



CHAPTER 1

INTRODUCTION

The PCCOM ISA bus 4 port serial 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 ISA bus 4 port adapter is particularly suited to facilitate the connection of terminals (VDUs) in multi-user operating systems. Each board is supplied complete with many kinds of connectors.

The PCCOM ISA bus board may be installed in any PC/486, Pentium or hardware compatible systems. To accommodate a variety of operating systems, nine jumper blocks permit maximum flexibility of configuration. You may select which interrupt (IRQ2 - IRQ15), I/O address, and interrupt vector you desire.

The PCCOM ISA 4 port board can be addressed anywhere within the full range of PC I/O ports and each port address can be set individually as your requirement. The interrupt selectable features also provide individual interrupt selection for each port, so that you can arrange the 4 ports in any combination of interrupt you need.


The PCCOM ISA 4 port board can be used to plug in 8250, 16450, 16550, or 16650 chips, and the PCCOM 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 ISA bus 4 port adapter are:

- Four RS232 ports for asynchronous communications.
- Suitable for XENIX/UNIX (SCO, AT&T, Interactive, UNIXWARE), MS/DOS, WINDOWS/NT, WINDOWS 95/98/2000, OS/2, MS/WINDOWS, PICK, CONCURRENT DOS, QNX, PROLOGUE, MUMPS, ... etc.
- PC/486, Pentium hardware compatibles.
- ISA bus Interrupt selectable. (IRQ2 – IRQ15)
- I/O address selectable.
- Interrupt vector address selectable.
- 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 ISA bus 4 port adapter.
- Expansion cable with standard 25 pin connectors or 9 pin connectors.
- User manual.
- Decision Studio CD for PCCOM software.
- Warranty form.

SYSTEM REQUIREMENTS

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

- The host computer is an PC/486, and Pentium compatibles.
- The nine 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.



CHAPTER 4

HARDWARE INSTALLATION

Your PCCOM ISA bus 4 port adapter is designed to be inserted in any available slot in your 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 ISA bus 4 port adapter.
2. Remove the cover of the computer.
3. Insert the pre-configured PCCOM ISA bus 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.



CHAPTER 5

SWITCH SETTING

5.1 Introduction

The nine jumper blocks on the PCCOM ISA bus 4 port adapter must be configured correctly in accordance with the operating system you are using.

JP1 (Jumper 1)

Determines the I/O address of port 1.

JP2 (Jumper 2)

Determines the I/O address of port 2.

JP3 (Jumper 3)

Determines the I/O address of port 3.

JP4 (Jumper 4)

Determines the I/O address of port 4.

JP5 (Jumper 5)

Selects the interrupt vector address and determines which port is active when an interrupt occurs.

JP6 (Jumper 6)

Selects which interrupt will be used in the range IRQ2 through IRQ15.

JP7 (Jumper 7)

Enable selected interrupt. The selection of this jumper should correspond to the selection of JP6.

JP8 (Jumper 8)

Select delay wait state.

JP9 (Jumper 9)

Select the activation status (low or high) of interrupt vector.

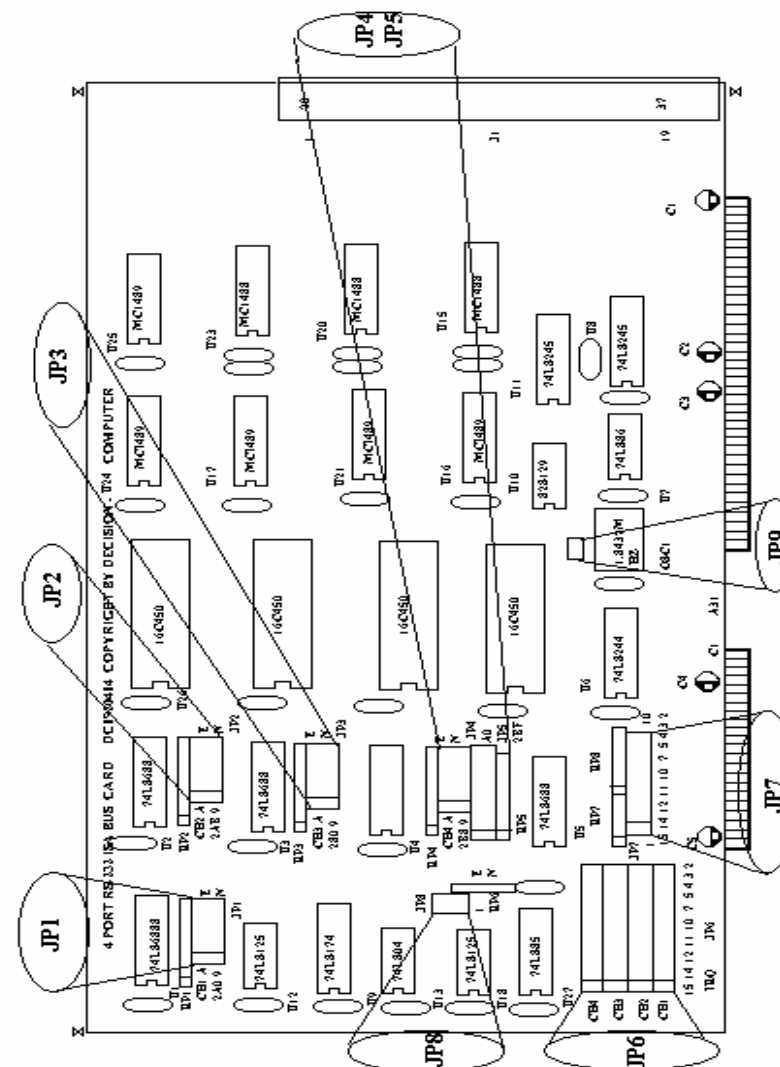
5.2 Configuration for Dip Switch and Jumper

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.

DECISION COMPUTER INTERNATIONAL CO., LTD.



1. I/O Port Address

A	A	A	A	A	A	A	E
9	8	7	6	5	4	3	N
.		.		.			.
.		.		.			.
1	0	1	0	1	0	0	|
2	|	A	|	0	|		

JP1 to JP4 are used to select UART I/O address for each port. Where JP1 is used to select port 1 address, JP2 is used to select port 2 address etc. Each JP contains A9 to A3 jumper pins and EN jumper pin. The A9 to A3 are used to set I/O port address, when the corresponding pin is short means 0, otherwise no pin short means 1. The figure above set the I/O address to 2A0H. The EN pin is used to enable the selected port, not short the jumper means enable the port, otherwise, if you short the jumper means disable this port.

➤ *The default setting of this board are:*

JP1	A	A	A	A	A	A	A	E
CH1	9	8	7	6	5	4	3	N
2A0	.	|	.	|	.	|	|	.

JP2	A	A	A	A	A	A	A	E
CH2	9	8	7	6	5	4	3	N
2A8	.	|	.	|	.	|	.	.

JP3	A	A	A	A	A	A	A	E
CH3	9	8	7	6	5	4	3	N
2B0	.	|	.	|	.	.	|	.

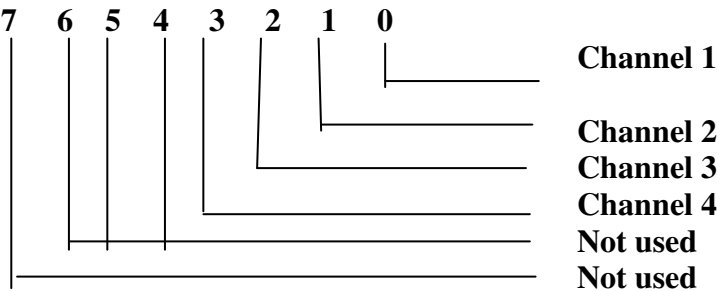
JP4	A	A	A	A	A	A	A	E
CH4	9	8	7	6	5	4	3	N
2B8	.	|	.	|	.	.	.	.

2. Interrupt Vector

JP5	A	A	A	A	A	A	A	A	A	A	E
	9	8	7	6	5	4	3	2	1	0	N
	
	

JP5 is used to set the interrupt vector address. A9 to A0 corresponding to address selection bit, not short the pin when the user select the bit to 1, otherwise short the pin to select 0. The default setting of this board is 2BFH. The EN pin is used to enable the interrupt vector, when short the pin means enable, otherwise not short the pin means disable interrupt vector.

The interrupt vector is used to detect which of the four channels is creating the interrupt. After the interrupt vector is enabled, the user may read bit 0 from interrupt vector address 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. If you set active low (JP9 open), when read a data bit from the interrupt vector is 0, the corresponding channel is creating an interrupt. When the bit content is 1, there is no interrupt.



3. Interrupt Selection

IRQ JP6	15	14	12	11	10	7	5	4	3	2	
	CH4
	CH3
	CH2
	CH1
	

JP6 is a channel interrupt select matrix, you may select interrupt for each channel. It can arrange these interrupts in any combination, this means it can set all ports in different interrupt, or combine several ports into a group to share the same interrupt. The figures shown above are for CH1 and CH2 to be combined on interrupt 10, CH3 on interrupt 11 and CH4 on interrupt 12.

The default setting of this board is combined to share the same interrupt (IRQ5).

IRQ JP6	15	14	12	11	10	7	5	4	3	2	
	CH4
	CH3
	CH2
	CH1
	

4. Common IRQ

JP7 IRQ	15	14	12	11	10	7	5	4	3	2
	•	•	•	•	•	•		•	•	•
	•	•	•	•	•	•		•	•	•

The JP7 is used to enable IRQ2 to IRQ15 bus lines. Note that the selection of these jumpers should correspond to the selection of the interrupts on the interrupt select matrix (JP6). For example, if you select IRQ5 and IRQ10 on the JP6, you need short IRQ5 and IRQ10 of JP7. However, *If more than one boards use common IRQ, only select one board to short the JP7.*

5. Select Wait State

JP8
• • 4
• • 3
• • 2
• • 1

The JP8 is used to select delay wait state.

SHORT	WAIT STATE
1	Not more than 8 MHz
2	Not more than 12 MHz
3	Not more than 25 MHz
4	More than 33 MHz

6. Select Activation Status

JP9
• •
1 2

The JP9 is used to select the activation status of interrupt. Please see interrupt vector setting section for more details.

SHORT PIN	ACTIVATION
SHORT	ACTIVE HIGH
OPEN	ACTIVE LOW

If you set active low (JP9 open), when read a data bit from the interrupt vector is 0, the corresponding channel is creating an interrupt. When the content of bit is 1, there is no interrupt.

If you set active high (JP9 short), when read a data bit from the interrupt vector is 1, the corresponding channel is creating an interrupt. When the content of bit is 0, there is no interrupt.

CHAPTER 6

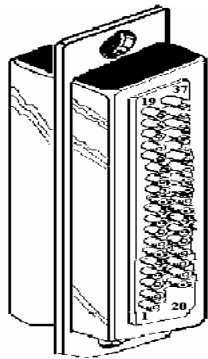
RS232 CABLING INFORMATION

6.1 DB25 Connector

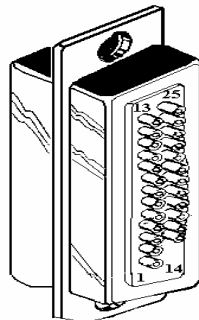
The communication interface follows the EIA RS232C standard. The signal assignments for a standard DB25 connector are shown below:

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
22	Ring Indicator(RI)	CE	Input

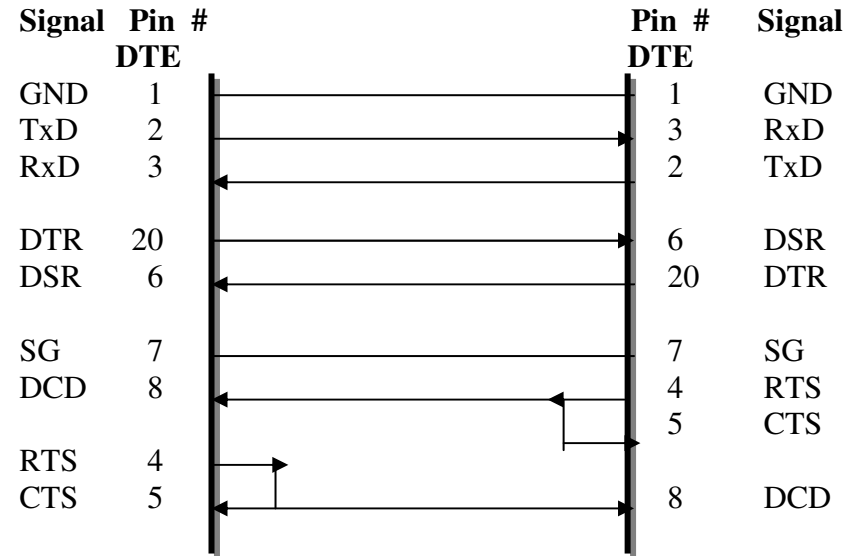
37 – PIN D-SHELL



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:



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:

Pin #	DB9 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

CHAPTER 7

STANDARD JUMPER SETTINGS

7.1 First adapter (Enhanced mode, high address)

Port 1 Address	2A0
Port 2 Address	2A8
Port 3 Address	2B0
Port 4 Address	2B8
Interrupt Vector Address	2BF
Interrupt Active Status	LOW
Interrupt	IRQ4

JP1	A	A	A	A	A	A	A	E
CH1	9	8	7	6	5	4	3	N
2A0	•	|	•	|	•	|	|	•
	•		•		•			•

JP2	A	A	A	A	A	A	A	E
CH2	9	8	7	6	5	4	3	N
2A8	•	|	•	|	•	|	•	•
	•		•		•		•	•

JP3	A	A	A	A	A	A	A	E
CH3	9	8	7	6	5	4	3	N
2B0	•	|	•	|	•	•	|	•
	•		•		•	•		•

JP4	A	A	A	A	A	A	A	E
CH4	9	8	7	6	5	4	3	N
2B8	•	|	•	|	•	•	•	•
	•		•		•	•	•	•

JP5	A	A	A	A	A	A	A	A	A	E	
2BF	9	8	7	6	5	4	3	2	1	0	N
	•		•		•	•	•	•	•	•	
	•		•		•	•	•	•	•	•	

IRQ											
JP6	15	14	12	11	10	7	5	4	3	2	
	•	•	•	•	•	•	•	|	•	•	CH4
	•	•	•	•	•	•	•	|	•	•	CH3
	•	•	•	•	•	•	•	|	•	•	CH2
	•	•	•	•	•	•	•	|	•	•	CH1
	•	•	•	•	•	•	•		•	•	
	•	•	•	•	•	•	•		•	•	

JP7	15	14	12	11	10	7	5	4	3	2
IRQ	•	•	•	•	•	•	•	|	•	•
	•	•	•	•	•	•	•		•	•

JP9
• •
1 2

7.2 Second adapter (Enhanced mode, low address)

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

JP1	A	A	A	A	A	A	A	E
CH1	9	8	7	6	5	4	3	N
1A0	|	•	•	|	•	|	|	•
		•	•		•			•

JP2	A	A	A	A	A	A	A	E
CH2	9	8	7	6	5	4	3	N
1A8	|	•	•	|	•	|	•	•
		•	•		•		•	•

JP3	A	A	A	A	A	A	A	E
CH3	9	8	7	6	5	4	3	N
1B0	|	•	•	|	•	•	|	•
		•	•		•	•		•

JP4	A	A	A	A	A	A	A	E
CH4	9	8	7	6	5	4	3	N
1B8	|	•	•	|	•	•	•	•
		•	•		•	•	•	•

JP5 1BF	A	A	A	A	A	A	A	A	A	E	
	9	8	7	6	5	4	3	2	1	0	N
		•	•		•	•	•	•	•	•	
		•	•		•	•	•	•	•	•	

IRQ JP6	15	14	12	11	10	7	5	4	3	2	
	CH4
	CH3
	CH2
	CH1
	

JP7 IRQ	15	14	12	11	10	7	5	4	3	2

JP9

.	.
1	2

CHAPTER 8

SOFTWARE PACKAGE

In the Decision Studio CD, it contains PCCOM device driver for WINDOWS 3.1/95/98/2000/NT, DOS, OS/2, UNIX, Linux, and the development tools for serial communication and telecommunication.

8.1 PCCOM Professional

The PCCOM Professional is the Serial Communication Software Development Tool Kits Under Windows 95/98/2000/NT. It contains Complete OCX and DLL Microsoft Win32 API software accessory function for application software developer. It is an easy to use tool and speed up serial communication application software development time and cost. Wide compatibility range hardware support for PCCOM multiport serial card and any standard port, and support Zmodem and Kermit file transfer protocols for ASCII, Text and Executable file.

8.2 PCCOM RemoteCom

The PCCOM RemoteCom is an OCX programming development tool for made application software. That will use to enhance RS-232/422 serial communication through Internet or Intranet by stand-alone program or by browser through World Wide Web (WWW) under Windows 95/98/2000/NT. User may call OCX functions to communicate with RemoteCOM both Server and Client using Internet communication; or encapsulate OCX function and remote serial ActiveX Control, then run development application program under Internet browser (IE and Netscape).

1. Send message to “PAGER”(BB Call).
2. Send and receive “VOICE MAIL” from computer to telephone or portable phone.
3. Send and receive E-MAIL.
4. Send and receive FAX.
5. Receive DTMF.

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

APPENDIX A

PCCOM DIAGNOSTIC UNDER MS/DOS

The TESTCOM a diagnostic program, provide routines to test your PCCOM ISA bus 4 port serial adapter under MS/DOS. It has both internal and external loopback tests. During external loopback test, a loop back plug must be connected to each port being tested. You can also select different hardware settings during testing from the SETUP RS232 menu.

User can get TESTCOM program from Decision Studio CD.

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

TESTCOM

The TestCom menu will appear.

Setup RS232 – is used to setup the baud rate, flow control, etc.

Internal loop test – is used to test the IC.

External loop test – is used to test the ports.

Auto – is used to test the IC and the ports of the card.

The hardware configuration is shown in the following.

Port 1 Address	2A0
Port 2 Address	2A8
Port 3 Address	2B0
Port 4 Address	2B8
Interrupt Vector Address	2BF
Interrupt Active Status	LOW
Interrupt	IRQ4

JP1	A	A	A	A	A	A	A	E
CH1	9	8	7	6	5	4	3	N
2A0	•	|	•	|	•	|	|	•
	•		•		•			•

JP2	A	A	A	A	A	A	A	E
CH2	9	8	7	6	5	4	3	N
2A8	•	|	•	|	•	|	•	•
	•		•		•		•	•

JP3	A	A	A	A	A	A	A	E
CH3	9	8	7	6	5	4	3	N
2B0	•	|	•	|	•	•	|	•
	•		•		•	•		•

JP4	A	A	A	A	A	A	A	E
CH4	9	8	7	6	5	4	3	N
2B8	•	|	•	|	•	•	•	•
	•		•		•	•	•	•

JP5	A	A	A	A	A	A	A	A	A	A	E
2BF	9	8	7	6	5	4	3	2	1	0	N
	
	

IRQ											
JP6	15	14	12	11	10	7	5	4	3	2	
	.	.	.	.	.	.	|	.	.	.	CH4
	.	.	.	.	.	.	|	.	.	.	CH3
	.	.	.	.	.	.	|	.	.	.	CH2
	.	.	.	.	.	.	|	.	.	.	CH1
	

JP7										
IRQ	15	14	12	11	10	7	5	4	3	2

JP9

.	.
1	2

APPENDIX B

PCCOM DEVICE DRIVER FOR MS/DOS

B.1 PCCOM Software

The PCCOM software is a high performance, easy to use RS232/RS422 device driver for 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.

 For more details, please refer PCCOM manual.

B.2 Hardware Configuration

Port 1 Address	2A0
Port 2 Address	2A8
Port 3 Address	2B0
Port 4 Address	2B8
Interrupt Vector Address	2BF
Interrupt Active Status	LOW
Interrupt	IRQ5
Modem Control Register	RTS + DTR

 Please refer appendix A for more details.

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 PCCOM manual.

APPENDIX C

XENIX/UNIX CONFIGURATION

The distribution CD 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 in the bellows.

C.1 Suggested Hardware Configuration

1. First adapter

I/O port address: 2A0H
 Interrupt level: IRQ3 or IRQ5 or IRQ10
 Interrupt vector: 2BFH

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 or IRQ12
 Interrupt vector: 1BFH

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:

- 1 Login as a root user.
- 2 Insert distribution CD (which contains device drivers) into CD-ROM drive d:, then copy the files from the distribution CD to a temporary directory.

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

- 3 To install device drivers, please type:

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

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

- ⑤ 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.

- ⑥ Connect each terminal to connector.

NOTE:

- ① 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
```

- ② 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
```

- ③ 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
```

- ④ 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/lpXYZ, that is, the prefix name is changed from "tty" to "lp" but the other "XYZ" 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" (ESC[4i)

The examples to invoke lpx

- Set 60 time slices reserved for /dev/ttyj11

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

- Set 2 time slices reserved for /dev/lpj11

```
# lpx -t 2 /dev/lpj11
```

- Get the time slices reserved for /dev/lpj11

```
# lpx -L /dev/lpj11
```

- Set PRINT-ON string for /dev/lpj11

```
# lpx -n "\033[51" /dev/lpj11
```

- Get PRINT-OFF string for /dev/lpj11

```
# lpx -F /dev/lpj11 \033[4i
```

APPENDIX D

MS-WINDOWS CONFIGURATION for V3.x

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

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

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

- Insert the distribution CD to CD-ROM drive, then run PCCOMW.EXE.
- Select [Install].
- Select the source path and the directory you want to install in it.
- When copy file is finish, enter to configuration window.
- Select your card type and the correct address/ IRQ value, then press [OK].
- 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 CD, 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.

APPENDIX E

WINDOWS 95/98 CONFIGURATION

The PCCOM 4 port adapter can be installed in the Windows 95/98 by using serial device driver in the distribution CD, 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:

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

2. Insert the distribution CD into CD-ROM drive. The CD is auto run, so you just wait until Decision Studio Applet appears.
3. Click “Device Driver” button, “Windows Operating System” then a selection of windows operating system platform appears.
4. Click “Windows 95 / Windows 98” button to view the device list of different hardware products.
5. Select “PCCOM Multiport Serial Card”. Install shield will do installation, for you just click “Next” when windows prompts you to resume installation procedure.

- ☞ If you need install more than one card, please run [PCCOM 2000] again and use different I/O address, IRQ when installing again. Never try to install 2 or more cards at the same time for you will have errors in installation.

- Another method to remove ports is:

- 

- 

WINDOWS 2000 CONFIGURATION

F.1 Installation

- ☞ If you need install more than one card, please run above procedure again. Never try to install 2 or more cards at the same time for you will have errors in installation.

F.2 Remove Ports

1. Go to [Control Panel Applet][Decision PCCOM Adapters].
2. Select the port you want to remove then press “Remove Port” to delete specified port. Reboot for changes to take effect.

APPENDIX G

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.

G.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 IRQ15
- 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
```

G.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.

G.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 H

WINDOWS/NT CONFIGURATION for V3.51 up

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.

H.1 Installation

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

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

2. Insert the distribution CD into CD-ROM drive. The CD is auto run, so you just wait until Decision Studio Applet appears.
3. Click "Device Driver" button, "Windows Operating System" then a selection of windows operating system platform appears.
4. Click "Windows NT" button to view the device list of different hardware products.
5. Select "PCCOM Multiport Serial Card". Install shield will do installation, for you just click "Next" when windows prompts you to resume installation procedure.

6. Go to [Control Panel]\[Decision PCCOM Adapters]. Click [Add] then choose the hardware you want to install then reboot your computer.

☞ Configuration of I/O address, IRQ and interrupt vectors in your hardware must be the same inside the device driver configuration.

H.2 Remove Ports

1. Go to [Control Panel]\[Ports] then select what you want to remove and click "Delete" to remove ports.

H.3 Uninstall

1. Enter [Control Panel]\[Decision PCCOM Adapter], and click [Completely Remove Driver].

APPENDIX I

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:

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

For multi-user DOS (Dr. DOS) configuration, please set I/O port address to 2A0H, any interrupt (IRQ3 to IRQ15) is used.

APPENDIX J

PICK CONFIGURATION

The first PCCOM ISA bus 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.

Please refer chapter 7 to set hardware configuration. One is First adapter (Enhanced mode, high address) and another is Second adapter (Enhanced mode, low address).

APPENDIX K

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

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
```

APPENDIX L

DIAGNOSTIC UNDER WINDOWS

After installing the PCCOM adapter to your computer, you can test it if it is functioning correctly via HyperTerminal (a Windows package communication program), or by using the Decision Terminal (a software of the Decision Computer International Co. Ltd.) included on the CD. Just make sure that there is a loop back plug connected to the COM Port under test.

L.1 Using Hyper Terminal

To test the card using the Hyper Terminal. Please do the following steps:

1. Run the HyperTerminal program.
2. During connection, the program will ask you to enter your name and choose an icon for the connection. Enter any name and select any icon.
3. After entering your name and selecting icon you will be ask for country code, area code, phone number and connect using what. Ignore all edit box except for the connect using, click the combo box and select Direct to COMx (You can use any port but usually the COM1 and COM2 is used by the computer motherboard).
4. Put the proper COM x properties.
5. You can now begin to type any message. Take note that whatever you type must appear to the textbox as long as

you have a loop back on the COM port of your card!

L.2 Using Decision Terminal

To test the card using the Decision Terminal. Please do the following steps:

1. Install the software using the Decision Studio (It is inside the CD AutoOpen program).
2. Run the program (Decision Terminal) at the program menu of the start menu.
3. Setup the COM port properties by selecting the setup option on the File menu.
4. You can now begin to type any message to transmit textbox. Take note that whatever you type must appear to receive textbox as long as you have a loop back on the COM port of your card.
5. You can also click the Test button to test your card automatically.

APPENDIX M

SOFTWARE DEVELOPMENT INFORMATION

We also provide other hardware with complete Internet/Intranet remote control software tool for more function availability

Decision Industrial Interface

The Decision Industrial Interface was created to provide a standard way to access the functionality provided by all data acquisition products.

Decision Industrial Control

Develop a program controlling the Industrial digital and analog cards remotely at any part of the world using the Internet technology! Done it in your application program or via Internet browser! It extends Decision Industrial Interface from single computer development environment to client-server development environment.

Remote Voice

Long distance call will not be expensive as before. There is no cheaper way to talk to your friend from another country than to talk through Internet! And the good news is that you can develop your own software with Remote sound!

Remote Chat

This development tool is used for chatting / communicating with another computer in the Internet / Intranet.

Remote White Board

This development tool uses client – server remote drawing board, every client can shared their image drawn on server drawing board.

Remote Image Capture

This development tool allows you to capture images taken from the CCD camera via Internet.

Pinger

This development tool make it possible for you to make a program that check if your still connected to the network or internet and check the speed of the response of your connection!

Internet Location Server

This development tool is used to find an IP address of a particular client / computer in the Internet by just specifying its email address!

Remote Access Server

This development tool use to dial-up like and phone dialer technology, able to dial an ISP and monitor some of some IP address on network

APPENDIX N

WARRANTY INFORMATION

N.1 Copyright

Copyright 1999, 2000, 2001 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.

N.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.