# 4COM
# Technical Reference

## HARDWARE SETUP

The 4COM four port serial adapter combines flexibility in the selection of IRQ and COM port addressing with the newest, high-speed UART technology and performance capabilities to deliver the port configurability and BAUD rate performance needed in LAN and E-Mail systems.

Each serial port is functionally identical to an IBM Asyncronous Serial Communications adapter and may be connected to any serial device that supports asynchronous RS-232 C communications. Each port is configurable to any of eight different port addresses. All ports residing on a single 4COM adapter may be configured to the same interrupt (IRQ) for systems using software which is capable of interrupt sharing.

## 4COM FEATURES

- Four high performance RS-232 asynchronous communication ports
- Each port independently configurable
- Four IBM 8-Pin DIN connectors
- Four 8-Pin to DB-9 converter cables
- Data Transfer rates up to 112K BAUD (burst rate)
- Available baud rates:
  50,75,110,150,300,600,1200,2400,4800,7200,9600,19.2k, 38.4k, 56k, 112k
- Available Port Addresses:
  3F8h, 2F8h, 3E8h, 2E8h, 1F8h, 1E8h, 2A8h, 1A8h
- Available IRQ selections:
  2, 3, 4, 5, 10, 11, 12, 15
- Up to four ports may share an IRQ

## 4COM LAYOUT

There are 40 jumpers on the 4COM to set the port address andd IRQ for each of the four ports. Below is the 4COM layout.
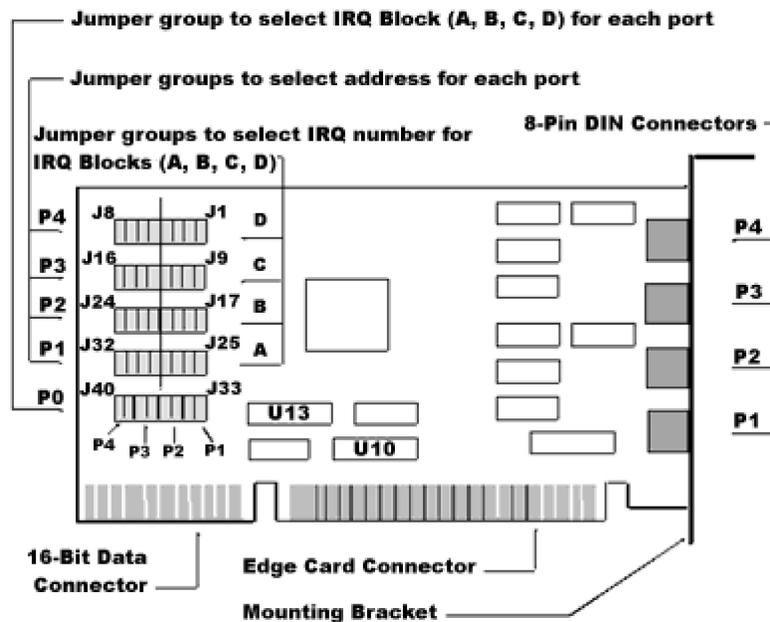
P4 (J5 - J8) = Port 4 address select jumpers
P3 (J13-J16) = Port 3 address select jumpers
P2 (J21-J24) = Port 2 address select jumpers
P1 (J29-J32) = Port 1 address select jumpers

# P1-P4 BLOCK LAYOUT

**Port Address and IRQ location**

The diagram below shows the layout of the jumper groups (P1 through P4). P1, P2, P3, and P4 are identical with respect to the location of IRQ numbers and the hex port addresses, i.e., IRQ2 is the upper rightmost location of the IRQ Block, address 3E8 is the lower leftmost position of the ort address jumper group.

**NOTE -** To disable a port or an IRQ, remove the jumper block from the corresponding jumper group so that no stake pins are jumpered.
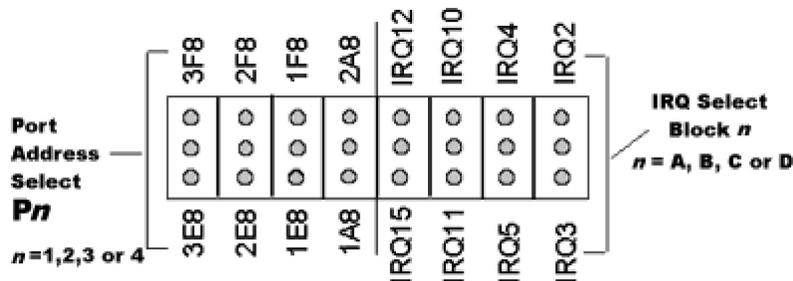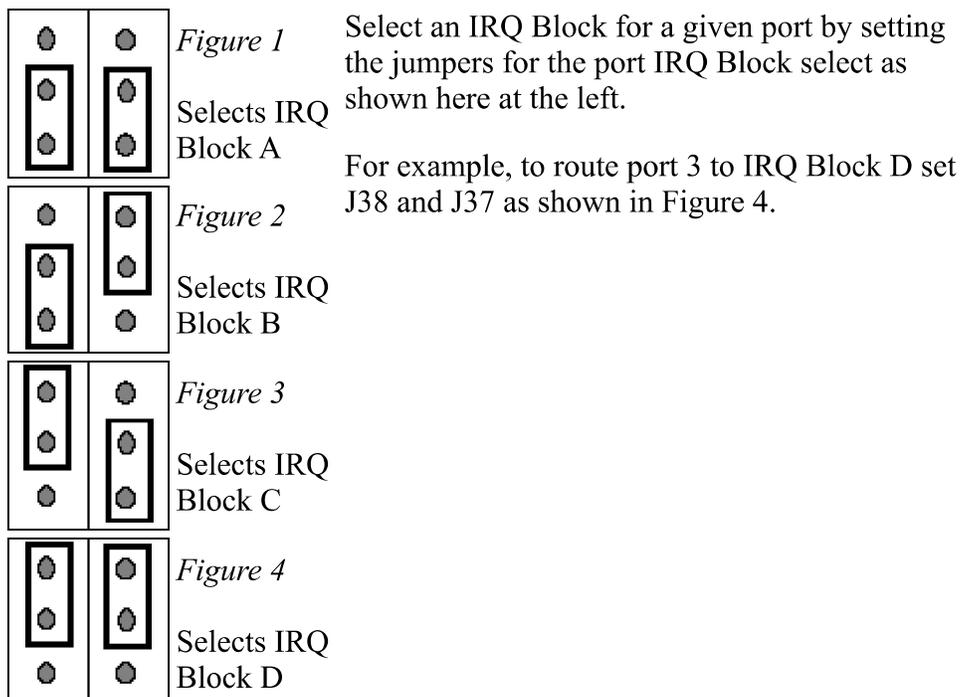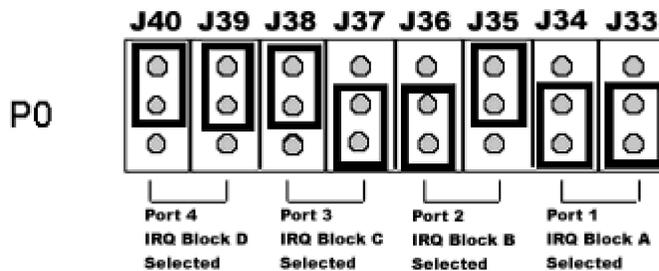


**Application Notes**

- The four jumpers labeled with IRQ numbers are referred to as an IRQ block and are designated Block A, Block B, Block C, or Block D. (See 4COM Layout for locations). These IRQ Blocks have *no direct relationship* to the adjacent port address select jumpers.
- It is not recommended that the 4COM share interrupts or port addresses with any other hardware, including other 4COM adapters.

- The 4COM has a variety of PORT/IRQ combinations. Some of these combinations may select address space or IRQs which conflict with other system hardware. Be sure your selected values are not already being used by other hardware before installing the 4COM adapter. Erratic operation or system damage may occur if conflicts exist.
- Most system BIOS's will not recognize the 1F8h, 1E8h, 1A8h, and 2A8h port address selections as COM 1, 2, 3, or 4.
- IRQ2 is software-redirected bus signal IRQ9
- No IRQ *Block* should be set to the same IRQ *number* as any other IRQ Block. (i.e., Do not set IRQ Block A and IRQ Block D to IRQ4.)
- Only address lines A0 through A9 are decoded on the 4COM.

# P0 - BLOCK LAYOUT

**Routing each port to an IRQ Block**

The P0 jumper group is used to route each port to an IRQ Block (Block A, B, C, or D) so that any of the eight different IRQ numbers can be selected for a given port. See 4COM layout for the respective IRQ Block locations. A pair of jumpers for each port (e.g., J33, J34 for port 1) determines which *IRQ Block* (A, B, C, or D) will be used to select the IRQ for a given port. Two or more ports may be "strapped" to the same IRQ Block so that the ports share an interrupt. Figures 1-4 below show the jumper configurations for block selection.





*Figure 1*

Selects IRQ Block A

*Figure 2*

Selects IRQ Block B

*Figure 3*

Selects IRQ Block C

*Figure 4*

Selects IRQ Block D

Select an IRQ Block for a given port by setting the jumpers for the port IRQ Block select as shown here at the left.

For example, to route port 3 to IRQ Block D set J38 and J37 as shown in Figure 4.

# FACTORY SETTINGS

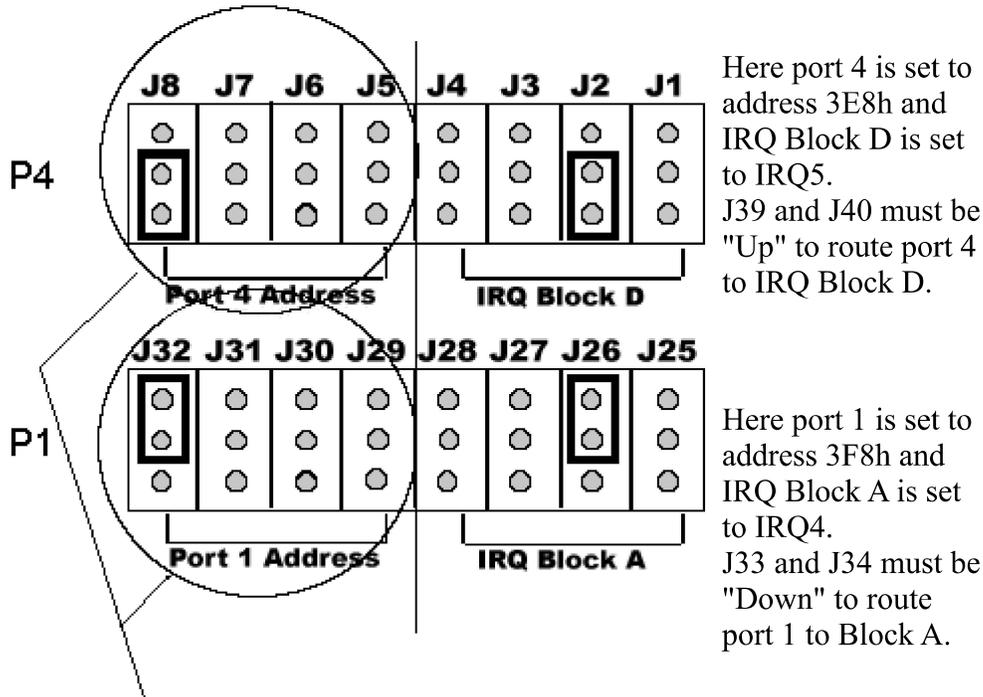| Port | COM number | Address | IRQ Block | IRQ number |
|------|-----------|---------|-----------|------------|
| P4 | COM4 | 2E8h | D | IRQ2 |
| P3 | COM3 | 3E8h | C | IRQ5 |
| P2 | COM2 | 2F8h | B | IRQ3 |
| P1 | COM1 | 3F8h | A | IRQ4 |
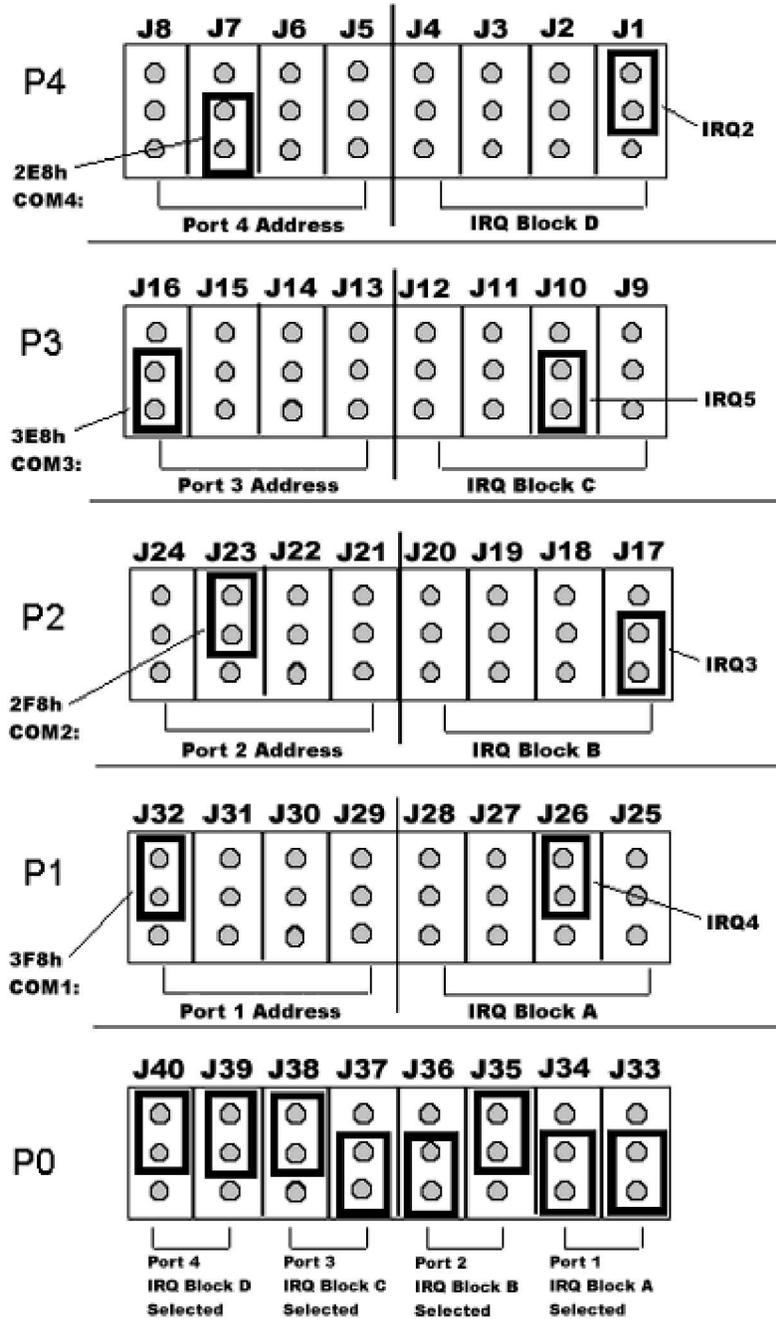
# PORT ADDRESS SELECTION EXAMPLES

In this example J8 of the port 4 (P4) address select is in the "Down" position which sets port 4 to hex address 3E8 and J32 of the port 1 (P1) address select is "Up" which sets port 1 to hex address 3F8.

**NOTE -** To set port 4 to hex port address 2A8 remove the black jumper block from J8 and place it at J5 in the "Up" position.

**Each port should be set to a unique port address.**



Here port 4 is set to address 3E8h and IRQ Block D is set to IRQ5.
J39 and J40 must be "Up" to route port 4 to IRQ Block D.

Here port 1 is set to address 3F8h and IRQ Block A is set to IRQ4.
J33 and J34 must be "Down" to route port 1 to Block A.

Port Address selection groups. The small black jumper block determines the port address. To disable a port simply remove the black jumper block from the group so that no stake pins are jumpered.

# IRQ SELECTION

The IRQ selection is a two step process. First, an IRQ block (A, B, C or D) must be selected for each port (See P0 - Block Layout). This step routes the IRQ signal for the desired port (e.g., port 1, IRQ signal to Block C) to one of the four IRQ Blocks, A, B, C, or D. Once the IRQ signal is routed to an IRQ Block, each block can be "strapped" to the desired IRQx (where $x$ = 2, 3, 4, 5, 10, 11, 12, 15) on the system bus by the jumper block.

For example, if you want port 4 (P4) to use IRQ3 from IRQ Block D, route port 4 to IRQ Block D (J39 and J40 "Up" as shown below), then set the jumper "Down" at J1 to select IRQ3 for Block D.
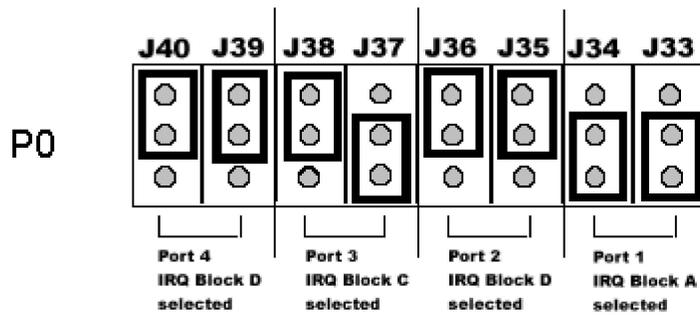
Here port 4 and port 2 are routed to IRQ Block D, port 1 is routed to Block A, and port 3 is routed to Block C.

**NOTE -** Interrupt sharing is accomplished by setting multiple ports to use the same IRQ Block. DO NOT SELECT the same IRQ number on more than one IRQ Block.

Ports 2 and 4 are routed to IRQ Block D where IRQ3 is selected as the IRQ for both ports.
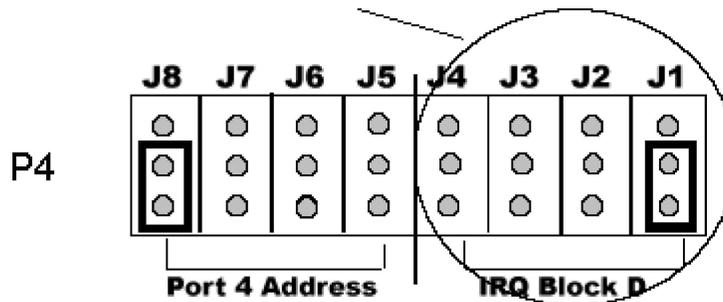


Here port 4 is set to address 3E8h and IRQ3.
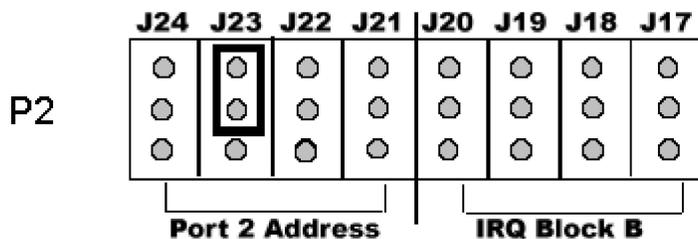


Here port 2 is set to address 2F8h and shares IRQ3 with port 4 because J35 and J36 route port 2 to IRQ Block D, which is strapped to IRQ3. IRQ Block B is not used.

## ADDRESS APPLICATION NOTES

Some of the addresses available on the 4COM adapter may pose potential address conflicts with other installed hardware. Some potential conflicts are listed below.

| Address | Potential Conflict |
|---------|--------------------|
| 1F8h | Some disk controller adapters |
| 2A8h | PS/2 systems with AT expansion bus |
| 2E8h | Graphics co-processor based video adapters<br><br>Other serial port adapters<br><br>Some modem adapters and some network adapters |

Should you experience any conflicts such as erractic operation of another connected hardware device, either reconfigure the 4COM adapter or consult the device documentation for alternate addressing. Symptoms of conflicts may include erratic performance or a mouse or network adapter, a modem dropping characters, or diminished hard disk performance.

# IRQ APPLICATION NOTES

Some of the IRQs available on the 4COM may cause conflicts with other installed hardware. The following hardware may use the indicated IRQ.

| Potential Conflict | IRQ # |
|---|---|
| Network Adapters | IRQ2 |
| Bus Mouse Adapters | IRQ5 |