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Software Manual

Digi AccelePort C/X, EPC/X, Xem, Xr and Xe
PC/Xi, PC/Xe, MC/Xi, MC/Xe and COM/Xi

OS/2 Device Drivers

92000244 Rev B

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Introduction

The device driver for the OS/2 operating system supports the following Digi intelligent communications products:

- AccelePort C/X, EPC/X and Xem systems
- AccelePort Xr and Xe boards
- PC/Xe, PC/Xi, MC/Xe, MC/Xi and COM/Xi boards

The OS/2 device driver takes all of its configuration information from the **DEVICE=** command line in **CONFIG.SYS**, and all Digi intelligent products in a system are configured from a single command line.

In addition to the device driver, a configuration utility, **DMODE.EXE** is provided to change communication parameters for individual ports without rebooting. **DMODE.EXE** is similar to the OS/2 **MODE** command, but has some added features, and supports communications devices beyond OS/2's range of COM1 to COM8.

The OS/2 device driver for Digi intelligent products supports only OS/2 applications, or DOS applications that use the INT 21 fct 44 IOCTL interface.

OS/2 provides two native Com device drivers for communication with non intelligent serial ports (e.g. COM1 and COM2). These drivers are **COM.SYS**, the OS/2 native Com port driver, and **VCOM.SYS**, the virtual DOS window Com port driver. These drivers cannot control intelligent serial devices.

Installation

ISA, EISA and Micro Channel Adapters

Before proceeding with the software installation for the OS/2 device driver, you must first install the board(s) according to the instructions in the board's *Installation Guide*.

Before attempting to install the OS/2 Device driver, be sure to run the Memory Map utility to find the required amount of available address space, and the User Diagnostics to verify that the board is working correctly. See the Installation Tips *section of the* Installation Guide *for your board for details.*

The Digi device driver diskette for OS/2 is divided into two main directories: **XALL**, which contains the device driver and support software for ISA, EISA and Micro Channel adapters, and **DIGI_OS2**, which contains the files for PCI adapters.

The **XALL** directory of the device driver diskette contains three files: **XALLZIP.EXE**, a self-extracting archive which contains all of the files and documentation needed to install the OS/2 device driver in your system; **INSTALL.CMD**, an OS/2 command file to help you copy and extract the files to your hard disk; and **README.DOC**, which explains how to extract the files (also explained here).

A list of the files contained in **XALLZIP.EXE** follows:

XALL.SYS
: The installable device driver.

DMODE.EXE
: A **MODE** work-alike program for configuring serial ports (including ports beyond COM8).

DMODE.C
: Source code for the **DMODE** program.

DMODE.DOC
: Instructions for the **DMODE** program.

RELNOTES.DOC
: Release notes.

XALL.DOC
Programmer's information about the driver and applicable system calls.

***.BIN**
Miscellaneous binary files used by the driver.

To install the software, insert the Digi device driver diskette in the diskette drive and change to the root directory on that drive (e.g. **A:**), then enter:

INSTALL <*drive*> [<*directory*>]

where <*drive*> is the letter and colon for the drive onto which you wish to install the driver (e.g. **C:**), and <*directory*> is the directory into which you wish the files to be installed (e.g. **\DIGI**). If <*directory*> is not specified, the default directory of **\DIGI** will be used.

Example:

```
INSTALL C: \OS2DRV
```

Be sure to put a space between the drive and directory designations.

PCI Adapters

Before proceeding with the software installation for the OS/2 device driver, you must first install the board(s) according to the instructions in the board's *Installation Guide*.

The Digi device driver diskette for OS/2 is divided into two main directories: **XALL**, which contains the device driver and support software for ISA, EISA and Micro Channel adapters, and **DIGI_OS2**, which contains the files for PCI adapters.

The **DIGI_OS2** directory of the device driver diskette contains three files: **DIGIZIP.EXE**, a self-extracting archive which contains all of the files and documentation needed to install the OS/2 PCI device driver in your system; **INSTALL.CMD**, an OS/2 command file to help you copy and extract the files to your hard disk; and **README.DOC**, which explains how to extract the files (also explained here).

A list of the files contained in **DIGIZIP.EXE** follows:

DIGIOS2.SYS
The installable device driver.

DIGIDEVF.EXE
The PCI device function ID utility.

DMODE.EXE

A **MODE** work-alike program for configuring serial ports (including ports beyond COM8).

DMODE.C

Source code for the **DMODE** program.

DMODE.DOC

Instructions for the **DMODE** program.

INSTALL.DOC

Installation instructions for the current release of the driver.

RELNOTES.DOC

Release notes.

***.bin**

Miscellaneous binary files used by the driver.

To install the software, insert the Digi device driver diskette in the diskette drive and change to the root directory on that drive (e.g. **A:**), then enter:

INSTALL <*drive*> [<*directory*>]

where <*drive*> is the letter and colon for the drive onto which you wish to install the driver (e.g. **C:**), and <*directory*> is the directory into which you wish the files to be installed (e.g. **\DIGI**). If <*directory*> is not specified, the default directory of **\DIGI** will be used.

Example:

INSTALL C: \OS2DRV

Be sure to put a space between the drive and directory designations.

Loading the Device Driver

ISA, EISA and Micro Channel Adapters

The device driver is invoked by placing its name and configuration arguments into the system's **CONFIG.SYS** file. All Digi intelligent serial boards must be installed from a single command line, which contains complete set-up information for each board. The general format of the command line is shown in the box below. The only required parameters are the board type, the board's I/O port address and memory start address (see Examples 1 and 2).

Command Line Examples for XALL.SYS (ISA, EISA and Micro Channel)

General Format:
DEVICE=\DIGI\XALL.SYS [**/F:***digipath*] [**/B:***baud*] [**/D:***data_type*] [**/V:***message_file*] [**/N:***names*] [**/L:***lptnames*] [**/A:***alternates*] **/T:***adapter* **/P:***port* **/M:***mem* [**,** **/T:***adapter* **/P:***port* **/M:***mem*] [**,** ...]

Example 1: Single PC/Xe, AccelePort Xe or MC/Xe board, basic installation
DEVICE=\DIGI\XALL.SYS /P:320 /M:D8000

Example 2: Two ISA boards, such as PC/Xe, AccelePort Xe …
DEVICE=\DIGI\XALL.SYS /P:320 /M:D8000, /P:300 /M:D8000

Example 3: Single AccelePort Xem - ISA, basic installation
DEVICE=\DIGI\XALL.SYS /T:P /P:224 /M:D8000

Example 4: Single AccelePort Xr board, basic installation
DEVICE=\DIGI\XALL.SYS /T:A /P:224 /M:D8000

Example 5: Single AccelePort C/X - ISA host adapter, with one concentrator on line 1 and two concentrators on line 2
DEVICE=\DIGI\XALL.SYS /T:I12 /P:228 /M:D8000

*Example 6: AccelePort C/X - EISA host adapter in slot 3, with two local concentrators on line 1, and a remote concentrator via an EIA-232 synchronous modem on line 2; ports named **DIGI1**, **DIGI2**, etc.*
DEVICE=\DIGI\XALL.SYS /N:"DIGI"1 /T:E21(17) /P:3005 /M:D8000

Example 7: AccelePort EPC/X - ISA host adapter, with one EPC/CON-16 concentrator on line 1; concentrator has a PORTS/8emp module attached; printer port named COM3, serial ports named from COM4
DEVICE=\DIGI\XALL.SYS /L:3 /T:C1([9])0 /P:228 /M:D8000

Important! The command line must appear on a *single* line in the **CONFIG.SYS** file. This line may be up to 255 characters long.

Global Parameters — ISA, EISA, Micro Channel

The first six parameters in the command line are *global* parameters, and affect all boards installed. These parameters are optional, and may be omitted. If omitted, default values will be used.

/F:*digipath*

Defines an alternative directory for the location of the binary files (***.BIN**), if different from the location of the driver file, **XALL.SYS**.

/B:*baud*

Sets the default baud rate to be used for all ports. If this parameter is not specified, all ports will be set to the OS/2 default of 1200 baud. Since most OS/2 applications initialize the ports each time they are run, this parameter is usually not necessary.

/B:9600

Initializes all ports to 9600 baud.

/D:*data_type*

Initializes all ports to the specified data type (parity, character length and number of stop bits). If this parameter is omitted, the OS/2 default data type of even parity, 7 data bits and 1 stop bit will be used. The syntax is *pds*, where *p* is **E** (even parity), **O** (odd parity) or **N** (no parity), *d* is **8**, **7**, **6** or **5**, and *s* is **1**, **1.5** or **2**. All three values must be specified, in the correct order. Since most OS/2 applications initialize the ports each time they are run, this parameter is usually not necessary.

/D:N81

Initializes all ports to no parity, 8 data bits and 1 stop bit.

/V:*message_path*

Forces banner and all verbose messages to be written to the specified file instead of the screen. If **/V:** is given without a filename, messages will be written to **\XALL.MSG**. Without this flag, all messages will appear on the system console. The message file is overwritten each time the system is started.

/V:\ERRMSG

Banner and all messages are written to the file **\ERRMSG**.

/V:

Banner and all messages are written to the file **\XALL.MSG**.

/N:*names*

Defines the naming convention to be used for the Digi ports. *names* consists of an optional "stem" followed by the starting device number. The new stem must be enclosed in double-quotes (**""**). If the stem is omitted, "COM" will be used. If the number is omitted, "3" will be assumed. If the **/N** parameter is not specified, the default name COM3 will be assigned to the first port.

NOTE: If the **/L:** parameter (see below) is present in the command line, and the stems for both serial and parallel ports are the same, the parallel ports are given preference in numbering. Thus, if **/L:3** is specified, all existing parallel ports will be named first, beginning with COM3, regardless of the **/N:** parameter. Serial ports will then be named according to the rules in the above paragraph, but any names that have already been assigned to parallel ports will be skipped.

/N:"DIGI"0

DIGI0, DIGI1, ... DIGI*n*

/N:4

COM4, COM5, ... COM*n*

/N:"QDEV"

QDEV3, QDEV4, ... QDEV*n*

/L:*lptnames*

Defines the naming convention to be used for the parallel printer ports on PORTS/8emp modules. *lptnames* consists of an optional "stem" followed by the starting device number. The new stem must be enclosed in double-quotes (**""**). If the stem is omitted, "COM" will be used. If the number is omitted, "3" will be assumed. If the **/L:** parameter is omitted entirely, the parallel port will be treated as the ninth port on the module, and numbered in sequence according to the rules defined by the **/N:** parameter (see above). If the names specified by the **/L:** parameter overlap the names specified in the **/N:** parameter, the **/L:** parameter takes precedence. **NOTE: The OS/2 printer spooler only recognizes COM names COM1-COM4.**

/L:3 (*and no* **/N:** *parameter*)

Parallel ports of all PORTS/8emp modules are named beginning with COM3; serial ports are then named beginning with the next available name in sequence (i.e. if there are two PORTS/8emp modules, the parallel ports are named COM3 and COM4, and the serial ports begin with COM5).

For more examples of the **/L:** parameter, see the text file **INSTALL.DOC**, in the directory containing your Digi device driver files.

/A:*alternates*

Activates alternate processing modes (see below). Multiple alternates may be specified with this flag (e.g. **/A:AQDR** specifies all four alternates).

/A:A

Initializes all ports to use alternate wiring for the DCD (Data Carrier Detect) signal. This swaps the functions of DCD (Data Carrier Detect) and DSR (Data Set Ready) to make DCD available on an 8-pin RJ-45 connector. This parameter is necessary only when connecting modems to RJ-45 equipped Digi products. See the Connecting Peripherals section of the *Installation Guide* for your board for more details.

/A:Q

Disables the performance enhancing quick-write mode. The driver defaults to quick-write mode enabled. When enabled, DosWrite calls return as soon as the transmit data is copied to the Digi hardware transmit buffer. When this mode is disabled, DosWrite calls will return only after the transmit data has actually left the Digi hardware, mimicking the OS/2 **COM.SYS** driver. This reduces the throughput of the Digi hardware. A side effect of using quick-writes is that when DosClose is called, the driver must wait for the Digi hardware to empty its transmit buffer before the DosClose call is completed.

/A:D

Forces DTR to remain LOW, or not asserted, after opening a port.

/A:R

Forces RTS to remain LOW, or not asserted, after opening a port.

Per-Card Parameters — ISA, EISA, Micro Channel

The remaining three parameters are *per-card* parameters, and are used to inform the driver of the type of board and where it is to be addressed in the host's I/O and memory buses. *Except as noted, these parameters are mandatory, and must be given for each board!*

The per-card parameters must be given in complete sets, and the sets must be separated by commas.

/T:*adapter* ***(C/X, EPC/X, Xem and Xr only)***

Defines the adapter type to the driver. Legal values for adapter are: **I** for the AccelePort C/X - ISA, **E** for the AccelePort C/X - EISA, **M** for the AccelePort C/X - MC, **C** for AccelePort EPC/X systems (all bus types) **P** for AccelePort Xem systems (all bus types) and **A** for AccelePort Xr boards (all bus types). The designators **I**, **E**, **M** and **C** must be followed by an additional two digits defining the arrangement and number of concentrators on each host adapter channel. If there are any 8-port concentrators in a configuration, their position in the configuration must be specified by placing the number of ports per concentrator (including 16-port concentrators) in *curly brackets* (**{}**) immediately following the number of concentrators per line. If there is more than one concentrator, the number of ports on each concentrator must be included and separated by semicolons. If there are no parameters in curly brackets, all concentrators on that line are assumed to have 16 ports. If the concentrator(s) are connected to the host adapter via a dial-up or leased line (remote concentrators), each of the two digits must also be followed by a parameter, enclosed in *parentheses*, which specifies the synchronous communications mode to be used for that line. See page 30 for a list of available synchronous communications modes.

/T:P AccelePort Xem host adapter.

/T:A AccelePort Xr.

/T:I10 AccelePort C/X - ISA host adapter, one local 16-port concentrator on line 1 (and nothing on line 2).

/T:E11 AccelePort C/X - EISA host adapter, one local 16-port concentrator on each of lines 1 and 2.

/T:M21{8}

AccelePort C/X - MC host adapter, two local 16-port concentrators on line 1, and one local 8-port concentrator on line 2.

/T:C3{16;16;8}2

AccelePort EPC/X host adapter. Line 1 has three local concentrators (two 16-port and one 8-port); line 2 has two local 16-port concentrators.

/T:C2(21)3{16;16;8}(8)

AccelePort EPC/X host adapter, two remote 16-port concentrators on line 1, and three remote concentrators (two 16-port and one 8-port) on line 2. The concentrators on line 1 will use mode 21 (76,800 baud, 8-wire, external clock) to communicate with the host adapter, and the concentrators on line 2 will use mode 8 (57,600 baud, 8-wire, internal clock). *See page 30 for a list of synchronous communications modes.*

When PORTS modules are attached to EPC/CON-16 concentrators, the PORTS modules for each concentrator must be identified by placing the number of ports (8, 9 or 16) on each module within square brackets (**[]**), and all of the concentrators for each host adapter synchronous line must be enclosed in parentheses. Multiple PORTS modules connected to a single concentrator must be enclosed in one set of square brackets and separated by semicolons (e.g. **[16;8;9]** denotes a concentrator with three PORTS modules attached: a 16em, an 8em and an 8emp). If the concentrators are connected to the host adapter via a dial-up or leased line (remote concentrators), the PORTS module parameters follow the synchronous mode number.

/T:C2([16][9])3([][8][16;16;9])

AccelePort EPC/X host adapter, two local concentrators on line 1, and three on line 2.

On line 1, the first concentrator has an attached PORTS/16em (denoted by **[16]**), and the second has a PORTS/8emp (denoted by **[9]**).

On line 2, the first concentrator has no PORTS modules (empty brackets **[]** must be used as a place-holder); the second concentrator has a PORTS/8em (**[8]**) and the third concentrator has two PORTS/16em modules and one PORTS/8emp module (**[16;16;9]**).

If the concentrators are connected to the host adapter via a dial-up or leased line (remote concentrators), the PORTS module parameters follow the synchronous mode number.

/T:C2(21[16])3(8[9;16][][16;16;16])

AccelePort EPC/X host adapter, two remote concentrators on line 1, and three remote concentrators on line 2.

The concentrators on line 1 will use mode 21 (76,800 baud, 8-wire, external clock) to communicate with the host adapter. The first concentrator has one PORTS/16em module attached.

The concentrators on line 2 will use mode 8 (57,600 baud, 8-wire, internal clock). The first concentrator has two PORTS modules, an 8emp and a 16em, attached; the second concentrator has no PORTS modules attached; the third concentrator has three PORTS/16em modules attached.

See page 30 for a list of synchronous communications modes.

/P:*port*

Defines the I/O port address for the card.

/P:300

Board is addressed at I/O port 300h.

/P:2005

EISA board (AccelePort C/X, EPC/X or Xem) is in slot 2 (EISA I/O addresses are 4 digits: the slot number, followed by "005").

When plugging an ISA board (AccelePort C/X, EPC/X, Xem, Xr, Xe, PC/Xe, PC/Xi, COM/Xi) into an EISA machine, the **/P** parameter must contain the 3-digit I/O address as set by the DIP switches or jumpers on the board, rather than the slot-number based address.

/M:*mem*

Dual-ported memory starting address. This is the full 32-bit hexadecimal address of the beginning of the board's dual-ported memory.

/M:D8000

Sets dual-ported memory start address to 0D8000h (in the BIOS expansion area between 640K and 1 megabyte).

/M:E80000

Sets start address of E80000h (in the fifteenth megabyte).

With the exception of COM/Xi and Micro Channel boards, all boards may share the same memory starting address. Micro Channel and COM/Xi boards must each have unique memory addresses.

PCI Adapters

The device driver is invoked by placing its name and configuration arguments into the system's **CONFIG.SYS** file. All Digi intelligent serial boards must be installed from a single command line, which contains complete set-up information for each board. The general format of the command line is shown in the box below.

Command Line Examples for DIGI_OS2.SYS (PCI)

General Format:

DEVICE=\DIGI\DIGI_OS2.SYS [**/CN=***num*] [**/T:devfunc:***con_str*]
[**, /T:devfunc:***con_str*] [**,** ...]

Example 1: Single AccelePort Xem - PCI, basic installation

```
DEVICE=\DIGI\DIGI_OS2.SYS
```

Example 2: Single AccelePort Xr - PCI board, basic installation

```
DEVICE=\DIGI\DIGI_OS2.SYS
```

Example 3: Single C/X - PCI host adapter, with one concentrator on line 1 and two concentrators on line 2

```
DEVICE=\DIGI\DIGI_OS2.SYS /T:DEVFUNC:12
```

*Example 4: C/X - PCI host adapter with two local concentrators on line 1, and a remote concentrator via an EIA-232 synchronous modem on line 2; ports named **COM3**, **COM4**, etc.*

```
DEVICE=\DIGI\DIGI_OS2 /CN=3 /T:DEVFUNC:21(17)
```

Example 5: EPC/X - PCI host adapter, with one EPC/CON-16 concentrator on line 1; concentrator has a PORTS/8em module attached

```
DEVICE=\DIGI\DIGI_OS2 /T:DEVFUNC:1([9])0
```

Important! The command line must appear on a *single* line in the **CONFIG.SYS** file. This line may be up to 255 characters long.

PCI Parameters

There are two command line parameters for the PCI device driver.

/CN=*num*

This global parameter applies to all Digi PCI products supported by this device driver, and defines the naming convention to be used to identify the individual asynchronous ports. When this parameter is present, the ports are identified as **COM***n*, where *n* is the sequential number of the port. The first value of *n* is *num*, as defined by **/CN=***num*.

Example: **/CN=3** causes the ports to be identified as COM3, COM4, etc.

If this parameter is not given, the ports are identified by default as **DIGI***xy*, where *x* is a letter value A, B, C, etc. which identifies the adapter, and *y* is the number of the port on that adapter.

Example: if two 8-port adapters are installed, the default port names will be:

DIGIA1, **DIGIA2**, **DIGIA3**,...**DIGIA8** and
DIGIB1, **DIGIB2**, **DIGIB3**,...**DIGIB8**

/T:*DEVFUNC***:***con_str*

This per-card parameter is required for C/X and EPC/X host adapters, and is used to identify the configuration of the concentrators connected to each host adapter's synchronous lines.

DEVFUNC identifies a specific host adapter on the PCI bus. The value of *DEVFUNC* is obtained by running the utility **DIGIDEVF.EXE**. Instructions for running **DIGIDEVF** are on page 19.

con_str is the configuration string for the host adapter specified by *DEVFUNC*. The configuration string identifies the type, number and manner of connection of all C/CON and/or EPC/CON concentrators attached to the specified host adapter's synchronous lines.

con_str consists of two digits which indicate the number of concentrators on each host adapter channel. If there are any 8-port concentrators in a configuration, their position in the configuration must be specified by placing the number of ports per concentrator (including 16-port concentrators) in *curly brackets* (**{}**) immediately following the number of concentrators per line. If there is more than one concentrator, the number of ports on each concentrator must be included and separated by semicolons. If there are no parameters in curly brackets, all concentrators on that line are assumed to have 16 ports. If the concentrator(s) are connected to the host adapter via a dial-up or leased line (remote concentrators), each of the two digits must also be followed by a parameter, enclosed in *parentheses*, which

specifies the synchronous communications mode to be used for that line. See page 30 for a list of available synchronous communications modes.

/T:*DEVFUNC***:10**

C/X - PCI or EPC/X - PCI host adapter, one local 16-port concentrator on line 1 (and nothing on line 2).

/T:*DEVFUNC***:11**

C/X - PCI or EPC/X - PCI host adapter, one local 16-port concentrator on each of lines 1 and 2.

/T:*DEVFUNC***:21{8}**

C/X - PCI or EPC/X - PCI host adapter, two local 16-port concentrators on line 1, and one local 8-port concentrator on line 2.

/T:*DEVFUNC***:3{16;16;8}2**

C/X - PCI or EPC/X - PCI host adapter. Line 1 has three local concentrators (two 16-port and one 8-port); line 2 has two local 16-port concentrators.

/T:*DEVFUNC***:2(21)3{16;16;8}(8)**

C/X - PCI or EPC/X - PCI host adapter, two remote 16-port concentrators on line 1, and three remote concentrators (two 16-port and one 8-port) on line 2. The concentrators on line 1 will use mode 21 (76,800 baud, 8-wire, external clock) to communicate with the host adapter, and the concentrators on line 2 will use mode 8 (57,600 baud, 8-wire, internal clock). *See page 30 for a list of synchronous communications modes.*

When PORTS modules are attached to EPC/CON-16 concentrators, the PORTS modules for each concentrator must be identified by placing the number of ports (8, 9 or 16) on each module within square brackets (**[]**), and all of the concentrators for each host adapter synchronous line must be enclosed in parentheses. Multiple PORTS modules connected to a single concentrator must be enclosed in one set of square brackets and separated by semicolons (e.g. **[16;8;9]** denotes a concentrator with three PORTS modules attached: a 16em, an 8em and an 8emp). If the concentrators are connected to the host adapter via a dial-up or leased line (remote concentrators), the PORTS module parameters follow the synchronous mode number.

/T:*DEVFUNC***:2([16][9])3([][8][16;16;9])**

EPC/X - PCI host adapter, two local concentrators on line 1, and three on line 2.

On line 1, the first concentrator has an attached PORTS/16em (denoted by **[16]**), and the second has a PORTS/8emp (denoted by **[9]**).

On line 2, the first concentrator has no PORTS modules (empty brackets **[]** must be used as a place-holder); the second concentrator has a PORTS/8em (**[8]**) and the third concentrator has two PORTS/16em modules and one PORTS/8emp module (**[16;16;9]**).

If the concentrators are connected to the host adapter via a dial-up or leased line (remote concentrators), the PORTS module parameters follow the synchronous mode number.

/T:*DEVFUNC***:2(21[16])3(8[9;16][][16;16;16])**

EPC/X - PCI host adapter, two remote concentrators on line 1, and three remote concentrators on line 2.

The concentrators on line 1 will use mode 21 (76,800 baud, 8-wire, external clock) to communicate with the host adapter. The first concentrator has one PORTS/16em module attached.

The concentrators on line 2 will use mode 8 (57,600 baud, 8-wire, internal clock). The first concentrator has two PORTS modules, an 8emp and a 16em, attached; the second concentrator has no PORTS modules attached; the third concentrator has three PORTS/16em modules attached.

See page 30 for a list of synchronous communications modes.

Using DIGIDEVF to Identify C/X - PCI Host Adapters

Digi has provided a software utility, **DIGIDEVF.EXE**, for identifying individual host adapters on the PCI bus. The utility requires no command line parameters, and returns a PCI Device Function identifier *DEVFUNC*, which is used in the device driver command line **/T** parameter.

To run the utility, enter:

```
DIGIDEVF.EXE
```

The software returns a message similar to the following:

```
Digi PCI Device Function identifier - Version 1.0.
Found: PCI C/X ASIC
PCI Device Function:88
```

In the above example, *DEVFUNC* = 88. The **/T** parameter in this case would be:

/T:88:*con_str*

If you are installing multiple C/X - PCI host adapters, **DIGIDEVF** must be run separately for each host adapter.

1. Turn off the computer and remove all but one C/X - PCI host adapter. It is not necessary to remove any other PCI devices.
2. Start the computer, boot OS/2 and run **DIGIDEVF**. Make a note of the Device Function identifier and the PCI slot in which the host adapter is installed.
3. Shut down the computer, remove the first host adapter, and install the second host adapter. Be sure to install the second adapter in a different slot from the one used for the first adapter.
4. Start the computer and run **DIGIDEVF** again, as in step 2.
5. Repeat steps 3 and 4 for each additional C/X - PCI host adapter to be installed.
6. Shut down the computer and reinstall all the host adapters, making sure that each board is installed in the same slot that was used for the identification process in the previous steps.

Important! Each host adapter must be installed in the same PCI slot that was used when **DIGIDEVF** was run against that board, or the *DEVFUNC* value for that board will be invalid.

Testing the Ports

The simplest (and probably the best) way to check the driver and I/O connections is to connect an ASCII terminal to one of the ports and redirect some output to that port. If the terminal is connected to COM3, try something like the following:

`DMODE COM3`
: This will verify that the driver can find the port—the port's parameters will be displayed.

`DMODE COM3:,OCTS=OFF ODSR=OFF`
: This ensures that the hardware handshaking signals CTS and DSR will not prevent output— we are not concerned with flow control at this time.

`DIR > COM3`
: This redirects the current directory to COM3.

The console should simply respond by repeating the **`C:\>`** prompt, and the current directory (in this case, **`C:\`**) will appear on the terminal.

User Diagnostics

The Digi device driver diskette contains a serial port test utility, **`DGOS2UD.EXE`**, which can be used to test any OS/2 serial device supported by a Physical Device Driver. Documentation for **`DGOS2UD.EXE`** can be found in the file **`DGUDREAD.ME`**.

Troubleshooting

Important! *Be sure to run the Memory Map utility to find the required amount of available address space, and the User Diagnostics (***UD-CISC.EXE** *or* **UD-RISC.EXE***) to verify that the board is working correctly. See the Installation Tips section of the Installation Guide for your board for details.*

If the **C:\>** prompt doesn't reappear, and the system seems to be "hung", you probably used a memory start address that is being used by some other device, or the board is not set for the address specified in **CONFIG.SYS**. Try a different address. If it still hangs, try a different I/O port. If your computer has a memory cache and the board's memory start address is above 1 megabyte, try either disabling the cache or moving the board to a low-memory address (D8000 is usually a good choice).

It is also possible that a conflict exists with another device driver which has been loaded via **CONFIG.SYS**. The **XALL.SYS** (or **DIGI_OS2.SYS**) line should be placed near the end of **CONFIG.SYS**, and must *not* be placed before the **DEVICE=TESTCFG.SYS** line. With Warp 3.0 and 4.0, place the command line at the end of **CONFIG.SYS**; with Citrix WinView, place the command line immediately before the line: "**REM NetWare Requester Statements Begin**".

Due to potential device naming conflicts, the pair of lines

DEVICE=\OS2\COM.SYS
and
DEVICE=\OS2\VCOM.SYS

may cause problems. Be sure that the device driver command line (**XALL.SYS** or **DIGI_OS2.SYS**) is placed before these lines in **CONFIG.SYS**. If the device driver generates an error message, try temporarily putting "**REM**" in front of the above two lines. If this works, there is probably a naming conflict. You may need to add a **/N:***name* command line flag to the device driver command line to force the driver to use a different base name or start numbering the COM devices at 5 or above.

If the **C:\>** prompt does reappear, but there is no output on the terminal screen, there is probably a cabling problem. Make sure that all cable plugs are securely seated in their receptacles, and that they are configured correctly (see the Connecting Peripherals section in the *Installation Guide* for your board).

If the terminal displays output, but the data on the screen is garbled, the terminal is probably not set with the same baud rate and data type as specified in **CONFIG.SYS** (or the defaults, if not specified). Verify these settings.

If everything checks out and you still have problems, there could be a problem with your board. Contact your distributor or Digi Technical Support for further assistance.

Error Messages

If, when the driver is loaded, it cannot find the board(s), or if they fail to respond properly to commands, certain error messages may be sent to the console. These error messages are defined below:

Could not find BIOS file
Could not find FEP file
Could not find data file

One or more files were missing from the *digipath* directory. The default *digipath* directory is the directory containing **XALL.SYS**. If you have loaded the driver and data files into different directories, that directory containing the data files (***.BIN**) must be specified in the **XALL** command line with the **/F:***digipath* parameter.

IO Port Not Responding

I/O port address set incorrectly, or conflicting with some other device. Verify setting, or try a different address.

Digi BIOS Will Not Boot
Digi BIOS Will Not Respond
Digi FEPOS Will Not Boot

BIOS on board will not respond to commands from the driver. Typically due to a memory conflict, or a memory cache conflict.

Driver Failed to Hook Timer
System Cannot Allocate Memory

A system call to OS/2 has failed.

Invalid Command Line Arguments

Syntax error in the command line in **CONFIG.SYS**. Double-check your entries.

Before calling Technical Support, be sure to run the Memory Map utility to find the required amount of available address space, and the User Diagnostics to verify that the board is working correctly. See the Installation Tips section of the Installation Guide for your board for details.

DMODE Port Configuration Utility

DMODE is Digi's I/O channel configuration utility. **DMODE** functions like the OS/2 **MODE** command, but is more flexible, and provides some added features.

- Supports communications device names other than COM1-COM8.
- Any single parameter may be changed without causing all others to be reset to default values.
- Maintains the familiar **MODE** syntax.

With the exception of the baud rate (which, if specified, must be first), **DMODE** arguments may be entered in any order, and in many cases may be abbreviated. For example, a baud rate of 19,200 may be entered simply as "19", since within the context of the **DMODE** command, "19" cannot be interpreted as anything else. Arguments may be separated by spaces or commas, and unspecified parameters are left unchanged. **DMODE** returns the settings of all parameters *after* any requested changes have been made. If no parameters are given, **DMODE** simply returns the current settings.

The syntax of **DMODE** is:

DMODE *port_name* [*parameters*]

Port names and parameters are *not* case sensitive, so upper and lower case letters may be freely mixed without effect on the operation of the **DMODE** command.

If no baud rate is specified, a place holder consisting of a colon followed by a comma ("**:,**") must be inserted to indicate that the baud rate is to remain unchanged. See the examples on page 28.

The following parameters are accepted:

Baud Rate

Baud rates can be specified with 2 to 6 digit designations, according to the table below.

Accepted Values					Baud Rate
50					50
75					75
11	110				110
13	134				134
15	150				150
20	200				200
30	300				300
60	600				600
12	120	1200			1200
18	180	1800			1800
24	240	2400			2400
48	480	4800			4800
96	960	9600			9600
14	144	1440	14400		14400
19	192	1920	19200		19200
28	288	2880	28800		28800
	384	3840	38400		38400
	576	5760	57600		57600
	768	7680	76800		76800
		1152	11520	115200	115200
		2304	23040	230400	230400

Character Length

Characters may be 5, 6, 7 or 8 bits long. Enter the appropriate number in the **DMODE** arguments.

Parity

Enter the desired parity checking method with a single letter **E**, **O**, **N**, **M** or **S** for Even, Odd, None, Mark or Space, respectively.

Stop Bits

Enter the desired number of stop bits. Recognized values are **1**, **2** and **1.5** (**1.5** is valid only when Character Length is set to **5**)

Flags

DMODE supports the following flags in the same way as the OS/2 **MODE** command. Refer to your OS/2 documentation for explanations of the flags. To set a flag, enter the mnemonic for the flag, followed by an equals sign (**=**), and the desired value (**ON**, **OFF**, etc.).

Read Timeout Flag

TO=ON

Read timeout in effect.

TO=OFF

No timeout.

XON/XOFF Handshake Flag

XON=ON

XON/XOFF handshaking enabled for transmit.

XON=BOTH

XON/XOFF handshaking enabled for transmit and receive.

XON=OFF

XON/XOFF handshaking disabled.

Input DSR Sensitivity

IDSR=ON

Enables Input DSR Sensitivity.

IDSR=OFF

Disables Input DSR Sensitivity.

Output DSR Sensitivity

ODSR=ON

Enables Output DSR Sensitivity.

ODSR=OFF

Disables Output DSR Sensitivity.

Output Handshake on CTS

OCTS=ON

Enables CTS output flow control.

OCTS=OFF

Disables CTS output flow control.

DTR Signal Control

DTR=ON

Sets DTR to "ON" or HIGH.

DTR=OFF

Sets DTR to "OFF" or LOW.

DTR=HS

DTR used for output flow control.

RTS Signal Control

RTS=ON

Sets RTS to "ON" or HIGH.

RTS=OFF

Sets RTS to "OFF" or LOW.

RTS=HS

RTS used for input flow control.

RTS=TOG

Toggles RTS from LOW to HIGH, or from HIGH to LOW.

Alt-Pin (Alternate DCD Wiring)

ALT=ON

Use alternate wiring for the selected port. This swaps the functions of DCD (Data Carrier Detect) and DSR (Data Set Ready) to make DCD available on an 8-pin RJ-45 connector. This parameter is necessary only when connecting modems to RJ-45 equipped Digi products. See the Connecting Peripherals section of the *Installation Guide* for your board for more details.

ALT=OFF

Use default wiring for the selected port.

Quick-Write Processing Control

QW=ON

Enables quick-write mode on specified port.

QW=OFF

Disables quick-write mode on specified port.

Examples

DMODE DIGI12

Returns the current settings of device digi12. No changes are made.

DMODE COM5:,2

Configures COM5 for 2 stop bits. All other parameters remain unaffected.

DMODE COM5 38 RTS=ON

Configures COM5 for a baud rate of 38400 and sets RTS to "ON" or HIGH.

DMODE COM5:,8

Configures COM5 for 8 data bits. No other parameters are affected.

DMODE COMDV83 12 IDSR=OFF, TO=OFF E 7

Sets COMDV83 to a baud rate of 1200, disables Input DSR Sensitivity, disables input timeout, selects even parity and 7 data bits.

DMODE COM5 38 ALT=ON

Sets up COM5 for a baud rate of 38400, and enables Alt-Pin Processing.

DMODE COM5:,E ALT=OFF

Sets COM5 for even parity checking and disables Alt Pin processing.

DMODE COM3:,ODSR=OFF OCTS=OFF

Disables sensing of output flow control signals Clear To Send (CTS) and Data Set Ready (DSR).

Programming Information

The **PROGINFO** directory on the device driver diskette contains programming examples and information on how to obtain OS/2 programming manuals from IBM.

Synchronous Communications Modes

Digi AccelePort C/X and EPC/X host adapters communicate with attached C/CON-16, C/CON-8 or EPC/CON-16 concentrators via two EIA-422 synchronous channels (newer concentrators and host adapters also support EIA-232 synchronous communication—see your hardware *Installation Guide*). The default operating mode for these channels is 1.2 megabaud, 8-wire, internally clocked (AccelePort EPC/X host adapters connected to local EPC/CON-16 concentrators can operate at 10 megabaud *as long as no C/CON-16 or C/CON-8 concentrators are also connected to the same synchronous line*). This provides the fastest possible communication between the host adapter and locally connected concentrators (in this context, *local* indicates that concentrators are connected directly to the host adapter via a four or eight wire cable; *remote* refers to concentrators that are connected to the host adapter via data communications devices such as modems or DSUs).

Local concentrators always communicate with the host adapter in either an eight wire internally clocked mode or a four wire self clocked mode (in the four wire modes the clock is encoded with the data instead of being carried on separate lines as in the eight wire modes).

Remote concentrators always use an eight wire externally clocked mode (the clock signal is provided by the synchronous modem).

The tables on the following pages show the modes that are supported by the **XALL.SYS** device driver. Note that the external clock baud rates are approximations used to set up time-outs and tuning parameters only. Values do not need to be exact; select the speed closest to the actual speed of your synchronous modem.

Table 1 EIA-422 Synchronous Modes (AccelePort C/X and EPC/X)

Eight Wire Internal Clock		Eight Wire External Clock		Four Wire Self Clocking	
Mode	*Baud Rate*	*Mode*	*Baud Rate*	*Mode*	*Baud Rate*
0	115K	15	2400	1	230K
		16	4800	2	460K
3	2400	17	9600		
4	4800	18	19.2K		
5	9600	19	38.4K		
6	19.2K	20	57.6K		
7	38.4K	21	76.8K		
8	57.6K	22	115K		
9	76.8K	23	230K		
10	115K	24	460K		
11	230K	25	920K		
12	460K	26	1.2M		
13	920K				
14	1.2M	33	14000		

Table 2 EIA-422 Synchronous Modes (AccelePort EPC/X Only)

Eight Wire Internal Clock		Four Wire Self Clocking	
Mode	*Baud Rate*	*Mode*	*Baud Rate*
70	1.843M	60	115K
71	2.458M	62	230K
72	3.686M	64	460K
73	7.373M	66	921K
74	10M	68	1.843M

Table 3 EIA-232 Synchronous Modes (AccelePort C/X and EPC/X)

Eight Wire Internal Clock	
Mode	*Baud Rate*
35	2400
36	4800
37	9600
38	14000
39	19.2K
40	38.4K
41	57.6K
42	64000
43	76.8K