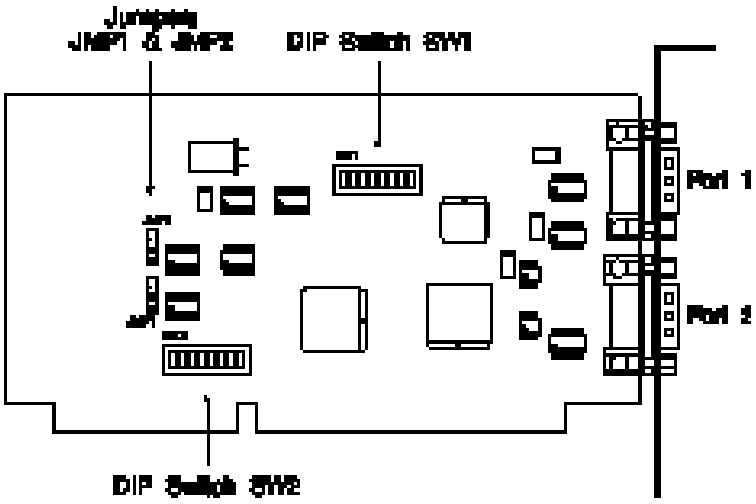
AccelePort C1 & C2 Quick Install Guide

Before you plug in the board ...

Write down the serial number of the board. You will need it if you have to contact Digi regarding the board.

The AccelePort boards have two banks of DIP switches for setting the I/O address and interrupt to be used for each port, and one jumper (AccelePort C1) or two jumpers (AccelePort C2) for selecting normal or fast baud rates for each port.

Figure 1 AccelePort Board Layout



Important! AccelePort boards contain static-sensitive components. Always touch a grounded surface to discharge static electricity before handling the circuit board.

Setting I/O Port Address and Interrupt Request Line

The AccelePort C1 and C2 boards emulate COM devices COM1-COM4. Since the AccelePort uses the same I/O addresses and interrupts as standard COM1-COM4 devices, it may be necessary to either disable existing COM ports or set the AccelePort board for a non-standard interrupt to avoid conflicts. Table 1 shows the I/O address ranges and interrupts used by standard COM ports.

Table 1 I/O Addresses and Interrupts of Standard PC COM Ports

Name	I/O Address	Interrupt
COM1	3F8h-3FFh	IRQ4
COM2	2F8h-2FFh	IRQ3
COM3	3E8h-3EFh	IRQ4
COM4	2E8h-2EFh	IRQ3

If your computer has no standard COM ports, or if the standard COM ports have been disabled, set the AccelePort board for COM1 or COM2 (or COM1 *and* COM2, if it is an AccelePort C2), with the default interrupt. See Tables 2 and 5 for switch settings.

If your machine has only a standard COM1 port, set the AccelePort board for COM2 (for an AccelePort C2, select COM2 and COM4), with the default interrupt. See Tables 2 and 5 for switch settings.

If your machine already has standard COM1 *and* COM2 ports, set the AccelePort for COM3 (and COM4, for AccelePort C2), but instead of the default interrupt, select an unused interrupt (IRQ 2, 5, 10, 11, 12 or 15). To select an alternate interrupt, turn OFF SW1-3 (and SW1-7 for AccelePort C2), then turn ON the switch in SW2 (see Table 8) that corresponds to the desired interrupt. Note: Not all application software can be configured for non-default interrupts.

Table 2 I/O Address Switch Settings for Port 1

Port Name	I/O Address	Default Interrupt	SW1-1	SW1-2
COM1	3F8h-3FFh	IRQ4	ON	ON
COM2	2F8h-2FFh	IRQ3	OFF	ON
COM3	3E8h-3EFh	IRQ4	ON	OFF
COM4	2E8h-2EFh	IRQ3	OFF	OFF

Table 3 Interrupt Selection for Port 1

Interrupt Selection	SW1-3
Default (see Table2)	ON
Set by DIP Switch SW2	OFF

Table 4 Enable/Disable Control for Port 1

Port Enable/Disable	SW1-4
Enabled	ON
Disabled	OFF

Table 5 I/O Address Switch Settings for Port 2 of C2 Board

Port Name	I/O Address	Default Interrupt	SW1-5	SW1-6
COM1	3F8h-3FFh	IRQ4	ON	ON
COM2	2F8h-2FFh	IRQ3	OFF	ON
COM3	3E8h-3EFh	IRQ4	ON	OFF
COM4	2E8h-2EFh	IRQ3	OFF	OFF

Table 6 Interrupt Selection for Port 2 of C2 Board

Interrupt Selection	SW1-7
Default (see Table5)	ON
Set by DIP Switch SW2	OFF

Table 7 Enable/Disable Control for Port 2 of C2 Board

Port Enable/Disable	SW1-8
Enabled	ON
Disabled	OFF

Table 8 Interrupt Selection (SW1-3 and/or SW1-7 Set to OFF)

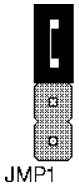
SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7	SW2-8
IRQ2	IRQ3	IRQ4	IRQ5	IRQ10	IRQ11	IRQ12	IRQ15
Turn ON switch for desired interrupt, turn OFF all other switches. If both ports use*default* interrupt (SW1-3 and SW1-7 ON, see Tables 3 and 6), turn OFF all eight switches in SW2.							

Baud Rate Range Selection

The AccelePort C1 and AccelePort C2 boards can be set to use the normal baud rates from 75 to 115K, or (through jumper or software selection) baud rates of up to 460K baud may be selected.

Jumper JMP1 controls baud rate selection for Port 1; on AccelePort C2 boards, JMP2 controls the baud rate selection for Port 2. Figure 1, on page 1, shows the location of the jumpers on the AccelePort board; Table 9 shows the three settings of the jumper.

Table 9 Baud Rate Range Selection

Software Select*	Fast Baud Rates	Standard Baud Rates
		

* Default setting

When installing the AccelePort board and the AccelePort device drivers for Windows environments, the jumpers *must* be set for either Software Select or Fast Baud Rates if serial devices other than a mouse will be connected to the AccelePort port. If a mouse is to be connected to an AccelePort port, that port's jumper must be set to standard baud rate mode in order for the mouse to operate.

Table 10 Correspondence of Fast and Standard Baud Rates

Fast Baud Rates	Standard Baud Rates
300	75
1200	300
2400	600
9600	2400
19200	4800
28800	7200
38400	9600
57600	14400
115200	28800
230400	57600
460800	115200

Table 10 gives examples of the correlation of standard and fast baud rates for DOS and NetWare environments. Please note that this is not intended to be a complete list of available baud rates. The AccelePort board will accept any standard baud rate up to 115K. With FASTBAUD selected, the standard baud rate is multiplied by 4, for baud rates up to 460K.

Note: The Windows device drivers handle baud rates differently. See the help screen for Baud Mapping in the AccelePort configuration applet in the Control Panel.

Using Fast Baud Rates

To use the fast baud rates, install a jumper on the top two pins of JMP1 (JMP2 for the second port of a C2 board). This configures the board so that fast or standard baud rates may be selected through software. For DOS and NetWare applications, use the TurboSet utility to select baud rates. For Windows applications, use the **Enable Baud Mapping** checkbox in the AccelePort configuration applet in the Control Panel.

Alternatively, you can force fast baud rates by installing the jumper on the middle two pins; please note, however, that the standard baud rates are unavailable with this method.

For example, to operate the board at 460,800 baud, select fast baud rates as described above, then configure your application for 115,200 baud. In Windows, check the **Enable Baud Mapping** checkbox in the AccelePort configuration applet in the Control Panel, then set the baud rate for the port to 2400.

Plugging in the Board

Now you are ready to install the AccelePort board in your computer. Follow these steps:

1. Turn off your computer's power and remove the cover. Refer to your computer's manual for instructions on cover removal and option board installation and cautions.
2. Locate an available 16-bit slot in your computer and remove the slot plate.
3. Plug the AccelePort board into the slot and screw the endplate to the computer chassis (use the screw you removed from the slot plate). The endplate must to be screwed in to the computer chassis to remain in compliance with Part 15 of the FCC rules.
4. Replace your computer's cover.

Port Configuration Utilities

The AccelePort C1 and AccelePort C2 boards have capabilities that exceed those of standard "dumb" ports. The 16C650 UARTs permit baud rates of up to 460K, and directly support hardware and software flow control on the board. The Windows 3.1 and Windows for Workgroups 3.11 device drivers (included with the board) automatically implement these features. For DOS and NetWare applications, software utilities have been provided to set and view the board configuration.

Hardware Flow Control

The AccelePort board supports hardware flow control for both input and output. To activate hardware flow control, use the TurboSet utility (see "Setting the Port Configuration", on page 7).

The RTS (Request To Send) output is used for input flow control. When there is room in the input buffer for data, the AccelePort board asserts the RTS line. When the buffer is nearly full, RTS is dropped.

The CTS (Clear To Send) input is used for output flow control. When CTS is asserted by the receiving device, the AccelePort board will transmit any characters it has in its buffer. When CTS is dropped, the AccelePort board will complete transmission of the current character, but will not transmit any further characters until CTS is once again asserted.

Software Flow Control

The AccelePort board supports XON/XOFF software flow control for both input and output. XON and XOFF characters may be specified by the user, and can be different for input and output flow control. To activate software flow control, or to change the XON/XOFF characters, use the TurboSet utility (see "Setting the Port Configuration", on page 7).

When the AccelePort board's receive buffer is nearly full, it transmits the XOFF character. When the buffer has room for more data, the XON character is transmitted.

When transmitting data, the AccelePort board will stop transmission when it receives an XOFF character, and will resume transmission upon receipt of an XON character.

Setting the Port Configuration

Use the TurboSet utility to set flow control options and select fast or standard baud rates. TurboSet may be placed in your AUTOEXEC.BAT file so that your ports are configured automatically when you boot your machine. The syntax for the TurboSet command is:

TURBOSET COM*x* [FASTBAUD=ON|OFF] [HWFLOW=ON|OFF] [SWFLOW=ON|OFF] [TXXON= *xx*] [TXXOFF=*xx*] [RXXON=*xx*] [RXXOFF=*xx*]

Enter the command on a single line, and include only the parameters you wish to change.

Example: To set COM3 for fast baud rates and software flow control (with the default XON and XOFF characters), enter:

```
TURBOSET COM3 FASTBAUD=ON SWFLOW=ON
```

The command line parameters are described below.

COM*x*

The name of the port. Possible values are COM1, COM2, COM3 or COM4. This is the only mandatory parameter.

FASTBAUD=ON|OFF

When the baud rate selection jumper is set for software control (see page 4), this parameter configures the board to use standard baud rates (FASTBAUD=OFF), or fast baud rates (FASTBAUD=ON). If this parameter is omitted, the baud rate range remains unchanged. The default range at boot time is standard baud rates. This parameter has no effect if the jumper is set for forced standard or fast baud rates.

HWFLOW=ON|OFF

This parameter activates (HWFLOW=ON) or deactivates (HWFLOW=OFF) hardware flow control. If this parameter is omitted, the current hardware flow control setting remains unchanged. The default setting at boot time is HWFLOW=OFF).

SWFLOW=ON|OFF

This parameter enables (SWFLOW=ON) or disables (SWFLOW=OFF) software flow control. If this parameter is omitted, the current software flow control setting remains unchanged. The default setting at boot time is SWFLOW=OFF .

TXXON=*xx*

Defines the XON character to be transmitted when software flow control is enabled. *xx* is the hexadecimal value of the desired character. If this parameter is omitted, the current XON character remains unchanged. This parameter has no effect if software flow control is disabled (SWFLOW=OFF). The default XON character at boot time is 11 (hex).

TXXOFF=*xx*

Defines the XOFF character to be transmitted when software flow control is enabled. *xx* is the hexadecimal value of the desired character. If this parameter is omitted, the current XOFF character remains unchanged. This parameter has no effect if software flow control is disabled (SWFLOW=OFF). The default XOFF character at boot time is 13 (hex).

RXXON=*xx*

Defines the XON character that the UART will recognize to restart transmission of data which has been previously suspended by the receipt of an XOFF character. If this parameter is omitted, the current XON character remains unchanged. This parameter has no effect if software flow control is disabled (`SWFLOW=OFF`). The default XON character at boot time is `11` (hex).

RXXOFF=*xx*

Defines the XOFF character that will cause the UART to stop transmitting data. If this parameter is omitted, the current XOFF character remains unchanged. This parameter has no effect if software flow control is disabled (`SWFLOW=OFF`). The default XOFF character at boot time is `13` (hex).

Viewing the Port Configuration

To view the settings of the ports in DOS and NetWare environments, run `TURBOGET`. The parameters for COM1-COM4 will be displayed as follows (note that hexadecimal numbers are preceded by "`0x`"):

```
Base I/O Address             0x3f8        0x2f8        0x3e8        0x2e8
-----------------------  ------------  -----------  -----------  -----------
Detected by BIOS as              COM1         COM2         COM3  Not Detected
Baud Rate                        9600         9600       115200             0
Parity Type                      None         None         None          None
Data Bits per Character             7            8            8             8
Stop Bits per Character             1            1            1             1
State of RTS Output               Off           On           On            On
State of CTS Input                Off          Off          Off           Off
State of DSR Input                Off          Off          Off           Off
State of DCD Input                Off          Off          Off           Off
State of DTR Output               Off          Off          Off           Off
State of RI Input                 Off          Off          Off           Off
UART Chip Used                16550AF       16C650       16C650   Not Present
Hardware Flow Control             N/A      Enabled     Disabled           N/A
Software Flow Control             N/A     Disabled      Enabled           N/A
Transmitter XON Char              N/A          N/A         0x11           N/A
Transmitter XOFF Char             N/A          N/A         0x13           N/A
Receiver XON Char                 N/A          N/A         0x11           N/A
Receiver XOFF Char                N/A          N/A         0x13           N/A
```

Glossary of Terms Used in this Document

Base I/O Address

The I/O addresses for standard serial ports in the system. TurboGet examines each of these addresses and lists the appropriate parameters.

Detected by BIOS as

The system BIOS looks for COM ports during boot time and stores the base I/O addresses of the ports it detects in a table in memory. A port can be detected as COM1, COM2, COM3 or COM4, or it may be listed as "Not Detected". "Not Detected" indicates that either no COM port is installed at that I/O address or the system BIOS did not detect a port at that address. Some older systems' BIOS only look for two COM ports and will not indicate COM3 or COM4 in the table.

Baud Rate

The setting of the baud rate clock generator for each port. Note that fast baud rates are not reflected here. This is because the fast baud rates are generated inside the 16C650 UART chip by multiplying the baud rate clock rate by 4. Thus, in the example, COM2 is configured either for 9600 baud in standard mode, or 38,400 baud (9600 x 4) in fast baud mode.

Parity Type

The parity setting for the port. Possible values are Even, Odd, Mark, Space or None.

Data Bits per Character

The number of data bits for each character. Possible values are 5, 6, 7 or 8.

Stop Bits per Character

The number of stop bits for each character. Possible values are 1 or 2 if Data Bits per Character is 6, 7 or 8. Possible values are 1 or 1.5 if Data Bits per Character is 5.

State of Signal (XXX) Input/Output

These lines show the state of the hardware handshake lines for the port. "`On`" indicates an asserted input or output, and "`Off`" indicates a negated input or output.

UART Chip Used

Indicates the type of UART detected by the utility. Possible values are `8250/16450`, `16550AF` or `16C650`.

Hardware Flow Control

Indicates whether or not hardware flow control is active. Possible values are `Enabled` or `Disabled` (16C650 UARTs) or `N/A` (other UARTs).

Software Flow Control

Indicates whether or not software flow control is active. Possible values are `Enabled` or `Disabled` (16C650 UARTs) or `N/A` (other UARTs).

Transmitter XON Char

Indicates the hexadecimal value of the transmitter XON character. If the UART is not a 16C650, or if software flow control is disabled, the value will be `N/A`.

Transmitter XOFF Char

Indicates the hexadecimal value of the transmitter XOFF character. If the UART is not a 16C650, or if software flow control is disabled, the value will be `N/A`.

Receiver XON Char

Indicates the hexadecimal value of the receiver XON character. If the UART is not a 16C650, or if software flow control is disabled, the value will be `N/A`.

Receiver XOFF Char

Indicates the hexadecimal value of the receiver XOFF character. If the UART is not a 16C650, or if software flow control is disabled, the value will be `N/A`.