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# Software Manual

**Digi PC/X and MC/X**  
**Microsoft Windows 3.x, OS/2 and FOSSIL**  
**Device Drivers**  
92000161 Rev C

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# **Microsoft Windows 3.x**

# Introduction

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## Overview

This Microsoft Windows™ device driver package provides full Windows communication support for the Digi PC/X and MC/X four and eight port serial communications boards under Microsoft Windows versions 3.0 and 3.1, and Windows for Workgroups version 3.1. The driver will also work with the PC/16 and MC/16 sixteen port boards, but will not support all sixteen ports due to the limitations of the Microsoft Windows COMM API (Application Programming Interface), which only provides support for nine ports, COM1-COM9.

See the file **readme.wri** on the distribution diskette for other information not available at this manual's press time.

## Hardware and Software Requirements

1. Digi PC/X or MC/X board with 16C550 UARTs installed (PC/X and MC/X boards may be special-ordered with 16C550 UARTs; the UARTs may also be purchased from Digi Sales or an electronics store and installed in the field).
2. One or more application programs, such as the Windows Terminal program or PROCOMM PLUS for Windows, which support Windows COMM API calls; you may also need a special **.DLL** file to enable support for more than four ports— if available, this can be obtained from your software publisher.
3. Limitations: The Microsoft Windows COMM API supports a maximum of nine serial ports, COM1-COM9. These ports may reside on one or more PC/X or MC/X boards, and can include existing COM ports included with your machine. Each board must have its own IRQ.

Examples: One serial port on the motherboard set for COM1 (I/O address 3F8h, IRQ4), and eight ports, COM2-COM9, on a PC/8 board set for IRQ3);

One serial port on the motherboard set for COM1 (I/O address 3F8h, IRQ4), four ports, COM2-COM5, on a PC/4 board set for IRQ3, and four ports, COM6-COM9, on another PC/4 board set for IRQ5.

4. A serial mouse, if used, must be installed on either COM1 (3F8h, IRQ4) or COM2 (2F8h, IRQ3), and must have its own dedicated IRQ.

# Installation

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## Hardware Installation



Before proceeding with the software installation for the Microsoft Windows 3.x device driver, you must first configure your board(s) for the correct I/O addresses and interrupt request (IRQ) lines, and install the board(s) according to the instructions in the *Installation Guide* for your board, and the instructions on the following pages.

### Standard COM Ports

Most PCs are shipped with one or more COM ports already installed, either on the motherboard itself, or on a separate board plugged into the I/O bus (a typical add-in card might have two COM ports, a printer port and a joystick port). The addresses and IRQs used by standard COM ports are:

Port	Address	IRQ
COM1	3F8h	4
COM2	2F8h	3
COM3	3E8h	4
COM4	2E8h	3

Nearly all PCs come with COM1, and most also have a COM2 port installed.

When configuring your board and the Windows device driver, you need to work around (or disable) the existing COM ports. The main point of conflict when installing a PC/X or MC/X board is the IRQ. Since PC/X boards plug into an 8-bit slot, only IRQs 2, 3, 4, 5, 6 and 7 are available. MC/X boards can use IRQs 3, 4, 5, 7, 10, 11, 12 or 15. Many of these IRQs will already be in use by other devices, such as disk and tape drives, printers, network cards, etc. Each board must be assigned an IRQ that is not used by any other device in the system. Check your system documentation to determine what IRQs are already



in use. Furthermore, each individual port on the board must be assigned a unique I/O address.



On some PCs, IRQ2 is internally mapped to IRQ 9. When installing a PC/X board in one of these machines, the PC/X board may be configured for IRQ2, but the Windows device driver must be set to IRQ9.

## **PC/4 and PC/8 Boards**

PC/4 and PC/8 boards have five or nine banks of DIP switches, respectively. DS1 is a 10-position switch bank used for the status register. DS2 through DS9 (DS2 through DS5 on PC/4 boards) are 8-position switch banks, and determine the I/O port address for the individual ports.

The Windows device driver does not use the status port, so the setting of DS1 is irrelevant, as long as the address does not conflict with that of any other device in the system (including the ports on the PC/X board itself). To eliminate the possibility of such a conflict, the recommended setting for DS1 is all ten switches in the OFF position (status port disabled).

Refer to the *PC/X and MC/X Installation Guide* for information on how to set the DIP switches and jumpers on PC/4 and PC/8 boards. Also see the Setup Examples on page 21 for the DIP switch and jumper settings for the configuration examples on pages 16-18.

## **PC/16 Boards**

Although the PC/16 board is not recommended for use with Windows since the Windows API only supports nine COM ports, the device driver will support up to nine of the PC/16 board's ports.

The PC/16 board is configured by installing appropriate PAL chips on the board. Any PAL set can be used, as long as you enter the correct I/O addresses in the setup program's Configuration dialog box. The addresses provided by the standard DOS PAL set (part numbers 40000246 and 40000247) provide the following I/O addresses: 100h, 108h, 110h, 118h, 120h, 128h, 130h, 138h, 148h, 150h, 158h, 160h, 168h, 170h, 178h and 180h.

The Windows device driver will support up to nine of the sixteen ports, provided that the computer's built in ports are disabled (if the built-in ports are enabled, they count against the nine ports supported by the driver).

Refer to the PC/X and MC/X *Installation Guide* for information on selecting the IRQ, and other jumper settings.

## MC/X Boards

MC/X boards are configured through the POS (Programmable Option Select) feature of Micro Channel computers. To install and configure your MC/X board, follow the instructions in the PC/X and MC/X *Installation Guide*.

1. Boot your system from the IBM Reference Diskette.
2. Make a working copy of the reference diskette by selecting the “Backup the Reference Diskette” option.
3. Select the “Copy an Option Diskette” option, and follow the instructions on the screen to copy the ADF (Adapter Description File) files from the Digi ADF Files diskette to the working copy of the reference diskette just created.
4. Turn off the computer and install the MC/X board in an available slot in your computer. Follow the instructions in the MC/X *Installation Guide*.
5. Boot the system from the working copy of the IBM reference diskette made in Step 3. Run the Automatic Configuration.
6. Select “View Configuration”. You will see something like the following:

```
View Configuration
-----
slot 3 - Digi MC/8
  UART Address Range . . . . . 0xDB80 -> 0xDBC0
  Com2 Status . . . . . Disabled
  Interrupt Select . . . . . INT 5
```

Make a note of the UART Address Range and the Interrupt Select. This is the information you will need to set up the Windows Driver. Also verify that “Com2 Status” is set to “Disabled”. If it is not, you can change it by selecting the “Set Configuration” menu.

The UART Address Range shows only the address of the first port on the board, and the address of the status port. The following list provides all of the addresses needed to configure the Windows device driver:

**MC/4, MC/8:**

**0xDB80 → 0xDBC0**

DB80h, DB88h, DB90h, DB98h,  
DBA0h, DBA8h, DBB0h, DBB8h.

**0xDC00 → 0xDC40**

DC00h, DC08h, DC10h, DC18h,  
DC20h, DC28h, DC30h, DC38h.

**0xBB80 → 0xBBC0**

BB80h, BB88h, BB90h, BB98h,  
BBA0h, BBA8h, BBB0h, BBB8h.

**0xBC00 → 0xBC40**

BC00h, BC08h, BC10h, BC18h,  
BC20h, BC28h, BC30h, BC38h.

**0xAB80 → 0xABC0**

AB80h, AB88h, AB90h, AB98h,  
ABA0h, ABA8h, ABB0h, ABB8h.

**0xAC00 → 0xAC40**

AC00h, AC08h, AC10h, AC18h,  
AC20h, AC28h, AC30h, AC38h.

**0xCB80 → 0xCBC0**

CB80h, CB88h, CB90h, CB98h,  
CBA0h, CBA8h, CBB0h, CBB8h.



The addresses shown in bold type represent the *range* of I/O addresses to be used in each instance. The addresses in normal type are the addresses of each physical UART. For example, **0xDB80 → 0xDBC0** assigns all addresses from DB80 through DBC0 to the board; DB80 is the address of the first UART, and DBC0 is the address of the Interrupt Status Register.

If you are installing an MC/4 board, only the first four addresses in each list are pertinent.

**MC/16:**

**0x3000 → 0x307F**

3000h, 3008h, 3010h, 3018h, 3020h, 3028h, 3030h, 3038h,  
3040h, 3048h, 3050h, 3058h, 3060h, 3068h, 3070h, 3078h.

**0x4000 → 0x407F**

4000h, 4008h, 4010h, 4018h, 4020h, 4028h, 4030h, 4038h,  
4040h, 4048h, 4050h, 4058h, 4060h, 4068h, 4070h, 4078h.

**0x4100 → 0x417F**

4100h, 4108h, 4110h, 4118h, 4120h, 4128h, 4130h, 4138h,  
4140h, 4148h, 4150h, 4158h, 4160h, 4168h, 4170h, 4178h.

**0x4200 → 0x427F**

4200h, 4208h, 4210h, 4218h, 4220h, 4228h, 4230h, 4238h,  
4240h, 4248h, 4250h, 4258h, 4260h, 4268h, 4270h, 4278h.

**0x4300 → 0x437F**

4300h, 4308h, 4310h, 4318h, 4320h, 4328h, 4330h, 4338h,  
4340h, 4348h, 4350h, 4358h, 4360h, 4368h, 4370h, 4378h.

**0x5000 → 0x507F**

5000h, 5008h, 5010h, 5018h, 5020h, 5028h, 5030h, 5038h,  
5040h, 5048h, 5050h, 5058h, 5060h, 5068h, 5070h, 5078h.

**0x6000 → 0x607F**

6000h, 6008h, 6010h, 6018h, 6020h, 6028h, 6030h, 6038h,  
6040h, 6048h, 6050h, 6058h, 6060h, 6068h, 6070h, 6078h.

**0x7000 → 0x707F**

7000h, 7008h, 7010h, 7018h, 7020h, 7028h, 7030h, 7038h,  
7040h, 7048h, 7050h, 7058h, 7060h, 7068h, 7070h, 7078h.



The addresses shown in bold type represent the *range* of I/O addresses to be used in each instance. The addresses in normal type are the addresses of each physical UART. For example, **0x3000 → 0x307F** assigns all addresses from 3000h through 307Fh to the board; 3000h is the address of the first UART, and 307Fh is the address of the Interrupt Status Register.

# Software Installation

1. Start Windows.
2. Place the Digi Windows, OS/2 and FOSSIL driver diskette in drive A. Select **File**, then **Run**. In the dialog box, type **A:\WINDOWS\SETUP** and click on the **OK** button. (If you install from a drive other than drive A, substitute the appropriate drive designation for **A:** in the **Run** dialog box.)
3. Follow the instructions in the dialog boxes. Help buttons have been provided.

You will see the following dialog box:

The image shows a 'Configuration' dialog box with a title bar and a close button. Inside, there is a table with two columns: 'IO (hex)' and 'IRQ'. The rows are labeled 'COM1' through 'COM9'. Each row has two empty input boxes. At the bottom, there are three buttons: 'Continue', 'Exit', and 'Help'.

	IO (hex)	IRQ
COM1:	<input type="text"/>	<input type="text"/>
COM2:	<input type="text"/>	<input type="text"/>
COM3:	<input type="text"/>	<input type="text"/>
COM4:	<input type="text"/>	<input type="text"/>
COM5:	<input type="text"/>	<input type="text"/>
COM6:	<input type="text"/>	<input type="text"/>
COM7:	<input type="text"/>	<input type="text"/>
COM8:	<input type="text"/>	<input type="text"/>
COM9:	<input type="text"/>	<input type="text"/>

Continue    Exit    Help

Fill in the boxes according to the way you have set up the board.

**Note:**

The Digi device driver replaces the Microsoft Windows device driver, so you must configure the non-Digi COM ports first (e.g. COM1 I/O 3F8, IRQ4; COM2 I/O 2F8, IRQ3; then the Digi ports. See the examples beginning on page 16).

After installing the device driver, if you wish to change your serial configuration, rerun **setup.exe** from the Digi diskette, as above (The Microsoft Windows Control Panel Ports program does not provide a method to configure ports 5 through 9).

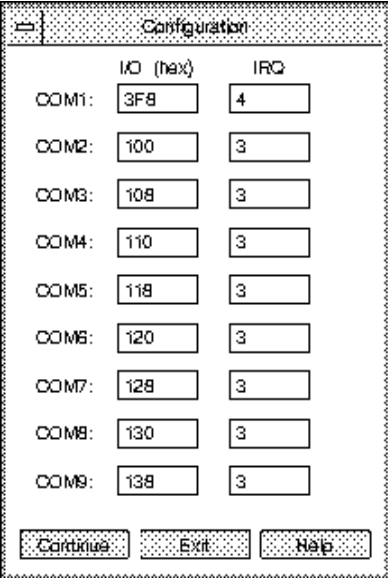
See the file **readme.wri** on the installation diskette for more configuration information.

Please note that not all Windows communications programs are aware of COM5 through COM9 (Microsoft's Terminal program, for example, only supports four COM ports). Please read your software manual to determine if your application can access COM5 through COM9.

Following are some examples of ways to configure PC/X and MC/X boards with or without existing COM ports. In each example, the Configuration dialog box is shown as it should appear after you have filled in the I/O addresses and IRQ for each port.

**EXAMPLE 1:**

COM1 on motherboard (or separate add-in card), COM2 through COM9 on a PC/8 board.





**EXAMPLE 2:**

No standard COM ports (COM1-COM4) on motherboard or other add in card, PC/8 board configured so that port 1 looks like standard COM1:

	IO (hex)	IRQ
COM1:	3F8	4
COM2:	100	3
COM3:	108	3
COM4:	110	3
COM5:	118	3
COM6:	120	3
COM7:	128	3
COM8:	130	3
COM9:		

Continue Exit Help

**EXAMPLE 3:**

COM1 and COM2 on motherboard or add-in card, COM3 through COM9 on a PC/8 board:

Note that because the Microsoft Windows API only supports COM1 through COM9, only seven ports of the PC/8 board are supported in this configuration.

	IO (hex)	IRQ
COM1:	3F8	4
COM2:	2F8	3
COM3:	100	5
COM4:	108	5
COM5:	110	5
COM6:	118	5
COM7:	120	5
COM8:	128	5
COM9:	130	5

Continue Exit Help

**EXAMPLE 4:**

COM1 on motherboard or add-in card, COM2 through COM5 on a PC/4 board, COM6 through COM9 on another PC/4 board:

Note that the two PC/4 boards must have different IRQs.

	IO (hex)	IRQ
COM1:	3F8	4
COM2:	148	3
COM3:	150	3
COM4:	158	3
COM5:	160	3
COM6:	168	5
COM7:	170	5
COM8:	178	5
COM9:	180	5

Buttons: Continue, Exit, Help

**EXAMPLE 5:**

COM1 through COM4 on motherboard or add-in card, COM5 through COM8 on a PC/4 board:

	IO (hex)	IRQ
COM1:	3F8	4
COM2:	2F8	3
COM3:	3E8	4
COM4:	2E8	3
COM5:	100	5
COM6:	108	5
COM7:	110	5
COM8:	118	5
COM9:		

Buttons: Continue, Exit, Help

**EXAMPLE 6:**

COM1 on PS/2 motherboard, COM2 through COM9 on MC/8 board:

	IO (hex)	IRQ
COM1:	3F8	4
COM2:	DB80	3
COM3:	DB88	3
COM4:	DB90	3
COM5:	DB98	3
COM6:	DBA0	3
COM7:	DBA8	3
COM8:	DBB0	3
COM9:	DBB8	3

Buttons: Continue, Exit, Help

**EXAMPLE 7:**

COM1 and COM2 on PS/2 motherboard, COM3 through COM9 on a MC/8 board:

Note that since the Windows COMM API only supports COM1 through COM9, only seven ports of the MC/8 board are supported in this configuration.

	IO (hex)	IRQ
COM1:	3F8	4
COM2:	2F8	3
COM3:	BB80	11
COM4:	BB88	11
COM5:	BB90	11
COM6:	BB98	11
COM7:	BBA0	11
COM8:	BBA8	11
COM9:	BBB0	11

Buttons: Continue, Exit, Help

# Troubleshooting

Most installation problems are caused by IRQ conflicts, I/O port address conflicts and I/O cabling problems. Additionally, the COM ports must be configured properly within the user's application program. Consult the application program documentation for the correct configuration setup.

If a hardware problem is suspected, a diagnostic program, **ud-std.exe**, for PC/X and MC/X boards can be found in the **\DIAGS** directory of the device driver diskette. Instructions for running the diagnostics are in a text file in the same directory. Please run the diagnostics prior to calling Digi technical support.

As an alternative, you may test the Digi ports under Windows, by using the Windows Terminal application or Digi's TTY program.

Windows Terminal will allow you to test COM1-COM4.

**TTY.EXE** is a Digi program similar to Terminal, and allows you to test COM1-COM9. **TTY.EXE** is in the **\WINDOWS** directory of the device driver diskette, and may also be obtained from Digi's BBS or FTP server (see Digi Support Services, starting on page 68, for BBS and FTP information).

# Setup Examples

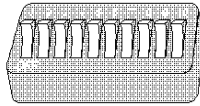
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The following pages show the DIP switch or POS settings for the configuration examples on pages 16-19.

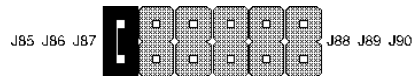
## EXAMPLE 1

---

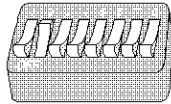
DS1: Status port disabled:



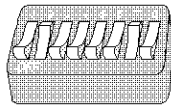
Select IRQ3 by installing a jumper on J85:



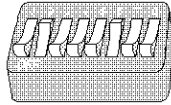
DS2: Port 1 set to 100h:



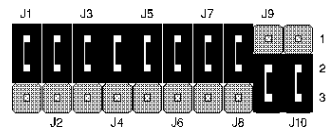
DS3: Port 2 set to 108h:



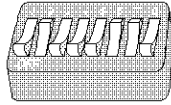
DS4: Port 3 set to 110h:



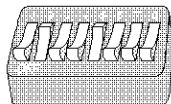
Select ODD interrupts by installing jumpers on J1-J10:



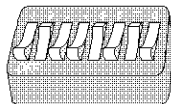
DS5: Port 4 set to 118h:



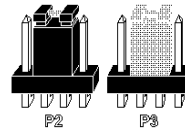
DS6: Port 5 set to 120h:



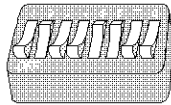
DS7: Port 6 set to 128h:



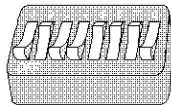
Install a jumper on P2. A jumper may also be installed on P3. This will have no effect.



DS8: Port 7 set to 130h:

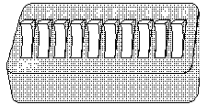


DS9: Port 8 set to 138h:



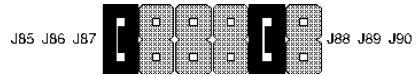
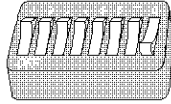
## EXAMPLE 2

DS1: Status port disabled:

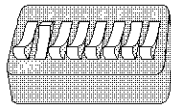


Select *both* IRQ3 and IRQ4 by installing jumpers on J85 and J89:

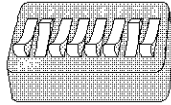
DS2: Port 1 set to 3F8h



DS3: Port 2 set to 100h:

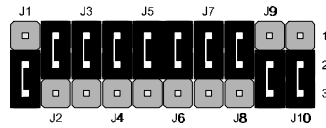
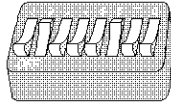


DS4: Port 3 set to 108h:

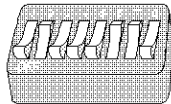


Set even interrupts for the first port, odd interrupts for the remaining ports:

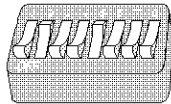
DS5: Port 4 set to 110h:



DS6: Port 5 set to 118h:

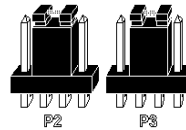
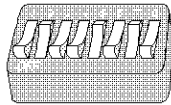


DS7: Port 6 set to 120h:

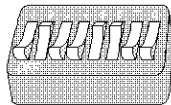


Install jumpers on both P2 and P3.

DS8: Port 7 set to 128h:

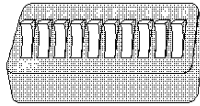


DS9: Port 8 set to 130h:

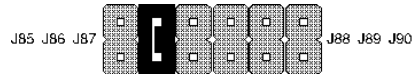


### EXAMPLE 3

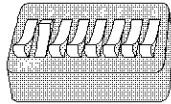
DS1: Status port disabled:



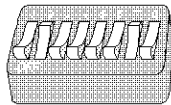
Select IRQ5 by installing a jumper on J86:



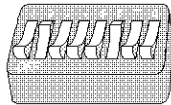
DS2: Port 1 set to 100h:



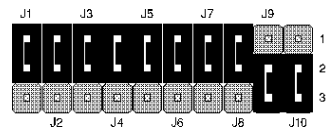
DS3: Port 2 set to 108h:



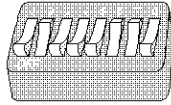
DS4: Port 3 set to 110h:



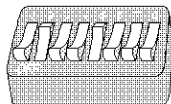
Select ODD interrupts by installing jumpers on J1-J10:



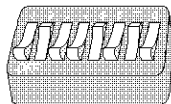
DS5: Port 4 set to 118h:



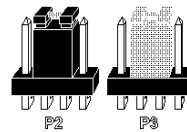
DS6: Port 5 set to 120h:



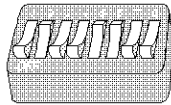
DS7: Port 6 set to 128h:



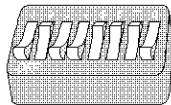
Install a jumper on P2. A jumper may also be installed on P3. This will have no effect.



DS8: Port 7 set to 130h:



DS9: Port 8 set to 138h:

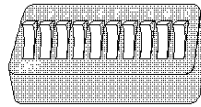




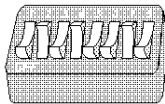
**EXAMPLE 4**

Board #1

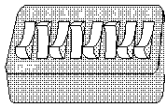
DS1: Status port disabled:



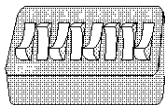
DS2: Port 1 set to 148h:



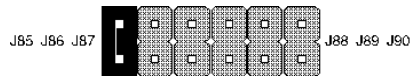
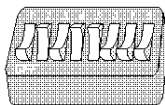
DS3: Port 2 set to 150h:



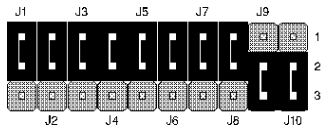
DS4: Port 3 set to 158h:



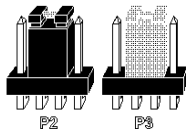
DS5: Port 4 set to 160h:



Install J85 for IRQ3



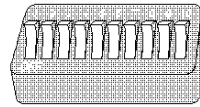
ODD Interrupts



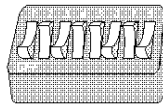
P2 Installed

Board #2

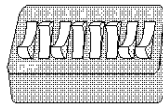
DS1: Status port disabled:



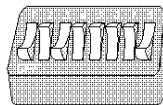
DS2: Port 1 set to 168h:



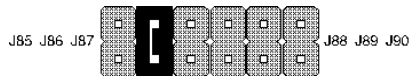
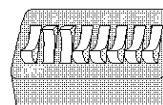
DS3: Port 2 set to 170h:



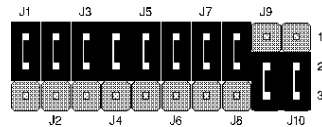
DS4: Port 3 set to 178h:



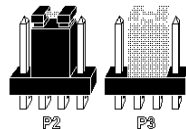
DS5: Port 4 set to 180h:



Install J86 for IRQ5



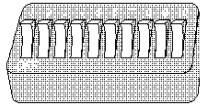
ODD Interrupts



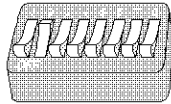
P2 Installed

## EXAMPLE 5

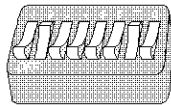
DS1: Status port disabled:



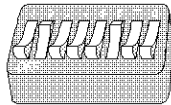
DS2: Port 1 set to 100h:



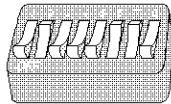
DS3: Port 2 set to 108h:



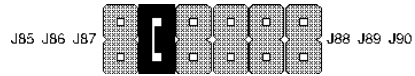
DS4: Port 3 set to 110h:



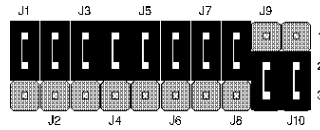
DS5: Port 4 set to 118h:



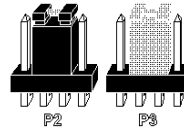
Select IRQ5 by installing a jumper on J86:



Select ODD interrupts by installing jumpers on J1-J10:



Install a jumper on P2. A jumper may also be installed on P3. This will have no effect.



## EXAMPLE 6

View Configuration

---

Slot 3 - Digi MC/8

UART Address Range . . . . . 0xDB80 -> 0xDBC0  
Com2 Status . . . . . Disabled  
Interrupt Select . . . . . INT 5

## EXAMPLE 7

View Configuration

---

Slot 3 - Digi MC/8

UART Address Range . . . . . 0xBB80 -> 0xBBC0  
Com2 Status . . . . . Disabled  
Interrupt Select . . . . . INT 11



**OS/2**

# Introduction

---

This OS/2 device driver software documentation is for all of the communication boards in the Digi PC/X and MC/X series. The software is a fully interrupt-driven, OS/2 API call compatible device driver, and will support up to 32 serial communication channels.

## Board Differences

The Digi PC/4 and PC/8 boards are nearly identical, the PC/4 merely having four fewer channels. The DIP switch and jumper setting procedures are the same for these boards, as is the device driver software installation.

The PC/16 has no DIP switches to set; its addresses are “burned” into PAL (**P**rogrammable **A**rray **L**ogic) chips. The device driver software installation is the same as for the PC/4 and PC/8, with the exception that the *Per-Card parameters are required*. (The default settings are for the PC/4 or PC/8, and won't work with the PC/16.)

*If you are installing a PC/16 board, skip to page 34.*

# Hardware Installation

---



Before proceeding with the software installation instructions for **OS/2**, you must first configure your board(s) for the correct I/O port addresses and interrupt request (IRQ) line(s), and install the board(s) in your computer system, according to the hardware installation instructions in the *Installation Guide* for your board, and the instructions on the following pages.

The device driver allows you to specify I/O address and interrupt parameters for each board installed; however, for *single-board* installations, the four and eight-port boards may be installed with a set of pre-configured addresses and interrupts, and the driver can be loaded without specifying these parameters. The I/O addresses and interrupt parameters *must* be specified for each PC/16 board installed. See page 34 for PC/16 installation instructions.

# PC/X Boards

## PC/4 and PC/8 Boards

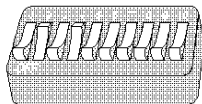
The following page shows the correct DIP switch and jumper settings for the PC/4 and PC/8 boards in single-board installations (if you have just taken your board out of the box, it may already be correctly set—in this case, use the following diagrams to verify the configuration).

For configurations other than the ones given here, refer to the *Installation Guide* for your board.

*Set PC/4 and PC/8 boards up according to the diagrams on the following page. If you are installing a PC/16 board, skip to page 34.*



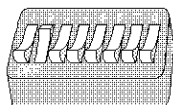
DS1: Status port set to 140h:



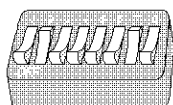
Select IRQ3 by installing a jumper on J85:



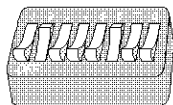
DS2: Port 1 set to 100h:



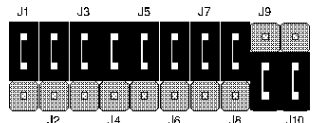
DS3: Port 2 set to 108h:



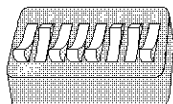
DS4: Port 3 set to 110h:



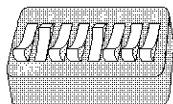
Select ODD interrupts by installing jumpers on J1-J10:



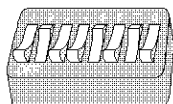
DS5: Port 4 set to 118h:



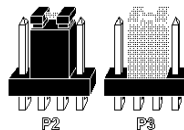
DS6: Port 5 set to 120h:



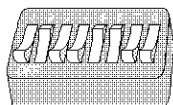
DS7: Port 6 set to 128h:



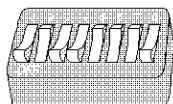
Install a jumper on P2. A jumper may also be installed on P3. This will have no effect.



DS8: Port 7 set to 130h:



DS9: Port 8 set to 138h:

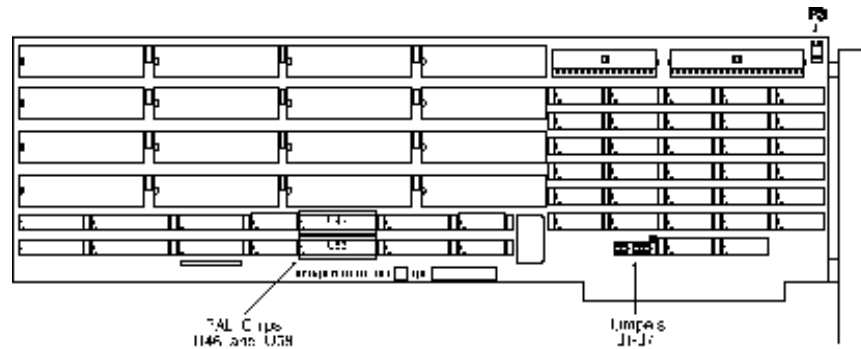


Now proceed to *Software Installation* on page 42.

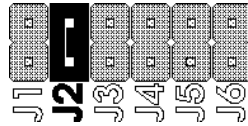
## PC/16 Boards

The Status Port and I/O Port address selections are made in a different manner for the PC/16 board. Instead of DIP switches, the addresses are programmed into special integrated circuits called *PALs* (for **P**rogrammable **A**rray **L**ogic). The PC/16 board has two PAL chips which determine its I/O Port and Status Port addresses.

The PC/16 must have PAL chips numbered 40000246 (in socket U58) and 4000247 (in socket U46) for the device driver software to work with OS/2. If for some reason you have different PAL chips, call Digi Customer Service (see *Digi Support Services*, in the back of this book).



Three jumpers must be installed on the PC/16 board to complete the hardware configuration. To select **IRQ3**, place a jumper on **J2**, as shown below. Other IRQs may be selected (see the *PC/X and MC/X Installation Guide*).



A jumper must also be installed across pins **2 & 3** (the *bottom* two pins) of **J7**. See the figure below:



Finally, be sure that there is a jumper installed on the daisy-chain connector, **P3**, located in the upper right-hand corner of the board.



Now proceed to the *Software Installation* on page 42.

# Custom Installation

## Choosing Your Own Addresses and Interrupts

If you are installing multiple PC/X boards, or if you wish to use address and interrupt parameters other than the default selections, you can custom-configure your board(s) with parameters of your choice. See the guidelines below for setting up your own I/O Port and Status Port addresses.

## I/O Port and Status Port Address for 4 and 8-Port Boards

Each PC/X board must have its *own* unique I/O Port and Status Port addresses, as well as a unique IRQ selection. Each range of addresses you choose must not be used by any other device in your computer.

When loading the OS/2 device driver, only the Status Port address is specified. The driver expects to find the I/O Ports in the 64 bytes (40 hex) *preceding* the Status Port (each I/O Port uses eight contiguous bytes). Thus, if the Status Port address is set to 140h, the I/O Ports must begin at 100h. If the Status Port is addressed at 2A0h, the I/O Ports must begin at 260h. See the *Installation Guide* for your board for details on how to set I/O Port and Status Port addresses.

Here are some legal address combinations for the four and eight-port PC/X boards.

Status Port	Serial Port (Channel)							
	1	2	3	4	5*	6*	7*	8*
140h	100h	108h	110h	118h	120h	128h	130h	138h
188h	148h	150h	158h	160h	168h	170h	178h	180h
250h	210h	218h	220h	228h	230h	238h	240h	248h
2A0h	260h	268h	270h	278h	280h	288h	290h	298h

*\*8-port boards only*

Page 33 of this manual shows the suggested DIP switch and jumper settings for installing one board. A Status Port address of 140h is chosen, resulting in I/O Port addresses of 100h, 108h, 110h, 118h, 120h, 128h, 130h and 138h. If you choose to use these settings, set your DIP switches as shown in the figures.

If you are installing more than one board, you'll have to pick more addresses as described above.

**Important!**

When setting the DIP switches on the PC/4 and PC/8 boards, switches 8, 9 and 10 of switch bank DS1 and switch 8 of switch banks DS2—DS9 (DS2—DS5 for the PC/4) *must be set to "ON"* to enable the ports.

## Choosing an Interrupt

Each PC/X board installed must have its *own* unique Interrupt Request line (IRQ), and the IRQ you choose must not be used by any other device in your computer.

The IRQ choices are: 2, 3, 4, 5, 6, and 7. Each board uses a single IRQ for all of its channels.

See the *Installation Guide* for your board for information on selecting the IRQ. Note that while the PC/X board can support two separate IRQ lines on one board, the OS/2 driver supports only *one* IRQ per board.



Remember which addresses and interrupts you choose for each board. You will have to supply this information when loading the device driver.

Board #	Status Port Address	IRQ
1		
2		
3		
4		

If you have completed setting the DIP switches and jumpers, you may proceed to the **Software Installation** instructions on page 42.

## MC/X Boards

MC/X boards are configured through the POS (Programmable Option Select) feature of Micro Channel computers. To install and configure your MC/X board, follow the instructions in the PC/X and MC/X *Installation Guide*.

1. Boot your system from the IBM Reference Diskette.
2. Make a working copy of the reference diskette by selecting the “Backup the Reference Diskette” option.
3. Select the “Copy an Option Diskette” option, and follow the instructions on the screen to copy the ADF (Adapter Description File) files from the Digi ADF Files diskette to the working copy of the reference diskette just created.
4. Turn off the computer and install the MC/X board in an available slot in your computer. Follow the instructions in the MC/X *Installation Guide*.
5. Boot the system from the working copy of the IBM reference diskette made in Step 3. Run the Automatic Configuration.
6. Select “View Configuration”. You will see something like the following:

```
View Configuration
-----
Slot 3 - Digi MC/8
  UART Address Range . . . . . 0xDB80 -> 0DBC0
  Com2 Status . . . . . Disabled
  Interrupt Select . . . . . INT 5
```

Make a note of the UART Address Range and the Interrupt Select. This is the information you will need to set up the OS/2 Driver. Also verify that “Com2 Status” is set to “Disabled”. If it is not, you can change it by selecting the “Set Configuration” menu.

The UART Address Range provides only the address of the first port on the board, and the address of the status port. The following list provides all of the addresses needed to configure the OS/2 device driver:

**MC/4, MC/8:**

**0xDB80 → 0xDBC0**

DB80h, DB88h, DB90h, DB98h,  
DBA0h, DBA8h, DBB0h, DBB8h.

**0xDC00 → 0xDC40**

DC00h, DC08h, DC10h, DC18h,  
DC20h, DC28h, DC30h, DC38h.

**0xBB80 → 0xBBC0**

BB80h, BB88h, BB90h, BB98h,  
BBA0h, BBA8h, BBB0h, BBB8h.

**0xBC00 → 0xBC40**

BC00h, BC08h, BC10h, BC18h,  
BC20h, BC28h, BC30h, BC38h.

**0xAB80 → 0xABC0**

AB80h, AB88h, AB90h, AB98h,  
ABA0h, ABA8h, ABB0h, ABB8h.

**0xAC00 → 0xAC40**

AC00h, AC08h, AC10h, AC18h,  
AC20h, AC28h, AC30h, AC38h.

**0xCB80 → 0xCBC0**

CB80h, CB88h, CB90h, CB98h,  
CBA0h, CBA8h, CBB0h, CBB8h.



The addresses shown in bold type represent the *range* of I/O addresses to be used in each instance. The addresses in normal type are the addresses of each physical UART. For example, **0xDB80 → 0xDBC0** assigns all addresses from DB80 through DBC0 to the board; DB80 is the address of the first UART, and DBC0 is the address of the Interrupt Status Register.

If you are installing an MC/4 board, only the first four addresses in each list are pertinent.



**MC/16:**

**0x3000 → 0x307F**

3000h, 3008h, 3010h, 3018h, 3020h, 3028h, 3030h, 3038h,  
3040h, 3048h, 3050h, 3058h, 3060h, 3068h, 3070h, 3078h.

**0x4000 → 0x407F**

4000h, 4008h, 4010h, 4018h, 4020h, 4028h, 4030h, 4038h,  
4040h, 4048h, 4050h, 4058h, 4060h, 4068h, 4070h, 4078h.

**0x4100 → 0x417F**

4100h, 4108h, 4110h, 4118h, 4120h, 4128h, 4130h, 4138h,  
4140h, 4148h, 4150h, 4158h, 4160h, 4168h, 4170h, 4178h.

**0x4200 → 0x427F**

4200h, 4208h, 4210h, 4218h, 4220h, 4228h, 4230h, 4238h,  
4240h, 4248h, 4250h, 4258h, 4260h, 4268h, 4270h, 4278h.

**0x4300 → 0x437F**

4300h, 4308h, 4310h, 4318h, 4320h, 4328h, 4330h, 4338h,  
4340h, 4348h, 4350h, 4358h, 4360h, 4368h, 4370h, 4378h.

**0x5000 → 0x507F**

5000h, 5008h, 5010h, 5018h, 5020h, 5028h, 5030h, 5038h,  
5040h, 5048h, 5050h, 5058h, 5060h, 5068h, 5070h, 5078h.

**0x6000 → 0x607F**

6000h, 6008h, 6010h, 6018h, 6020h, 6028h, 6030h, 6038h,  
6040h, 6048h, 6050h, 6058h, 6060h, 6068h, 6070h, 6078h.

**0x7000 → 0x707F**

7000h, 7008h, 7010h, 7018h, 7020h, 7028h, 7030h, 7038h,  
7040h, 7048h, 7050h, 7058h, 7060h, 7068h, 7070h, 7078h.



The addresses shown in bold type represent the *range* of I/O addresses to be used in each instance. The addresses in normal type are the addresses of each physical UART. For example, **0x3000 → 0x307F** assigns all addresses from 3000h through 307Fh to the board; 3000h is the address of the first UART, and 307Fh is the address of the Interrupt Status Register.

# Software Installation

---

To install the OS/2 device driver, simply copy the file **DGX.SYS** from the OS/2 device driver diskette onto your hard disk. Then use a text editor to add the line

```
DEVICE=DGX.SYS [parameters]
```

to the **CONFIG.SYS** file. Note that if **DGX.SYS** is not in the root directory, you will have to give its full pathname. (e.g. **DEVICE=C:\BIN\DGX.SYS**).

If you are installing a *single* four or eight-port board with the default parameters (see page 33 for the PC/X default configuration), the *parameters* portion may be omitted.

For MC/X boards, address and IRQ information is taken directly from the computer's POS (Programmable Option Select) registers, so the *parameters* portion may be omitted if you wish to use the default device names, baud rate and data type.



Digi PC/16 users must enter the line above with *Per-Card Parameters* as follows:

```
DEVICE=DGX.SYS /P:140 /C:16 /I:IRQ
```

where *IRQ* is the Interrupt Request line you have selected for the board.

## Default Device Names

With one board in the system, the default names for the devices are **COM3**, **COM4**, **COM5**, **COM6**, **COM7**, **COM8**, **COM9**, **COM10**...

Default modes for each of the channels follow the OS/2 standards of 1200 Baud, 7 data bits, 1 stop bit, even parity, and RTS control-mode.

## Command Line Arguments

There are both global as well as per-card arguments that can be specified on the device driver command line. If *any* arguments are given, the defaults in the data segment of the driver will be ignored. Use a comma ( , ) to separate sets of arguments for each card in your system. *Each card in your system must be fully described by these arguments.*

### Global Arguments (PC/X and MC/X Boards)

The following *Global Arguments* set parameters for *all channels on all boards* controlled by the device driver. To change parameters for individual ports, use the utility **DMODE.EXE** provided on the distribution diskette with the driver. **DMODE.EXE** is discussed beginning on page 50 of this manual.

#### **/n:device\_names**

Sets up the naming algorithm to be used to generate device names. This consists of an optional new stem followed by the starting device number. Without the new stem, the stem name "COM" will be used. Quotes are mandatory to set a new stem. Without a number, "3" is assumed.

Examples:

```
/n:"digi"0  DIGI0, DIGI1, DIGI2 ...  
/n:4        COM4, COM5, COM6 ...  
/n:"digi"   DIGI3, DIGI4, DIGI5 ...
```

#### **/b:baud\_rate**

OS/2 sets all serial devices to 1200 baud at initialization time. Use this option to set a different baud rate.

Example:

```
/b:9600      Set all channels to 9600 baud.
```

#### **/d:data\_type**

OS/2 sets all serial devices to even parity, 7 data bits and 1 stop bit at initialization time. Use this option to override those values. The syntax is *Parity Data Stop* (without spaces), where *Parity* is **E**, **O** or **N** for "Even", "Odd" or "None"; *Data* is **8**, **7**, **6** or **5**; and *Stop* is **1** or **2**. All three values **MUST** be provided.

Example:

**/d:N81**      Set all channels to no parity, 8 data bits, 1 stop bit.

*/u:uart address*

The **/u:** parameter permits the user to specify the starting UART addresses for daisy chained cards (cards joined by daisy chained cables, sharing the same IRQ, and set to the same status port address).

All UART addresses on the PC/8 card must be contiguous starting with the address specified (100 108 110 ...).

Only boards of the same type may be daisy-chained together; 8 port cards can only be daisy-chained with other 8 port cards, 4 port cards with 4 port cards and so on.

The status port option **/p:** must be specified before the **/u:** option.

Multiple UART addresses (**/u:**) (one for each board configured) must be specified in the same order as their board ID#s set on the card.

Daisy-chained PC/16 cards must use DOS pals #1 and #2 for boards 0 and 1 and must be specified with **/u:100** and **/u:188** along with the **/c:16** specifier.

**Examples:**

Use this command line:

```
device=dgx.sys /p:140 /u:200 /u:100 /u:300 /u:248 /i:5
```

if you have four PC/8 cards configured as follows:

Board ID# 0 Addresses:	200h	Board ID# 1 addresses:	100h
	208h		108h
	210h		110h
	218h		118h
	220h		120h
	228h		128h
	230h		130h
	238h		138h
Board ID# 2 addresses:	300h	Board ID# 3 addresses:	248h
	308h		250h
	310h		258h
	318h		260h
	320h		268h
	328h		270h
	330h		278h
	338h		280h

All status ports set to 140h and all IRQs set to 5

If you have two PC/16 cards with DOS pals #1 and #2 (which configure both boards for status port 140h, IRQ 5 and starting port addresses of 100h and 188h), use this command:

```
device=dgx.sys /p:140 /c:16 /u:100 /u:188 /i:5
```

**/s:sigs\_off**

Forces modem control output signals off on port open.

**/s:d** DTR remains low or off on port open.

**/s:r** RTS remains low or off on port open.

**/s:dr** DTR & RTS remain low or off on port open.

**/a:q**

Disables “quick writes”. The use of this switch causes the driver to mimic the COM.SYS write routine, where DosWrite commands will not return until the transmit data has left the card or a timeout occurs. The driver defaults to “quick writes” ENABLED to enhance performance by returning as soon as the transmit data is copied to the driver’s buffers. Thus an application can perform other functions while the driver is transmitting the data and can also keep the transmit buffers topped off with subsequent DosWrite commands for better throughput.

Generally, this switch should not be used unless the “quick write” nature of the driver causes difficulties for a particular application.

## Per-Card Arguments (PC/X Boards Only)

*Per-Card* arguments MUST be in complete sets identifying the Status Port address and IRQ number. The preceding global arguments may be given without interfering with the default Per-Card settings in the driver file.



*Each board in your system must be fully described by these Per-Card arguments.* Use a comma to separate the board sets from one another.

Also note that the channel numbers (COM3, COM4, etc.) will be assigned to the boards *in the same order in which the per-card arguments are given.*

### */p:Status Port Address*

Set the Status Port address. This argument specifies the top of the range of I/O Port addresses that will be used by a PC/X board. This address should correspond to the dip-switch setting for the Status Port. Individual channel port addresses should then begin 40 (hex) bytes *below* this address, occupying a contiguous block.

Example:

```
/p:280    (set Status Port address to 280h)
           I/O Port for Channel 1 = 240h
           .
           .
           .
           I/O Port for Channel 8 = 278h
```



PC/16 users *must* specify a Status port address of 140h, as follows: **/p:140**

### */i:IRQ*

Sets the IRQ line number to one of the legal options for the PC/X board.

Example:

```
/i:5      (set card to IRQ 5)
```

### */c:channels*

Sets the number of channels (either 4, 8 or 16). *This is required for four and sixteen-port boards. If omitted, eight ports is assumed.*

Examples:

```
/c:4      (PC/4)
/c:16     (PC/16)
```

## Command Line Example

This two-card example uses the preceding GLOBAL examples, and sets the two eight-channel boards to:

Board 1: Status Port=140  
IRQ 4

Board 2: Status Port=188  
IRQ 3

A command line for the above parameters would read:

```
device=dgx.sys /n:"digi"0 /b:9600 /d:N81 /p:140 /i:4, /p:188 /i:3
```



# Troubleshooting

---

If, after installation, the device driver software comes up with a problem message, first check that your configuration matches the DIP switch settings on the board. Next, try powering down the system and then bringing it back up. If it still fails, call Digi Technical Support.

In general, a good way to test the basic functionality of the driver is to hook up a terminal to one of the ports (COM3 for example), set it up for the correct Baud rate, Handshake, and Data type characteristics, and then simply try to re-direct output to it from the command prompt. For example:

```
C:\>dir > com3
```

If the terminal is set up correctly (the above defaults are typical) you should get the directory listing coming out on it. If there is no output, or if the above command hangs, then you may need some technical support. It is possible that the board is not functioning properly.

# DMODE I/O 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 (e.g. COM9, DIGI2, etc).
- Timeout, handshake modes, etc. can be specified without affecting baud rate, data type, etc.
- Any single parameter may be changed without causing all others to be reset to default values.
- Maintains the familiar MODE syntax.

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 54.

The following parameters are accepted:

**Baud Rate**

Baud rates can be specified with 2 to 5 digit designations, according to the following table:

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
19	192	1920	19200		19200
	384	3840	38400		38400
	576	5760	57600		57600

**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.

**Stop Bits**

Enter the desired number of stop bits. Recognized values are 1, 2 and 1.5.

## 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  
**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 output flow control  
**RTS=TOG** Toggles RTS from LOW to HIGH, or from HIGH to LOW

### **Alt-Pin Processing**

**ALT=ON** Internally “swaps” DSR and DCD signals (see explanation below)

**ALT=OFF** DSR and DCD are not swapped

Digi products use 10-pin RJ-45 connectors in order to support all of the signals normally available on a 9-wire EIA-232 connection. However, many commercially available RJ-45 connectors have only 8 pins. 8-pin RJ-45 plugs will fit in a 10-pin jack, but the first and last pins (numbers 1 and 10) are not connected. Digi uses these pins for the modem control signals RI (Ring Indicator, pin 1) and DCD (Data Carrier Detect, pin 10). While Ring Indicator is rarely a concern (since most modems have auto-answer capability), Data Carrier Detect is often monitored to insure that the modem has established, and is maintaining, a valid connection with a remote modem.

To facilitate the use of 8-pin RJ-45 connectors in modem applications, a special DMODE flag, **ALT**, has been provided. ALT instructs the device driver to monitor pin 2 for DCD instead of pin 10. The DSR (Data Set Ready) signal, normally on pin 2 is switched to pin 10. Since most programs don't monitor DSR, this signal can be safely ignored.

See the *Installation Guide* for your board for cabling diagrams and pin assignment charts for DB-25 and RJ-45 connectors.

## 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 com5:19 rts=ON**

Configures COM5 for a baud rate of 19,200 and sets RTS to “ON” or HIGH.

**dmode com5:,8**

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

**dmode comdev83:,,IDSR=OFF, TO=off e 7 12**

Sets COMDEV83 to disable Input DSR Sensitivity, disable input timeout, select even parity, 7 data bits and a baud rate of 1200.

**dmode com5 19 ALT=ON**

Sets up COM5 for a baud rate of 19,200, and enables Alt-Pin Processing.

**dmode com5:,e alt=off**

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

# FOSSIL

# Introduction

---

The FOSSIL for PC/X and MC/X boards provides a generic Interrupt 14h interface between many popular bulletin board systems and Digi non-intelligent serial communications boards. The Digi FOSSIL supports up to eight channels on PC/4, PC/8, PC/16, MC/4 and MC/8 boards (MC/16 boards are not supported by the FOSSIL).

FOSSIL is an acronym for Fido/Opus/SEAdog Standard Interface Layer. For technical and programming information, download **FOSSIL.DOC** from the Digi BBS or our anonymous FTP server (see the PC/X and MC/X *Installation Guide* for details). **FOSSIL.DOC** is also freely available on other BBS systems around the world, and the Internet.

Digi's FOSSIL is a terminate and stay resident (TSR) program which intercepts Interrupt 14h calls from applications and processes them for use with PC/X or MC/X boards. If the FOSSIL determines that the call is not for a Digi device, the call is passed back to the operating system for processing.



Digi support for FOSSIL is limited to the device driver for PC/X and MC/X boards. If you have problems with software that is known to work on other FOSSIL implementations, please call Digi Technical Support for assistance. We cannot, however, provide programming support for new implementations. For programming information, refer to **FOSSIL.DOC**.



# Hardware Installation

---



Before proceeding with the software installation, you must first configure your board(s) for the correct I/O port addresses and interrupt request (IRQ) line(s), and install the board(s) in your computer system, according to the hardware installation instructions in the *Installation Guide* for your board, and the instructions on the following pages.

## PC/X Boards

### PC/4 and PC/8 Boards

The following page shows the default DIP switch and jumper settings for the PC/4 and PC/8 boards (if you have just taken your board out of the box, it should already be correctly set—in this case, use the following diagrams to verify the configuration).

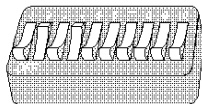
For configurations other than the ones given here, refer to the *Installation Guide* for your board.

*Set PC/4 and PC/8 boards up according to the diagrams on the following page. If you are installing a PC/16 board, skip to page 59.*



When setting the DIP switches on the PC/4 and PC/8 boards, switches 8, 9 and 10 of switch bank DS1 and switch 8 of switch banks DS2—DS9 (DS2—DS5 for the PC/4) *must be set to “ON”* to enable the ports.

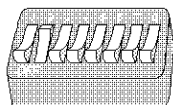
DS1: Status port set to 140h:



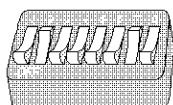
Select IRQ3 by installing a jumper on J85:



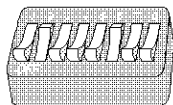
DS2: Port 1 set to 100h:



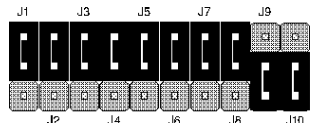
DS3: Port 2 set to 108h:



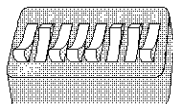
DS4: Port 3 set to 110h:



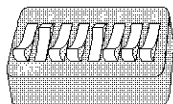
Select ODD interrupts by installing jumpers on J1-J10:



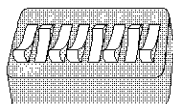
DS5: Port 4 set to 118h:



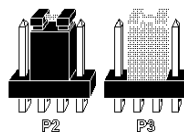
DS6: Port 5 set to 120h:



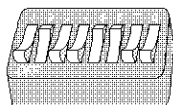
DS7: Port 6 set to 128h:



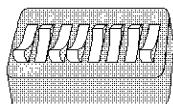
Install a jumper on P2. A jumper may also be installed on P3. This will have no effect.



DS8: Port 7 set to 130h:



DS9: Port 8 set to 138h:



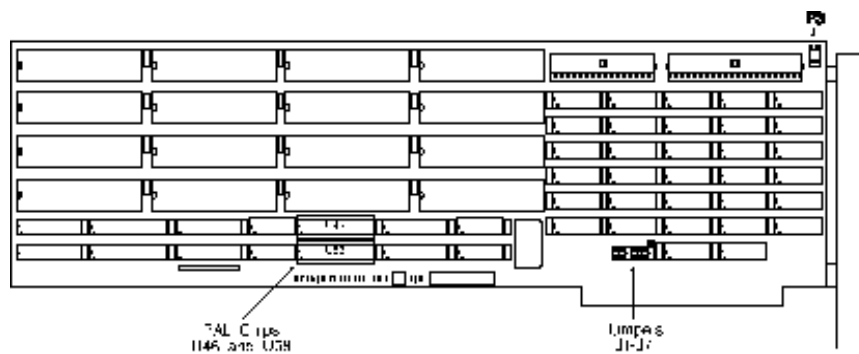
Now proceed to *Software Installation* on page 62.

## PC/16 Boards

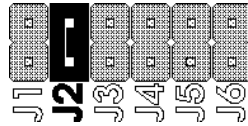
The Status Port and I/O Port address selections are made in a different manner for the PC/16 board. Instead of DIP switches, the addresses are programmed into special integrated circuits called *PALs* (for **P**rogrammable **A**rray **L**ogic). The PC/16 board has two PAL chips which determine its I/O Port and Status Port addresses.

The standard MS-DOS PAL chips for PC/16 boards are numbered 40000246 (in socket U58) and 4000247 (in socket U46). The I/O port and Status Register addresses programmed into these chips are shown below. If you have different PAL chips, check the PC/X and MC/X *Installation Guide* for the applicable addresses.

Status Port: 140h			
Port	Address	Port	Address
1	100h	9	148h
2	108h	10	150h
3	110h	11	158h
4	118h	12	160h
5	120h	13	168h
6	128h	14	170h
7	130h	15	178h
8	138h	16	180h



Three jumpers must be installed on the PC/16 board to complete the hardware configuration. To select **IRQ3**, place a jumper on **J2**, as shown below. Other IRQs may be selected (see the PC/X and MC/X Installation Guide).



A jumper must also be installed across pins **2 & 3** (the *bottom* two pins) of **J7**. See the figure below:



Finally, be sure that there is a jumper installed on the daisy-chain connector, **P3**, located in the upper right-hand corner of the board.



Now proceed to the *Software Installation* on page 62.

## MC/4 and MC/8 Boards

MC/X boards are configured through the POS (Programmable Option Select) feature of Micro Channel computers. To install and configure your MC/X board, follow the instructions in the PC/X and MC/X *Installation Guide*.

1. Boot your system from the IBM Reference Diskette.
2. Make a working copy of the reference diskette by selecting the “Backup the Reference Diskette” option.
3. Select the “Copy an Option Diskette” option, and follow the instructions on the screen to copy the ADF (Adapter Description File) files from the Digi ADF Files diskette to the working copy of the reference diskette just created.
4. Turn off the computer and install the MC/X board in an available slot in your computer. Follow the instructions in the MC/X *Installation Guide*.
5. Boot the system from the working copy of the IBM reference diskette made in Step 3. Run the Automatic Configuration.



MC/16 boards are not supported by the Digi FOSSIL.

# Software Installation

---

The FOSSIL configuration software, **DGCONFS.EXE** provides configuration support for Digi's implementation of FOSSIL. **DGCONFS** creates and maintains a standard ASCII text file describing the characteristics of your machine that are important to the FOSSIL. The configuration file can be modified with a standard text editor, but we strongly recommend that modifications be done only with **DGCONFS .EXE**.

## Before You Start

Before running **DGCONFS .EXE**, you will need to be able to provide the following information:

*For Each Board:*

Interrupt Status Register Address

*For Each Channel:*

Base I/O address\*

IRQ\*

Altpin configuration (see hardware *Installation Guide*)

Initial Data Rate

Initial XON/XOFF configuration for transmitter

Initial CTS/RTS configuration for transmitter and receiver

Initial XON/XOFF configuration for receiver

Parity

Stop bits

Data bits

\*PS/2 users: Base I/O address and IRQ will be automatically retrieved from the POS registers.

## Configuring the FOSSIL

Before loading the FOSSIL, you must create a configuration file by running the configuration utility, **DGCONFS.EXE**. The syntax for this command is:

**DGCONFS.EXE** [*config\_file*]

where *config\_file* specifies the name of the configuration file (if not specified, the default filename **FOSSIL.INI** is used).

To start the configuration utility, go to the directory containing **DGCONFS.EXE** and type **DGCONFS** followed by a filename for the configuration file.

### *PC/X Users*

A display with default information will appear, showing a fully configured PC/8 board and a command prompt. The default board configuration matches the factory default settings of the PC/8 board's DIP switches and jumpers.

### *MC/X Users*

**DGCONFS** will search the slots in your machine for MC/X boards. When it finds one it will ask if you want to generate a default configuration for the board in that slot. Answer "Y" to generate configuration information for that board. Otherwise answer "N", and **DGCONFS** will look for the next board. After default configuration information is generated, a display will show a fully configured board. *Note:* You will also see any other MC/X boards present in your machine. Delete boards or channels that you do not wish to configure (see page 66).

## Adding Boards

To add a board, press “**A**” for Add, then “**B**” for Board. You will be prompted for the status register address for the new board. The new board will be added to the configuration screen with no channels. Use the procedure below to add channels.

## Adding Channels

To add a channel, position the pointer by the board containing the channel and press “**A**”, for Add, then “**C**” for Channel. You will be asked:

**Please enter the new channel number?**

Enter the number of the channel (0 to 7) you wish to add.

**Please enter the Base Port Address:**

*PC/X boards:*

Enter the I/O address set by the DIP switches on the board containing this channel.

*MC/X boards: The I/O port address is obtained from the POS registers.*

**Please enter the IRQ for this port:**

*PC/X boards:*

Enter the IRQ that is selected by the jumpers on the board containing this channel.

*MC/X boards: IRQ information is obtained from the POS registers.*

The remainder of the channel parameters will be automatically filled in with default values. Verify that these values are correct for your application. If you wish to modify any of these parameters, follow the procedure below.



## Modifying Parameters

To modify the parameters for a specific channel, position the selection pointer next to the desired channel and select “M” (for Modify). You will be asked:

**Please enter the Base Port Address (hex):**

*PC/X boards:*

Press <Enter> to keep the current I/O address, or enter a new I/O address (matching the address set by the DIP switches on the board containing this channel).

*MC/X boards: The I/O port address is obtained from the POS registers.*

**Please enter the IRQ for this port:**

2) IRQ2 3) IRQ3 4) IRQ4 5) IRQ5 6) IRQ6 7) IRQ7

*PC/X boards:*

Press <Enter> to keep the current IRQ, or enter a new IRQ (matching the IRQ set by the jumpers on the board containing this channel).

*MC/X boards: IRQ information is obtained from the POS registers.*

**Enable ALTPIN on the port (Y/N)?**

Press <Enter> to keep the current ALTPIN configuration, or press “Y” for “yes” or “N” for “no”.

This is for connecting RJ-45 equipped boards to modems. ALTPIN swaps the DSR and DCD signals to make DCD available on 8-pin RJ-45 connectors (normally, a 10-pin connector is required to get DCD). *ALTPIN should only be used for boards equipped with RJ-45 connectors!* See the PC/X and MC/X hardware *Installation Guide* for cable diagrams and a complete description of ALTPIN.

**Please select a valid data rate:**

1) 300 2) 600 3) 1200 4) 2400 5) 4800 6) 9600 7) 19200 8) 38400

Press <Enter> to keep the current data rate, or type the number corresponding to the data rate you wish to select.

**Use XON/XOFF on Transmit (Y/N)?**

Press <Enter> to keep the current selection, or press “Y” for “yes” or “N” for “no”.

**Use CTS on Transmit, RTS on Receive (Y/N)?**

Press <Enter> to keep the current selection, or press “Y” for “yes” or “N” for “no”.

Use XON/XOFF on Receive (Y/N)?

Press <Enter> to keep the current selection, or press “**Y**” for “yes” or “**N**” for “no”.

Please select parity:  
1) None 2) Odd 3) Even

Select **1**, **2**, or **3** for None, Odd or Even, respectively. FOSSILs typically use None.

Please select stop bits:  
1) One 2) Two

FOSSILs typically use 1.

Please enter character length (5-8):

The FOSSIL standard is 8 bits per character.

Repeat the modifications for each channel, as necessary.

## Setting the Start Port Number

By default, channels will be mapped to COM1-COM8. If this conflicts with other devices (e.g. standard COM1 and COM2 devices), channels may be remapped. To set a new start port number, press “**S**”. You will be asked:

**Please enter the start port number (1-92):**

Enter the number you wish to assign to the first port of the first board. Ports will be renumbered sequentially, beginning with the specified number (e.g. if the start port number is 5, ports will be named COM5-COM12).

## Deleting Channels

To delete a channel from the configuration, position the selection pointer next to the channel to be deleted, and press “**D**”.

## Deleting Boards

To delete a board from the configuration, position the selection pointer next to the board to be deleted, and press “**D**”. All channels must be deleted from a board configuration before the board itself can be deleted.

## Loading the FOSSIL

To load the FOSSIL, change to the directory containing the FOSSIL and its configuration file, and enter the following command at the DOS prompt:

```
DGFSTD [config_file] [/cfirst_port]
```

*config\_file* is the optional filename that may have been specified in the **DGCONFS** command line during FOSSIL configuration (see page 63). If no filename is specified, the configuration file is expected to be named **FOSSIL.INI**. Note: You can run the FOSSIL from any directory, as long as you supply complete pathnames for the FOSSIL and the configuration file (*even if it is the default filename*). For example, if the program and configuration file are in the directory **C:\FOSSIL**, enter:

```
C:\FOSSIL\DGFSTD C:\FOSSIL\FOSSIL.INI
```

*/cfirst\_port* is an optional parameter that overrides the Start Port parameter in the FOSSIL configuration file (see page 66).

When the FOSSIL is successfully loaded, a message will indicate the version number and the port mapping information. The FOSSIL is now loaded and ready for use.

# Digi Support Services

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## The Digi Bulletin Board System

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

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

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

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

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

## Internet FTP Server

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

## World Wide Web Server

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

## DigiFACTs FaxBack Server

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

## Information About Your System

Serial number of your Digi product: \_\_\_\_\_

Make, model and clock speed of your computer: \_\_\_\_\_

\_\_\_\_\_

How much RAM does your computer have? \_\_\_\_\_

### Hard disk

controller: Type: \_\_\_\_\_ Memory addressed at: \_\_\_\_\_

I/O port used: \_\_\_\_\_ IRQ: \_\_\_\_\_

LAN card: Type: \_\_\_\_\_ Memory addressed at: \_\_\_\_\_

I/O port used: \_\_\_\_\_ IRQ: \_\_\_\_\_

Other: Type: \_\_\_\_\_ Memory addressed at: \_\_\_\_\_

I/O port used: \_\_\_\_\_ IRQ: \_\_\_\_\_

Operating system: \_\_\_\_\_ Version: \_\_\_\_\_

Digi device driver version: \_\_\_\_\_

## Technical Support

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

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

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

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

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

## Customer Service

Digi also has a staff of Customer Service representatives to help you with software and documentation update requests, as well as Returned Merchandise Authorizations (RMAs) in case you need to return your Digi product for repair (see page 72). They may be reached at **(612) 912-3456**. Digi Customer Service may be contacted by FAX at (612) 912-4959.

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

## Return Procedures

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



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

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



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



