Release Note

Specialix

I/O4 and I/O4+

Introduction

The Specialix I/O4 and I/O4+ are ISA PC adaptor cards, each of which add four serial ports to your machine. The differences between the two products are as follows:

the I/O4 is fitted with unbuffered UARTs (devices bearing the number 16C450), and its serial ports run at a maximum speed of 19.2KBit/s.

the I/O4+ is fitted with buffered UARTs (devices bearing the number 16C550), and its serial ports run at a maximum speed of 38.4KBit/s.

Figure 1 : I/O4 and I/O4+ card; appearance

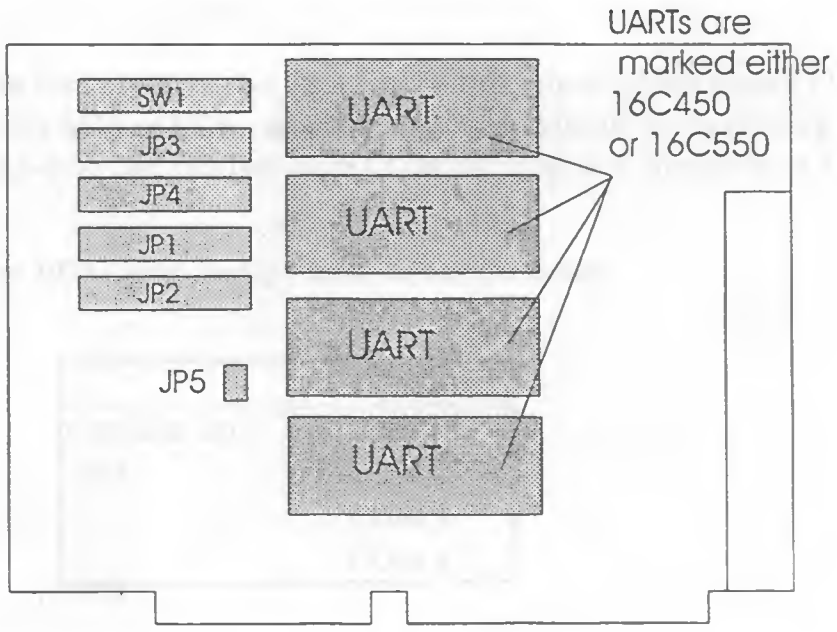


Figure 1 shows the general layout of the I/O4 and I/O4+ card. The appearance of an I/O4 and I/O4+ is identical; the UART device numbers identify which of the two cards you have.

The I/O4 and I/O4+ cards are configured using one 12-position DIP switch and five jumpers. Figure 1 shows the position of this switch and the jumpers on the card. The sections that follow describe in detail the functions of the switch and jumpers.

You should consult your operating system documentation to determine the best configuration for your I/O4 or I/O4+ cards.

NOTE: the configuration of your I/O4 or I/O4+ card(s) must not clash with any other hardware in your machine. A clash could result in failure of either device. If you are installing two I/O4 or I/O4+ cards, you must ensure they are configured differently, so that they do not clash with one another.

Mode of Operation

The I/O4 or I/O4+ can operate in two modes: NORMAL and ENHANCED.

Normal mode is used for DOS and Windows. The I/O4 or I/O4+ emulates (and takes-over) COM1 and COM2, the first two serial ports on a standard PC. The I/O4 and I/O4+'s third and fourth ports emulate or take-over a/the third and fourth serial port(s) on your machine.

Enhanced mode is used for multi-operating systems like SCO **UNIX/XENIX** and PC/MOS 386. The I/O4 or I/O4+ emulates four serial ports (in addition to any COM ports that you may already have fitted).

Tables 1 and 2 show the port emulation for normal and enhanced modes, including the fitting of a second card.

You select normal or enhanced modes by adjusting switches 11 and 12 on SW1 as per Table 3.

Before installing a card in Normal mode, we recommend that you disable existing COM ports. Upon installation, the I/O4 or I/O4+ will take-over and emulate those existing COM ports; it will then add/take-over and emulate more COM ports up to a maximum of four ports. Table 1 shows the I/O4 or I/O4+ port configuration in normal mode:

Table 1:

normal mode

	PORT
First And Only card	COM 1
	COM 2
	COM 3
	COM 4

Note: you can have only one card in normal mode. You cannot run a second I/O4 or I/O4+ card if the first card is in normal mode. Table 2 (below) shows the I/O4 or I/O4+ port configuration in enhanced mode:

Table 2: enhanced mode

	PORT
Standard Ports	COM1 COM2
First Card	1 2 3 4
Second Card	5 6 7 8

Memory addresses

Table 3 shows the range of memory addresses used in normal and enhanced modes:

Table 3: mode selection and memory address

SW11	SW12	PORT 1	PORT 2	PORT 3	PORT 4	VECTOR	MODE
ON	ON	3F8-3FF	2F8-2FF	3E8-3EF	2E8-2EF		NORMAL
ON	OFF	2A0-2A7	2A8-2AF	2B0-2B7	2B8-2BF	2BF	ENHANCED
OFF	ON	1A0-1A7	1A8-1AF	1B0-1B7	1B8-1BF	1BF	ENHANCED
OFF	OFF	180-187	188-18F	190-197	198-19F	19F	ENHANCED

Note: for multi-operating systems other than SCO UNIX/XENIX, consult the associated documentation to decide which of the above enhanced choices you should select.

For SCO UNIX/XENIX, see the section 'SCO UNIX/XENIX' later in this Release Note.

Global Interrupts

On device SW1, *one of* switches 1-10 selects the global interrupt available for your channels, as shown in Table 4.

Table 4: switches 1 - 1 0

SWITCH	1	2	3	4	5
IRQ	IRQ3	IRQ4	IRQ5	IRQ6	IRQ7
SWITCH	6	7	8	9	10
IRQ	IRQ 10	IRQ 11	IRQ 12	IRQ 14	IRQ15

IMPORTANT: You set only *one* of the switches 1-10 to the ON position. All the other switches must be in the OFF position. Placing more than one of these switches in the ON position will cause the card to fail.

OUR RECOMMENDATIONS:

in **normal** mode, set switches **1-10** to OFF; i.e. no global interrupt.

in **enhanced** mode, the settings will differ between operating systems; however, a common setting is:

for the first card - switch 2 (IRQ4) on; switches 1 and 3-10 off
for the second card - switch 1(IRQ3) on; switches 2-10 off.

Note: in MS-DOS/Windows the first (and only) card must be in normal mode.

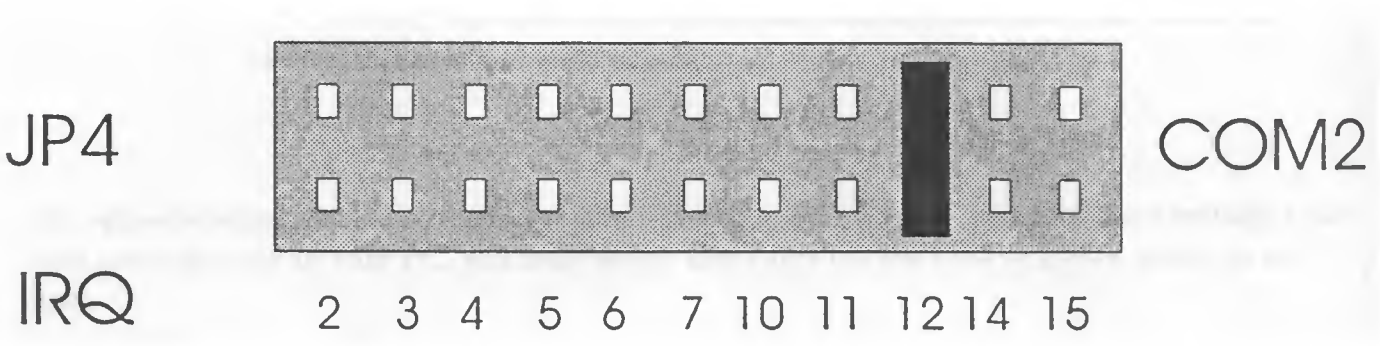
Serial Port Settings

Jumpers 1-4 on the card surface (see Figure 1) apply in Normal mode only; they select IRQs for the COM ports as in Table 5. (The jumpers are removed entirely from JPs 1-4 in Enhanced mode - see Figure 8).

Table 5; correlation of jumper JP number to COM port number

JP	COM
3	1
4	2
1	3
2	4

To select an interrupt, move the jumper over the two relevant posts; for example, to select IRQ12 for COM2, go to JP4 and place the jumper as shown in Figure 2. Figure 2 : example of a JP jumper setting

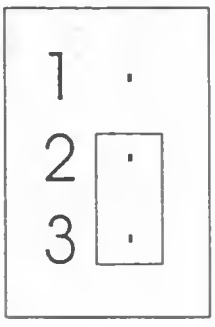


Jumper JP5 (for position on card, see Figure 1) selects PC-MOS/386, as in Figure 3. It is placed in the following positions:

positions 1-2 for all operating systems, except PC-MOS/386.

positions 2-3 fot the PC-MOS/386 operating system only.

Figure 3: JP5 jumper position (example)



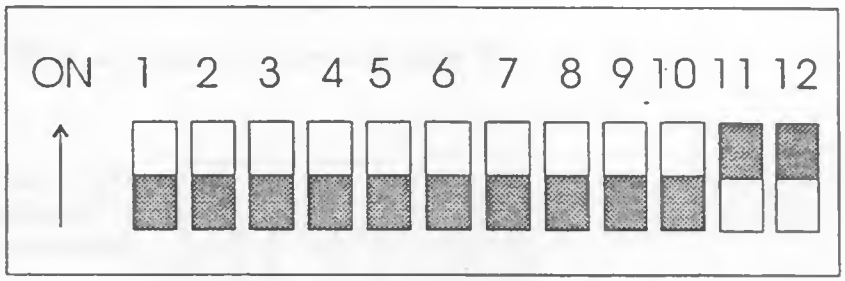
Normal Mode (DOS or Windows)

In normal mode the I/O4 and I/O4+ use COMs 1, 2, 3 and 4. These serial ports are the same as the four communication ports as defined in MS-DOS and Windows. You do not need to use any additional serial communication driver software.

Before installing a card in Normal mode, we recommend that you disable existing COM ports. Upon installation the I/O4 or I/O4+ will take-over and emulate those existing COM ports and add more COM ports up to a maximum of four ports.

The switch settings are shown below in Figure 4:

Figure 4 : Switch SW1 settings in Normal mode



The *recommended* jumper settings are shown in Figures 5 and 6. If you find these settings clash with other devices in your PC, you must select interrupts for the I/O4 or I/O4+ which do not clash.

Figure 5 : JP1 and JP3 settings in Normal mode

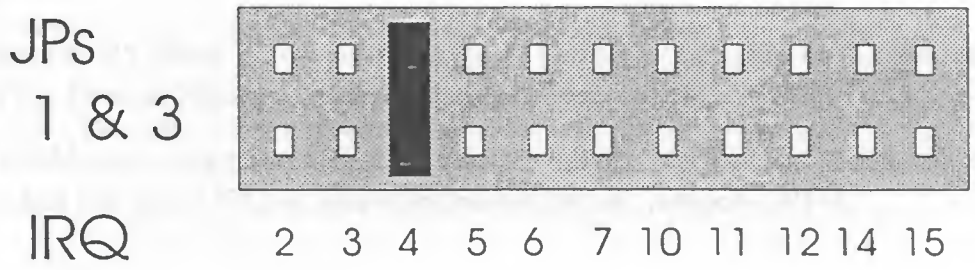
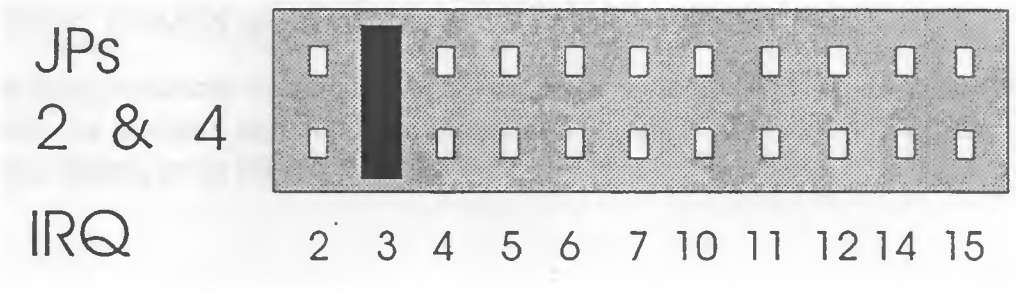
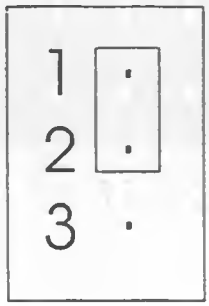


Figure 6 : JPs 2 and 4 settings in Normal mode



The setting for Jumper JP5 in Normal mode is shown in Figure 7:

Figure 7: JP5 setting for Normal mode



In Windows/DOS, after installing the card, you will need to add/configure the COM ports one at a time. To reach the appropriate dialogue boxes, do as follows:

in Windows 3.1, 3.11 or NT, from the Program Manager, go to Control Panel and then select 'Ports'.

in Windows 95, from Start - Settings, go to Control Panel, select the System icon, then select the Device Manager, and then select 'Ports (COM, LPT)'.

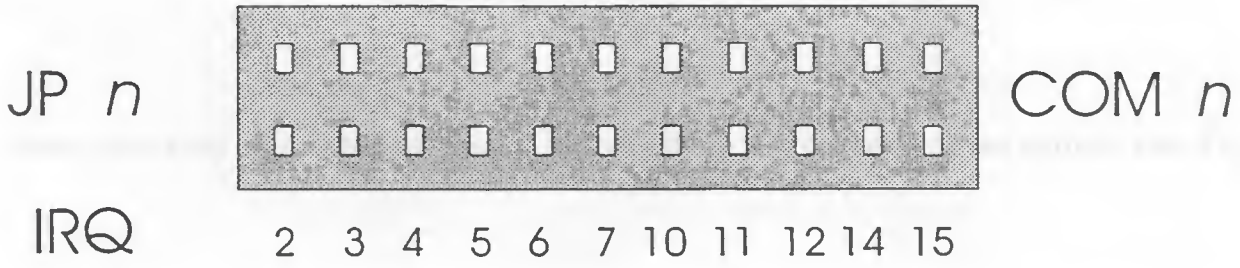
For each COM port, you enter the same memory address as you manually selected on switches 11 and 12 and the same IRQ as you selected on one of jumpers JP1-4.

Enhanced Mode

Enhanced mode is used in multi-operating systems such as SCO UNIX/XENIX, IBM XENIX, PICK, PC/MOS386, AT&T UNIX and CONCURRENT DOS.

When selecting enhanced mode you must remove completely all jumpers from JPs 3, 4, 1 and 2. Keep the jumpers separate from the card. The jumper devices will appear open (no jumper fitted), as in Figure 8 below:

Figure 8 : appearance of JPs1 -4 in Enhanced mode



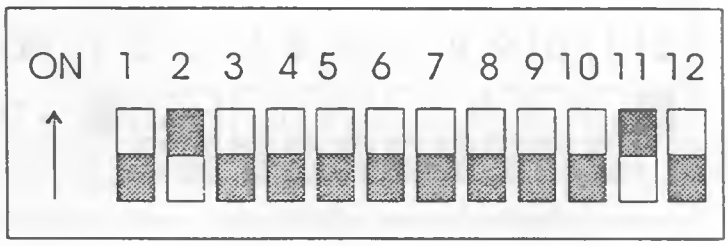
SCO UNIX/XENIX Configuration

Hardware Configuration

A. First adapter (COM1)

Address : 2A0 - 2BF
Interrupt Vector : 2BF
IRQ : 4

Figure 9 : SW1 settings for the first card

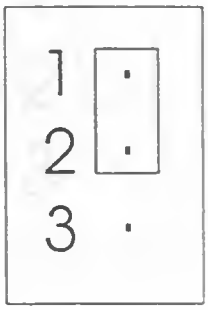


Since your card is in enhanced mode, jumpers JP 1 - 4 must be removed entirely (see Figure 8).

Table 6: port configuration (first card only)

PORT	Address	Device	Modem
1	2A0	/dev/tty1a	dev/tty/1A
2	2A8	/dev/tty1b	dev/tty/1B
3	2B0	/dev/tty1c	dev/tty/1C
4	2B8	/dev/tty1d	dev/tty/1D

Figure 10 : JP5 setting for the first card

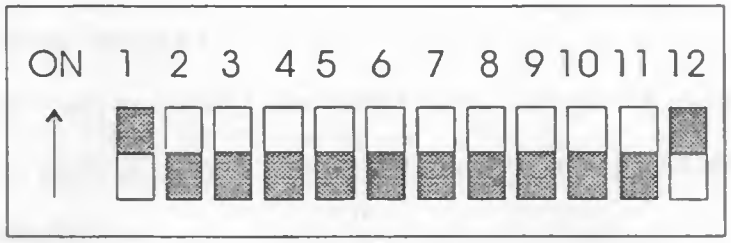


CAUTION: check that the **IRQ** selected on SW1 (see Figure 9 above) does not clash with any other device in your machine.

Hardware Configuration SCO UNIX/XENIX (continued):

B. Second adapter (COM2) Address :
1A0 - 1BF
Interrupt Vector : 1BF IRQ :
3

Figure 11 : SW1 settings for the second card

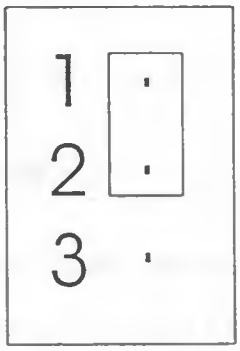


Since your card is in enhanced mode, jumpers JP 1 - 4 must be removed entirely (see Figure 8).

Table 7:
port configuration
(second card)

PORT	Address	Device	Modem
1	1A0	/dev/tty2a	dev/tty/2A
2	1A8	/dev/tty2b	dev/tty/2B
3	1B0	/dev/tty2c	dev/tty/2C
4	1B8	/dev/tty2d	dev/tty/2D

Figure 12 : JP5 setting for the second card



CAUTION: check that the IRQ selected on SW1 (see Figure 9 above) does not clash with any other device in your machine.

Software Configuration for SCO UNIX/XENIX

STEPS

1. Boot the SCO UNIX/XENIX operating system and go into system maintenance mode.
2. Install serial port:

   type # mkdev serial

3. When asked if you want to install a new serial board, accept the choice.
4. When asked if you want to install a standard tty device, accept the choice.
5. The screen will display:

```
You would like to install a:
  1.  1 port card
  2.  2 port card
  3.  4 port card
  4.  5 port card
  5.  8 port card
  6.  6.16 port card
  Select an operation or enter 'q' to quit:
```

Choose option 3 (4 port card) then press <CR> 6. The screen will then display:

```
The card is configured as:
1.        COM1
2.        COM2
3.        COM3
4.        COM4
Select an option or 'q' for quit
```

Choose option 1 (COM1) then press <CR>; the system will configure four ports.

7. When asked which card you wish to install, a list of manufacturer's names will be presented; select 'AST'. You will also be asked for the baud rate; enter a speed up to the maximum for either an I/O4 or I/O4+ card (see page 1), depending on which card you have.

8. When prompted, enable the serial ports by typing:

```
# enable tty1a
# enable tty1b
# enable tty1c
# enable tty1d
```

To install the software for a second I/O4 or I/O4+ card:

1. Repeat steps 2 - 5.

2. In step 6, choose option 2 (COM2) then press <CR>; the system will configure another four ports.

3. Repeat step 7.

4. When prompted, enable the serial ports by typing:

```
# enable tty2a
# enable tty2b
# enable tty2c
# enable tty2d
```

Adding Terminals

The I/O4 or I/O4+ is supplied with a four-way cable. The four DB9 or DB25 connectors can be connected to terminals, either directly or via a modem. Your supplier should be able to advise you which ready made cables to use. If you want to make your own cables ensure they conform to the pin-outs below.

Pin Specifications

The DB9 and DB25 connectors are wired as standard RS232 Data Terminal Equipment (DTE). You use straight through cables when connecting to RS232 Data Communications Equipment (DCE), such as modems. When connecting to DTE devices, such as terminals or printers, use a cross-over cable. The I/O4 and I/O4+ supports all the lines required for modem control.

Table 8: DB9 pin-outs

DB9 Connector		
PIN	FUNCTION	DIRECTION
1	Data Carrier Detect	Input
2	Receive Data	Input
3	Transmit Data	Output
4	Data Terminal Ready	Output
5	Signal Ground	
6	Data Set Ready	Input
7	Request to Send	Output
8	Clear to Send	Input
9	Ring Indicator	Input

Table 9: DB25 pin-outs

DB25 Connector		
PIN	FUNCTION	DIRECTION
1	Chassis	
2	Transmit Data	Output
3	Receive Data	Input
4	Request to Send	Output
5	Clear to Send	Input
6	Data Set Ready	Input
7	Ground	
8	Data Carrier Detect	Input
20	Data Terminal Ready	Output
22	Ring Indicator	Input