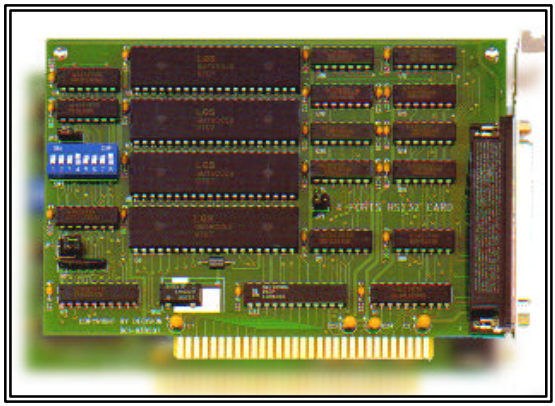
PC COM 4 PORT RS232 CARD



OPERATION MANUAL

DECISION
Computer International Co., Ltd.

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INTRODUCTION

The PCCOM 4 port adapter provides four asynchronous serial communication ports (RS232), which link the computer and serial peripheral devices such as terminals, modems, serial printers, plotters, ... etc.

The PCCOM 4 port adapter is particularly suited to facilitate the connection of terminals (VDUs) in multi-user operating systems. The PCCOM board may be installed in any IBM PC/AT, PC/386, PC/486, Pentium or hardware compatible systems. To accommodate a variety of operating systems three jumper blocks and one switch permit maximum flexibility of configuration. You may select which interrupt (IRQ2 - IRQ7), I/O address, and interrupt vector you desire.

The PCCOM 4 port adapter can be configured to either compatible mode or enhanced mode. When configured to compatible mode, it takes the place of the standard serial ports (COM1:,COM2:). When configured to enhanced mode, the four ports coexist with standard serial ports.

The PCCOM 4 port board can be used to plug in 8250, 16450, 16550, or 16650 chips, and the PCCOM98 device driver can detect it automatically. There are two kinds of board can be choose, one is normal speed card that its baud rate up to 115200, another is high speed card that its baud rate up to 460K.

The features of the PCCOM 4 port adapter are:

- Four RS232 ports for asynchronous communications.
- Suitable for XENIX/UNIX (SCO, AT&T, Interactive, UNIXWARE), MS/DOS, WINDOWS/NT, WINDOWS/95, OS/2, MS/WINDOWS, PICK, CONCURRENT DOS, QNX, PROLOGUE, MUMPS, ... etc.
- IBM PC/AT, PC/386, PC/486, Pentium hardware compatibles.
- Interrupt selectable. (IRQ2 - IRQ7)
- I /O address selectable.
- AST FourPort/XN compatible.
- COM1 and COM2 compatible.
- Auto-detect 16450 or 16550 or 16650 chips on board.
- Baud rate up to 115200 for normal speed board and up to 460K for high speed board.

UNPACKING INFORMATION

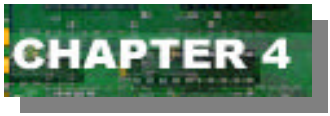
Check that your PCCOM package includes the following items:

- PCCOM 4 port adapter.
- Expansion cable with standard 25 pin connectors or 9 pin connectors.
- User manual.
- PCCOM98 software.
- Warranty form.

SYSTEM REQUIREMENTS

Before installing your PCCOM 4 port adapter, make sure that:

- The host computer is an IBM PC/AT, PC/386, PC/486, and Pentium compatibles.
- The three jumpers' blocks and one switch are correctly configured to coincide with the operating system you are using.
- The operating system you intend to use is capable of driving multiple serial ports.



HARDWARE INSTALLATION

Your PCCOM 4 port adapter is designed to be inserted in any available slot in your PC/AT, PC/386, PC/486, Pentium or compatibles. In order to gain access to the expansion slots, follow the steps listed below:

1. Turn off all power to your computer and all peripheral devices before installing your PCCOM 4 port adapter.
2. Remove the cover of the computer.
3. Insert the pre-configured PCCOM 4 port adapter into any available slot. Make sure the adapter is firmly seated in the chosen slot.
4. Replace the cover of the computer.
5. Connect cables to D25 connectors as required.

SWITCH SETTING

5.1 Compatible Mode

The first two serial ports are referred to as COM1: and COM2: which are standard ports for IBM PCs. If the PCCOM 4 port adapter is configured to emulate two standard ports by setting two of the four ports to be compatible with COM1: and COM2:. This is called compatible mode.

5.2 Enhanced Mode

The PCCOM 4 port adapter may be configured to coexist with the two standard ports, adding four ports for a total of six. This is called enhanced mode. Under the enhanced mode, a maximum of two adapters can be added to the system, which provides eight additional ports for a total of ten.

5.3 Add two PCCOM 4 Port Adapters

A. Compatible with COM1: and COM2:

	Port
➢ First Adapter	COM1: COM2: 3 4
➢ Second Adapter	5 6 7 8

B. Coexist with COM1: and COM2:

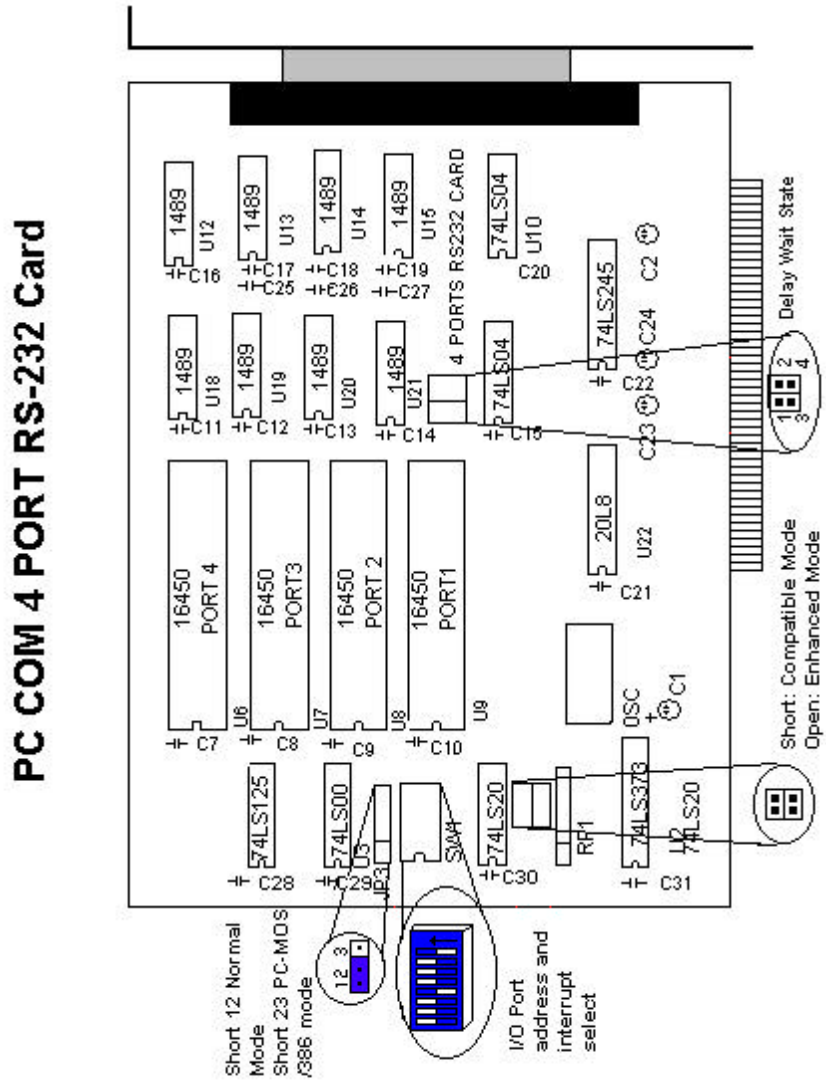
	Port
➢ Standard Port	COM1: COM2:
➢ First Adapter	1 2 3 4
➢ Second Adapter	5 6 7 8

5.4 Configuration for Dip Switch and Jumper

It is important to refer to the user manual supplied with your operating system to determine the correct configuration. Although we provide installation advice for various operating systems, it is not possible to cover all systems in this user guide. Please contact your supplier if you have any difficulties with configuration.

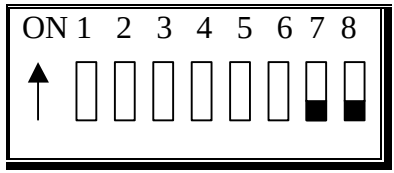
- ***IMPORTANT:*** CARE MUST BE TAKEN IN SELECTING THE CONFIGURATION OF JUMPERS AND SWITCH TO ENSURE YOU DO NOT DUPLICATE SETTINGS OF OTHER EQUIPMENT ALREADY INSTALLED IN YOUR COMPUTER. DUPLICATION OF SETTINGS WILL RESULT IN A MALFUNCTION OF ONE OR BOTH DEVICES.

- Please refer to the following settings for each switch and jumper block. If you are installing more than one board, do not duplicate jumper settings for any parameter.


PC COM 4 PORT RS-232 Card
4 PORTS RS232 CARD
16450 PORT 4
16450 PORT3
16450 PORT 2
16450 PORT1
74LS125
74LS00
74LS20
74LS373
74LS245
74LS04
20L8
OSC
SW4
RP1
Delay Wait State
Short: Compatible Mode
Open: Enhanced Mode
Short 12 Normal Mode
Short 23 PC-MOS /386 mode
I/O Port address and interrupt select

1. I / O Address Selection

SWITCH 7,8*: Select Compatible Mode or Enhanced Mode.*



SW7	SW8	MODE
ON	ON	Compatible Mode (high address)
ON	OFF	Compatible Mode (low address)
OFF	ON	*Enhanced Mode (high address)
OFF	OFF	Enhanced Mode (low address)

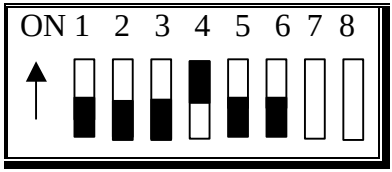
- *Default setting is in Enhanced mode (high address).*

- *The mapping of I/O addresses to each channel are shown in below:*

SW7 SW8	Channel 1	Channel 2	Channel 3	Channel 4	Vector
ON ON	3F8-3FF	2F8-2FF	2B0-2B7	2B8-2BF	2BF
ON OFF	3F8-3FF	2F8-2FF	1B0-1B7	1B8-1BF	1BF
OFF ON	2A0-2A7	2A8-2AF	2B0-2B7	2B8-2BF	2BF
OFF OFF	1A0-1A7	1A8-1AF	1B0-1B7	1B8-1BF	1BF

2. Interrupt Selection

SWITCH 1, 2, 3, 4, 5, 6: ***Select interrupt line***

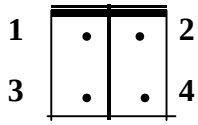


Switch On	1	2	3	4	5	6
Interrupt Enable	IRQ2	IRQ3	IRQ4	IRQ5	IRQ6	IRQ7

In compatible mode, COM1: and COM2: automatically generate interrupts on IRQ4 and IRQ3 respectively.

3. Select Wait State

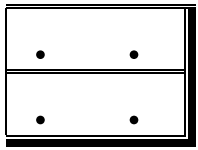
JP1: ***Select Wait State***



	SPEED
Short 1,3	Lower Than 16MHZ
Short 2,4	Above 16MHZ

4. Mode Selection

JP2*: Mode selection*

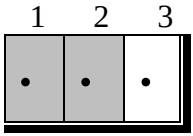


Short	Compatible Mode
Open	Enhanced Mode

- To short the JP2, it enables 3F8 (IRQ4) and 2F8 (IRQ3) of this board. So that do not short the jumper when your card is in enhanced mode, otherwise the system may generate both IRQ4, IRQ3 and IRQ that you set by switch. Only short it when compatible mode is set.

5. Select software interrupt or hardware interrupt

JP3: *Mode Selection*



	MODE
Short 1, 2	Normal Mode
Short 2,3	PC_MOS/386 Mode

- To short 1,2 means you must enable global interrupt (see chapter 7) by software.

- To short 2,3 means the hardware set global interrupt automatically.

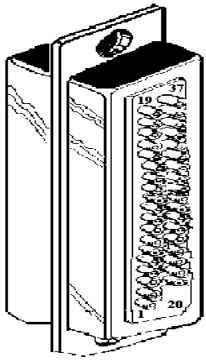
RS232 CABLING INFORMATION

6.1 DB25 Connector

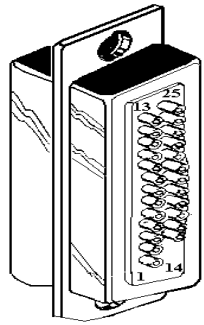
The communication interface follows the EIA RS232C standard. The signal assignments for a standard DB25 connector are shown below:

Pin #	DB25 Signal Name	RS-232C Name	Signal Direction
1	Chassis Ground(GND)	AA	Common
2	Transmit Data(TxD)	BA	Output
3	Receive Data(RxD)	BB	Input
4	Request to Send(RTS)	CA	Output
5	Clear to Send(CTS)	CB	Input
6	Data Set Ready(DSR)	CC	Input
7	Signal Ground(SG)	AB	Common
8	Data Carrier Detect(DCD)	CF	Input
20	Data Terminal Ready(DTR)	CD	Output

37 – PIN D-SHELL



25 – PIN D-SHELL



To connect the PCCOM 4 port adapter to other DATA TERMINAL EQUIPMENT (DTE) devices, we recommend using a DTE to DTE connection as shown below:

Signal	Pin # DTE		Pin # DTE	Signal
GND	1	⟷	1	GND
TxD	2	→	3	RxD
RxD	3	←	2	TxD
DTR	20	→	6	DSR
DSR	6	←	20	DTR
SG	7	⟷	7	SG
DCD	8	←	4	RTS
			5	CTS
RTS	4	→		
CTS	5	←	8	DCD

6.2 Null Modem Connections: RS232

If the software supplier or operating system does not specify a particular cable configuration, we recommend you use the following "null modem" cable when XON/XOFF is utilized.

HOST	REMOTE
2	3
3	2
4	4
5	5
6	6
7	7
8	8
20	20

If hardware handshaking is necessary, use the following cable:

HOST	REMOTE
2	3
3	2
4	4
5	5
6	20
7	7
8	8
20	6

Some serial devices have the buffer control signal on pin 19, in which case pin 6 on the host is connected to pin 19 on the remote device.

6.3 Modem Connections

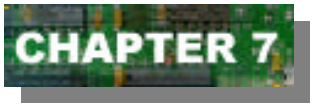
A straight through cable is required, e.g. pin 2 to pin 2, pin 3 to pin 3, etc.

HOST	REMOTE
2	2
3	3
4	4
5	5
6	6
7	7
8	8
20	20

6.4 DB9 Connector

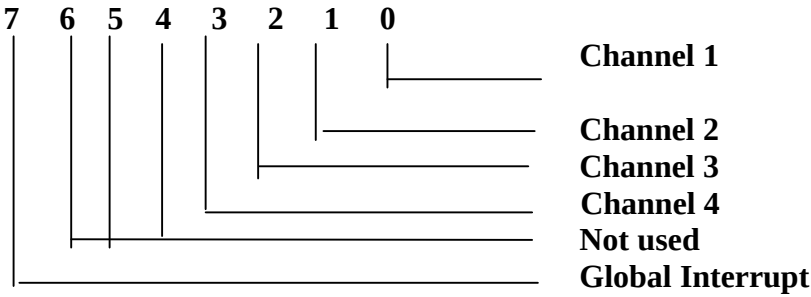
The signal assignments for a standard DB9 connector are shown below:

DB9 Pin # Signal Name	RS-232C Name	Signal Direction
1 Data Carrier Detect(DCD)	CF	Input
2 Receive Data(RxD)	BB	Input
3 Transmit Data(TxD)	BA	Output
4 Data Terminal Ready(DTR)	CD	Output
5 Chassis Ground(GND)	AA	Common
6 Data Set Ready(DSR)	CC	Input
7 Request to Send(RTS)	CA	Output
8 Clear to Send(CTS)	CB	Input
9 Ring Indicator(RI)	CE	Input



INTERRUPT LATCH ADDRESS

The interrupt vector is used to detect which of the four channels is creating the interrupt. A global interrupt (bit 7 of interrupt vector) is used to enable or disable all four channels by writing a logic 1 to enable, or 0 to disable the interrupt. After enable global interrupt (by software or hardware), each channel must be enabled or disabled separately by programming the OUT1 (0 for enable) signal in the 16450 chip. After the interrupt is enabled, you may read bit 0 to detect whether channel 1 is creating an interrupt or not? To read bit 1 to detect whether channel 2 is creating an interrupt or not? ...etc. When a data bit of the interrupt vector is set to 0, the corresponding channel is creating an interrupt. When the bit is set to 1, there is no interrupt.



- Under compatible mode, (since COM1: and COM2: are handled by PC system) the bit 0 and bit 1 of interrupt vector are not used.

APPENDIX A

PC COM DIAGNOSTIC UNDER MS/DOS

The PCCOMQC program provides a diagnostic routine to test your PCCOM 4 port serial adapter under MS/DOS. It provides internal and external loopback tests. A loopback plug must be connected to each port being tested, and you can select different signal's connection to test communication signals from hardware configuration function.

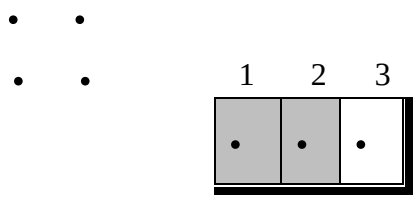
- To test your PCCOM 4 port adapter under MS/DOS, please type

A>PCCOMQC

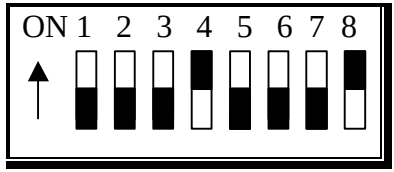
(A> means system prompt)
*Then select "PCCOM 4 port RS232" item.

The hardware configuration is shown in the following.

JP2 **JP3**



SWITCH



Port 1 Address	2A0
Port 2 Address	2A8
Port 3 Address	2B0
Port 4 Address	2B8
Interrupt Vector Address	2BF
Interrupt	IRQ5

PC COM98 DEVICE DRIVER FOR MS/DOS

B.1 PCCOM Software

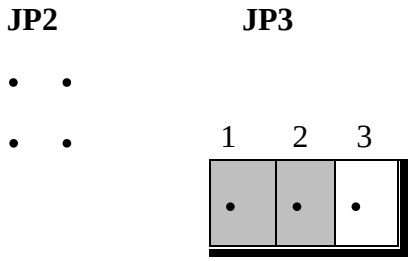
The PCCOM V2.0 is a high performance, easy to use RS232/RS422 device driver for PC/XT, PC/AT, PC/386, PC/486, Pentium or compatibles. Under MS/DOS environment, you can set up your serial ports by PCCOM device driver, and these serial ports can be treated as COM1: and COM2: devices. The setup procedure provides flexible functions to specify the configuration of multi-serial card, that is, the hardware configurations of I/O port number, I/O port address, interrupt and interrupt vector are user selectable.

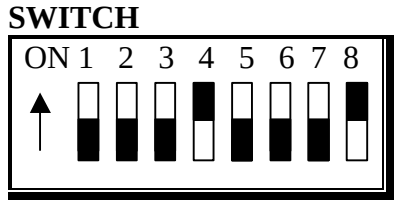
After the device driver is installed, It takes over communication between CPU and multi-serial cards such as four port card, eight port card, ... etc. For each I/O port, the service routine handles a ring buffer to keep track of all I/O data. Moreover, the PCCOM software provides library routines (C, PASCAL, BASIC, FoxPro) and DOS communication interface (DOS device driver, BIOS call) for several access levels.

The PCCOM V2.0 is an upgrade version of PCCOM V1.0 software, it combines with PCCOM V1.0 and SERIAL DRIVER utilities. Each serial port may be either 8250, 16450, 16550, or 16650 chip that was detected automatically.

📖 ***For more details, please refer PCCOMV2 manual.***

B.2 Hardware Configuration





IRQ5

Port 1 Address	2A0
Port 2 Address	2A8
Port 3 Address	2B0
Port 4 Address	2B8
Interrupt Vector address	2BF
Interrupt	IRQ5
Modem Control register	RTS+DTR

B.3 Software Installation

When the board is installed, please install software drivers as follows:

STEP 1: Prepare PCCOM4.OPT file

The PCCOM4.OPT file contents are :

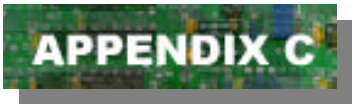
```
/B:2
/D:COM3
/A:[5:2A0,4,2BF,LO:(2k:9600:N-8-1:RTS+DTR:XON) * 4]
```

STEP 2: Prepare CONFIG.SYS file

Insert statement into CONFIG.SYS file

```
DEVICE = PCCOM.SYS@c:\pccom4.opt
```

☞ If more than one PCCOM board is installed, Please refer to PCCOMV2 manual.



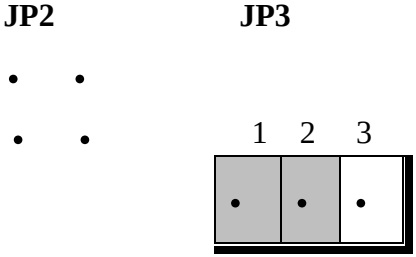
XENIX/UNIX CONFIGURATION

The distribution disk contains SCO, AT&T, UNIXWARE, and INTERACTIVE UNIX/XENIX driver, it detects non-FIFO or FIFO chips automatically. Our drivers also provide transparent printer features that let user to connect local printer from auxiliary port of terminal. The hardware configuration and software installation procedures are shown is the bellows.

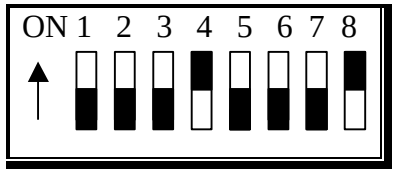
C.1 Suggested Hardware Configuration

1. **First adapter**

   I/O port address: 2A0H
   Interrupt level: IRQ3 or IRQ5
   Interrupt vector: 2BFH



SWITCH



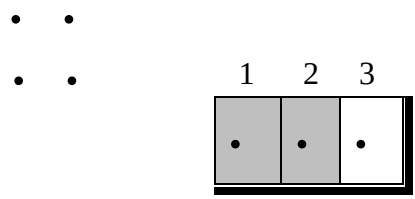
IRQ5

Port	Device Name	MODEM Name	Transparent Printer Name
1	/dev/ttyj11	/dev/ttyJ11	/dev/lpj11
2	/dev/ttyj12	/dev/ttyJ12	/dev/lpj12
3	/dev/ttyj13	/dev/ttyJ13	/dev/lpj13
4	/dev/ttyj14	/dev/ttyJ14	/dev/lpj14

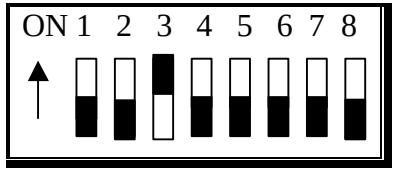
2. Second Adapter

I/O port address: 1A0H
Interrupt level: IRQ4
Interrupt vector: 1BFH

JP2 **JP3**



SWITCH



Port	Device Name	MODEM Name	Transparent Printer Name
1	/dev/ttyj21	/dev/ttyJ21	/dev/lpj21
2	/dev/ttyj22	/dev/ttyJ22	/dev/lpj22
3	/dev/ttyj23	/dev/ttyJ23	/dev/lpj23
4	/dev/ttyj24	/dev/ttyJ24	/dev/lpj24

C.2 Software Installation

- The installation procedure for the device drivers is described as follows:

  ❶ Login as a root user.

  ❷ Insert distribution diskette (which contains device drivers) into floppy disk drive A:, then copy the files from the distribution diskette to a temporary directory.

```
#cd /
# doscp a:dc.tz ./dc.tar.Z   ["dosget" in Interactive UNIX]
# zcat dc.tar / tar xvfp -
```

❸ To install device drivers, please type:

```
#cd /usr/sys/pccom/dc
# ./install
```

❹ Reboot the system. Now, your new UNIX system that includes device drivers is activated.

❺ Enable each terminal by using the **entty** or **enable** command. For USL UNIX (AT&T, UNIXWARE), Interactive UNIX

```
# entty   ttyj11
# entty   ttyj12
          .
          .
```

For SCO UNIX & XENIX by using **enable** command**.**

❻ Connect each terminal to connector.

NOTE:

❶ If the new system fails to reboot, please boot the original system. When system is boot, please press return key to halt autoboot, then type

```
:unix.old
```

❷ To remove device driver from UNIX, please type

```
a. login as a root user
b. # cd /usr/sys/pccom/dc
```

c. Remove PCCOM Driver from the kernel
#./ remove

❸ After installation, please enable each port by **entty** (for USL, Interactive UNIX) or **enable** (for SCO UNIX and XENIX) command and disable port by **distty** (for USL, Interactive UNIX) or **disable** (for SCO UNIX and XENIX) command.

#distty ttyj11

❹ To change baud rate, please update /etc/inittab and /etc/conf/cf.d/init.base files.

C.3 Option for High Speed

The configuration of High-Speed Baud Rate card is change as follows:

Original	Extensible
50	14.4 K
75	28.8 K
110	57.6 K
134	76.8 K
150	115.2 K
200	153.6 K
300	230.4 K
600	460.8 K
1200	1200 (unchanged)
2400	2400 (unchanged)
4800	4800 (unchanged)
9600	9600 (unchanged)

EXTA	19200 (unchanged)
EXTB	38400 (unchanged)

C.4 Transparent Printer

The default device names to Transparent Printer(TP) are /dev/lpXYY, that is, the prefix name is changed from "tty" to "lp" but the other "XYY" is the same. e.g. under default device names, the corresponding TTY line of /dev/lpj11 is /dev/ttyj11.

By multiplexing a serial line, there are two sorts of data channels for TTY data(by /dev/ttyXYY) and TP data(by /dev/lpXYY). If the /dev/ttyj11 is used for a TTY, it has to be enabled before you would like to print data through /dev/lpj11 to a printer that connected to the terminal that is operated via /dev/ttyj11.

The channel for TP data that is uni-directional is used to transmit the data from a host to a terminal only. The differentiates of TTY data and TP data in the same serial line is that TP data are encapsulated within a couple of PRINT-ON and PRINT-OFF escape strings that are recognized by connected terminals. The PRINT-ON and PRINT-OFF is defined by connected terminals.

The scheme to multiplex a serial line for these two channels is based on time-division method. The time slices for TTY or TP data are generated according to the entry procedure, polling, in the PCCOM driver, which is periodically called by system clock. The period of system clocks is different among various operating systems, e.g. most UNIXs is 100hz, but SCO Xenix is 50hz.

The interval reserved for TTY or TP channel in the same serial line is important to output TP data to a low-speed printer through high-

throughput line from PCCOM cards if there is no flow control XON/XOFF to the serial line.

The lpx command is used to adjust the time interval for TTY or TP data and the TP protocol.

lpx [option] device name

- **option:**

-t number: set interval for TTY
-l number: set interval for Transparent Printer
-n string: set esc string to turn on printer
-f string: set esc string to turn off printer
-T : get interval for TTY
-L : get interval for Transparent Printer
-N : get esc_string to turn on printer
-F : get esc_string to turn off printer

- **device_name : lpXYY**

The range of interval reserved for TTY or TP channel is from 1 to maximum integer. The default setting for any /dev/lpXYY is as follows:

Interval for TTY : 50
Interval for TP : 1
PRINT - ON escape : “\033[5i” (ESC[5i)
PRINT – OFF escape : “\033[4i” (ECS[4i)

☞ **The examples to invoke lpx**

❶ Set 60 time slices reserved for /dev/ttyj11

```
# lpx -t 60 /dev/ttyj11
```

❷ Set 2 time slices reserved for /dev/lpj11

```
# lpx –12 /dev/lpj11
```

❸ Get the time slices reserved for /dev/lpj11

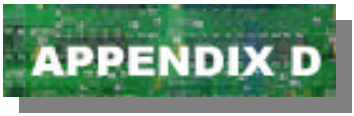
```
# lpx –L /dev/lpj11
```

❹ Set PRINT-ON string for /dev/lpj11

```
# lpx –n “\033[51” /dev/lpj11
```

❺ Get PRINT-OFF string for /dev/lpj11

```
# lpx –F /dev/lpj11 \033[4i
```



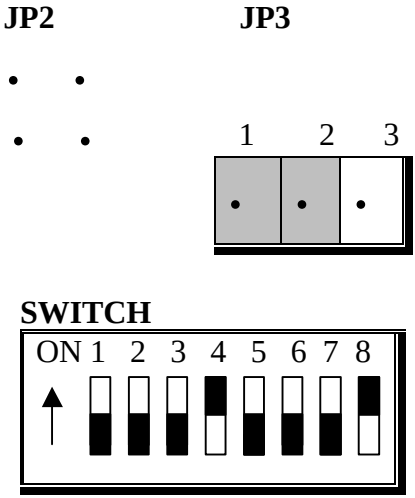
MS-WINDOWS CONFIGURATION

The PCCOM 4 port device driver for MS/WINDOWS works for 8250, 16450, 16550 (FIFO), 16650 etc. User can set up any address to PCCOM 4 port card, and the address must be set to consecutive.

D.1 Installation

1. You may set arbitrary I/O address and interrupts. However, we suggest you use the following:

   Enhance Mode
   I/O port address = 2A0 H
   Interrupt = IRQ5



Port 1 Address	2A0
Port 2 Address	2A8
Port 3 Address	2B0
Port 4 Address	2B8
Interrupt Vector Address	2BF
Interrupt	IRQ5

2. Insert the distribution diskette to floppy disk drive, then run PCCOMW.EXE.
3. Select [Install].
4. Select the source path and the directory you want to install in it.
5. When copy file is finish, enter to configuration window.
6. Select your card type and the correct address/ IRQ value, then press [OK].
7. When the window presents 'complete', please restart Windows to let the driver work.

D.2 Uninstall

1. Enter Windows to run PCCOMW.EXE by click on PCCOM icon.
2. Select [Uninstall], and confirm that sure to uninstall.
3. When the window shows 'Uninstall complete", restart Windows to let old driver work.

D.3 Utilities

1. Programming Manual

Since window manager can recognize only COM1 to COM9, however, to install PCCOM 4 port card, it may occupy COM3 to COM10. In the distribution diskette, we provide DLL library and include file, all functions are similar to USER.EXE functions.

Files:	**COMMX.DLL**	**(Dynamic linked library for aux COMs)**
	COMMX.LIB	**(Static library for aux COMs API)**
	COMMX.H	**(The include file for C/C++)**
	COMMX.DOC	**(Document)**

PCCOM library functions are similar to API Comm function

API functions are ???COMM???()
PCCOM functions are ???COMMX???()

For example, OpenComm() become OpenCommX() , parameters are the same.

- **Following are the functions used with communications devices.**

```
int   FAR PASCAL _export BuildCommXDCB(LPCSTR, DCB
FAR*);
int   FAR PASCAL _export OpenCommX(LPSTR, UINT,
UINT);
int   FAR PASCAL _export CloseCommX(int);
int   FAR PASCAL _export ReadCommX(int, LPSTR , int);
int   FAR PASCAL _export WriteCommX(int,LPSTR , int);
```

```
int   FAR PASCAL _export UngetCommXChar(int, char);
int   FAR PASCAL _export FlushCommX(int, int);
int   FAR PASCAL _export TransmitCommXChar(int, char);
int   FAR PASCAL _export SetCommXState(const DCB
FAR*);
int   FAR PASCAL _export GetCommXState(int, DCB FAR*);
int   FAR PASCAL _export GetCommXError(int, COMSTAT
FAR* );
int   FAR PASCAL _export SetCommXBreak(int);
int   FAR PASCAL _export ClearCommXBreak(int);
UINT FAR* FAR PASCAL _export SetCommXEventMask(int,
UINT);
UINT  FAR PASCAL _export GetCommXEventMask(int, int);
LONG FAR PASCAL _export EscapeCommXFunction(int, int);
BOOL FAR PASCAL _export EnableCommXNotification(int,
HWND, int,  int);
```

2. Under standard WINDOW environment, to use "TERMINAL" and "CONTROL PANEL", only COM1 to COM4 can be used. If you need use COMx (more than COM4) with TERMINAL.EXE, please modify WIN.INI before enter to WINDOW. For example, to use COM6 with TERMINAL.EXE, please find

```
[TERMINAL]
 port=COMx
```

in WIN.INI, then modify port=COMx to port=COM6.

3. No modification are necessary for applications using up to COM9, and the printers , modems may be connected up to COM9.

4. **SPECIAL NOTE** : When you set 115200 baud(only with FIFOs), please set 0xFF20 (or CBR_56000+1) to certain functions.

D.4 Testing

1. Open two terminal applications under Windows.
2. Open COM port for each terminal, and have the same configuration(baud, stop bit, protocol...) e.g.

Open COM3 to one terminal (9600 baud, 1 stop bit, 8 data bit)
Open COM4 to another terminal (9600 baud, 1 stop bit, 8 data bit)

3. Use 'NULL MODEM' method to connect the two ports.
4. Try to transmit and receive data between the two terminal windows.

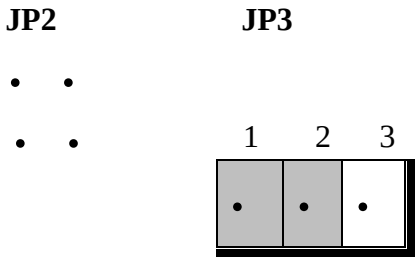
WINDOWS95 CONFIGURATION

The PCCOM 4 port adapter can be installed in the Windows 95 by using serial device driver in the distribution diskette, and the device driver will detect 8250, 16450, 16550, 16650 chips automatically.

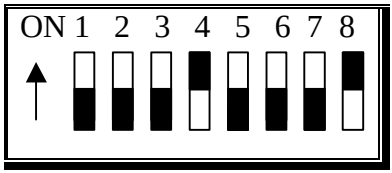
E.1 Installation

1. You may set arbitrary I/O address and interrupts. However, we suggest you use the following:

   Enhance Mode
   I/O port address = 2A0 H
   Interrupt = IRQ5



SWITCH



IRQ5

Port 1 Address	2A0
Port 2 Address	2A8
Port 3 Address	2B0
Port 4 Address	2B8
Interrupt Vector Address	2BF
Interrupt	IRQ5

2. Insert the distribution diskette to floppy disk drive, then run SETUP.EXE.
3. Click 'PCCOM98 Setup Panel' to run configuration setup.
4. Select your card type and the correct address/IRQ value, then press [OK].
5. When a dialog box presents 'Setup Complete', restart Windows 95 to let driver work.

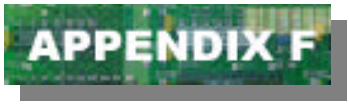
☞ If you need install more than one card, please run 'PCCOM98 Setup Panel' again. Do not set the same address and interrupt.

E.2 Remove Ports

1. Enter Windows 95.
2. Enter [Control Panel]\[System]\[Device Manager]\[Ports].
3. Select the port that you want to remove, then press [Remove] to remove it.

E.3 Uninstall

1. Remove the file group and icons that created by InstallShield.
2. Enter [Control Panel]\[Add/Remove Program], select the 'PCCOM98 Setup Panel' and remove it.



OS/ 2 CONFIGURATION

Under OS/2 2.x and OS/2 Warp operating system, the PCCOM device driver provides total 96 ports and baud rate up to 115200. PCCOM also supports device driver for high speed card, and the baud rate can be up to 460800. The device driver works for 8250, 16450, 16550 (FIFO), 16650 etc.

F.1 Installation

The installation procedures are shown in the following.

1. Add command into CONFIG.SYS file then reboot.

DEVICE=C:\PCCOM4.SYS/D/Axxx /Iyy/Czz /4

- xxx The first I/O port address
- yy IRQ2 to IRQ7
- zz Assign the first port name (1 to 92)
- D Compatible mode for COM1 and COM2. The system uses COM.SYS (from IBM) for these 2 ports and PCCOM4.SYS for other ports. This option must be put to the front of all other options.
- 4 high speed card used only

☞ **if "/C" is not use, the first port is COM3.**
☞ **if option /C1 or /C2 is use, the port COM1 or COM2 is a logical port but not compatible to COM1 or COM2 on a PC machine.**

2. To set up communication parameters, please use the MODE.COM command from OS/2, or use PCCOM.EXE command. We highly recommend to use PCCOM.EXE command, because MODE.COM can be used only for COM1 to COM9 and for maximum baud rate to 57600.

The PCCOM.EXE can be used to set COM1 to COM96. The syntax of PCCOM.EXE is the same as MODE.COM.

- ***For example :***

1. Set two cards from COM3 to COM6 and COM7 to COM10.

```
DEVICE=C:\PCCOM4.SYS /A2A0 /I5 /C3
DEVICE=C:\PCCOM4.SYS /A1A0 /I7 /C7
```

2. Set up communication parameters.

```
C:\PCCOM  COMx:38400,N,8,1,TO=OFF,XON=OFF,
IDSR=ON, ODSR=ON, OCTS=ON, RTS=OFF,DTR=OFF
C:\PCCOM COMx:115200,N,1
```

F.2 Utilities

COMTEST.EXE is a general testing program for COM port. It will create the threads associated with each communication port that will be test. The testing function includes OPEN/CLOSE/READ/WRITE/Non-Destructive Read/Non-Destructive WRITE/Get Status/Device IOCTL. Due to lack of OS/2 API, Non-Destructive I/O is not support for OS/2 even this device driver has implemented this feature.

In the COMTEST program, you can use up-right arrow to choice the option, and use enter/escape to start/stop the program.

The ComSent/ComRecv are a pair of communication programs for testing the performance of communication port. You have to connect the test ports with a null modem before you test communication port. You can use PCCOM.EXE to change the parameters of communication port. Then use this program to test heavy (transmission) duty on communication port.

F.3 API Communication Functions

In the following, there are API communication functions, for more detail information, please refer to Control Program Programming Ref. of OS/2, and programming Guide Vol. I-III of OS/2.

- **DosClose** - Close a Handle to a File, Pipe, or Devices
  #define INCL_DOSFILEMGR APIRET DosClose(HFILE FileHandle);

- **DosDevConfig** - Get Information about Attached Devices
  #define INCL_DOSPROCESS APIRET DosDevConfig(PVOID pDeviceInfo, ULONG ulDeviceType);

- **DosDevIOCtl** - Perform Control Function on a Device Specified by an Opened Device Handle
  #define INCL_DOSPROCESS APIRET DosDevIOCtl(HFILE DevHandle, ULONG ulCategory, ULONG ulFunction, PVOID pParmList, ULONG ulParmLengthMax, PULONG pParmLengthInOut, PVOID pDataArea, ULONG ulDataLengthMax, PULONG pDataLengthInOut);

- **DosOpen** - Open a File
  #define INCL_DOSFILEMGR APIRET DosOpen(PSZ pszFileName, PHFILE ppFileHandle, PULONG pActionTaken, ULONG ulFileSize, ULONG ulFileAttribute,ULONG ulOpenFlag, ULONG ulOpenMode, PEAOP2 ppEABuf);

- **DosRead** - Read from a File, Pipe, or Device to a Buffer
  #define INCL_DOSFILEMGR APIRET DosRead(HFILE FileHandle, PVOID pBufferAre, ULONG ulBufferLength, PULONG pByteRead);

- **DosWrite** - Write to a File from a Buffer
  #define INCL_DOSFILEMGR APIRET DosWrite(HFILE FileHandle, PVOID pBufferArea, ULONG ulBufferLength, PULONG pByteWritte);

APPENDIX G

WINDOWS/NT CONFIGURATION

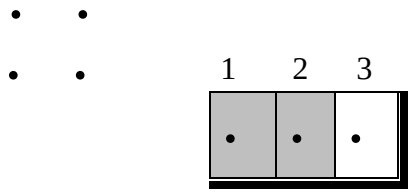
The PCCOM 4 port adapter can be installed in the Windows NT by using serial device driver in the distribution diskette, and the device driver will detect 8250, 16450, 16550, 16650 chips automatically.

G.1 Installation

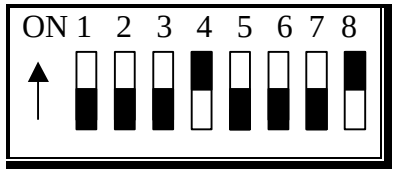
1. You may set arbitrary I/O address and interrupts. However, we suggest you use the following:

   Enhance Mode
   I/O port address = 2A0 H
   Interrupt = IRQ5

JP2 **JP3**



SWITCH



IRQ5

Port 1 Address	2A0
Port 2 Address	2A8
Port 3 Address	2B0
Port 4 Address	2B8
Interrupt Vector Address	2BF
Interrupt	IRQ5

2. Insert the distribution diskette into floppy disk drive, then run SETUP.EXE.
3. Click 'PCCOM98 Setup Panel' to run configuration setup.
4. Select your card type and the correct address/IRQ value, then press [OK].
5. When a dialog box presents 'Setup Complete', restart Windows NT to let driver work or execute the following two commands:

net stop serial	**// stop the origin driver**
net start serial	**// start our new driver**

then our driver will start to work.

6. The COM1 to COM9 can be directly referenced just like a filename from program and from the command line. However, COM10 and above must be referenced with the following syntax:

```
\\.\com10
```

Because the command line mode doesn't recognize ports above COM9.

7. Don't overlap port address and interrupt vector address, otherwise, it may conflict with UART chips.
8. If you need install more than one card, please run 'PCCOM98 Setup Panel' again. Do not set the same address and interrupt.

G.2 Remove Ports

1. Enter Windows NT.
2. Enter [Control Panel]\[Ports].
3. Select the port to delete.

G.3 Uninstall

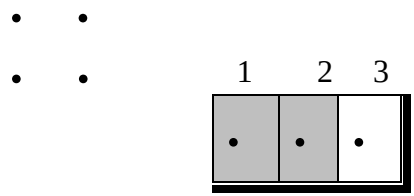
1. Remove the file group and icons that created by InstallShield.
2. Enter [Control Panel]\[Add/Remove Program], select the 'PCCOM98 Setup Panel' and remove it.

APPENDIX H

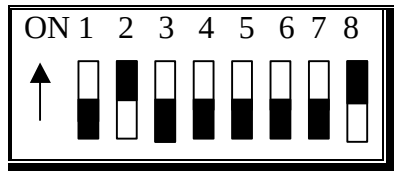
CONCURRENT DOS CONFIGURATION
MULTI - USER DOS CONFIGURATION

Set I/O port address to 2A0 and interrupt to IRQ3. To install device drivers, please run the SETUP program, then follow the menu instructions to set up I/O port address, communication parameters (such as: baud rate, parity, data bits, ... etc.), and handshaking. The hardware configuration is shown below:

JP2 **JP3**

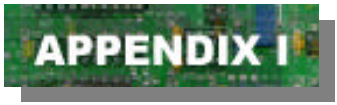


SWITCH



Port 1 Address	2A0
Port 2 Address	2A8
Port 3 Address	2B0
Port 4 Address	2B8
Interrupt Vector Address	2BF
Interrupt	IRQ3

For multi-user DOS (Dr. DOS) configuration, please set I/O port address to 2A0H, any interrupt (IRQ3 to IRQ7) is used.



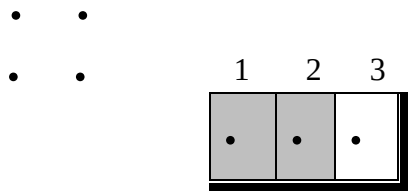
PICK CONFIGURATION

The first PCCOM 4 port board should be installed using IRQ4 (COM1:) and the second board as IRQ3 (COM2:). Be sure to disable any existing COM1 or COM2 serial ports.

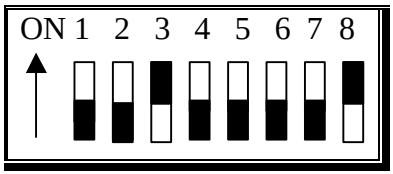
1. First board

Address range : 2A0H to 2B8H
Interrupt : IRQ4

JP2 **JP3**



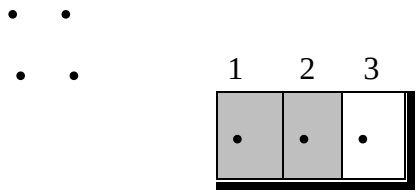
SWITCH



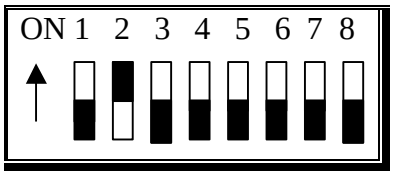
2. Second board

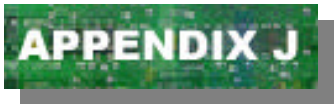
Address range : 1A0H to 1B8H
Interrupt : IRQ3

JP2 **JP3**



SWITCH



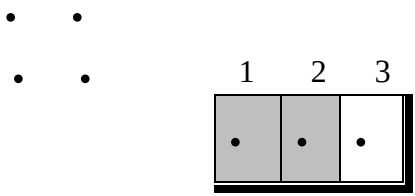


LINUX CONFIGURATION

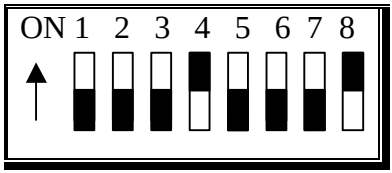
The PCCOM 4 port adapter can be installed in the Linux by using serial device driver supported by Linux, and the device driver will detect 8250, 16450, 16550, 16650 chips automatically. For more details, please refer to 'setserial' man-pages.

I/O port address = 2A0H
Interrupt = IRQ5
Chip type = 16550A

JP2 **JP3**



SWITCH



Port	Address
1	2A0-2A7
2	2A8-2AF
3	2B0-2B7
4	2B8-2BF

☞ ***Please add the following lines to /etc/rc.d/rc.serial or rc.local file.***

SETSERIAL="/bin/setserial -b"
${SETSERIAL} /dev/cua8 uart 16550A port 0x2A0 irq 5 ~fourport
${SETSERIAL} /dev/cua9 uart 16550A port 0x2A8 irq 5 ~fourport
${SETSERIAL} /dev/cua10 uart 16550A port 0x2B0 irq 5 ~fourport
${SETSERIAL} /dev/cua11 uart 16550A port 0x2B8 irq 5 ~fourport

WARRANTY INFORMATION

K.1 Copyright

Copyright 1997, 1998 DECISION COMPUTER INTERNATIONAL CO., LTD. All rights reserved. No part of PCCOM software and manual may be reproduced, transmitted, transcribed, or translated into any language or computer language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual, or otherwise, without the prior written permission of DECISION COMPUTER INTERNATIONAL CO., LTD.

Each piece of PCCOM package permits user to use PCCOM only on a single computer, a registered user may use the program on a different computer, but may not use the program on more than one computer at the same time.

Corporate licensing agreements allow duplication and distribution of specific number of copies within the licensed institution. Duplication of multiple copies is not allowed except through execution of a licensing agreement. Welcome call for details.

K.2 Warranty Information

DECISION warrants that for a period of one year from the date of purchase (unless otherwise specified in the warranty card) that the goods supplied will perform according to the specifications defined

in the user manual. Furthermore that the PCCOM product will be supplied free from defects in materials and workmanship and be fully functional under normal usage.

In the event of the failure of a PCCOM product within the specified warranty period, DECISION will, at its option, replace or repair the item at no additional charge. This limited warranty does not cover damage resulting from incorrect use, electrical interference, accident, or modification of the product.

All goods returned for warranty repair must have the serial number intact. Goods without serial numbers attached will not be covered by the warranty.

Transportation costs for goods returned must be paid by the purchaser. Repaired goods will be dispatched at the expense of PCCOM.

To ensure that your PCCOM product is covered by the warranty provisions, it is necessary that you return the Warranty card.

Under this Limited Warranty, DECISION's obligations will be limited to repair or replacement only, of goods found to be defective as specified above during the warranty period. DECISION is not liable to the purchaser for any damages or losses of any kind, through the use of, or inability to use, the PCCOM product.

DECISION reserves the right to determine what constitutes warranty repair or replacement.

Return Authorization: It is necessary that any returned goods are clearly marked with an RA number that has been issued by

DECISION. Goods returned without this authorization will not be attended to.