
X.21	122	50

Cables are not supported for outdoor operation.

Hardware Tools

- Required:
 - Medium-size flat-blade screwdriver
 - Small-size needle-nose pliers.
- Optional:
 - Medium screwstarter
 - 3/16-inch nutdriver
 - 1/4-inch nutdriver.

Handling Static-Sensitive Devices: Components for your 4-Port Multi-Protocol Communications Controller, ISA can be damaged by static discharges. To prevent this damage, your 4-Port Multi-Protocol Communications Controller, ISA is wrapped in an anti-static bag. Observe the following precautions when handling the adapter:

- Keep the adapter in its anti-static bag until you are ready to install or configure the adapter into your personal computer system.
- Make the least possible movement to minimize the electrostatic charges created by contact with clothing fibers, carpets, and furniture.
- If possible, keep one hand on the computer chassis when you are inserting an adapter into or removing an adapter from the system unit; always switch off the power before performing either task.
- *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.
- Do not allow the adapter to be touched accidentally by others.

Configuring the Adapter

You must configure the 4-Port Multi-Protocol Communications Controller, ISA before installing it into your system by setting one or more of the following characteristics using DIP switches.

- Interrupt level
- Memory size
- I/O base address or bus memory address
- Edge connector
- Bus width

The 4-Port Multi-Protocol Adapter has a 10-position DIP switch and is shipped with the DIP switch positions preset as shown (shown in Table 2-2 and Table 2-3). These settings need to be configured or changed.

Suggested settings for the DIP switches are included for the following scenarios:

- The adapter you are configuring is the only or first 4-Port Multi-Protocol Communications Controller, ISA installed in your system.
- The adapter you are configuring is the second 4-Port Multi-Protocol Communications Controller, ISA installed in your system.
- The adapter you are configuring is the third 4-Port Multi-Protocol Communications Controller, ISA installed in your system.

If you have other ISA adapters in your system other than the 4-Port Multi-Protocol Communications Controller, ISA, you may have to determine what interrupt levels and bus memory addresses are available to use during installation. Refer to Appendix B, "Using the `lsresource` Command" on page B-1 for suggested instructions.

For additional information about other configurations, refer to Appendix C, "Setting the Interrupt Level" on page C-1.

Suggested Settings for the First 4-Port Multi-Protocol Communications Controller, ISA

Use the switch settings in Table 2-2 if the 4-Port Multi-Protocol Communications Controller, ISA is the *only* 4-Port adapter installed in your system.

<i>Table 2-2. DIP Switch Settings for the First 4-Port Adapter</i>										
Switch Number	10	9	8	7	6	5	4	3	2	1
ON/OFF	OFF	ON	ON	ON	ON	OFF	OFF	ON	OFF	ON

<i>Table 2-3. Description of the First 4-Port Adapter Switch Settings</i>	
Switch Number(s)	Function/Configuration
1 + 2 + 3	Interrupt Level = 7
4	Memory Size = 1MB
5 + 6 + 7 + 8	Card Base Address = 0x6A0
9	Edge Connector = 2 Edges
10	Bus Width = 16 Bits

These switch settings specify an interrupt of 7 and a card I/O base address 0x06A0. You should record this information in Appendix A, "Configuration Table" on page A-1.

Proceed to "Installing the 4-Port Multi-Protocol Adapter in the System Unit" on page 2-8.

Suggested Settings for the Second 4-Port Multi-Protocol Communications Controller, ISA

Use the switch settings in Table 2-4 if the 4-Port Multi-Protocol Communications Controller, ISA is the *second* 4-Port adapter installed in your system.

<i>Table 2-4. DIP Switch Settings for the Second 4-Port Adapter</i>										
Switch Number	10	9	8	7	6	5	4	3	2	1
ON/OFF	OFF	ON	ON	ON	OFF	OFF	OFF	ON	OFF	OFF

<i>Table 2-5. Configuration for the Second 4-Port Adapter</i>	
Switch Number(s)	Function/Configuration
1 + 2 + 3	Interrupt Level = 9
4	Memory Size = 1MB
5 + 6 + 7 + 8	Card Base Address = 0xEA0
9	Edge Connector = 2 Edges
10	Bus Width = 16 Bits

These switch settings specify an interrupt of 9 and a card I/O base address 0xEA0. You should record this information in Appendix A, "Configuration Table" on page A-1.

Proceed to "Installing the 4-Port Multi-Protocol Adapter in the System Unit" on page 2-8.

Suggested Settings for the Third 4-Port Multi-Protocol Communications Controller, ISA

Use the switch settings in Table 2-6 if the 4-Port Multi-Protocol Communications Controller, ISA is the *second* 4-Port adapter installed in your system.

<i>Table 2-6. DIP Switch Settings for the Third 4-Port Adapter</i>										
Switch Number	10	9	8	7	6	5	4	3	2	1
ON/OFF	OFF	ON	ON	OFF	ON	OFF	OFF	OFF	ON	ON

<i>Table 2-7. Configuration for the Third 4-Port Adapter</i>	
Switch Number(s)	Function/Configuration
1 + 2 + 3	Interrupt Level = 10
4	Memory Size = 1MB
5 + 6 + 7 + 8	Card Base Address = 0x16A0
9	Edge Connector = 2 Edges
10	Bus Width = 16 Bits

These switch settings specify an interrupt of 10 and a card I/O base address 0x16A0. You should record this information in Appendix A, "Configuration Table" on page A-1.

Proceed to "Installing the 4-Port Multi-Protocol Adapter in the System Unit" on page 2-8.

Installing the 4-Port Multi-Protocol Adapter in the System Unit

Use the following steps below as general information for installing your 4-Port Multi-Protocol Adapter. For specific adapter installation instructions, consult the operating manual or the installation and setup manual for your specific system unit.

1. Enter:
 Shutdown -F
 wait for the Halt complete message to display.
2. Set all power switches to Off.
3. Unplug the power cords from the wall outlets.
4. Remove the cable-retaining brackets from the rear of the system unit and display.
5. Disconnect all cables from the rear of the system unit.
6. Use a flat-blade screwdriver or 1/4-inch nutdriver to remove the cover mounting screws.
7. Remove the system-unit cover.
8. Locate an available expansion slot in your system unit.
9. Use a flat-blade screwdriver or a 3/16-inch nutdriver to remove the screw that holds the expansion-slot cover in place. Lift the expansion-slot cover from the system unit.
10. Press the card-support bracket (if not already installed) into the corresponding holes in the front panel of the system unit.
Attention: Use a card-support bracket when installing the 4-Port Multi-Protocol Adapter or damage may result.
11. Hold the 4-Port Multi-Protocol Adapter by the top and firmly press it into the expansion slot.

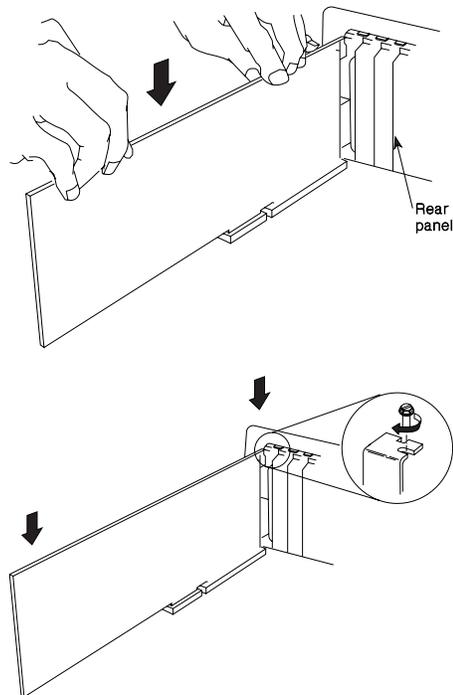


Figure 2-1. Inserting the 4-Port Adapter Into the Expansion Slot

12. Align the slot in the card-retaining bracket with the hole in the rear panel of the system unit.
13. Insert and tighten the screw to secure the card-retaining bracket to the rear panel of the system unit.
14. Replace the system-unit cover.
15. Reconnect all cables previously removed from the system unit.

Diagnostics

Diagnostics may be supplied with your device driver, or may be found in a separate package. Refer to your system unit documentation for more information about running diagnostics.

Chapter 3. Installing, Configuring, and Verifying Software

Once you have completed installing the hardware, you must next install and configure the device software and then verify that your software installation and configuration were successful by following the procedures below.

Software Installation

1. Turn the system unit on.
2. Log in as **root**.
3. Insert the media containing the device driver software into the appropriate media device, for example, CD-ROM drive.
4. Type the following:

```
smit isa
```

and press Enter.
5. Select **Install ISA Adapter Software** and press Enter.
The Install Additional Device Software screen is displayed. The "INPUT device/directory for software" option is highlighted. The cursor is positioned on the entry field where you can enter the input device you are using.
6. Press F4 to display a list of input devices you can select.
7. Select the appropriate device and press Enter. The device or directory you selected is now displayed in the "INPUT device/directory for software" entry field.
The Install Additional Device Software screen is displayed.
8. Press F4 to display a list of software packages you can select.
The **SOFTWARE to install** list is displayed. Type a / (slash) to display a Find window.
9. In the Enter Search Pattern field, type the following and press Enter.

```
isa.mm2
```

The system finds the correct software package to install and highlights it.
10. Press F7 and then press Enter. The Install Additional Devices Software screen is displayed with the required information.
11. Press Enter. The ARE YOU SURE list is displayed. Press Enter. The COMMAND STATUS screen is displayed. The term RUNNING is highlighted to indicate that the install command is in progress. When RUNNING changes into OK, scroll down to the bottom of the page and locate the Installation Summary. If the

installation was successful, SUCCESS will appear in the Result column of this summary.

12. Remove the installation media from the drive.
13. Press F3 twice to return to the ISA Adapter screen.

Proceed with the next section.

Configuring the 4-Port Multi-Protocol Communications Controller, ISA

Using SMIT, configure the device driver to recognize the 4-Port Multi-Protocol Communications Controller, ISA at the specific interrupt level and Bus I/O Address that you set and recorded in the Appendix A, "Configuration Table" on page A-1. If you have installed more than one 4-Port Multi-Protocol Communications Controller, ISA, repeat this procedure for every adapter installed.

1. Select **Add an ISA Adapter** from the Add an ISA Adapter screen.
2. Select **portmaster isa 4-Port CoProcessor/1 Adapter** and press Enter. The "Parent Device" list is displayed.
3. Select **bus1** and press Enter.

You are now at the Add a Multiport Model 2 Adapter screen with the cursor positioned on the entry field for the ISA Interrupt Level. If your adapter is set to interrupt level 7, proceed to the next step. If it is not set to interrupt level 7, press F4 and select the correct interrupt level.

4. Move the cursor to the Bus I/O Address line. If your adapter is set to the default of 0x06A0, proceed to the next step. If it is not set to 0x06A0, press F4 and select the correct Bus I/O address.
5. Move the cursor to the Bus Memory Address line. The value you enter depends on the number of 4-Port adapters installed in your system.

Important: SMIT does not allow you to enter an x in the entry field. If the value of the Bus Memory Address needs to be changed, edit only the characters necessary.

If you clear the entire Bus Memory Address field, press F3 and start at 3.

- If this is the first or only 4-Port adapter installed, use the default 0xE2000.
- If this is the second 4-Port adapter installed, change the value to 0xE4000.
- If this is the third 4-Port adapter installed, change the value to 0xE6000.
- For each subsequent 4-Port adapter increment, this value by 0x02000.

6. All required information is filled in on the Add a Multiport Model 2 Adapter screen. Press Enter. The COMMAND STATUS screen is displayed. The term

RUNNING is highlighted to indicate that the configure command is in progress. When RUNNING changes to OK, the following message is displayed:

```
apmn Available
```

where n is 0 for the first 4-Port adapter, 1 for the second 4-Port adapter, and 2 for the third 4-Port adapter, etc..

If you are installing only one 4-Port Multi-Protocol Communications Controller, ISA, exit SMIT or continue configuring your network. Refer to *AIXLink/4-Port 1.1 for AIX: Guide and Reference*.

If you have more 4-Port adapters to configure, press F3 to return to the the ISA Adapter screen and configure each additional adapter.

If RUNNING changes to FAILED instead of OK, refer to "Add a 4-Port Multi-Protocol Communications Controller, ISA Failed."

Add a 4-Port Multi-Protocol Communications Controller, ISA Failed

If the status changes to Command: FAILED and the following is displayed:

```
Cfgmm2:
```

```
The interrupt level switch settings on this adapter (Switches 1, 2, and 3)
are incorrect for the specified interrupt value.
```

```
The switch settings for interrupt 11 should be:
```

```
Switch 1 - OFF
```

```
Switch 2 - ON
```

```
Switch 3 - OFF
```

```
Please set these switches to the above positions, then try again.
```

The configuration has failed for one of two reasons:

1. The adapter switch settings are set correctly and you entered the wrong interrupt level in the ISA Interrupt Level field. If this is the case, press F3 to return to the Add a Multiport Model 2 Adapter screen and reenter the correct information.
2. The value you entered for ISA Interrupt Value is the one you must use and the switch positions may be wrong. If this is the case, record the correct switch settings and follow the instructions for powering off the system and removing the adapter on page 2-8. Reset the switch settings to those indicated on the error screen. Power on the system and restart your 4-Port Multi-Protocol Communications Controller, ISA configuration at the first step of this procedure.

If the status changes to Command: FAILED and the following is displayed:

```
lsresource : The attribute(s) for some device(s) in the system
could not be resolved. To resolve conflicts, attribute(s) need to be
modified. A suggested value for each attribute is provided.
```

Device	Attribute	Current	Suggested	Description
apm0	bus_intr_lvl	3	9	Parent adapter
apm0	bus_i0_addr	0x6a0	0xaa0	Connection Address
apm0	bus_mem_addr	0xe2000	0xe4000	Description

The configuration failed because one or more device attributes were not available for the 4-Port adapter. The previous example shows conflicts and suggested settings for each of the 4-Port selectable attributes.

1. Record the suggested values for the attribute(s) that need to be changed and follow the instructions for powering off the system and removing the adapter on page 2-8.
2. Reset the adapter switch settings to the suggested values you recorded. Refer to Appendix C, "Setting the Interrupt Level" on page C-1.
3. Power on the system and restart your 4-Port Multi-Protocol Communications Controller, ISA configuration at the first step of this procedure.

Verifying Device Driver Installation

To verify that your newly installed 4-Port Multi-Protocol Communications Controller, ISA is available for use, follow the steps below:

1. At the prompt, type the following and press Enter.

```
lsdev -Cs isa
```
2. A list of ISA devices displays. Verify that the 4-Port Multi-Protocol Communications Controller, ISA is in Available mode.

If the 4-Port Multi-Protocol Communications Controller, ISA registers Available, your installation is ready to use.

Appendix A. Configuration Table

Use this table to record the specifics of your configuration.

<i>Table A-1. Co-Processor Adapter</i>			
Description	0	1	2
Interrupt Level	Level _____	Level _____	Level _____
I/O Base Address	Hex _____	Hex _____	Hex _____

Appendix B. Using the Isresource Command

This section will aid you in determining what hardware resources are available prior to installing a 4-Port Multi-Protocol Communications Controller, ISA, or after a configuration failure due to a resource conflict.

Using the Isresource Command for Available Interrupts

1. Enter:

```
lsresource -a -l bus0 | grep bus_intr | grep A0
```

The output is a list of interrupts currently in use by the system which should look similar to the following:

TYPE	ADAPTER	ATTRIBUTE	S G	CURRENT VALUE
N	fda0	bus_intr_lvl		6 (A0)
N	sa0	bus_intr_lvl		4 (A0)
N	sa1	bus_intr_lvl		3 (A0)
N	sioka0	bus_intr_lvl		1 (A0)
N	sioma0	bus_intr_lvl		12 (A0)
N	ampx0	bus_intr_lvl		15 (A0)
N	apm0	bus_intr_lvl		11 (A0)

Note: The ADAPTER names in the previous list correspond to the following devices: fda0 = floppy disk, sa0 = serial port 0, sa1 = serial port 1, sioka0 = keyboard, sioma0 = mouse, ampx0 = 4-Port adapter, apm0 = sdhc adapter.

The current value field is the interrupt being reserved for that device. The previous example shows interrupts 1, 3, 4, 6, 11, 12, and 15 are in use. Interrupts 1, 2, 3, 4, and 12 are reserved for the system leaving interrupts 7, 9, 10, 11, and 15 available for the 4-Port Multi-Protocol Communications Controller, ISA. Each 4-Port Multi-Protocol Communications Controller, ISA must use a unique value.

2. Select one of the interrupts that is not in use and go to Appendix C, "Setting the Interrupt Level" on page C-1 to determine the appropriate switch settings. In some systems none of the interrupts required may be available. If this is the case you may be able to change the configuration of one of the adapters already in use to a different interrupt not used by 4-Port Multi-Protocol Communications Controller, ISA to free up an interrupt that is supported by the 4-Port Multi-Protocol Communications Controller, ISA.

Note: There are certain configurations where the 4-Port Multi-Protocol Communications Controller, ISA cannot be installed unless one of the adapters already in the system is removed.

Using the lsresource Command for Bus I/O Addresses: This section will aid you in resolving Bus I/O address conflict resolution.

1. Enter:

```
lsresource -a -l bus0 | grep bus_io
```

This command generates a list of adapters using Bus I/O which should look similar to the following:

TYPE	ADAPTER	ATTRIBUTE	S	G	CURRENT VALUE
0	fda0	bus_io_addr			0x000003f0 - 0x000003f5
0	fda0	bus_io_addr2			0x000003f7
0	sa0	bus_io_addr			0x000003f8 - 0x000003ff
0	sa1	bus_io_addr			0x000002f8 - 0x000002ff
0	sioka0	bus_io_addr	1		0x00000060
0	sioma0	bus_io_addr	1		0x00000060
0	ppa0	bus_io_addr			0x000003bc - 0x000003be
0	ampx0	bus_io_addr			0x000002a0 - 0x000002a6
0	apm0	bus_io_addr			0x000006a0 - 0x000006a6
0	scsi0	bus_io_addr			0x0000f000 - 0x0000f0ff
0	scsi1	bus_io_addr			0x01000000 - 0x010000ff

The 4-Port Multi-Protocol Communications Controller, ISA requires a unique Bus I/O address for each adapter installed. The valid address locations start at 0x02a0 and increment by 0x0400. For example, 0x02a0, 0x06a0, 0x0aa0, 0x0ea0, 0x12a0. The example shows 0x02a0 bus_io is in use by ampx0 and 0x06a0 is in use by apm0. The next 4-Port Multi-Protocol Communications Controller, ISA may use 0x0aa0, as no other devices are using that address.

2. Select a bus_io address that is not currently in use and go to "Setting the Card I/O Base Address" on page C-2 to set the switch settings accordingly.

Using the lsresource Command for Bus Memory Addresses: This section will aid you in resolving Bus memory address conflict resolution.

1. Enter:

```
lsresource -a -l bus0 | grep bus_mem
```

An example of the output from this command follows:

TYPE	ADAPTER	ATTRIBUTE	S	G	CURRENT VALUE
B	ampx0	bus_mem_addr			0x000e0000 - 0x000e1fff
B	apm0	bus_mem_addr			0x000e2000 - 0x000e3fff
B	gga0	bus_mem_start			0x01000000 - 0x01ffffff

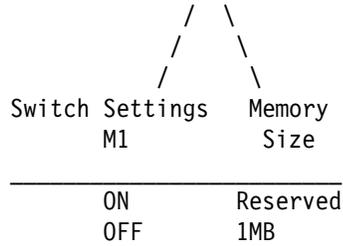
The valid bus memory values for use with the 4-Port Multi-Protocol Communications Controller, ISA start at 0x0e0000 and increment by 0x002000. For example, 0x0e2000, 0x0e4000, 0x0e6000. The previous example shows ampx0 is using the first bus_mem range of 0xe0000 and apm0 is using the second range of 0xe2000. The next 4-Port Multi-Protocol Communications Controller, ISA could be configured using 0xe4000.

2. Determine the next available bus_mem address based on the output of the lsresource command.

Setting the Memory Size

Switch position S4 (M1) is factory-set to indicate the size of the RAM installed on the 4-Port Multi-Protocol Adapter. Verify that M1 is set to OFF to indicate that 1M byte of RAM is installed on the co-processor adapter card.

10	9	8	7	6	5	4	3	2	1
BW	ED	C8	C4	C2	C1	M1	L4	L2	L1



Memory Size Switch Position

Setting the Card I/O Base Address

When installing more than one Realtime Interface Co-Processor (this may include co-processor adapters other than the Multiport Adapter, Model 2), set a different base I/O address for each adapter. Use the lowest base I/O address first.

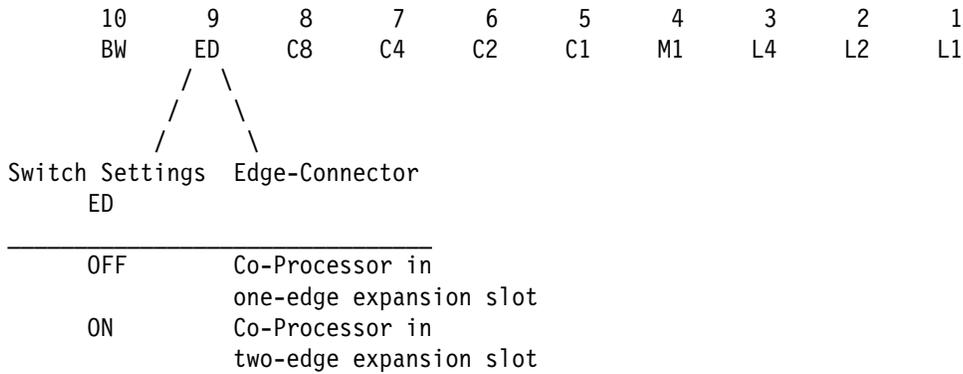
Set switch positions 5, 6, 7, and 8 (C1, C2, C3, and C4) as indicated on the next page. Record the 4-Port Multi-Protocol Adapter number (number 0, for the first 4-Port Multi-Protocol Adapter installed) and the base address in Appendix A, "Configuration Table" on page A-1.

10	9	8	7	6	5	4	3	2	1
BW	ED	C8	C4	C2	C1	M1	L4	L2	L1
Switch Settings				Base Address (Hex)	Physical Card Designation				
		C8	C4	C2	C1				
ON	ON	ON	ON	02A0	0				
ON	ON	ON	OFF	06A0	1				
ON	ON	OFF	ON	0AA0	2				
ON	OFF	ON	ON	0EA0	3				
ON	OFF	ON	ON	12A0	4				
ON	OFF	ON	OFF	16A0	5				
ON	OFF	OFF	ON	1AA0	6				
ON	OFF	OFF	OFF	1EA0	7				
OFF	ON	ON	ON	22A0	8				
OFF	ON	ON	OFF	26A0	9				
OFF	ON	OFF	ON	2AA0	10				
OFF	ON	OFF	OFF	2EA0	11				
OFF	OFF	ON	ON	32A0	12				
OFF	OFF	ON	OFF	36A0	13				
OFF	OFF	OFF	ON	3AA0	14				
OFF	OFF	OFF	OFF	3EA0	15				

Card I/O Base Address Switch Positions

Setting the Edge-Connector (ED)

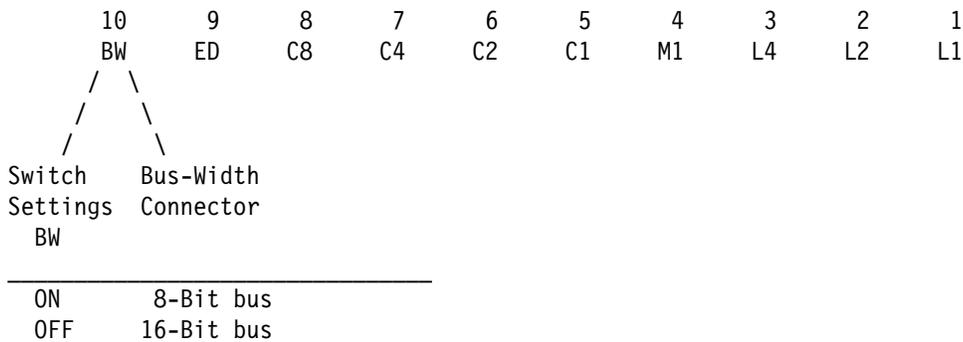
Switch position 9 (ED) indicates whether a one-edge (62-pin) connector or a two-edge (62-pin and 36-pin) connector is in the expansion slot holding your 4-Port Multi-Protocol Adapter.



Edge-Connector Switch Position

Setting the Bus-Width (BW)

Switch position 10 (BW) sets the bus width. If the expansion slot holding your 4-Port Multi-Protocol Adapter is a one-edge edge connector, set BW for an 8-bit bus width. A 4-Port Multi-Protocol Adapter in a two-edge edge connector may be set for an 8-bit or 16-bit bus width depending on the application.



Bus-Width Switch Position

Appendix D. Configuring More Than One 4-Port Multi-Protocol Adapter Adapter

This process becomes complicated since each adapter must have a unique switch setting for each interrupt level and Bus I/O Address, as well as have those values properly set on the Add a 4-Port adapter screen in SMIT.

To aid in installing multiple 4-Port adapters in a system the following list of all possible values of these variables is shown below.

Note: Other ISA or PCI adapters in the system may use some of these resources, reducing the total number of 4-Port adapter that may be installed.

ISA Interrupt Levels =	7	9	10	11	15
Bus I/O Address	0x2A0,	0x6A0,	0xAA0,	0xEA0,	0x12A0
Bus Memory Address	0xE0000,	0xE2000,	0xE4000,	0xE6000,	0xE8000

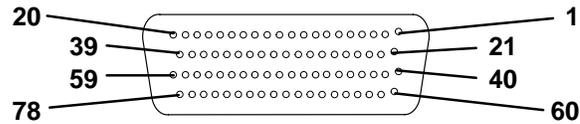
Hardware Resources available for 4-Port adapter when no other adapters are installed in the system.

Note: All combinations of the three variables are valid, for example, Interrupt Level 9 with Bus I/O Address of 0x6A0 and Bus Memory Address of 0xE4000 is a valid combination if no other adapters are using these resources.

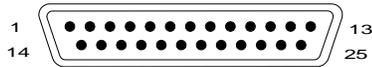
Appendix E. Connector Information

Pin Numbers

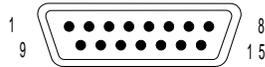
The 78-pin, D-shell, female connector on the 4-Port Multi-Protocol Communications Controller, ISA is shown below.



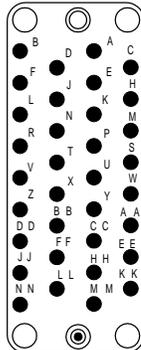
The 25-pin, D-shell, male connector on the Selectable Cable is shown below.



The 15-pin, D-shell, male connector on the Selectable Cable is shown below.



The 34-pin, D-shell, male connector on the One-Port V.35 Cable is shown below.



Pin Assignments

X.21 Connector Information: Table E-1 through Table E-4 list the pin assignments for the 78-pin connector on the Selectable Interface Board/A and the corresponding connector(s) on the Selectable Cable. These tables also identify the direction (I for input and O for output) that the signal is driven with respect to the interface board.

<i>Table E-1. RS-232-C Connector Pin Assignments</i>			
Signal Name	I/O	78-Pin Connector (Ports 0-3) 0 1 2 3	25-Pin Connectors (1,4,6,7)
TXD	O	40 04 66 69	02
RXD	I	02 64 28 31	03
RTS	O	01 63 27 30	04
CTS	I	61 25 48 51	05
DCD	I	22 45 09 12	08
DTR	O	60 24 47 50	20
DSR	I	42 06 68 71	06
HRS	O	21 44 11	23 (1,4,7)
RI	I	03 65 29 32	22
DTECLK	O	15 34 54 73	24
TCLKIN	I	23 56 70 75	15
RCLKIN	I	62 26 10 17	17
SG	n/a	43 07 08 67	07

<i>Table E-2. RS-422-C Connector Pin Assignments</i>			
Signal Name	I/O	78-Pin Connector (Ports 0 and 2) 0 2	25-Pin Connectors (3 and 8)
TxD	O O	37 13 76 52	02 02 SDA 04 04 SDB
RxD	I I	19 33 58 72	03 03 RDA 05 05 RDB
TxCLK	I I	18 57	23 -- STA 24 -- STB
RxCLK	I I	38 77	22 -- RTA 17 -- RTB
SGND	n/a	43 08	07 07 GND

Table E-3. V.35 Connector Pin Assignments

Signal Name	I/O	78-Pin Connector (Ports 0 and 1) 0 1	15-Pin Connectors (0 and 5)
TXDA	O	36 49	09
TXDB	O	53 14	02
RXDA	I	19 78	11
RXDB	I	58 35	04
TXCA	I	18 39	10
TXCB	I	57 16	12
RXCA	I	38 74	14
RXCB	I	77 55	13
RTS	O	01 63	03
CTS	I	61 25	05
DCD	I	22 45	07
DSR	I	42 06	06
DTR	O	60 24	15
SGND	n/a	43 07	08

Table E-4. X.21 Connector Pin Assignments

Signal Name	I/O	78-Pin Connector (Port 0) 0	15-Pin Connectors (2)
T (A)	O	37	02
T (B)	O	76	09
R (A)	I	19	04
R (B)	I	58	11
C (A)	O	20	03
C (B)	O	59	10
I (A)	I	18	05
I (B)	I	57	12
S (A)	I	38	06
S (B)	I	77	13
SG	n/a	43	08

Appendix F. Specifications for the 4-Port Multi-Protocol Communications Controller, ISA

The following specifications apply:

Physical

Length	200.0 mm (8.0 inches)
Width	17.5 mm (0.7 inches)
Height	101.6 mm (3.9 inches)
Weight	0.23 kg (0.5 lbs)

Environment

Air temperature:	Operating: 0 to 60C (32 to 140F)
Humidity	Non-Operating: 0 to 60C (32 to 140F) Operating: 5% through 90%

Electrical

Optimum Voltages:	Maximum Current:
+4.8 V dc to +5.25 V dc	+4.8 V dc to +5.25 V dc
-5.5 V dc to -4.525 V dc	875mA
+11.3 V dc to +12.7 V dc	50 mA
-11.3 V dc to -12.7 V dc	25 mA
	25 mA

Appendix G. Communications Statements

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

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. 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.

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 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.

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 A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Canadian Department of Communications Compliance Statement

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

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A情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

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

This equipment is in the Class 1 category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in commercial and/or industrial areas.

Consequently, when used in a residential area or in an adjacent area thereto, radio interference may be caused to radios and TV receivers, etc.

Read the instructions for correct handling. VCCI-1.

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.



Part Number: 93H3475



Printed in the United States of America
on recycled paper containing 10%
recovered post-consumer fiber.

93H3475

