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Installation Guide

Digi C/X

Cluster Controller System

Host Adapters

90027700 Rev G

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Approvals and Notices

Federal Communications Commission (FCC) Statements (All Models)

Radio Frequency Interference (RFI) (FCC 15.105)

This equipment has been tested and found to comply with the limits for Class A digital devices pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Labeling Requirements (FCC 15.19)

This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Modifications (FCC 15.21)

Changes or modifications to this equipment not expressly approved by Digi may void the user's authority to operate this equipment.

Cables (FCC 15.27)

Shielded cables *must* be used to remain within the Class A limitations.

Federal Communications Commission (FCC) Statements (PCI Model)

Radio Frequency Interference (RFI)

(FCC 15.105)

This equipment has been tested and found to comply with the limits for Class B digital devices pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Labeling Requirements

(FCC 15.19)

This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Modifications

(FCC 15.21)

Changes or modifications to this equipment not expressly approved by the manufacturer may void the user's authority to operate this equipment.

Cables

(FCC 15.27)

Shielded cables *must* be used to remain within the Class B limitations.



Declaration Of Conformity

(in accordance with FCC Dockets 96-208 and 95-19)

Manufacturer's Name: Digi International
Corporate Headquarters: 11001 Bren Road East
Minnetonka MN 55343

Digi International declares that the product:

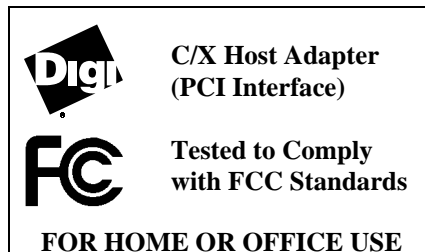
Product Name: C/X PCI host adapter

Model Numbers: 50000606-01

to which this declaration relates, meets the requirements specified by the Federal Communications Commission as detailed in the following specifications:

- Part 15, Subpart B, for Class B Equipment
- FCC Docket 96-208 as it applies to Computers and Peripherals

The product listed above has been tested at an External Test Laboratory certified per FCC rules and has been found to meet the FCC, Part 15, Class B, Emission Limits. Documentation is on file and available from the Digi International Homologation Department.



Industry Canada Compliance Statements

All Models

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.

PCI Model Only

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

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

European Union EMC Directives

All Models

This product has been tested and found to comply with the following European Union standards:

- EN 55022 Class A
- EN 50082-2
- EN 60950

PCI Model Only

This product has been tested and found to comply with the following European Union standards:

- EN 55022 Class B
- EN 50082-2
- EN 60950

Notes:

Introduction

The Digi C/X System

The C/X system is a cluster controller system consisting of two major subsystems: the C/X host adapter, which plugs into a slot in your computer's interface bus, and one or more C/CON-16 or C/CON-8 concentrators, which are connected to the host adapter via a high-speed EIA-422 synchronous serial interface. Each host adapter has two EIA-422 synchronous serial ports, and each concentrator is equipped with eight or sixteen EIA-232 asynchronous serial ports. Depending upon the operating system and device driver software, up to eight concentrators can be connected to each host adapter, and up to seven host adapters can be installed in a system, for a total of 896 asynchronous serial ports.

The Digi C/X host adapter is an intelligent dual-channel EIA-422 synchronous communication board available in configurations for PCI, ISA, EISA or Micro Channel bus platforms. The C/X ISA, EISA and Micro Channel host adapters feature a 10 MHz 80186 microprocessor, 128K (a 512K version is also available) bytes of dual-ported RAM and two high-speed EIA-422 synchronous channels used to communicate with C/CON or EPC/CON concentrators at data rates of up to 1.2 megabaud. The PCI host adapter features a 3041 RISC processor, 1 megabyte of RAM and two high-speed EIA-422 synchronous channels used to communicate with C/CON or EPC/CON concentrators at data rates of up to 3.6 megabaud.

Installation Tips

This section provides information about the Digi memory mapping and diagnostic utilities.

Installing your C/X host adapter is easy; however, since the boards require unique I/O and memory addresses, you may experience conflicts with other devices in your system. To minimize installation difficulties, two utilities are available: **DIGIMMAP.EXE**, a program which will help you find a block of available memory address space in your computer (ISA, EISA and Micro Channel boards only — PCI adapters are configured automatically), and **UD-CISC.EXE** (**UD-PCI.EXE** for PCI host adapters), a diagnostic program which will verify that the board is functioning correctly, and help you to identify any hardware problems or conflicts with the board. These utilities are on the Digi Diagnostics diskette.

Note:

The diagnostics diskette is a DOS format diskette; if you purchased the board for a UNIX system, the diagnostics diskette is not included, but the programs may be obtained via our BBS, FTP server, or by calling Digi Customer Service. See the Customer Support Services section in the back of this book for addresses and phone numbers.

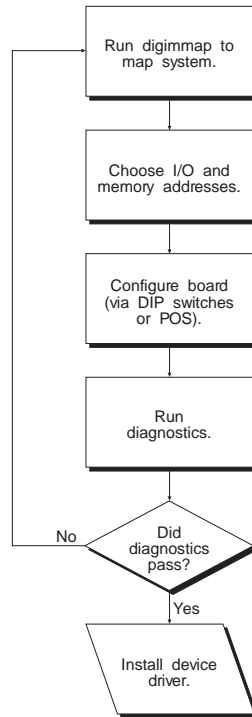
The flow chart on the following page shows a good sequence to follow when installing your board. Following this procedure will minimize installation difficulties and minimize the need for calls to Technical Support.

Important!

Please run the memory map utility and diagnostics before calling Technical Support for assistance.

Figure 1

C/X Host Adapter Installation Flow Chart



Note:

If you are installing the PCI version of the C/X host adapter, skip the first three boxes in the flow chart and simply run the diagnostics.

Memory Map Utility

Note:

If you are installing the PCI version of the C/X host adapter, skip this procedure. PCI boards are mapped automatically.

The memory map utility, **DIGIMMAP.EXE**, is an MS-DOS based executable program that is designed to aid in the installation of Digi hardware by detailing locations in memory that are available for the Digi product.

To run **DIGIMMAP.EXE**, follow this procedure:

1. Boot your system normally. This should cause any adapters in your system to be initialized.
2. Place a bootable DOS formatted diskette in drive A (or your boot drive, if different from drive A). This diskette must have no TSRs or memory managers present, or **DIGIMMAP** may give erroneous results (hint: rename **CONFIG.SYS** and **AUTOEXEC.BAT**, if present, so they are not executed during bootup).
3. Press the <Ctrl>, <Alt> and <Delete> keys simultaneously to reboot your machine. DO NOT press the RESET button or cycle power to reboot; resetting the machine may turn off any adapters that were activated in Step 1.
4. Now place the Digi Diagnostics diskette in the diskette drive and enter: **A:\CISC\DIGIMMAP** (assuming that you put the diskette in drive A).
5. After reading the initial screen, press <E> to execute the utility.
6. The center column will contain a list of 32K starting addresses which appear to be available. Write down several of these addresses (some devices can fool the memory mapper by turning their memory off, making the area appear to be available). A good order for trying addresses is:
 1. Addresses beginning with "D" (D0000h & D8000h)
 2. Addresses beginning with "C" (C0000h & C8000h)
 3. Addresses beginning with "E" (E0000h & E8000h)

User Diagnostics

ISA, EISA and Micro Channel Host Adapters

The \CISC directory on the Digi Diagnostics diskette contains a user diagnostic program called **UD-CISC.EXE**.

1. After starting MS-DOS, insert the Digi Diagnostics diskette in the diskette drive and enter **A:\CISC\UD-CISC** (assuming that you put the diskette in drive A).
2. When asked for a board family, press **<A>**.
3. Now you need to enter at least two parameters: the host adapter's I/O address (as set on the DIP switches; see page 10) and the Host Base Address (the starting address of the board's dual ported memory—use the memory map utility **DIGIMMAP.EXE** to find a good address to use).

Depending on the version of the diagnostic program, the other parameters may already be filled in with default values; if they are not, enter the following values:

Window Size:	32K
IRQ:	Disabled
Machine Environment:	ISA
Port:	1
EIA-232/422:	232
Loopback:	No
Continuous Test:	Yes
Stop on first:	Yes

4. Now press **<E>** to start the tests. The tests will be run consecutively, and pass/fail status will be indicated on the right hand side of your screen.
5. If all the tests pass, the board is functioning correctly and you are ready to install the device driver software. Make a note of the Host Base Address and I/O address before exiting the diagnostic program (you will need to specify these when you install the device driver software).
6. If failures occur, the most likely cause is a memory conflict. Try a different Host Base Address and execute the diagnostics again. If you get a Hardware Reset Error, try a different I/O address (be sure to set the DIP switches for the new address).

PCI Host Adapters

The `\PCI` directory on the Digi Diagnostics diskette contains a user diagnostic program called `UD-PCI.EXE`.

1. After starting MS-DOS, insert the Digi Diagnostics diskette in the diskette drive and enter `A:\PCI\UD-PCI` (assuming that you put the diskette in drive A).
2. When asked for a board family, press `<A>`.
3. The program will display the adapter base address that was assigned by the host. The other parameters are filled in with the following default values:

Port:	1
EIA-232/422:	232
Loopback:	No
Continuous Test:	Yes
Stop on first:	Yes
4. Now press `<E>` to start the tests. The tests will be run consecutively, and pass/fail status will be indicated on the right hand side of your screen.
5. If all the tests pass, the board is functioning correctly and you are ready to install the device driver software.

Note!

For more information on the diagnostic software, see the text files `USERPCI.TXT` and `RELNOT-P.TXT`, in the `\PCI` directory of the Digi Diagnostics diskette.

Installation

Installation of the Digi C/X system consists of configuring and installing the host adapter in your computer, connecting one or more C/CON-16 concentrators and installing the device driver software. This manual covers the C/X host adapter installation—installation of the device driver software and connection of C/CON-16 concentrator(s) are described in separate manuals.

This section is divided into four subsections, for the PCI, ISA, EISA and Micro Channel versions of the host adapter.

Important!

Before installing your Digi C/X host adapter, be sure to write down the serial number of your board. You will be asked for it if you need to call Technical Support.

PCI Host Adapters

Configuring the Host Adapter

No hardware configuration is required for PCI host adapters.

Installing the PCI Host Adapter in your Computer

1. Turn off your computer's power and remove the cover (refer to your computer's manual for instructions on cover removal and option board installation and cautions).
2. Locate an available PCI slot in your computer and remove the slot plate.
3. Plug the host adapter into the PCI slot and screw the endplate to the computer chassis.
4. Replace your computer's cover.

Note:

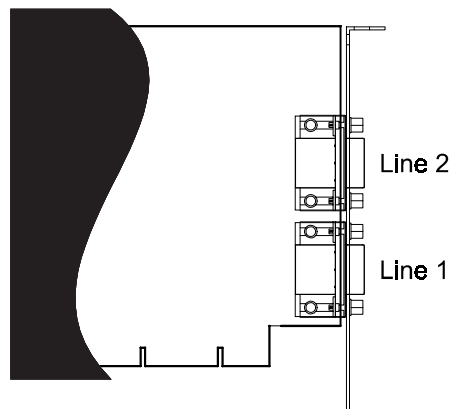
PCI C/X host adapters are shipped with a diagnostic diskette. The MS-DOS based diagnostic program, **UD-PCI.EXE**, will help verify correct installation of the host adapter, and help identify possible hardware problems. See the text file, **USERPCI.TXT**, for complete instructions, and **RELNOT-P.TXT** for release information.

Synchronous Lines

C/X host adapters have two EIA-422 synchronous serial lines for communication with the concentrators. The locations of the synchronous connectors are shown below.

Connection of concentrators to the EIA-422 synchronous lines of the C/X host adapters is discussed in detail in the *Installation Guide* for the concentrators.

Figure 2 C/X - PCI Host Adapter Synchronous Connectors



Important!

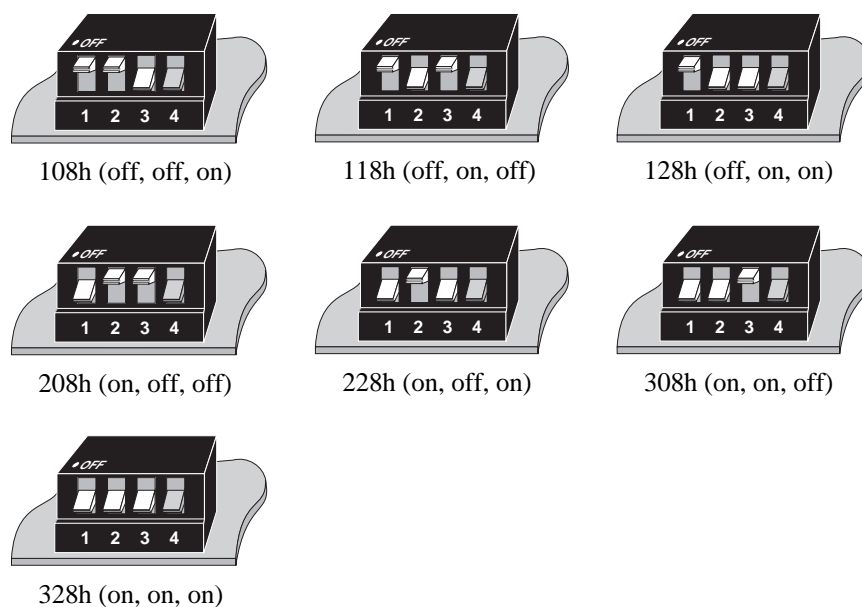
If you are installing this host adapter in an AIX system, the positions of Line 1 and Line 2 are reversed.

ISA Host Adapters

Setting the I/O Port Starting Address

The ISA C/X host adapter uses four bytes of address space on the host computer's I/O bus. Before installing the host adapter, the board's I/O port starting address must be set on DIP switch SW1 (located on the top edge of the board). To insure flexibility, seven I/O port address ranges are available: 108h-10Bh, 118h-11Bh, 128h-12Bh, 208h-20Bh, 228h-22Bh, 308h-30Bh and 328h-32Bh. Choose one of the starting addresses and set SW1-1, 2 and 3 as shown in Figure 2, below.

Figure 3 DIP Switch Settings for I/O Port Starting Address



Jumper Settings

There are five jumpers on the host adapter. These jumpers are set in the factory, and must not be changed.

Installing the ISA Host Adapter in your Computer

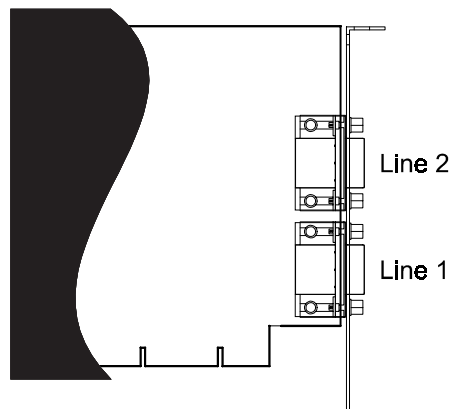
1. Turn off your computer's power and remove the cover (refer to your computer's manual for instructions on cover removal and option board installation and cautions).
2. Locate an available 16-bit AT slot in your computer and remove the slot plate.
3. Plug the host adapter into the ISA slot and screw the endplate to the computer chassis.
4. Replace your computer's cover.

Synchronous Lines

C/X host adapters have two EIA-422 synchronous serial lines for communication with the concentrators. The locations of the synchronous connectors are shown below.

Connection of concentrators to the EIA-422 synchronous lines of the C/X host adapters is discussed in detail in the *Installation Guide* for the concentrators.

Figure 4 C/X - ISA Host Adapter Synchronous Connectors



Important!

If you are installing this host adapter in an AIX system, the positions of Line 1 and Line 2 are reversed.

EISA Host Adapters

Jumper Setting

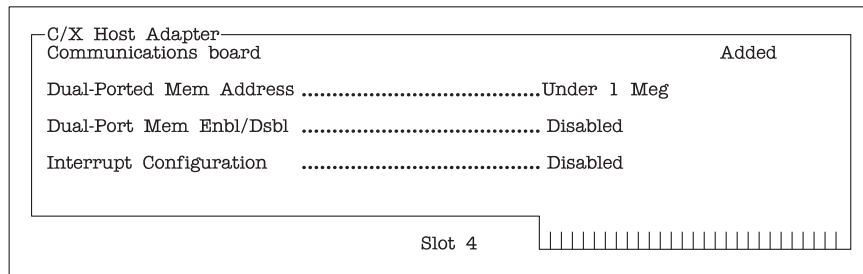
There is one jumper, J1 on the EISA C/X host adapter. J1 is set in the factory, and must not be changed.

Installing the EISA Host Adapter in your Computer

1. Turn off your computer and disconnect any attached peripheral devices.
2. Remove the cover from the computer. Refer to your system's documentation for instructions on how to remove the cover, and for other add-in board installation instructions and precautions.
3. Unscrew and remove the external slot cover plate from the slot into which you wish to install the C/X host adapter.
4. Carefully insert the C/X host adapter into the slot in the computer. Press the board firmly into the EISA bus connector, and replace the screw in the host adapter's endplate.
5. Replace the computer's cover.

System Configuration

1. Boot up your EISA system with the EISA Configuration Diskette. During the boot-up process, the system should display a message to the effect that an unknown board has been found. This is the C/X host adapter installed in the previous procedure.
2. When the boot-up has been completed, copy the file **!DBI0102.CFG** from the Digi distribution diskette to your EISA system's Configuration Diskette.
3. Run the configuration program to add the EISA host adapter.
4. From the **Edit** pull-down menu, select **Add**. The program will display a list of the **.CFG** configuration files for boards; select **C/X Host Adapter**. (If this is not displayed as an option, you may not have copied the **.CFG** file to the correct directory in Step 2.)
5. Use a mouse, or the arrow keys and Tab key to pull down the **View** menu, and choose **Detailed by Slot**. Next, use the up and down arrow keys to move to "**C/X Host Adapter**" and press <Enter>. You should see a screen similar to the following:



- Place the cursor on “**Dual-Ported Mem Address**” and press <Enter>. A screen similar to the following will appear:

Memory Address	<input type="radio"/> 80000h <input type="radio"/> 88000h <input type="radio"/> 90000h <input type="radio"/> 98000h <input type="radio"/> A0000h <input type="radio"/> A8000h <input type="radio"/> B0000h <input type="radio"/> B8000h <input checked="" type="radio"/> C0000h <input type="radio"/> C8000h	Type: OTHER
Size	<input checked="" type="radio"/> 8000h	

The following address choices are available:

Below 1 Megabyte:*

80000h	88000h	90000h	98000h
A0000h	A8000h	B0000h	B8000h
C0000h	C8000h	D0000h	D8000h
E0000h	E8000h	F0000h	F8000h

Above 1 Megabyte:

F0000000h	F1000000h	F2000000h	F3000000h
F4000000h	F5000000h	F6000000h	F7000000h
F8000000h	F9000000h	FA000000h	FB000000h
FC000000h	FD000000h	FE000000h	FF000000h

- * Although there are 16 choices offered for memory start addresses below 1 megabyte, a limited number of these choices is likely to be available. Of the 16, the best choices are probably **D0000** and **D8000**. See the appendix on memory conflicts on page 25 for more information.

Multiple EISA C/X host adapters may share the same addresses.

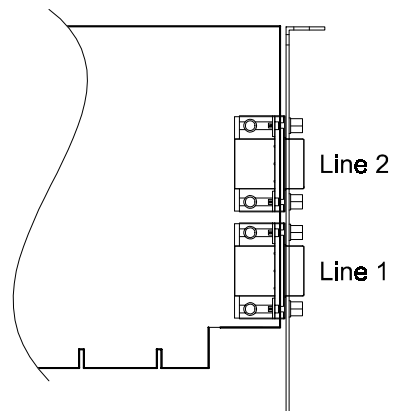
- Use the cursor keys to select one of the listed addresses, or press <Enter> to accept what the configuration program has chosen. Write this address down—you will need to know it when installing the device driver software.
- Leave the **Dual-Port Mem Enbl/Dsbl** at “**Disabled**”.
- Leave the **Interrupt Configuration** at “**Disabled**”.
- Pull down the **SYSTEM** menu, and choose “**Exit**”. Make sure that you **SAVE** the new configuration as the program suggests.

Synchronous Lines

C/X host adapters have two EIA-422 synchronous serial lines for communication with the concentrators. The locations of the synchronous connectors are shown below.

Connection of concentrators to the EIA-422 synchronous lines of the C/X host adapters is discussed in detail in the *Installation Guide* for the concentrators.

Figure 5 C/X - EISA Host Adapter Synchronous Connectors



Micro Channel Host Adapters

Jumper Settings

There are three jumpers on the Micro Channel C/X host adapter.

J1 and J2 are set in the factory, and must not be changed.

J3 selects the POS ID for the board. When a jumper is placed on pins 1 and 2, the POS ID is **6FEC**. When the jumper is on pins 2 and 3, the POS ID is **6FE8**. The factory default position is pins 1 and 2 connected (POS ID=6FEC). See *Setting the POS ID*, below, for more information.

Note!

The C/X host adapter for installation under AIX has no jumper J3. The POS ID is hard-coded to **FF01**.

Setting the POS ID

Current Micro Channel C/X host adapters support 32-bit addressing, which allows the dual-ported memory to be mapped into any 32K byte region up to the 4 gigabyte limit. To maintain compatibility with previous versions of the board, the Micro Channel host adapter now has two POS IDs, selectable by jumper J3.

When J3 is set in the factory-default position, between pins 1 and 2, the POS ID is **6FEC**, which corresponds to ADF file **@6FEC.ADF**. This POS ID maintains compatibility with previous versions of the Micro Channel C/X host adapter.

When J3 is placed on pins 2 and 3, the POS ID is **6FE8**, which corresponds to ADF file **@6FE8.ADF**. This permits full 32-bit addressing.

Important!

Device driver software released prior to 11/1/92 does not support 32-bit addressing for the Micro Channel C/X host adapter. When using this software, the POS ID *must* be set to **6FEC** (jumper J3, pins 1 and 2 connected). For software releases after 11/1/92, check the release notes to determine whether 32-bit addressing is supported.

Installing the Micro Channel Host Adapter in your Computer

1. Turn off your computer's power and remove the cover (refer to your computer's manual for instructions on cover removal and option board installation and cautions).
2. Locate an available Micro Channel slot in your computer and remove the external slot plate (you will need to loosen the thumbscrew to do this). The C/X host adapter can be installed in either a 16 or 32-bit slot—note, however, that if a 16-bit slot is used, the memory start address is limited to one of the choices *below* 1 megabyte or in the sixteenth megabyte (i.e. 24-bit addresses; see *Jumper Settings*, on the preceding page). *If you plug the board into a 16-bit slot, be sure that the exposed 32-bit extension does not come into contact with any components on the motherboard.*
3. Plug the host adapter into the Micro Channel slot, making sure that the “fork” is in position under the endplate thumbscrew. Tighten the thumbscrew.
4. Replace your computer's cover.

Configuring the Host Adapter

Note:

This procedure is necessary for **PS/2** compatible machines only. If you are installing the host adapter in an **RS-6000** system, skip this procedure.

1. Insert your *working* copy (don't use the original copy) of the IBM Reference Diskette into your boot drive (Drive A) and turn on the computer's power. Expect an error message—the host adapter board won't be found in the configuration file at this point.
2. Select “**Copy an Option Diskette**” from the main menu. Follow the instructions given on your computer screen for copying ADF files onto your Reference Diskette.
3. Select “**Set Configuration**” from the main menu. Then select “**Run Automatic Configuration**” from the Set Configuration menu. Auto-Config will find non-conflicting address and interrupt parameters for the board for you. If you choose to set the parameters manually, you will be given the following choices:

Memory Start Address:***POS ID 6FEC:***

0C0000h, 0C8000h, 0D0000h, 0D8000h (1st megabyte);
F80000h, FA0000h or FC0000h (16th megabyte).

POS ID 6FE8:

0C0000h, 0C8000h, 0D0000h, 0D8000h (1st megabyte);
F80000h, FA0000h, FC0000h (16th megabyte);
F0000000h, F2000000h, F4000000h, F6000000h,
F8000000h or FC000000h (4th gigabyte).

(see page 17 for information about POS IDs)

I/O Port Address:

108h, 118h, 128h, 208h, 228h, 308h or 328h.

Interrupt Select:

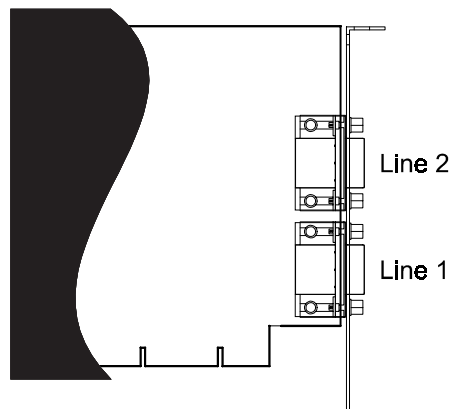
IRQ 3, 5, 7, 10, 11, 12, 15 or None (disabled).

Synchronous Lines

C/X host adapters have two EIA-422 synchronous serial lines for communication with the concentrators. The locations of the synchronous connectors are shown below.

Connection of concentrators to the EIA-422 synchronous lines of the C/X host adapters is discussed in detail in the *Installation Guide* for the concentrators.

Figure 6 C/X - MC Host Adapter Synchronous Connectors



Important!

If you are installing this host adapter in an AIX system, the positions of Line 1 and Line 2 are reversed.

Specifications

PCI Host Adapter

Power Requirements

+5 Volts \pm 5%	0.9 amps typical
+12 Volts \pm 5%	20 milliamps typical
-12 Volts \pm 5%	20 milliamps typical

Environmental

Temperature	10° C to 55° C
Relative Humidity	5% to 90%
Air Movement	30 CFM Forced

Mechanical

Length:	6.875 inches	Width:	.570 inches
Height:	4.2 inches	Weight:	5.45 ounces

ISA Host Adapter

Power Requirements

+5 Volts \pm 5%	2.0 amps typical
+12 Volts \pm 5%	40 milliamps typical
-12 Volts \pm 5%	40 milliamps typical

Environmental

Temperature	10° C to 55° C
Relative Humidity	5% to 90%
Air Movement	30 CFM Forced

Mechanical

Length:	10.8 inches	Width:	.6 inches
Height:	4.1 inches	Weight:	9 ounces

EISA Host Adapter

Power Requirements

+5 Volts \pm 5%	2.0 amps typical
+12 Volts \pm 5%	40 milliamps typical
-12 Volts \pm 5%	40 milliamps typical

Environmental

Temperature	10° C to 55° C
Relative Humidity	5% to 90%
Air Movement	30 CFM Forced

Mechanical

Length:	11 inches	Width:	.6 inches
Height:	3.7 inches	Weight:	9 ounces

Micro Channel Host Adapter

Power Requirements

+5 Volts \pm 5%	2.0 amps typical
+12 Volts \pm 5%	40 milliamps typical
-12 Volts \pm 5%	40 milliamps typical

Environmental

Temperature	10° C to 55° C
Relative Humidity	5% to 90%
Air Movement	30 CFM Forced

Mechanical

Length:	11.5 inches	Width:	.6 inches
Height:	3.5 inches	Weight:	9 ounces

Appendix—Memory Conflicts

Contention for Memory Addresses

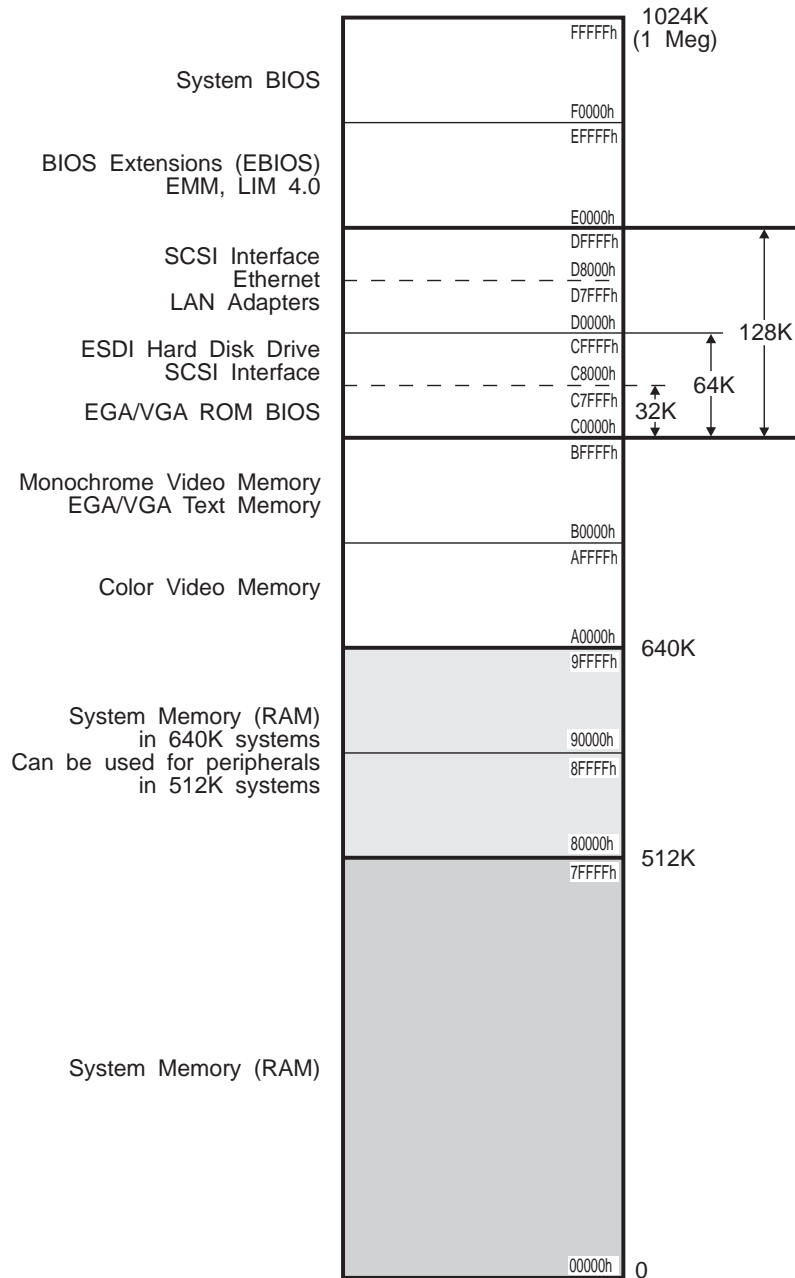
Many intelligent peripheral devices require a block of vacant memory addresses on the host computer's bus for their own use. These memory addresses may be used to access a dual-ported RAM on the peripheral device to facilitate the transfer of large volumes of data between the host and the peripheral (memory-to-memory transfers are much faster than I/O bus transfers), or they may point to a ROM BIOS (a firmware program used by the host computer to control the peripheral device). In either case, the host computer sees this memory as its own, and can use the same high-speed memory-referencing commands that it uses with its internal memory.

Figure 7 on the following page shows a map of the first megabyte of a host system's memory bus. The shaded areas represent the computer's internal RAM (nearly always 640K, but can often be reduced to 512K—there is also usually more RAM above the 1 Meg boundary). The area between the RAM and the 1 Meg boundary is used for the host system's BIOS, option ROMs and peripheral memory. The memory map shows the locations typically used by some of the most common peripheral devices.

Note:

The memory map on the following page shows typical memory usage. To be certain of what areas are available in your system, you will need to consult the documentation for your computer and peripheral devices.

Figure 7 **Typical PC Memory Usage - 1st Megabyte**



ISA Host Adapters

The ISA C/X host adapter has 128K or 512K bytes of on-board dual-ported RAM which is accessed through a 32K “window”, which can be mapped into any 32K region in the first sixteen megabytes of the computer’s memory address space.

Current Digi device drivers support sixteen preconfigured 32K address ranges for ISA host adapters, beginning at 80000h, 88000h, 90000h, 98000h, A0000h, A8000h, B0000h, C8000h, C0000h, C8000h, D0000h, D8000h, E0000h, E8000h, F0000h or F8000h. These addresses are all below the 1 megabyte boundary. In practice, only four of these address ranges are likely to be available. The addresses E0000h-FFFFFh are typically used for the system BIOS and BIOS extensions; the addresses A0000h-BFFFFh are used for video buffers, and the addresses 80000h-9FFFFh are between 512K and 640K, and so can only be used with host computers having no more than 512K of base memory (memory below 1 megabyte). Since most computers have 640K of base memory, only the addresses from C0000h-DFFFFh are generally usable. To complicate matters, most intelligent peripheral devices require some memory address space in this region for their ROM or shared memory. It is therefore necessary to insure that the memory address range chosen for the ISA host adapter does not conflict with the range used by any other device in your system.

Some typical sources of contention are:

- Plug-in VGA and EGA cards, which have a ROM BIOS beginning at C0000h.
- ESDI hard disk controllers, which typically have a ROM BIOS beginning at C8000h or CC000h.
- SCSI interfaces, which have a ROM BIOS that may be located anywhere in the C0000h-DFFFFh range.

Consult the documentation for your peripheral devices to determine what (if any) memory addresses they may be occupying on the host memory bus.

Micro Channel Host Adapters

Micro Channel C/X host adapters can operate in two different addressing modes: 24-bit or 32-bit. The mode is determined by the POS ID that has been selected for the board (see page 17 for information on setting the POS ID).

The Micro Channel host adapter has 128K or 512K bytes of on-board dual-ported RAM which is accessed through a 32K “window”, which can be mapped into any 32K region in either the first sixteen megabytes of the computer’s memory address space, or anywhere up to the 4 gigabyte limit, depending upon the addressing mode (see below).

24-Bit Addressing

For 24-bit addressing, the POS ID is **6FEC**, and the corresponding adapter description file is **@6FEC.ADF**. This maintains compatibility with older host adapters, which use the same ADF file. Software released prior to 11/1/92 supports only this mode. **@6FEC.ADF** supports the following starting addresses: 0C0000h, 0C8000h, 0D0000h, 0D8000h, F80000h, FA0000h and FC0000h. The first four of these addresses are below 1 megabyte; the last three are in the sixteenth megabyte. When the host adapter is installed in a machine with 16 megabytes or more of RAM, only the addresses below 1 megabyte can be used.

32-Bit Addressing

For 32-bit addressing, the POS ID is **6FE8**, and the corresponding adapter description file is **@6FE8.ADF**. **@6FE8.ADF** supports the seven address ranges listed above for 24-bit addressing, plus eight additional address ranges in the fourth gigabyte of address space, starting at F0000000h, F2000000h, F4000000h, F6000000h, F8000000h and FA000000h.

When installed below the 1 megabyte boundary, Micro Channel host adapters are subject to the same constraints as ISA host adapters (see page 27)

EISA Host Adapters

The EISA C/X host adapter has 128K or 512K bytes of on-board dual-ported RAM which is accessed through a 32K “window”, which can be mapped into any 32K region in the computer’s memory address space up to the 4 gigabyte limit. The EISA C/X configuration file provides sixteen address ranges below 1 megabyte, and sixteen address ranges in the fourth gigabyte:

Below 1 Megabyte:*

80000h	88000h	90000h	98000h
A0000h	A8000h	B0000h	B8000h
C0000h	C8000h	D0000h	D8000h
E0000h	E8000h	F0000h	F8000h

Above 1 Megabyte:

F0000000h	F1000000h	F2000000h	F3000000h
F4000000h	F5000000h	F6000000h	F7000000h
F8000000h	F9000000h	FA000000h	FB000000h
FC000000h	FD000000h	FE000000h	FF000000h

- * When addressed below 1 megabyte, the same constraints apply as for the ISA host adapter (see page 27).

Digi Support Services

The Digi Bulletin Board System

Digi provides an electronic bulletin board service (BBS) for our customers. This bulletin board provides general and technical information about Digi's products.

The Digi BBS allows users to download software drivers as soon as they become available. There is also a feature to allow users with problems or questions about Digi products to leave messages to Digi Technical Support.

Using the Digi BBS is easy. Simply dial **(612) 912-4800**. In Europe, dial **+49 221 9205211**; in Asia, dial **+65 735 2460**.

The recommended modem communications parameters are 8 bits, no parity and one stop bit (**8 N 1**). Other settings may also work.

Download protocols include Zmodem, Xmodem, Ymodem, Kermit and others.

Internet FTP Server

Digi has set up an Anonymous FTP server for those with access to the Internet network. The address is **ftp.dgii.com**. Log in as **anonymous**, and enter your E-mail address when asked for a password. Drivers and installation tips are located in the **/drivers** directory. A text file, **download.doc**, gives information on uncompressing the files after downloading. Tip: Be sure to enter **"bin"** before downloading, to ensure binary transfer of files.

World Wide Web Server

Product information, manuals, new product announcements, programs, application stories and more can be obtained through the World Wide Web. Our address is **http://www.dgii.com**.

DigiFACTs FaxBack Server

Manuals and technical information can also be obtained by FAX. To use the FaxBack server, simply call (612) 912-4990 on a touch tone phone.

Information About Your System

Serial number of your Digi product: _____

Make, model and clock speed of your computer: _____

How much RAM does your computer have? _____

Hard disk controller: Type: _____ Memory addressed at: _____

I/O port used: _____ IRQ: _____

LAN card: Type: _____ Memory addressed at: _____

I/O port used: _____ IRQ: _____

Other: Type: _____ Memory addressed at: _____

I/O port used: _____ IRQ: _____

Operating system: _____ Version: _____

Digi device driver version: _____

Technical Support

At Digi, we are proud of our products, and support them. Our dealers and distributors are fully trained on our product line, so that they can help you on a technical level should assistance be needed.

Your first level of support is your Digi dealer, the place where you purchased your Digi product. Your dealer has the training to help you with any installation questions or difficulties you might have.

If you still experience difficulties (after contacting your first level of support), Digi has a staff of Technical Support Specialists that can assist you. They can be reached at **(612) 912-3456**. In Europe, call **+49 221 920520**, and in Asia, call **+65 732 1318**. FAX numbers are: (612) 912-4958 (USA), +49 221 9205210 (Europe) and +65 732 1312 (Asia).

When you call Digi Technical Support, please call from a position where you can operate your system. Also, please fill out the form on the preceding page before calling, so your Technical Support representative can have a clear picture of your system and any potential conflicts between devices.

Digi Technical Support can also be reached via Internet E-mail. Please send correspondences to **support@dgii.com**, and include your voice and FAX phone numbers.

Customer Service

Digi also has a staff of Customer Service representatives to help you with software and documentation update requests, as well as Returned Merchandise Authorizations (RMAs) in case you need to return your Digi product for repair (see page 34). They may be reached at **(612) 912-3456**. Digi Customer Service may be contacted by FAX at (612) 912-4959.

Digi Customer Service can also be reached via Internet E-mail. Please send correspondences to **cust_serv@dgii.com**, and include your voice and FAX phone numbers.

Return Procedures

All Digi products have a five-year parts and labor warranty, and we are ultimately responsible for any defective parts, according to the limits specified in the warranty. However, many of the reported problems are due to factors other than defects in the product itself. To save you time and possibly additional cost, Digi asks that you *first* try to resolve any difficulties by contacting our Technical Support representatives at **(612) 912-3456**.

Important!

Be sure to have the serial number of your Digi product at hand before calling Technical Support.

Returns should be directed to the dealer or distributor from whom you purchased the product. If you need to return your Digi product for repair, it is first necessary to obtain an RMA (Returned Merchandise Authorization) number from Digi, by speaking to a Digi Customer Service representative. Authorized returns should be shipped to Digi International, 10000 West 76th Street, Eden Prairie, MN 55344. The RMA number should appear on the shipping carton, on or near the address label.

Note:

Products received without an RMA number clearly marked on the outside of the package will be returned, unopened, to the sender

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