Software Manual

Digi AccelePort Intelligent Serial Communications Products

Novell AIO Device Driver Package

92000243 Rev E

The Digi logo is a registered trademark of Digi International Inc.

AccelePort™, **C/X**™, **EPC/X**™, **Xem**™, **Xr**™, **EPC/CON-16**™, **C/CON-16**™, **C/CON-8**™, **PORTS/16em**™, **PORTS/8em**™, **PORTS/8emp**™, **Modem/8em**™, **Modem/4em**™, **AccelePort C/X**™, **AccelePort EPC/X**™, **AccelePort Xem**™, **AccelePort Xr**™, **AccelePort Xe**™, **PC/Xe**™, **PC/Xi**™, **MC/Xe**™, **MC/Xi**™, **Avanstar**™, and **T1 Modem Bank**™ are trademarks of Digi International Inc. All other brand and product names are the trademarks of their respective holders.

© Digi International Inc. 1996-1997
All Rights Reserved

Information in this document is subject to change without notice and does not represent a commitment on the part of Digi International.

Digi provides this document “as is”, without warranty of any kind, either expressed or implied, including, but not limited to, the implied warranties of fitness or merchantability for a particular purpose. Digi may make improvements and/or changes in this manual or in the product(s) and/or the program(s) described in this manual at any time.

This product could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes may be incorporated in new editions of the publication.

Table of Contents

Introduction 5

AccelePort Xem 6
- Overview 6
- Supported Boards 6
- Unsupported Hardware Features 7
- Installation 8
  - Loading the Device Driver 8
- Error Messages 13

AccelePort Xr 17
- Overview 17
- Supported Boards 17
- Unsupported Hardware Features 17
- Installation 18
  - Loading the Device Driver 18
- Error Messages 22

AccelePort Xe, PC/Xe and PC/Xi 25
- Overview 25
- Installation 26
  - Loading the Device Driver 27
    - NetWare Connect 2.0 27
    - NetWare Connect 1.x or 2.0 27
- Error Messages 29

AccelePort C/X (ISA, EISA) 31
- Overview 31
- Compatibility 31
- Installation and Configuration 32
  - Copying the Files 32
  - Configuring the AIO Driver 32
    - Adding Boards 34
    - Removing Boards 41
    - Enabling and Disabling the AltPin Feature 42
    - Selecting the AIO Version 44
    - Saving the Configuration 44
  - Loading the AIO Driver 45
  - Changing the AIO Driver's Configuration 46
- Error Messages 47

AccelePort C/X PCI 49
Overview 49
Compatibility 49
Installation and Configuration 50
Copying the Files 50
Configuring the AIO Driver 50
Adding Boards 52
Removing Boards 56
Enabling and Disabling the AltPin Feature 57
Saving the Configuration 58
Loading the AIO Driver 59
Changing the AIO Driver's Configuration 59
Error Messages 60

AccelePort EPC/X 62
Overview 62
Compatibility 62
Installation and Configuration 63
Copying the Files 63
Configuring the AIO Driver 63
Adding Boards 65
Removing Boards 71
Enabling and Disabling the AltPin Feature 72
Selecting the AIO Version 73
Saving the Configuration 73
Loading the AIO Driver 74
Changing the AIO Driver's Configuration 74
T1 Modem Bank Configuration 74
Error Messages 75

Avanstar Xp PCI Adapters 78
Overview 78
Installation 79
Loading the Device Driver 79
Error Messages 81

Introduction

This manual contains instructions for installing and configuring the Digi device drivers for Novell AIO. The device drivers in this package support the following Digi products:

- AccelePort (Xe, Xr, Xem, C/X, EPC/X)
- PC/Xe, PC/Xi
- Avanstar Xp PCI Adapters

The manual is divided into sections pertaining to each of the major families of Digi intelligent asynchronous communications products:

AccelePort Xem 6
AccelePort Xr 17
AccelePort Xe, PC/Xe and PC/Xi 25
AccelePort C/X (ISA, EISA) 31
AccelePort C/X (PCI) 49
AccelePort EPC/X 62
Avanstar Xp PCI Adapters 78

AccelePort Xem

Overview

Digi's support for Novell compatible asynchronous applications is provided through a universal driver conforming to the "AIO" (Asynchronous Input/Output) specification. Use the AIO driver when Digi hardware is being installed in the file server (or machine with run-time NetWare).

AIO drivers are loaded on the file server from the system console (or **RCONSOLE**) command line or the **AUTOEXEC.NCF** file. Installation is performed simply by copying the driver files **AIODGXEM.NLM**, **AIODGMEM.NLM**, **AIODGXME.ADI**, **AIODGXMI.ADI** and **AIODGXMP.ADI** from the distribution diskette to the system directory of the file server.

Supported Boards

The following host adapters are supported by this device driver:

- AccelePort Xem - EISA (up to 8 boards per system)
- AccelePort Xem - ISA (up to 7 boards per system)
- AccelePort Xem - PCI (up to 7 boards per system)

Unsupported Hardware Features

This driver uses no interrupts from the AccelePort Xem host adapter.

This driver does not support the ninth (parallel printer) port on PORTS/8emp modules. The driver will report nine serial ports, but the ninth port is unusable since AIO does not provide support for parallel ports.

Installation

To install the Digi AIO driver, simply copy the relevant files to your file server (although the driver can be loaded from the file server floppy, this will not be a typical way to set-up a system). The Digi AIO driver files (**AIODGXEM.NLM**, **AIODGMEM.NLM**, **AIODGXME.ADI**, **AIODGXMI.ADI** and **AIODGXMP.ADI**) should be copied to the system directory of the file server, typically called **F:\SYSTEM**. Copy the files from a workstation to the file server with the commands:

```
COPY A:\XEM\AIODGXEM.NLM F:\SYSTEM
COPY A:\XEM\AIODGMEM.NLM F:\SYSTEM
COPY A:\XEM\AIODGXME.ADI F:\SYSTEM\AIO
COPY A:\XEM\AIODGXMI.ADI F:\SYSTEM\AIO
COPY A:\XEM\AIODGXMP.ADI F:\SYSTEM\AIO
```

Loading the Device Driver

If you are running NetWare Connect 2.0, the driver load command line is configured from within the NetWare Connect Console. See the NetWare Connect 2.0 manual for information on installing AIO device drivers. Note that the **AIODGXEM.NLM**, **AIODGMEM.NLM**, **AIODGXME.ADI**, **AIODGXMI.ADI** and **AIODGXMP.ADI** files must be in the **SYS:SYSTEM** directory so that Connect 2.0 can select **AIODGXEM.NLM** as a loadable driver.

If you are running NetWare Connect 1.x, you must load the driver by hand. The user supplies information to the driver through a set of command line parameters at load time. Some or all of the parameters are optional, depending upon the type of board you are using. On ISA and EISA bus servers, the driver must be loaded for each board. On PCI bus servers, the driver must be loaded for each ISA or EISA board, if present, then once for all PCI boards.

The **load** command has the following general syntax:

load aiodgxem {*parameters*}

The final form of the command is determined by which board is installed, and the bus type of the computer (EISA, ISA or PCI). The variants of the command syntax follow. Parameters enclosed in brackets [ ] are optional parameters.

In systems with both PCI and ISA or EISA host adapters, the ISA and/or EISA drivers must be loaded *before* the PCI driver.

AccelePort Xem - ISA host adapters in ISA machines:
load aiodgxem port=*xxx* **mem=***xxxxx* [**name=***bname*][**node=0**][**altp**[**=***mask*]]

AccelePort Xem - ISA host adapters in EISA machines:
load aiodgxem slot=*x* **port=***xxx* **mem=***xxxxx* [**name=***bname*][**node=0**]
[**altp**[**=***mask*]]

AccelePort Xem - EISA host adapters in EISA machines:
load aiodgxem slot=*x* **mem=***xxxxx* [**name=***bname*][**node=0**][**altp**[**=***mask*]]

AccelePort Xem - PCI host adapters:
load aiodgxem [**altp**[**=***mask*[**,***mask*[**,***mask*[**,***mask*[**,***mask*[**,***mask*[**,***mask*]]]]]]]

port=*xxx* This parameter is the board's 3 digit hex I/O port address. For example: **port=324**. Valid port addresses are **104**, **114**, **124**, **204**, **224**, **304** and **324** for AccelePort Xem - ISA host adapters (I/O port addresses are not specified for EISA or PCI adapters).

Each host adapter must have a unique I/O port address, which must not be used by any other device in the system.

slot=*x* The host adapter's EISA slot number. For example, **slot=3**.

mem=*xxxxx* This parameter is the 5 digit hex starting address of the board's dual-ported memory. For example: **mem=d0000**. The device driver supports the following 32K starting addresses: **80000**, **88000**, **90000**, **98000**, **A0000**, **A8000**, **B0000**, **B8000**, **C0000**, **C8000**, **D0000**, and **D8000**—typically, the addresses from **C0000** to **D8000** will be the only addresses available in your server. AccelePort Xem - ISA and EISA host adapters may share the same memory address, since only one board's memory is turned on at a time.

name=*bname*: This parameter is optional and allows you to specify up to a 10 character name to identify the host adapter. *bname* may consist of any combination of alphanumerical characters. If you do not specify a name, one will be assigned by the driver. Following is a list of the board's I/O port addresses or slot numbers and the associated default names and board numbers:

For host adapters in ISA machines:

Port Address	Default Name	Board Number
104h	DigiXem00	0
114h	DigiXem01	1
124h	DigiXem02	2
204h	DigiXem03	3
224h	DigiXem04	4
304h	DigiXem05	5
324h	DigiXem06	6

For host adapters in EISA machines:

Slot Number	Default Name	Board Number
1	DigiXem00	0
2	DigiXem01	1
3	DigiXem02	2
4	DigiXem03	3
5	DigiXem04	4
6	DigiXem05	5
7	DigiXem06	6
8	DigiXem07	7

PCI host adapters are numbered in the order in which they were found.

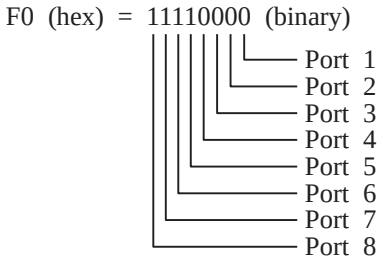
node=0 The **node=0** parameter informs the driver to assign board numbers sequentially. If this parameter is omitted, the driver will assign board numbers based on the I/O port address as defined above. The parameter is effective only when used in the first **load** command, and determines the method by which subsequently loaded boards will be numbered.

altp[=*mask***]**

The standard wiring for Digi PORTS modules equipped with RJ-45 connectors places the modem control lines RI (Ring Indicator) and DCD (Data Carrier Detect) on pins 1 and 10, respectively, which makes them inaccessible to an 8-pin RJ-45 plug. While RI is seldom used, DCD is necessary for most modem applications. To facilitate the use of 8-pin RJ-45 plugs, a software feature called "**ALTPIN**" has been included with this device driver. When ALTPIN is active, DCD is swapped with DSR (Data Set Ready), which is on pin 1 of an 8-pin RJ-45 plug.

This parameter is optional and allows you specify that you want to activate the driver's ALTPIN option. When this parameter is entered as just "**altp**", all ports on the board will operate with the ALTPIN option active. When entered as "**altp=***mask*" the driver uses the hex mask to determine which ports will use the ALTPIN feature. For example :

altp=f0



This will activate ALTPIN on ports 5-8. The mask can be up to 16 hex digits long to activate ALTPIN on up to 64 ports.

Error Messages

The following error messages may occur while the driver is parsing the parameters.

Usage Error: AIODGXEM port=XXXX mem=XXXXX [name=bname***][node=0].**

Usage Error: AIODGXEM slot=X [port=XXXX] mem=XXXXX [name=bname***] [node=0].**

These errors will appear if you load the driver with no parameters on ISA and EISA bus servers, respectively.

***Usage Error: First parameter not 'port='.**

The driver expects the first parameter to be **port=***xxx* on ISA machines, but this was not the case.

***Usage Error: First parameter not 'slot='.**

The driver expects the first parameter to be **slot=***x* on EISA machines, but this was not the case.

***Error: This is a Micro Channel system. Please use AIODGMXM.NLM.**

This message will appear if an attempt is made to load the driver on a Micro Channel system. A separate driver, **AIODGMXM.NLM** is required for Micro Channel systems.

***Error: Invalid Port Address 0x310.**

This message indicates that an invalid port address was specified.

***Error: Port Address 0x304 is already supported.**

This message indicates that the driver is already supporting an AccelePort Xem host adapter at this port address.

***Error: Invalid Slot 10.**

This message indicates that an invalid slot number was specified while loading the driver on an EISA computer (slots 1-8 are valid).

***Error: Slot 2 is already supported.**

This message indicates that the driver is already supporting an AccelePort Xem host adapter in this slot on an EISA computer.

***Usage Error: Second parameter not 'mem='**

The driver expects the second parameter to be **mem=***xxxxx* in ISA machines, but this was not the case. The driver also expects this to be the second parameter in EISA machines if the **port=** parameter was not the second parameter (when using an AccelePort Xem - EISA host adapter).

***Usage Error: Third parameter not 'mem='**

The driver expects the third parameter to be **mem=***xxxxx* in EISA machines when the **port=** parameter is the second parameter (specified for AccelePort Xem host adapters).

***Error: Invalid Memory Address 0xF0000.**

This message indicates that an invalid memory address was specified.

***Error: AllocateResourceTag failed.**

This message indicates that the driver could not allocate resources from NetWare. Unload unnecessary NLMs and reload the driver.

***Error: AIORegisterDriverA failed.**

This message indicates that NetWare failed to permit registration of the driver.

***Error: AllocateSemiPermMemory returns NULL.**

This message indicates that the driver's request to allocate memory failed. Unload unnecessary NLMs and reload the driver.

***Error: ISA/EISA boards must be loaded before PCI boards!**

Once PCI support is loaded, you cannot load support for an ISA or EISA board. Unload the driver. Load all ISA and EISA boards, then reload PCI support.

***AIODGXEM Xem PCI support has already been loaded.**

You only need to load the driver once to support all PCI Xem host adapters in the system.

***No PCI BIOS entry point found.**

The driver cannot locate the PCI BIOS. Fatal error.

***No usable PCI boards found.**

No functioning PCI Xem host adapters were found.

The following error messages may occur while the driver is performing some initial tests on the AccelePort Xem host adapter.

Board 4: Port 304 Mem D0000
***Error: This is not an Xem host adapter**

This message indicates that a board was found, but it is not an Xem host adapter.

Board 4: Port 304 Mem D0000 Failed Hardware Registration.

This message indicates that NetWare failed to accept the driver's attempt to register the board's hardware resources.

Board 4: Port 304 Mem D0000 Port 304 not found.

This message indicates that the driver could not find a board with port 304h. Check to insure that you have specified the correct I/O port or that you have properly configured the board's port address.

Board 4: Port 304 Mem D0000 Hardware Reset Fails.

This message indicates that the driver could not place the board into a reset state. This is most likely the result of an I/O port address conflict or a faulty board. Be sure that there are no other I/O ports in your system at the indicated I/O port address.

Board 4: Port 304 Mem D0000 Memory not found error *x*.

This message indicates that the driver could not find the board's memory. *x* indicates the number of memory errors found in a 256 byte block.

Board 4: Port 304 Mem D0000 Memory error *x*.

This message indicates that the driver has found the board's memory, but it appears to be faulty. *x* indicates the number of errors found in a 256 byte block.

Board 4: Port 304 Mem D0000 Memory fails disable.

This message indicates that the board's memory could not be disabled. This could be the result of a memory overlap with some other memory in the system, or a faulty board. Ensure that no memory conflict exists.

The following messages may occur during the driver's attempt to initialize the board.

`Board 4: Port 304 Mem D0000 BIOS fails initialization.`

This message indicates that the host adapter's on-board BIOS did not initialize properly.

`Board 4: Port 304 Mem D0000 FEPOS fails initialization.`

This message indicates that the on-board operating system did not initialize successfully.

`Board 4: Port 304 Mem D0000 FEPOS finds 0 ports.`

This message indicates that the on-board operating system initialized successfully, but found no ports. Check to see that the PORTS modules are connected to the AccelePort Xem host adapter.

`Board 4: Port 304 Mem D0000 Command failure during Initialization.`

This message indicates that the on-board operating system encountered a failure during initialization of the asynchronous channels.

AccelePort Xr

Overview

Digi's support for Novell compatible asynchronous applications is provided through a universal driver conforming to the "AIO" (Asynchronous Input/Output) specification. Use the AIO driver when Digi hardware is being installed in the file server (or machine with run-time NetWare).

AIO drivers are loaded on the file server from the system console (or **RCONSOLE**) command line or the **AUTOEXEC.NCF** file. Installation is performed simply by copying the driver files **AIODGXR.NLM**, **AIODGMEM.NLM**, **AIODGXRI.ADI** and **AIODGXRP.ADI** from the distribution diskette to the system directory of the file server.

Supported Boards

The following host adapters are supported by this device driver:

- AccelePort Xr - ISA (up to 7 boards per system)
- AccelePort Xr - PCI (up to 7 boards per system)

Unsupported Hardware Features

This driver uses no interrupts from the AccelePort Xr host adapter.

Installation

To install the Digi AIO driver, simply copy the relevant files to your file server (although the driver can be loaded from the file server floppy, this will not be a typical way to set-up a system). The Digi AIO driver files (**AIODGXR.NLM**, **AIODGMEM.NLM**, **AIODGXRI.ADI** and **AIODGXRP.ADI**) should be copied to the system directory of the file server, typically called **F:\SYSTEM**. Copy the files from a workstation to the file server with the commands:

```
COPY A:\XR\AIODGXR.NLM F:\SYSTEM
COPY A:\XR\AIODGMEM.NLM F:\SYSTEM
COPY A:\XR\AIODGXRI.ADI F:\SYSTEM\AIO
COPY A:\XR\AIODGXRP.ADI F:\SYSTEM\AIO
```

Loading the Device Driver

If you are running NetWare Connect 2.0, the driver load command line is configured from within the NetWare Connect Console. See the NetWare Connect 2.0 manual for information on installing AIO device drivers. Note that **AIODGXR.NLM**, **AIODGMEM.NLM**, **AIODGXRI.ADI** and **AIODGXRP.ADI** must be in the **SYS:SYSTEM** directory so that Connect 2.0 can select **AIODGXR.NLM** as a loadable driver.

If you are running NetWare Connect 1.x, you must load the driver by hand. The user supplies information to the driver through a set of command line parameters at load time. Some or all of the parameters are optional, depending upon the type of board you are using. On ISA bus servers, the driver must be loaded for each board. On PCI bus servers, the driver must be loaded for each ISA board, if present, then once for all PCI boards.

The **load** command has the following general syntax:

load aiodgxr {*parameters*}

The final form of the command is determined by which board is installed, and the bus type of the computer (ISA or PCI). The variants of the command syntax follow. Parameters enclosed in brackets [ ] are optional parameters.

In systems with both PCI and ISA host adapters, the ISA drivers must be loaded *before* the PCI driver.

AccelePort Xr - ISA boards:

load aiodgxr port=*xxx* **mem=***xxxxx* [**name=***bname*][**node=0**][**altp**[**=***mask*]] [**fastbaud**]

AccelePort Xr - PCI boards (load *after* ISA boards):

load aiodgxr [**altp**[**=***mask*[**,***mask*[**,***mask*[**,***mask*[**,***mask*[**,***mask*[**,***mask*]]]]]]] [**fastbaud**]

port=*xxx* This parameter is the board's 3 digit hex I/O port address. For example: **port=324**. Valid port addresses are **104**, **114**, **124**, **204**, **224**, **304** and **324** for ISA adapters.

Each adapter must have a unique I/O port address, which must not be used by any other device in the system.

mem=*xxxxx* This parameter is the 5 digit hex starting address of the board's dual-ported memory. For example: **mem=d0000**. The device driver supports the following 32K starting addresses: **80000**, **88000**, **90000**, **98000**, **A0000**, **A8000**, **B0000**, **B8000**, **C0000**, **C8000**, **D0000**, and **D8000**—typically, the addresses from **C0000** to **D8000** will be the only addresses available in your server. AccelePort Xr - ISA adapters may share the same memory address, since only one board's memory is turned on at a time.

name=*bname*: This parameter is optional and allows you to specify up to a 10 character name to identify the host adapter. *bname* may consist of any combination of alphanumerical characters. If you do not specify a name, one will be assigned by the driver. Following is a list of the board's I/O port addresses or slot numbers and the associated default names and board numbers:

Port Address	Default Name	Board Number
104h	DigiXr00	0
114h	DigiXr01	1
124h	DigiXr02	2
204h	DigiXr03	3
224h	DigiXr04	4
304h	DigiXr05	5
324h	DigiXr06	6

PCI adapters are numbered in the order in which they were found.

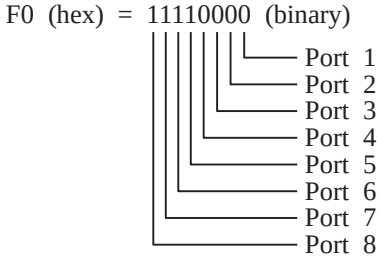
node=0 This parameter must be used if you are using **AIO.NLM** version 1.0.2 or earlier. These versions of AIO need sequential board numbers based on the load order of the driver. (The first board loaded will be assigned #0, the second board will be assigned #1 and so on.) Using the **node=0** parameter informs the driver to assign board numbers sequentially. If this parameter is omitted, the driver will assign board numbers based on the I/O port address as defined above. The parameter is effective only when used in the first **load** command, and determines the method by which subsequently loaded boards will be numbered.

altp[=*mask***]**

The standard wiring for Digi Xr adapters equipped with RJ-45 connectors places the modem control lines RI (Ring Indicator) and DCD (Data Carrier Detect) on pins 1 and 10, respectively, which makes them inaccessible to an 8-pin RJ-45 plug. While RI is seldom used, DCD is necessary for most modem applications. To facilitate the use of 8-pin RJ-45 plugs, a software feature called "**ALTPIN**" has been included with this device driver. When ALTPIN is active, DCD is swapped with DSR (Data Set Ready), which is on pin 1 of an 8-pin RJ-45 plug.

This parameter is optional and allows you specify that you want to activate the driver's ALTPIN option. When this parameter is entered as just "**altp**", all ports on the board will operate with the ALTPIN option active. When entered as "**altp=***mask*" the driver uses the hex mask to determine which ports will use the ALTPIN feature. For example :

altp=f0



This will activate ALTPIN on ports 5-8. The mask can be up to 16 hex digits long to activate ALTPIN on up to 64 ports.

fastbaud To operate an AccelePort Xr adapter at 230K baud, include the **fastbaud** parameter and set the port's baud rate to 300. **fastbaud** maps 300 baud to 230K baud.

To operate the adapter at 460K baud, include the **fastbaud** parameter and set the port's baud rate to 600. **fastbaud** maps 600 baud to 460K baud.

Error Messages

The following error messages may occur while the driver is parsing the parameters.

Usage Error: AIODGXR port=XXXX mem=XXXXX [name=bname***][node=0].**
This error will appear if you load the driver with no parameters on an ISA bus server.

***Usage Error: First parameter not 'port='.**
The driver expects the first parameter to be **port=***xxx* on ISA machines, but this was not the case.

***Error: Invalid Port Address 0x310.**
This message indicates that an invalid port address was specified.

***Error: Port Address 0x304 is already supported.**
This message indicates that the driver is already supporting an AccelePort Xr adapter at this port address.

***Usage Error: Second parameter not 'mem='**
The driver expects the second parameter to be **mem=***xxxxx* in ISA machines, but this was not the case.

***Error: Invalid Memory Address 0xF0000.**
This message indicates that an invalid memory address was specified.

***Error: AllocateResourceTag failed.**
This message indicates that the driver could not allocate resources from NetWare. Unload unnecessary NLMs and reload the driver.

***Error: AIORegisterDriverA failed.**
This message indicates that NetWare failed to permit registration of the driver.

***Error: AllocateSemiPermMemory returns NULL.**
This message indicates that the driver's request to allocate memory failed. Unload unnecessary NLMs and reload the driver.

***Error: ISA boards must be loaded before PCI boards!**
Once PCI support is loaded, you cannot load support for an ISA board. Unload the driver. Load all ISA boards, then reload PCI support.

***AIODGXEM Xr PCI support has already been loaded.**
You only need to load the driver once to support all PCI Xr host adapters in the system.

***No PCI BIOS entry point found.**
The driver cannot locate the PCI BIOS. Fatal error.

***No usable PCI boards found.**
No functioning PCI Xr host adapters were found.

The following error messages may occur while the driver is performing some initial tests on the AccelePort Xr host adapter.

Board 4: Port 304 Mem D0000
***Error: This is not an Xr host adapter**

This message indicates that a board was found, but it is not an Xr adapter.

Board 4: Port 304 Mem D0000 Failed Hardware Registration.

This message indicates that NetWare failed to accept the driver's attempt to register the board's hardware resources.

Board 4: Port 304 Mem D0000 Port 304 not found.

This message indicates that the driver could not find a board with port 304h. Check to insure that you have specified the correct I/O port or that you have properly configured the board's port address.

Board 4: Port 304 Mem D0000 Hardware Reset Fails.

This message indicates that the driver could not place the board into a reset state. This is most likely the result of an I/O port address conflict or a faulty board. Be sure that there are no other I/O ports in your system at the indicated I/O port address.

Board 4: Port 304 Mem D0000 Memory not found error *x*.

This message indicates that the driver could not find the board's memory. *x* indicates the number of memory errors found in a 256 byte block.

Board 4: Port 304 Mem D0000 Memory error *x*.

This message indicates that the driver has found the board's memory, but it appears to be faulty. *x* indicates the number of errors found in a 256 byte block.

Board 4: Port 304 Mem D0000 Memory fails disable.

This message indicates that the board's memory could not be disabled. This could be the result of a memory overlap with some other memory in the system, or a faulty board. Ensure that no memory conflict exists.

The following messages may occur during the driver's attempt to initialize the board.

Board 4: Port 304 Mem D0000 BIOS fails initialization.

This message indicates that the host adapter's on-board BIOS did not initialize properly.

Board 4: Port 304 Mem D0000 FEPOS fails initialization.

This message indicates that the on-board operating system did not initialize successfully.

Board 4: Port 304 Mem D0000 FEPOS finds 0 ports.

This message indicates that the on-board operating system initialized successfully, but found no ports.

Board 4: Port 304 Mem D0000 Command failure during Initialization.

This message indicates that the on-board operating system encountered a failure during initialization of the asynchronous channels.

AccelePort Xe, PC/Xe and PC/Xi

Overview

Digi's support for Novell compatible asynchronous applications is provided through a universal driver conforming to the "AIO" (Asynchronous Input/Output) specification. Use the AIO driver when Digi hardware is being installed in the file server.

AIO drivers are loaded on the file server from the system console (or **RCONSOLE**) command line or the **AUTOEXEC.NCF** file. Installation is performed simply by copying the driver files **AIODGXI.NLM**, **AIODGMEM.NLM** and **AIODGXI.ADI** from the distribution diskette to the system directory of the file server.

The driver will support up to seven AccelePort Xe - ISA, PC/Xe and/or PC/Xi boards on ISA and EISA bus servers. AccelePort Xe - ISA, PC/Xe and PC/Xi boards may be configured to use the same memory address space ("stacked") or may be configured for unique addresses.

PC/Xi boards must be configured for 64K of dual ported memory. Refer to the PC/Xi *Installation Guide* for information on configuring the PC/Xi board's memory.

Installation

To install the Digi AIO driver, simply copy the relevant files to your file server (although the driver can be loaded from the file server floppy, this will not be a typical way to set-up a system). The Digi AIO driver files (**AIODGXI.ADI**, **AIODGXI.NLM** and **AIODGMEM.NLM**) should be copied from the **\NETWARE\AIO** directory of the distribution diskette to the system directory of the file server, typically called **F:\SYSTEM**. Copy the files from a workstation to the file server with the commands:

```
COPY A:\XALL\AIODGXI.ADI F:\SYSTEM\AIO
COPY A:\XALL\AIODGXI.NLM F:\SYSTEM
COPY A:\XALL\AIODGMEM.NLM F:\SYSTEM
```

Loading the Device Driver

NetWare Connect 2.0

If you are running NetWare Connect 2.0, the driver load command line is configured from within the NetWare Connect Console. See the NetWare Connect 2.0 manual for information on installing AIO device drivers. Note that the **AIODGXI.ADI**, **AIODGXI.NLM** and **AIODGMEM.NLM** files must be in the **SYS:SYSTEM** directory so that Connect 2.0 can select **AIODGXI.NLM** as a loadable driver.

NetWare Connect 1.x or 2.0

If you are running NetWare Connect 1.x, you must load the driver by hand (if desired, this may also be done under NetWare Connect 2.0). The user supplies information to the driver through a set of command line parameters at load time. Some or all of the parameters are optional, depending upon the type of board you are using. The driver must be loaded for each board. The **load** command has the following general syntax:

load aiodgxi {*parameters*}

The final form of the command is determined by which board is installed, and the bus type of the computer (ISA or EISA). The command syntax is shown below. Parameters enclosed in brackets [ ] are optional parameters.

AccelePort Xe - ISA, PC/Xe and PC/Xi boards may be installed in either ISA or EISA platforms. In either case, the driver must be loaded for each board you wish to support. The syntax for loading the driver is as follows:

load aiodgxi port=*xxx* **mem=***xxxxx* **[name=***bname***] [node=0]**

Note: The above is a single command, and must be entered on one command line.

port=*xxx*

This parameter is the board's 3 digit hex I/O port address. For example: **port=320**. Valid port addresses are **100**, **110**, **120**, **200**, **220**, **300** and **320**.

Each board must have a unique I/O port address, which must not be used by any other device in the system, including other Digi products.

All AccelePort Xe - ISA, PC/Xe and PC/Xi boards may share the same memory addresses, since only one board's memory is turned on at a time.

name=*bname*:

This parameter is optional and allows you to specify up to a 10 character name to identify the board. *bname* may consist of any combination of alphanumeric characters. If you do not specify a name, one will be assigned by the driver. Following is a list of the I/O port addresses and the associated default names and board numbers.

Port Address	Default Name	Board Number
100h	DigiXi00	0
110h	DigiXi01	1
120h	DigiXi02	2
200h	DigiXi03	3
220h	DigiXi04	4
300h	DigiXi05	5
320h	DigiXi06	6

node=0

This parameter must be used if you are using **AIO.NLM** version 1.0.2 or earlier. These versions of AIO need sequential board numbers based on the load order of the driver. (The first board loaded will be assigned #0, the second board will be assigned #1 and so on.) Using the **node=0** parameter informs the driver to assign board numbers sequentially. If this parameter is excluded, the driver will assign board numbers based on the I/O port address as defined above. The **node=0** parameter is only effective when it is in the *first* **load aiodgxi** command.

The **node=0** parameter must also be used when running Cheyenne FaxServe which requires ports to be numbered sequentially.

Error Messages

The following error messages may occur while the driver is parsing the parameters.

Usage Error: AIODGXI port=XXXX mem=XXXXX [name=bname***].**
This error will appear if you load the driver with no parameters on ISA and EISA bus servers.

***Usage Error: First parameter not 'port='.**
The driver expects the first parameter to be **port=xxx**, but this was not the case.

***Error: This is a Micro Channel system. Please use AIODGMXI.NLM.**
This message will appear if an attempt is made to load the driver on a Micro Channel system. A separate driver, **AIODGMXI.NLM** is required for Micro Channel systems.

***Error: Invalid Port Address 0x310.**
This message indicates that an invalid port address was specified.

***Error: Port Address 0x320 is already supported.**
This message indicates that the driver is already supporting a board at this port address.

***Usage Error: Second parameter not 'mem='**
The driver expects the second parameter to be **mem=xxxxx**, but this was not the case.

***Error: Invalid Memory Address 0xF0000.**
This message indicates that an invalid memory address was specified.

The following error messages may occur while the driver is performing some initial tests on the board.

Board 4: Port 220 Mem D0000 Port 220 not found.
This message indicates that the driver could not find a board with port 220h. Check to insure that you have specified the correct I/O port or that you have properly configured the board's port address.

Board 4: Port 220 Mem D0000 Hardware Reset Fails.

This message indicates that the driver could not place the board into a reset state. This is most likely the result of an I/O port address conflict or a faulty board. Be sure that there are no other I/O ports in your system at the indicated I/O port address.

Board 4: Port 220 Mem D0000 Memory not found error *x*.

This message indicates that the driver could not find the board's memory. *x* indicates the number of memory errors found in a 256 byte block.

Board 4: Port 220 Mem D0000 Memory error *x*.

This message indicates that the driver has found the board's memory, but it appears to be faulty. *x* indicates the number of errors found in a 256 byte block.

The following messages may occur during the driver's attempt to initialize the board.

Board 4: Port 220 Mem D0000 BIOS fails initialization.

This message indicates that the board's on-board BIOS did not initialize properly.

Board 4: Port 220 Mem D0000 BIOS passes init but reports 0 ports.

This message indicates that the BIOS initialized successfully, but could not find any of the asynchronous channels.

Board 4: Port 220 Mem D0000 NMI Fails during FEPOS code move.

This message indicates a failure during transfer of the on-board operating system code.

Board 4: Port 220 Mem D0000 NMI Fails during FEPOS execution.

This message indicates a failure during startup of the on-board operating system.

Board 4: Port 220 Mem D0000 FEPOS Fails Initialization.

This message indicates that the on-board operating system did not initialize successfully.

Board 4: Port 220 Mem D0000 Command failure during Initialization.

This message indicates that the on-board operating system encountered a failure during initialization of the asynchronous channels.

AccelePort C/X (ISA, EISA)

Overview

Digi's support for Novell compatible asynchronous applications is provided through a universal driver conforming to the "AIO" (Asynchronous Input/Output) specification. Use the AIO driver when Digi hardware is being installed in the file server (or machine with run-time NetWare).

AIO drivers are loaded on the file server from the system console (or **RCONSOLE**) command line or the **AUTOEXEC.NCF** file. Installation is performed simply by copying the driver files **AIODGCX.NLM**, **AIODGMEM.NLM**, **AIOCXCFG.NLM**, **AIODGCX.ADI** and **AIOCXDTA.NLM** from the distribution diskette to the system directory of the file server.

Compatibility

Digi's AIO driver supports the ISA and EISA versions of the Digi C/X system and therefore can be used on both platforms.

The driver will support up to four C/X host adapters on ISA and EISA bus servers. These host adapters may be configured to use the same memory address ("stacked") or may be configured for unique addresses.

Concentrators may be connected locally (direct wiring), or remotely (via high-speed synchronous modems). This driver supports one modem pair per synchronous line, and the modems must be installed between the host adapter and the first concentrator (i.e. local and remote concentrators may not be combined on a single synchronous line).

Installation and Configuration

Copying the Files

To install the Digi AIO driver, simply copy the relevant files to your file server. The Digi AIO files should be copied to the system directory of the file server, typically called **F:\SYSTEM**. Copy the files from a workstation to the file server with the commands:

```
COPY A:\CX\AIODGCX.NLM F:\SYSTEM
COPY A:\CX\AIODGCX.ADI F:\SYSTEM\AIO
COPY A:\CX\AIOCXCFG.NLM F:\SYSTEM
COPY A:\CX\AIODGMEM.NLM F:\SYSTEM
COPY A:\CX\AIOCXDTA.NLM F:\SYSTEM
```

Configuring the AIO Driver

Before the AIO driver can be loaded for the first time, it must be configured to match the C/X System hardware you have installed in your server. The configuration program, **AIOCXCFG.NLM**, creates a data file in **SYS:SYSTEM** called **DGCXDATA.CFG**. **AIOCXDTA.NLM** reads this file at driver load and returns the configuration to the **AIODGCX.NLM** driver. The new configuration can be changed by re-running the configuration utility or by deleting the data file **DGCXDATA.CFG** from the **SYS:SYSTEM** directory. Note that this will clear out the configuration.

To configure the AIO driver, enter the following command from the server:

```
load aiocxcfg
```

You will see the banner for the configuration utility:

```
Digi C/X AIO Driver Configuration Utility              V 1.30
```

Below the banner, the current driver configuration will be displayed. The configuration fields will be empty, as shown below:

```
                    Digi Driver Configuration

  Brd Type   I/O Addr    Mem Addr    #Concs    Brd#     Brd Name

               AIODGCX.NLM configured for 0 Boards
```

Below the configuration display a box will appear listing the available configuration options:

```
    Available Options
>   Add Board
    Delete Board
    Change Board Parameters
    Configure Sync Lines
    Set Altpin Option
    Set AIO Version
    Exit
```

Adding Boards

1. To add a host adapter to the configuration, use the up and down arrow keys to position the pointer next to "Add Board" and press <Enter>. The configuration program will put up a series of menus requesting information about the host adapter and synchronous line configuration. These are the same menus that come up if you select "Change Board Parameters" and "Configure Sync Lines" from the main "Available Options" menu.

2. I/O Options

(ISA Host Adapters)

You will first be asked to specify the board's I/O port address (as set on the board's DIP switches):

	Port Selections
>	Port 108h Port 118h Port 128h Port 208h Port 228h Port 308h Port 328h

If you are installing an ISA host adapter in an EISA server, you will also be asked for the number of the slot in which the board resides.

(EISA Host Adapters)

You will now be asked to specify the board's slot number:

	Slot Selections
>	Slot 1
	Slot 2
	Slot 3
	Slot 4
	Slot 5
	Slot 6
	Slot 7
	Slot 8

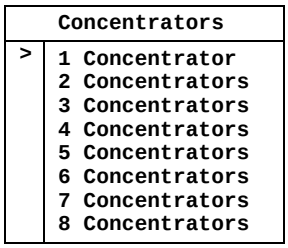
3. Memory Options ***(ISA and EISA Host Adapters)***

Now you will be asked to select a starting address for the board's shared memory. Multiple C/X host adapters may use the same starting address. Note that while there are 14 address options, many of these will be unavailable due to other memory and peripheral considerations. The addresses most likely to be available are 0D8000h and 0D0000h.

	Memory Options
>	080000h
	088000h
	090000h
	098000h
	0A0000h
	0A8000h
	0B0000h
	0B8000h
	0C0000h
	0C8000h
	0D0000h
	0D8000h
	0E0000h
	0E8000h

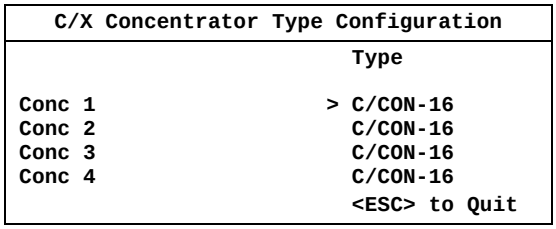
4. Number of Concentrators

The configuration program will now ask for the number of concentrators attached to the host adapter. Select 1 to 8 concentrators by moving the pointer to the desired number and press <Enter>.



5. Concentrator Type (C/CON-8 or C/CON-16)

Now identify each concentrator as either a C/CON-8 or C/CON-16. You will see a screen like this:



6. Host Adapter Sync Line Configuration

Now you need to set up the host adapter's synchronous line parameters. These include the wiring mode (4 or 8 wire), Transmit Clock mode (Internal or External), the baud rate and the modem type (if applicable). You will see:

```
            C/X Host Adapter Sync Line Configuration

  Line      Mode      TX Clock      Speed      Modem
    1    > 8-Wire     Internal      1.2M       N/A
    2      8-Wire     Internal      1.2M       N/A

                                <ESC> to Quit
```

6a. Wiring Mode

To change the wiring mode, use the up, down, left and right arrow keys to place the pointer next to the wiring mode you wish to change, then press <Enter>. For maximum throughput under moderate to heavy loads, 8-Wire mode is recommended. If the concentrators are to be located at a remote site and connected to the host adapter via high-speed synchronous modems, 8-Wire mode is required.

6b. Transmit Clock Mode

To change the Transmit Clock mode, use the up, down, left and right arrow keys to place the pointer next to the TX Clock mode you wish to change, then press <Enter>. Select Internal for local (hard-wired) concentrators, and External for remote concentrators (connected via high-speed synchronous modems).

6c. Line Speed Selection

Now choose the baud rate for the synchronous lines. Use the up, down, left and right arrow keys to place the pointer next to the Line Speed you wish to change, then press <Enter>. If you chose 8-Wire, Internal clocking above, the recommended Line Speed is 1.2 megabaud ("1.2M"). If you chose 4-Wire, Internal clocking, the maximum baud rate is 460K. If you are using high-speed synchronous modems to connect to remote concentrators, use the fastest baud rate supported by your modems.

	Select Line Speed
	2400
	4800
	9600
	19.2K
	38.4K
	57.6K
	76.8K
	115K
	230K
	460K
	920K
>	1.2M

6d. Modem Type

To change the synchronous modem type, use the arrow keys to position the cursor next to the Modem Type you wish to change and press <Enter>. If the Transmit Clock mode is set to Internal (step 6b), then this field is automatically set to "N/A" and cannot be changed. Otherwise the choices are EIA-232 and EIA-422.

7. Concentrator Sync Line Configuration

Next, you will be asked to set up the concentrator's sync line parameters (this will not affect the sync line parameters you set for the host adapter). You will see a screen similar to the following:

```
C/X Concentrator Sync Line Configuration

            Line      Mode      TX Clock      Speed

  Conc 1  > 1       8-Wire    Internal      1.2M
  Conc 2    1       8-Wire    Internal      1.2M
  Conc 3    1       8-Wire    Internal      1.2M
  Conc 4    1       8-Wire    Internal      1.2M
  Conc 5    2       8-Wire    Internal      1.2M
  Conc 6    2       8-Wire    Internal      1.2M
  Conc 7    2       8-Wire    Internal      1.2M
  Conc 8    2       8-Wire    Internal      1.2M

                                      <ESC> to Quit
```

Note that only the Line number and Speed can be changed, and that the speed of the last concentrator on each line will always reflect the host adapter's speed setting for that line.

7a. Sync Line Selection

By default, concentrators 1 through 4 will be placed on Line 1, and concentrators 5 through 8 will be placed on Line 2. To redistribute the concentrators, use the up, down, left and right arrow keys to move the pointer to the Line number of the concentrator you wish to change, and press <Enter>. Note that configuring any concentrator for Line 1 will automatically change all lower-numbered concentrators to Line 1, and setting any concentrator to Line 2 will automatically change all higher-numbered concentrators to Line 2.

7b. Line Speed Selection

By default, all concentrators will be assigned the maximum line speed for their wiring mode (1.2 megabaud for 8-wire and 460K for 4-wire), except the last concentrator in the daisy chain, which will be set for the same line speed as the host adapter line to which the concentrators are attached. Under normal circumstances, this setting should not be changed (changing the line speed will degrade the performance of all concentrators connected to this host adapter synchronous line).

8. Changing the C/X Host Adapter's Name

You will now be given the opportunity to change the name of the host adapter. By default, host adapters are named "DigiCX00" through "DigiCX03". You will see:

```
        Change C/X Host Adapter Name
   Current Name   : DigiCX00

   Enter New Name :

   <ENTER> to Accept Current Name
```

To keep the default name, simply press <Enter>.

This completes the procedure for adding host adapters to the configuration.

Removing Boards

To remove a host adapter from the configuration, select “Delete Board” from the main (“Available Options”) menu. Then, in the Driver Configuration box, move the pointer to the board you wish to remove, and press <Enter>.

Digi Driver Configuration

	Brd Type	I/O Addr	Mem Addr	#Concs	Brd#	Brd Name
>	ISA	Port 108h	0D8000h	8	0	DigiCX00
	ISA	Port 118h	0D8000h	8	1	DigiCX01
	ISA	Port 208h	0D8000h	8	2	DigiCX02
	ISA	Port 218h	0D8000h	8	3	DigiCX03

Enabling and Disabling the AltPin Feature

This feature internally swaps the signals DCD (Data Carrier Detect) and DSR (Data Set Ready). This is useful for concentrator models that are equipped with RJ-45 modular jacks for the serial connections. The DCD signal is normally on pin 10 of the RJ-45 jack, which makes it inaccessible to 8-pin RJ-45 plugs.

When the AltPin feature is enabled, pin 2 of the 10-pin RJ-45 connector will be interpreted by the driver as the DCD signal. This corresponds to pin 1 of an 8-pin RJ-45 connector. Pin 10 then becomes DSR. Be sure that your cabling reflects this configuration.

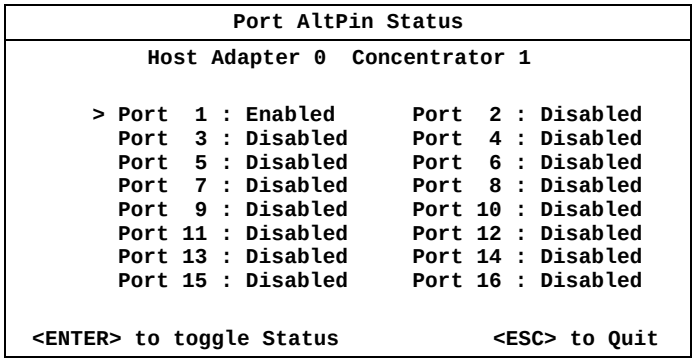
To configure the AIO driver to use the alternate pin assignments, select "Set AltPin Option" from the main ("Available Options") menu, then select the board from the Driver Configuration box:

```
                    Digi Driver Configuration
  Brd Type    I/O Addr    Mem Addr    #Concs    Brd#    Brd Name

> ISA         Port 108h   0D8000h       8       0      DigiCX00
  ISA         Port 118h   0D8000h       8       1      DigiCX01
  ISA         Port 208h   0D8000h       8       2      DigiCX02
  ISA         Port 218h   0D8000h       8       3      DigiCX03
```

Now you will be shown a list of the concentrators attached to that host adapter. Choose the concentrator you wish to configure for AltPin by positioning the pointer and press <Enter>.

```
          Select C/X Concentrator for AltPin Configuration
              Line     Mode     TX Clock     Speed

> Conc 1      1     8-Wire    Internal     1.2M
  Conc 2      1     8-Wire    Internal     1.2M
  Conc 3      1     8-Wire    Internal     1.2M
  Conc 4      1     8-Wire    Internal     1.2M
  Conc 5      2     8-Wire    Internal     1.2M
  Conc 6      2     8-Wire    Internal     1.2M
  Conc 7      2     8-Wire    Internal     1.2M
  Conc 8      2     8-Wire    Internal     1.2M

                                        <ESC> to Quit
```

You will now see a list of the ports on the selected concentrator, and their AltPin status. Use the up, down, left and right arrow keys to position the pointer by the port you wish to change. Press <Enter> to toggle the AltPin status of the selected port.



Selecting the AIO Version

The AIO driver needs to be configured to specify what method is to be used for numbering boards. In AIO versions 1.02 and earlier, board numbers were assigned sequentially in the order in which the boards were added to the configuration. In versions 1.03 and later, the board numbers are dependent upon the I/O port addresses (Port 108 = Board 0, Port 118 = Board 1, etc.), and therefore may not appear in sequential order in the Driver Configuration box.

The Digi AIO driver may be configured to use either numbering style. From the main ("Available Options") menu, select "Set AIO Version". You will see the following menu:

```
AIO Version : V1.02
> V1.02 and earlier
  V1.03 and later
```

Move the pointer to the appropriate line and press <Enter>.

Note: It is recommended that you choose the 1st option, V1.02 and earlier, so the boards are numbered sequentially.

The V1.02 option should also be selected if you are running Cheyenne FaxServe, which requires ports to be numbered sequentially.

Note: This parameter does not specify the version of AIO that you are running. It specifies the style of port numbering to be used.

Saving the Configuration

Once all parameters have been set as desired, select "Exit" from the main ("Available Options") menu. When asked if you want to save the configuration, answer "Y" to save the changes, or "N" to leave the driver unchanged.

Loading the AIO Driver

To load the configured AIO driver, enter the following command on the server's console:

```
load aiodgcx
```

Upon successfully loading the driver, the following banner message (or similar) will appear:

```
NetWare AIO Digi C/X Driver
Version 1.11    May 7, 1996
Copyright 1996, Digi International Inc. All rights reserved.

Board 0 :  Port 208, Mem D0000 - Initialized successfully.
```

The driver is now ready for use.

Changing the AIO Driver's Configuration

To reconfigure the AIO driver, enter the following command on the server's console:

```
load aiocxcfg
```

You will be shown the current configuration, and the "Available Options" menu. Make the desired changes and save the new configuration.

If you wish to reset the configuration to default values, delete the data file **DGCXDATA.CFG** from the **SYS:SYSTEM** directory.

Error Messages

If there is a problem with the installation, one or more of the following error messages may appear after you load the driver.

***Error: Driver Already Loaded.**

This message will appear if the driver is presently loaded. To reload the driver you must first unload the present memory copy of the driver by entering **unload aiodgcx** at the server console. Then you may reload the driver.

***Error: Driver Configured for 0 Boards. Configure Driver with AIOCXCFG.NLM.**

This message indicates that the driver is configured for 0 boards. You must **load aiocxcfg** to configure the driver to support at least one board.

***Error: This is a Micro Channel system. Please use AIODGMCX.NLM.**

This message will appear if an attempt is made to load the driver on a Micro Channel system. A separate driver, **AIODGMCX.NLM** is required for Micro Channel systems.

***Error: AllocateIOResourceTag failed.**
***Error: Allocate Resource Tag failed.**
***Error: AllocateAESResourceTag failed.**
***Error: Allocation of PortConfig memory failed.**
***Error: Allocation of PortStats memory failed.**

These messages indicate that the driver encountered difficulties while trying to obtain resources from AIO. This usually indicates that the system is out of resources. Unload any unnecessary NLMs and reload the driver.

***Error: AIORegisterDriver failed (code=xx).**

This message indicates that another driver has already registered the C/X hardware type (possibly illegally). Unload other AIO drivers and reload the C/X AIO driver.

Board 0 : Port 208, Mem D0000 - Port 208 not found.

This message indicates that the driver could not find a board with port 208h. Check to insure that you have specified the correct I/O port or that you have properly configured the board's port address.

Board 0 : Port 208, Mem D0000 - Hardware Reset fails.

This message indicates that the driver could not place the board into a reset state. This is most likely the result of an I/O port address conflict or a faulty board. Be sure that there are no other I/O ports in your system at the indicated I/O port address.

Board 0 : Port 208, Mem D0000 - AIORegisterBoard failed (code=xx).

This message indicates that an error occurred while trying to register the board with AIO. This failure is usually the result of no system resources, or a duplicate board number. Check the driver configuration for duplicate board numbers. If none exist, unload unnecessary NLMs to free system resources.

Board 0 : Port 208, Mem D0000 - Failed Hardware Registration.

This message indicates that an error occurred while trying to register the board's specific hardware addresses with AIO.

The following error messages are usually the result of memory and/or I/O address conflicts with other devices within your system. Insure that no such conflicts exist. If errors persist, your board may be defective.

Board 0 : Port 208, Mem D0000 - Memory not found error x.

This message indicates that the driver could not find the board's memory. x indicates the number of memory errors found in a 256 byte block.

Board 0 : Port 208, Mem D0000 - Memory error x.

This message indicates that the driver has found the board's memory, but it appears to be faulty. x indicates the number of errors found in a 256 byte block.

Board 0 : Port 208, Mem D0000 - Memory fails disable x.

This message indicates that the board's memory could not be disabled.

Board 0 : Port 208, Mem D0000 - BIOS fails initialization.

This message indicates that the board's on-board BIOS did not initialize properly.

Board 0 : Port 208, Mem D0000 - NMI Fails during FEPOS execution.

This message indicates a failure during transfer of the on-board operating system code.

Board 0 : Port 208, Mem D0000 - FEPOS Fails Initialization.

This message indicates that the on-board operating system did not initialize successfully.

Board 0 : Port 208, Mem D0000 - Command <x> failure during Initialization.

This message indicates that the on-board operating system encountered a failure during initialization of the asynchronous channels.

Board 0 : Port 208, Mem D0000 - Memory Fails Window Test.

This message indicates that the board fails to window it's memory pages correctly.

AccelePort C/X PCI

Overview

Digi's support for Novell compatible asynchronous applications is provided through a universal driver conforming to the "AIO" (Asynchronous Input/Output) specification. Use the AIO driver when Digi hardware is being installed in the file server (or machine with run-time NetWare). When Digi hardware is installed in a machine other than the server, use the specific driver for that application.

AIO drivers are loaded on the file server from the system console (or **RCONSOLE**) command line or the **AUTOEXEC.NCF** file. Installation is performed simply by copying the driver files **AIODGCXP.NLM**, **AIODGCXP.ADI**, **AIOCXPDT.NLM** and **DGCXPCFG.NLM** from the distribution diskette to the system directory of the file server.

Compatibility

Digi's AIO driver supports the PCI version of the Digi C/X system.

The driver will support up to four Digi C/X PCI host adapters on PCI bus servers. These C/X host adapters are automatically configured for unique memory addresses.

Concentrators may be connected locally (direct wiring), or remotely (via high-speed synchronous modems). This driver supports one modem pair per synchronous line, and the modems must be installed between the host adapter and the first concentrator (i.e. local and remote concentrators may not be combined on a single synchronous line).

Installation and Configuration

Copying the Files

To install the Digi AIO driver, simply copy the relevant files to your file server. The Digi AIO files should be copied to the system directory of the file server, typically called **F:\SYSTEM**. Copy the files from a workstation to the file server with the commands:

```
COPY A:\CXP\AIODGCXP.NLM F:\SYSTEM
COPY A:\CXP\AIODGCXP.ADI F:\SYSTEM\AIO
COPY A:\CXP\DGCXPCFG.NLM F:\SYSTEM
COPY A:\CXP\AIOCXPDT.NLM F:\SYSTEM
```

Configuring the AIO Driver

Before the AIO driver can be loaded for the first time, it must be configured to match the Digi C/X PCI System hardware you have installed in your server. The configuration program, **DGCXPCFG.NLM**, creates a data file in **SYS:SYSTEM** called **DGCXP.CFG**. **AIOCXPDT.NLM** reads this file at driver load and returns the configuration to the **AIODGCXP.NLM** driver. The new configuration can be changed by re-running the configuration utility or by deleting the data file **DGCXP.CFG** from the **SYS:SYSTEM** directory. Note that this will clear out the configuration.

When updating to future releases of this driver, the **DGCXP.CFG** file will still contain your configuration. To reset this configuration, simply delete the data file **DGCXP.CFG** from the **SYS:SYSTEM** directory.

To configure the AIO driver, enter the following command from the server:

```
load dgcxpcfg
```

You will see the banner for the configuration utility:

```
Digi C/X PCI AIO Driver Configuration Utility                V 1.00
```

Below the banner, the current driver configuration will be displayed

```
                    Digi C/X PCI Driver Configuration

  Brd Type       Mem Addr       #Concs       Brd#       Brd Name

                  DGCXPCFG.NLM configured for 0 Boards
```

Below the configuration display a box will appear listing the available configuration options:

```
    Available Options
>   Add Board
    Delete Board
    Change Board Parameters
    Configure Sync Lines
    Set Altpin Option
    Exit
```

Adding Boards

1. To add a host adapter to the configuration, use the up and down arrow keys to position the pointer next to "Add Board" and press <Enter>. Once "C/X PCI Host Adapter(s) has been selected, the configuration program will search the system for all C/X PCI host adapters. When a board is found, the configuration program will put up a series of menus requesting information about the host adapter and synchronous line configuration. These are the same menus that come up if you select "Change Board Parameters" and "Configure Sync Lines" from the main "Available Options" menu.

2. Host Adapter Sync Line Configuration

Now you need to set up the host adapter's synchronous line parameters. These include the wiring mode (4 or 8 wire), Transmit Clock mode (Internal or External) and the baud rate. The following screen will come up automatically:

```
                C/X PCI Host Adapter Sync Line Configuration

  Line     Mode     TX Clock     Speed     Modem     Concentrators
    1    > 8-Wire   Internal     1.2M      N/A             1
    2      8-Wire   Internal     1.2M      N/A             0

                                <ESC> to Quit
```

2a. Wiring Mode

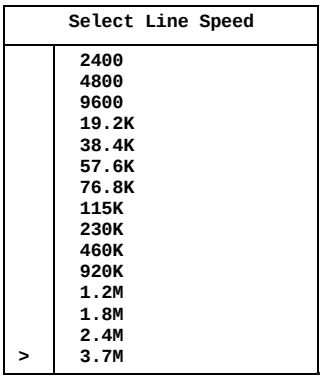
To change the wiring mode, use the arrow keys to place the pointer next to the wiring mode you wish to change, then press <Enter>. For maximum throughput under moderate to heavy loads, 8-Wire mode is recommended. If the concentrators are to be located at a remote site and connected to the host adapter via high-speed synchronous modems, 8-Wire mode is required.

2b. Transmit Clock Mode

To change the Transmit Clock mode, use the arrow keys to place the pointer next to the TX Clock mode you wish to change, then press <Enter>. Select Internal for local (hard-wired) concentrators, and External for remote concentrators (connected via high-speed synchronous modems).

2c. Line Speed Selection

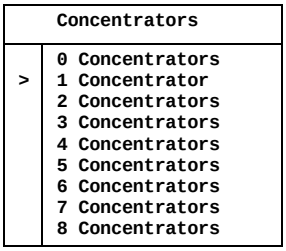
Now choose the baud rate for the synchronous lines. Use the arrow keys to place the pointer next to the Line Speed you wish to change, then press <Enter>. If you chose 8-Wire, Internal clocking above, and *all* concentrators on the line are EPC/CON-16 concentrators, the recommended Line Speed is 3.7 megabaud ("3.7M"). If you chose 4-Wire, Internal clocking, the maximum baud rate is 460K. If you are using high-speed synchronous modems to connect to remote concentrators, use the fastest baud rate supported by your modems. *If you have any C/CON-16 or C/CON-8 concentrators on the line, the maximum line speed is 1.2M.*



Note: Line speeds above 1.2M are supported *only* when *all* concentrators on a particular sync line are EPC/CON-16.

2d. Number of Concentrators

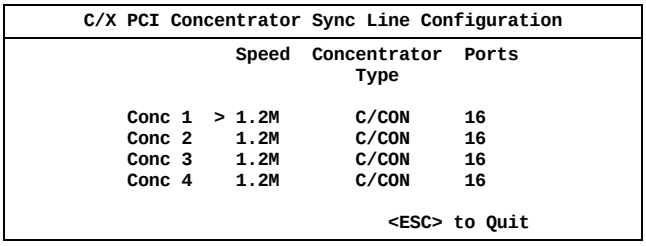
Now specify the number of concentrators connected to each line of the host adapter. You can have up to 8 concentrators on a line, but the total number (on both lines) must not exceed 8. Use the arrow keys to position the pointer next to the "Concentrators" option and press <Enter>. You will see:



Use the arrow keys to select the appropriate number and press <Enter>.

3. Concentrator Sync Line Configuration

Once you've set the number of concentrators on a sync line, you will be asked to set up each concentrator's sync line parameters (this will not affect the sync line parameters you set for the host adapter unless you specify a C/CON-16 concentrator on a line whose speed is greater than 1.2M). You will see a screen similar to the following:



3a. Line Speed Selection

By default, all concentrators will be assigned the maximum line speed for their wiring mode (1.2 megabaud for 8-wire and 460K for 4-wire), except the last concentrator in the daisy chain, which will be set for the same line speed as the host adapter line to which the concentrators are attached. Under normal circumstances, this setting should not be changed (changing the line speed will degrade the performance of all concentrators connected to this host adapter synchronous line).

3b. Concentrator Type Selection

EPC/CON-16, C/CON-16 and C/CON-8 concentrators can be connected to the C/X PCI host adapter. The Type setting defaults to C/CON.

4. Changing the C/X PCI Host Adapter's Name

You will now be given the opportunity to change the name of the host adapter. By default, host adapters are named "DigiCXP0" through "DigiCXP3". Select "Change Board Parameters" from the main ("Available Options") menu, then select "Host Adapter Name" to get this screen:

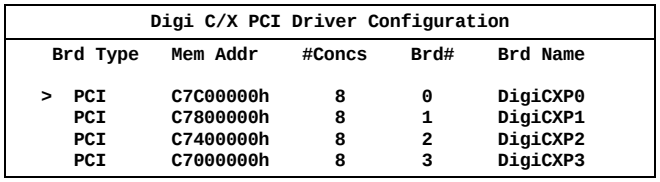
```
          Change C/X PCI Host Adapter Name
   Current Name   : DigiCXP0

   Enter New Name :

   <ENTER> to Accept Current Name
```

To keep the default name, simply press <Enter>.

This completes the procedure for adding host adapters to the configuration.

Removing Boards

To remove a C/X PCI host adapter from the configuration, select "Delete Board" from the main ("Available Options") menu. Then, in the Driver Configuration box, move the pointer to the board you wish to remove, and press <Enter>.



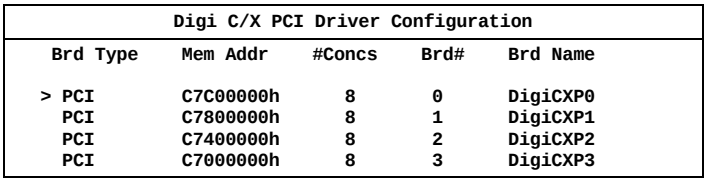
The board you removed should no longer appear in the driver configuration box.

Enabling and Disabling the AltPin Feature

This feature internally swaps the signals DCD (Data Carrier Detect) and DSR (Data Set Ready). This is useful for concentrator models that are equipped with RJ-45 modular jacks for the serial connections. The DCD signal is normally on pin 10 of the RJ-45 jack, which makes it inaccessible to 8-pin RJ-45 plugs.

When the AltPin feature is enabled, pin 2 of the 10-pin RJ-45 connector will be interpreted by the driver as the DCD signal. This corresponds to pin 1 of an 8-pin RJ-45 connector. Pin 10 then becomes DSR. Be sure that your cabling reflects this configuration.

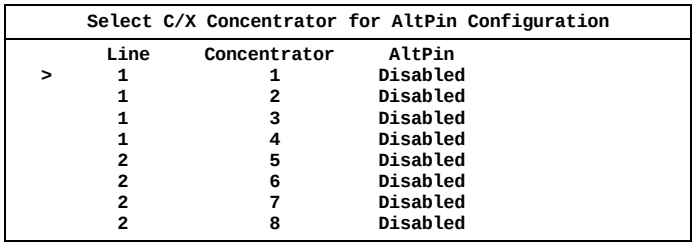
To configure the AIO driver to use the alternate pin assignments, select "Set AltPin Option" from the main ("Available Options") menu, then select the board from the Driver Configuration box:



Digi C/X PCI Driver Configuration

	Brd Type	Mem Addr	#Concs	Brd#	Brd Name
>	PCI	C7C00000h	8	0	DigiCXP0
	PCI	C7800000h	8	1	DigiCXP1
	PCI	C7400000h	8	2	DigiCXP2
	PCI	C7000000h	8	3	DigiCXP3

Now you will be shown a list of the concentrators attached to that host adapter. Choose the concentrator you wish to configure for AltPin by positioning the pointer and press <Enter>.



Select C/X Concentrator for AltPin Configuration

	Line	Concentrator	AltPin
>	1	1	Disabled
	1	2	Disabled
	1	3	Disabled
	1	4	Disabled
	2	5	Disabled
	2	6	Disabled
	2	7	Disabled
	2	8	Disabled

Enabling or disabling AltPin affects all ports on the specified concentrator.

Saving the Configuration

Once all parameters have been set as desired, select “Exit” from the main (“Available Options”) menu. When asked if you want to save the configuration, answer “**Y**” to save the changes, or “**N**” to leave the driver unchanged.

Loading the AIO Driver

To load the configured AIO driver, enter the following command on the server's console:

```
load aiodgcxp
```

Upon successfully loading the driver, the following banner message (or similar) will appear:

```
NetWare AIO Digi C/X PCI Driver
Version 1.00    October 22, 1996
Copyright 1996, Digi International Inc. All rights reserved.

Board 0 : Mem C7C00000 - Initialized successfully.
```

The driver is now ready for use.

Changing the AIO Driver's Configuration

To reconfigure the AIO driver, enter the following command on the server's console:

```
load dgcxpcfg
```

You will be shown the current configuration, and the "Available Options" menu. Make the desired changes (the various menus are described in the preceding pages of this manual) and save the new configuration.

If you wish to reset the configuration to default values, delete the data file **DGCXP.CFG** from the **SYS:SYSTEM** directory.

Error Messages

If there is a problem with the installation, one or more of the following error messages may appear after you load the driver.

***Error: Driver Already Loaded.**

This message will appear if the driver is presently loaded. To reload the driver you must first unload the present memory copy of the driver by entering **unload aiodgcxp** at the server console. Then you may reload the driver.

***Error: Driver Configured for 0 Boards. Configure Driver with DGCXPCFG.NLM.**

This message indicates that the driver is configured for 0 boards. You must **load dgcxpcfg** to configure the driver to support at least one board.

***Error: AllocateIOResourceTag failed.**
***Error: Allocate Resource Tag failed.**
***Error: AllocateAESResourceTag failed.**
***Error: Allocation of PortConfig memory failed.**
***Error: Allocation of PortStats memory failed.**

These messages indicate that the driver encountered difficulties while trying to obtain resources from AIO. This usually indicates that the system is out of resources. Unload any unnecessary NLMs and reload the driver.

***Error: AIORegisterDriverA failed (code=xx).**

This message indicates that another driver has already registered the C/X PCI hardware type (possibly illegally). Unload other AIO drivers and reload the C/X PCI AIO driver.

Board 0 : Mem C7C00000 - Hardware Reset fails.

This message indicates that the driver could not place the board into a reset state. This is most likely the result of an I/O port address conflict or a faulty board. Be sure that there are no other I/O ports in your system at the indicated I/O port address.

Board 0 : Mem C7C00000 - AIORegisterBoard failed (code=xx).

This message indicates that an error occurred while trying to register the board with AIO. This failure is usually the result of no system resources, or a duplicate board number. Check the driver configuration for duplicate board numbers. If none exist, unload unnecessary NLMs to free system resources.

Board 0 : Mem C7C00000 - Failed Hardware Registration.

This message indicates that an error occurred while trying to register the board's specific hardware addresses with AIO.

The following error messages are usually the result of memory and/or I/O address conflicts with other devices within your system. Insure that no such conflicts exist. If errors persist, your board may be defective.

Board 0 : Mem C7C00000 - Memory not found error x.

This message indicates that the driver could not find the board's memory. x indicates the number of memory errors found in a 256 byte block.

Board 0 : Mem C7C00000 - Memory error x.

This message indicates that the driver has found the board's memory, but it appears to be faulty. x indicates the number of errors found in a 256 byte block.

Board 0 : Mem C7C00000 - BIOS fails initialization.

This message indicates that the board's on-board BIOS did not initialize properly.

Board 0 : Mem C7C00000 - NMI Fails during FEPOS execution.

This message indicates a failure during transfer of the on-board operating system code.

Board 0 : Mem C7C00000 - FEPOS Fails Initialization.

This message indicates that the on-board operating system did not initialize successfully.

Board 0 : Mem C7C00000 - Command <x> failure during Initialization.

This message indicates that the on-board operating system encountered a failure during initialization of the asynchronous channels.

AccelePort EPC/X

Overview

Digi's support for Novell compatible asynchronous applications is provided through a universal driver conforming to the "AIO" (Asynchronous Input/Output) specification. Use the AIO driver when Digi hardware is being installed in the file server (or machine with run-time NetWare). When Digi hardware is installed in a machine other than the server, use the specific driver for that application.

AIO drivers are loaded on the file server from the system console (or **RCONSOLE**) command line or the **AUTOEXEC.NCF** file. Installation is performed by copying the driver files **AIODGEPC.NLM**, **AIODGEPC.ADI**, **AIODGMEM.NLM**, **AIOEPCDT.NLM**, **AIOEPCFG.NLM**, **DGEPCXF.BIN**, **DGEPCXPF.BIN**, **DGEPCXB.BIN**, **DGEPCXBF.BIN**, **DGSER.NLM**, **DGT1CFG.NLM** and **FEPMNGR.NLM** from the distribution diskette to the system directory of the file server.

Compatibility

Digi's AIO driver will support up to four Digi EPC/X host adapters on ISA, EISA and PCI bus servers. These EPC/X host adapters may be configured to use the same memory address ("stacked") or may be configured for unique addresses.

Concentrators may be connected locally (direct wiring), or remotely (via high-speed synchronous modems). This driver supports one modem pair per synchronous line, and the modems must be installed between the host adapter and the first concentrator (i.e. local and remote concentrators may not be combined on a single synchronous line).

Installation and Configuration

Copying the Files

To install the Digi AIO driver, simply copy the relevant files to your file server. The Digi AIO files should be copied to the system directory of the file server, typically called **F:\SYSTEM**. Copy the files from a workstation to the file server with the commands:

```
COPY A:\EPC\AIODGEPC.NLM F:\SYSTEM
COPY A:\EPC\AIODGEPC.ADI F:\SYSTEM\AIO
COPY A:\EPC\AIOEPCFG.NLM F:\SYSTEM
COPY A:\EPC\AIODGMEM.NLM F:\SYSTEM
COPY A:\EPC\AIOEPCDT.NLM F:\SYSTEM
COPY A:\EPC\DGEPCXF.BIN F:\SYSTEM
COPY A:\EPC\DGEPCXPF.BIN F:\SYSTEM
COPY A:\EPC\DGEPCXB.BIN F:\SYSTEM
COPY A:\EPC\DGEPCXBF.BIN F:\SYSTEM
COPY A:\EPC\DGSER.NLM F:\SYSTEM
COPY A:\EPC\DGT1CFG.NLM F:\SYSTEM
COPY A:\EPC\FEPMNGR.NLM F:\SYSTEM
```

Configuring the AIO Driver

Before the AIO driver can be loaded for the first time, it must be configured to match the Digi EPC/X System hardware you have installed in your server. The configuration program, **AIOEPCFG.NLM**, creates a data file in **SYS:SYSTEM** called **DGEPCX.CFG**. **AIOEPCDT.NLM** reads this file at driver load and returns the configuration to the **AIODGEPC.NLM** driver. The new configuration can be changed by re-running the configuration utility or by deleting the data file **DGEPCX.CFG** from the **SYS:SYSTEM** directory. Note that this will clear out the configuration.

When updating to future releases of this driver, the **DGEPCX.CFG** file will still contain your configuration. To reset this configuration, simply delete the data file **DGEPCX.CFG** from the **SYS:SYSTEM** directory.

To configure the AIO driver, enter the following command from the server:

```
load aioepcfg
```

You will see the banner for the configuration utility:

```
Digi EPC/X AIO Driver Configuration Utility                    V 2.00
```

Below the banner, the current driver configuration will be displayed. On ISA and EISA servers, the configuration fields will be empty, as shown below:

```
                    Digi EPC/X Driver Configuration

   Brd Type     I/O Addr     Mem Addr     #Concs     Brd#     Brd Name

                  AIODGEPC.NLM configured for 0 Boards
```

Below the configuration display a box will appear listing the available configuration options:

```
    Available Options
>   Add Board
    Delete Board
    Change Board Parameters
    Configure Sync Lines
    Set Altpin Option
    Set AIO Version
    Exit
```

Adding Boards

1. To add an ISA or EISA host adapter to the configuration, use the up and down arrow keys to position the pointer next to "Add Board" and press <Enter>. The configuration program will put up a series of menus requesting information about the host adapter and synchronous line configuration. These are the same menus that come up if you select "Change Board Parameters" and "Configure Sync Lines" from the main "Available Options" menu.

To add a PCI host adapter to the configuration, use the up and down arrow keys to position the pointer next to "Add Board" and press <Enter>. Once "PCI EPC/X Host Adapter(s)" has been selected, the configuration program will search the system for all PCI EPC/X host adapters. When a board is found, proceed to step 4 (I/O and memory options are configured automatically).

2. I/O Options

(ISA Host Adapters)

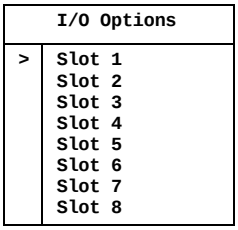
You will first be asked to specify the board's I/O port address (as set on the board's DIP switches):

	I/O Options
>	Port 108h Port 118h Port 128h Port 208h Port 228h Port 308h Port 328h

If you are installing an ISA host adapter in an EISA server, you will also be asked for the number of the slot in which the board resides.

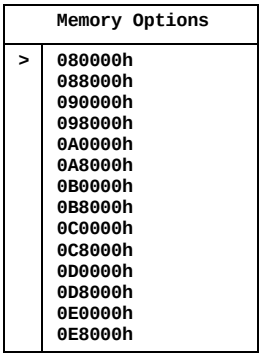
(EISA Host Adapters)

You will now be asked to specify the board's slot number:



3. Memory Options (ISA and EISA)

Now you will be asked to select a starting address for the board's shared memory. Multiple EPC/X host adapters may use the same starting address. Note that while there are 14 address options, many of these will be unavailable due to other memory and peripheral considerations. The addresses most likely to be available are 0D8000h and 0D0000h.



4. Host Adapter Sync Line Configuration

Now you need to set up the host adapter's synchronous line parameters. These include the wiring mode (4 or 8 wire), Transmit Clock mode (Internal or External) and the baud rate. You will see the following:

```
                    EPC/X Host Adapter Sync Line Configuration

  Line     Mode     TX Clock     Speed     Modem     Concentrators
    1    > 8-Wire   Internal     10.0M      N/A             1
    2      8-Wire   Internal     10.0M      N/A             0

                                <ESC> to Quit
```

4a. Wiring Mode

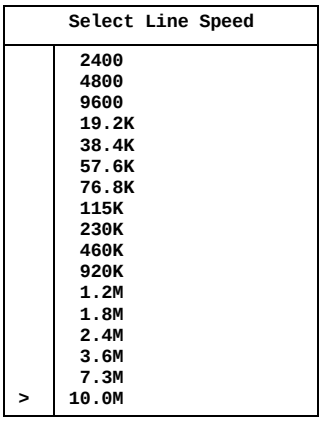
To change the wiring mode, use the arrow keys to place the pointer next to the wiring mode you wish to change, then press <Enter>. For maximum throughput under moderate to heavy loads, 8-Wire mode is recommended. If the concentrators are to be located at a remote site and connected to the host adapter via high-speed synchronous modems, 8-Wire mode is required.

4b. Transmit Clock Mode

To change the Transmit Clock mode, use the arrow keys to place the pointer next to the TX Clock mode you wish to change, then press <Enter>. Select Internal for local (hard-wired) concentrators, and External for remote concentrators (connected via high-speed synchronous modems).

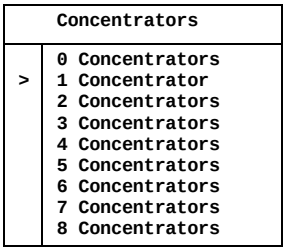
4c. Line Speed Selection

Now choose the baud rate for the synchronous lines. Use the arrow keys to place the pointer next to the Line Speed you wish to change, then press <Enter>. If you chose 8-Wire, Internal clocking above, and *all* concentrators on the line are EPC/CON-16 concentrators, the recommended Line Speed is 10.0 megabaud ("10.0M"). If you chose 4-Wire, Internal clocking, the maximum baud rate is 460K. If you are using high-speed synchronous modems to connect to remote concentrators, use the fastest baud rate supported by your modems. *If you have any C/CON-16 or C/CON-8 concentrators on the line, the maximum line speed is 1.2M.*



4d. Number of Concentrators

Now specify the number of concentrators connected to each line of the host adapter. You can have up to 8 concentrators on a line, but the total number (on both lines) must not exceed 14. If EBI (PORTS) modules are connected to any of the concentrators, the combined number of ports on both sync lines must not exceed 224. Use the arrow keys to position the pointer next to the "Concentrators" option and press <Enter>. You will see:



Use the arrow keys to select the appropriate number and press <Enter>.

5. Concentrator Sync Line Configuration

Once you've set the number of concentrators on a sync line, you will be asked to set up each concentrator's sync line parameters (this will not affect the sync line parameters you set for the host adapter unless you specify a C/CON-16 concentrator on a line whose speed is greater than 1.2M). You will see a screen similar to the following:

```
        EPC/X Concentrator Sync Line Configuration

            Speed    Type    Ports   EBI 1   EBI 2   EBI 3

Conc 1  > 10.0M   EPC/CON    16       0       0       0
Conc 2    10.0M   EPC/CON    16       0       0       0
Conc 3    10.0M   EPC/CON    16       0       0       0
Conc 4    10.0M   EPC/CON    16       0       0       0

                                    <ESC> to Quit
```

5a. Line Speed Selection

By default, all concentrators will be assigned the maximum line speed for their wiring mode (10.0 megabaud for 8-wire and 460K for 4-wire), except the last concentrator in the daisy chain, which will be set for the same line speed as the host adapter line to which the concentrators are attached. Under normal circumstances, this setting should not be changed (changing the line speed will degrade the performance of all concentrators connected to this host adapter synchronous line).

5b. Concentrator Type Selection

EPC/CON-16, C/CON-16, C/CON-8 concentrators and T1 Modem Banks can be connected to the EPC/X host adapter. The Type setting defaults to EPC/CON. If a C/CON concentrator is installed on the line, then set the appropriate concentrator's type to C/CON. Doing this will change the Line Speed to 1.2M (the maximum speed for a C/CON concentrator).

5c. EBI Modules

EBI (Extended Bus Interface) modules include PORTS/16em, PORTS/8em, PORTS/8emp, Modem/8em and Modem/4em modules.

If EBI modules are connected to an EPC/CON-16 concentrator, you must configure the EBI 1, EBI 2 and EBI 3 settings appropriately. Use the arrow keys to position the pointer next to the EBI module you wish to configure and press <Enter>. Select the type of EBI module from the displayed list. To remove an EBI module, select None.

6. Changing the EPC/X Host Adapter's Name

You will now be given the opportunity to change the name of the host adapter. By default, host adapters are named "DigiEPC0" through "DigiEPC3". You will see:

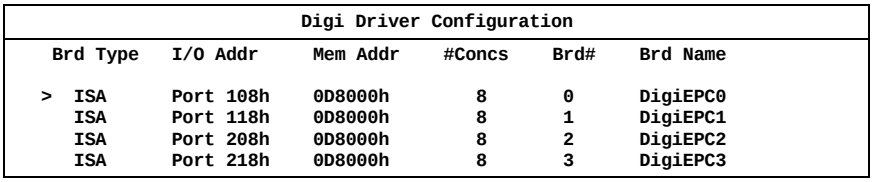
```
          Change EPC/X Host Adapter Name
   Current Name   : DigiEPC0

   Enter New Name :

   <ENTER> to Accept Current Name
```

To keep the default name, simply press <Enter>.

This completes the procedure for adding host adapters to the configuration.

Removing Boards

To remove an ISA, EISA or PCI host adapter from the configuration, select "Delete Board" from the main ("Available Options") menu. Then, in the Driver Configuration box, move the pointer to the board you wish to remove, and press <Enter>.

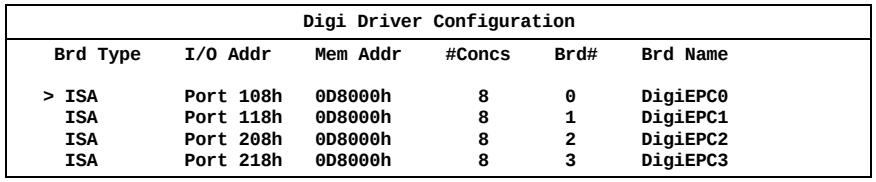


Enabling and Disabling the AltPin Feature

This feature internally swaps the signals DCD (Data Carrier Detect) and DSR (Data Set Ready). This is useful for concentrator models that are equipped with RJ-45 modular jacks for the serial connections. The DCD signal is normally on pin 10 of the RJ-45 jack, which makes it inaccessible to 8-pin RJ-45 plugs.

When the AltPin feature is enabled, pin 2 of the 10-pin RJ-45 connector will be interpreted by the driver as the DCD signal. This corresponds to pin 1 of an 8-pin RJ-45 connector. Pin 10 then becomes DSR. Be sure that your cabling reflects this configuration.

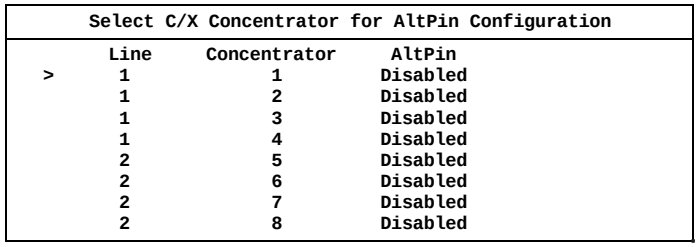
To configure the AIO driver to use the alternate pin assignments, select "Set AltPin Option" from the main ("Available Options") menu, then select the board from the Driver Configuration box:



Digi Driver Configuration

	Brd Type	I/O Addr	Mem Addr	#Concs	Brd#	Brd Name
>	ISA	Port 108h	0D8000h	8	0	DigiEPC0
	ISA	Port 118h	0D8000h	8	1	DigiEPC1
	ISA	Port 208h	0D8000h	8	2	DigiEPC2
	ISA	Port 218h	0D8000h	8	3	DigiEPC3

Now you will be shown a list of the concentrators attached to that host adapter. Choose the concentrator you wish to configure for AltPin by positioning the pointer and press <Enter>.



Select C/X Concentrator for AltPin Configuration

	Line	Concentrator	AltPin
>	1	1	Disabled
	1	2	Disabled
	1	3	Disabled
	1	4	Disabled
	2	5	Disabled
	2	6	Disabled
	2	7	Disabled
	2	8	Disabled

Enabling or disabling AltPin affects all ports on the specified concentrator.

AltPin must be disabled for T1 Modem Bank devices.

Selecting the AIO Version

The AIO driver needs to be configured to specify what method is to be used for numbering boards. In AIO versions 1.02 and earlier, board numbers were assigned sequentially in the order in which the boards were added to the configuration. In versions 1.03 and later, the board numbers are dependent upon the I/O port addresses (Port 108 = Board 0, Port 118 = Board 1, etc.), and therefore may not appear in sequential order in the Driver Configuration box.

The Digi AIO driver may be configured to use either numbering style. From the main ("Available Options") menu, select "Set AIO Version". You will see the following menu:

AIO Version : V1.02	
>	V1.02 and earlier V1.03 and later

Move the pointer to the appropriate line and press <Enter>.

Note: It is recommended that you choose the 1st option, V1.02 and earlier, so the boards are numbered sequentially.

The V1.02 option should also be selected if you are running Cheyenne FaxServe, which requires ports to be numbered sequentially.

Note: This parameter does not specify to the version of AIO that you are running. It specifies the style of port numbering to be used.

Saving the Configuration

Once all parameters have been set as desired, select "Exit" from the main ("Available Options") menu. When asked if you want to save the configuration, answer "**Y**" to save the changes, or "**N**" to leave the driver unchanged.

Loading the AIO Driver

To load the configured AIO driver, enter the following command on the server's console:

```
load aiodgepc
```

Upon successfully loading the driver, the following banner message (or similar) will appear:

```
NetWare AIO Digi EPC/X Driver
Version 2.00    May 20, 1996
Copyright 1996, Digi International Inc. All rights reserved.

Board 0 :  Port 208, Mem D0000 - Initialized successfully.
```

The driver is now ready for use.

Changing the AIO Driver's Configuration

To reconfigure the AIO driver, enter the following command on the server's console:

```
load aioepcfg
```

You will be shown the current configuration, and the "Available Options" menu. Make the desired changes (the various menus are described in the preceding pages of this manual) and save the new configuration.

If you wish to reset the configuration to default values, delete the data file **DGEPCX.CFG** from the **SYS:SYSTEM** directory.

T1 Modem Bank Configuration

To configure any T1 Modem Banks installed in the EPC/X system, load the device driver (**aiodgepc.nlm**), then load **dgt1cfg.nlm** (or run Quick Manager on a Windows NT workstation or server). Please refer to the Digi T1 Modem Bank documentation for more information.

Error Messages

If there is a problem with the installation, one or more of the following error messages may appear after you load the driver.

***Error: This machine has a Micro Channel bus. Please use AIODGMEP.NLM.**

This device driver does not support Micro Channel adapters. The correct driver for Micro Channel adapters is **AIODGMEP.NLM**.

***Error: Error Registering rfc-1406 for SNMP.**

A problem was encountered while attempting to register the standard dsx1 MIB. Non fatal error.

***Error: Error Registering DigiT1E1 MIB for SNMP.**

The Digi specific MIB could not be registered. Management of this device with Quick Manager will not be possible. Non fatal error.

***Error: Error Registering rfc-1659 for SNMP.**

A problem was encountered while attempting to register the standard EIA-232 MIB. Non fatal error.

***Error: Driver Already Loaded.**

This message will appear if the driver is presently loaded. To reload the driver you must first unload the present memory copy of the driver by entering **unload aiodgepc** at the server console. Then you may reload the driver.

***Error: Driver Configured for 0 Boards. Configure Driver with AIOEPCFG.NLM.**

This message indicates that the driver is configured for 0 boards. You must **load aioepcfg** to configure the driver to support at least one board.

***Error: AllocateIOResourceTag failed.**
***Error: Allocate Resource Tag failed.**
***Error: AllocateAESResourceTag failed.**
***Error: Allocation of PortConfig memory failed.**
***Error: Allocation of PortStats memory failed.**

These messages indicate that the driver encountered difficulties while trying to obtain resources from AIO. This usually indicates that the system is out of resources. Unload any unnecessary NLMs and reload the driver.

***Error: AIORegisterDriverA failed (code=xx).**

This message indicates that another driver has already registered the EPC/X hardware type (possibly illegally). Unload other AIO drivers and reload the EPC/X AIO driver.

***Error: No PCI BIOS entry point found.**

This message indicates that a PCI host adapter was configured, but the driver cannot locate the PCI BIOS.

Fatal error.

Board 0 : Port 208, Mem D0000 - Port 208 not found.

This message indicates that the driver could not find a board with port 208h. Check to insure that you have specified the correct I/O port or that you have properly configured the board's port address.

Board 0 : Port 208, Mem D0000 - Hardware Reset fails.

This message indicates that the driver could not place the board into a reset state. This is most likely the result of an I/O port address conflict or a faulty board. Be sure that there are no other I/O ports in your system at the indicated I/O port address.

Board 0 : Port 208, Mem D0000 - AIORegisterBoard failed (code=xx).

This message indicates that an error occurred while trying to register the board with AIO. This failure is usually the result of no system resources, or a duplicate board number. Check the driver configuration for duplicate board numbers. If none exist, unload unnecessary NLMs to free system resources.

Board 0 : Port 208, Mem D0000 - Failed Hardware Registration.

This message indicates that an error occurred while trying to register the board's specific hardware addresses with AIO.

The following error messages are usually the result of memory and/or I/O address conflicts with other devices within your system. Insure that no such conflicts exist. If errors persist, your board may be defective.

Board 0 : Port 208, Mem D0000 - Memory not found error x.

This message indicates that the driver could not find the board's memory. x indicates the number of memory errors found in a 256 byte block.

Board 0 : Port 208, Mem D0000 - Memory error x.

This message indicates that the driver has found the board's memory, but it appears to be faulty. x indicates the number of errors found in a 256 byte block.

Board 0 : Port 208, Mem D0000 - Memory fails disable x.

This message indicates that the board's memory could not be disabled.

Board 0 : Port 208, Mem D0000 - Unable to load BIOS file (\SYSTEM\DGEPCXB.BIN).

This message indicates that the specified BIOS file was not able to load properly.

Board 0 : Port 208, Mem D0000 - Unable to load BIOS file (\SYSTEM\DGEPCXPB.BIN).

This message indicates that the specified BIOS file was not able to load properly.

Board 0 : Port 208, Mem D0000 - BIOS fails initialization.

This message indicates that the board's on-board BIOS did not initialize properly.

Board 0 : Port 208, Mem D0000 - NMI Fails during FEPOS execution.

This message indicates a failure during transfer of the on-board operating system code.

Board 0 : Port 208, Mem D0000 - Unable to load FEPOS file (\SYSTEM\DGEPCXF.BIN).

This message indicates that the specified FEP/OS file was not able to load properly.

Board 0 : Port 208, Mem D0000 - Unable to load FEPOS file (\SYSTEM\DGEPCXPF.BIN).

This message indicates that the specified FEP/OS file was not able to load properly.

Board 0 : Port 208, Mem D0000 - FEPOS Fails Initialization.

This message indicates that the on-board operating system did not initialize successfully.

Board 0 : Port 208, Mem D0000 - Command <x> failure during Initialization.

This message indicates that the on-board operating system encountered a failure during initialization of the asynchronous channels.

Board 0 : Port 208, Mem D0000 - Memory Fails Window Test.

This message indicates that the board fails to window it's memory pages correctly.

Avanstar Xp PCI Adapters

Overview

Digi's support for Novell compatible asynchronous applications is provided through a universal driver conforming to the "AIO" (Asynchronous Input/Output) specification. Use the AIO driver when Digi hardware is being installed in the file server (or machine with run-time NetWare).

AIO drivers are loaded on the file server from the system console (or **RCONSOLE**) command line or the **AUTOEXEC.NCF** file. Installation is simply a matter of copying of the driver files **AIODGAVN.NLM**, and **AIODGAVN.ADI**.

The device driver supports up to eight Avanstar Xp PCI host adapters. Each Avanstar Xp host adapter supports up to sixteen ports, for a total of up to 128 ports per system.

Installation

To install the Digi AIO driver, simply copy the relevant files to your file server (although the driver can be loaded from the file server floppy, this will not be a typical way to set-up a system). The Digi AIO driver files (**AIODGAVN.NLM** and **AIODGAVN.ADI**) should be copied to the system directory of the file server, typically called **F:\SYSTEM**. Copy the files from a workstation to the file server with the commands:

```
COPY A:\AVAN\AIODGAVN.NLM F:\SYSTEM
COPY A:\AVAN\AIODGAVN.ADI F:\SYSTEM\AIO
```

Loading the Device Driver

If you are running NetWare Connect 2.0, the driver load command line is configured from within the NetWare Connect Console. See the NetWare Connect 2.0 manual for information on installing AIO device drivers. Note that the **AIODGAVN.NLM** and **AIODGAVN.ADI** files must be in the **SYS:SYSTEM** directory so that Connect 2.0 can select **AIODGAVN.NLM** as a loadable driver.

If you are running NetWare Connect 1.x, you must load the driver by hand. The user supplies information to the driver through a set of command line parameters at load time.

The **LOAD** command has the following syntax:

LOAD AIODGAVN [**name=***bname*]

name=*bname*: This parameter is optional and allows you to specify a name stem of up to 10 characters to identify the Avanstar board. *bname* may consist of any combination of alphanumerical characters. If you do not specify a name, the default name, **DigiAvn**, will be assigned by the driver. A two digit board number is appended to the name stem, as shown below:

Board Number	Default Name
0	DigiAvn00
1	DigiAvn01
2	DigiAvn02
3	DigiAvn03
4	DigiAvn04
5	DigiAvn05
6	DigiAvn06
7	DigiAvn07

Avanstar Xp boards are numbered in the order in which they were found by the PCI BIOS, beginning with 0.

Error Messages

The following error messages may occur during driver initialization:

***Error: AllocateResourceTag failed.**

This message indicates that the driver could not allocate resources from NetWare. Unload unnecessary NLMs and reload the driver.

***Error: AIORegisterDriverA failed.**

This message indicates that NetWare failed to permit registration of the driver.

***Error: AllocateSemiPermMemory returns NULL.**

This message indicates that the driver's request to allocate memory failed. Unload unnecessary NLMs and reload the driver.

No usable boards found. / Installed boards already supported.

This message indicates that the driver is already supporting the board(s) that were found.

***AIODGAVN Avanstar Xp support has already been loaded.**

You only need to load the driver once to support all Avanstar Xp boards in the system.

***No PCI BIOS entry point found.**

The driver cannot locate the PCI BIOS. Fatal error.

***No usable PCI boards found.**

No functioning Avanstar Xp boards were found.

The following error messages may occur while the driver is performing some initial tests on the Avanstar Xp board.

Board 4: Failed Hardware Registration.

This message indicates that NetWare failed to accept the driver's attempt to register the board's hardware resources. Note that addresses above C8000000 are remapped below C8000000. If there is no valid address space for the adapter in this range, the error will occur.

Board 4: Hardware Reset Fails.

This message indicates that the driver could not place the board into a reset state.

The following messages may occur during the driver's attempt to initialize the board.

Board 4: BIOS fails initialization.

This message indicates that the host adapter's on-board BIOS did not initialize properly.

Board 4: FEPOS fails initialization.

This message indicates that the on-board operating system did not initialize successfully.

Board 4: FEPOS finds 0 ports.

This message indicates that the on-board operating system initialized successfully, but found no ports.

Board 4: Command failure during Initialization.

This message indicates that the on-board operating system encountered a failure during initialization of the asynchronous channels.