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CHAPTER 1

INTRODUCTION

The PCI bus multi-8255/8254 adapter is a 32 bits PCI bus adapter with Plug and Play (PnP) features, it is a programmable I/O interface for PC/486, Pentium or compatible computers. The PnP features let hardware configuration for IRQ and I/O address is detected by BIOS automatically, you don't need set switch and jumper.

The PCI bus multi-8255/8254 adapter provides total 24 digital I/O ports, each I/O port contains 8 I/O lines, and can be set either input or output by the user's program. Two 8254 on board chips provides six programmable interval timer/counter.



 The features of the PCI bus multi-8255/8254 adapter are:

- 32 bits PCI bus with Plug and Play (PnP) features.
- Programmable I/O control functions.
- Up to 192 I/O lines.
- Up to 6 counter/timer.
- Maximum of 10 MHZ counter rate.
- Support several operating modes that are programmable.
- Provides DII device driver for PnP features.



CHAPTER 2

UNPACKING INFORMATION



Check that your PCI bus multi-8255/8254 package includes the following items:

- PCI bus multi-8255/8254 adapter.
- Demo Program.
- Data Capture Software Manual with CD.
- Four expansion flat cables with IDC50/DB50 connector.
- One expansion flat cables with IDC40/DB50 connector.
- DII device driver.
- User manual.
- Warranty form.





CHAPTER 3

HARDWARE INSTALLATION

Your PCI bus multi-8255/8254 adapter is designed to be inserted in any available PCI 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 multi-8255/8254 adapter.
2. Remove the cover of the computer.
3. Insert the multi-8255/8254 adapter into any available PCI slot. Make sure the adapter is firmly seated in the chosen slot.
4. Replace the cover of the computer.
5. Connects the expansion cables.
6. Turn on the power of your computer, the PnP features will recognize the multi-8255/8254 adapter.





CHAPTER 4

HARDWARE CONFIGURATION

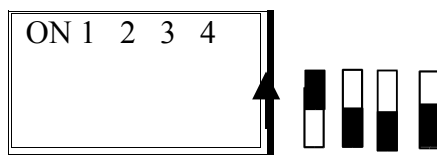
4.1 I/O Port Address

Base + 0 : Port 1A input/output buffer.
Base + 1 : Port 1B input/output buffer.
Base + 2 : Port 1C input/output buffer.
Base + 3 : Port 1 control register.
Base + 4 : Port 2A input/output buffer.
Base + 5 : Port 2B input/output buffer.
Base + 6 : Port 2C input/output buffer.
Base + 7 : Port 2 control register.
Base + 8 : Port 3A input/output buffer.
Base + 9 : Port 3B input/output buffer.
Base + 10 : Port 3C input/output buffer.
Base + 11 : Port 3 control register.
Base + 12 : Port 4A input/output buffer.
Base + 13 : Port 4B input/output buffer.
Base + 14 : Port 4C input/output buffer.
Base + 15 : Port 4 control register.
Base + 16 : Port 5A input/output buffer.
Base + 17 : Port 5B input/output buffer.
Base + 18 : Port 5C input/output buffer.
Base + 19 : Port 5 control register.
Base + 20 : Port 6A input/output buffer.
Base + 21 : Port 6B input/output buffer.
Base + 22 : Port 6C input/output buffer.
Base + 23 : Port 6 control register.
Base + 24 : Port 7A input/output buffer.
Base + 25 : Port 7B input/output buffer.



Base + 26 : Port 7C input/output buffer.
Base + 27 : Port 7 control register.
Base + 28 : Port 8A input/output buffer.
Base + 29 : Port 8B input/output buffer.
Base + 30 : Port 8C input/output buffer.
Base + 31 : Port 8 control register.
Base + 32 : Counter 0 input/output buffer.
Base + 33 : Counter 1 input/output buffer.
Base + 34 : Counter 2 input/output buffer.
Base + 35 : Counter control register for counter 0,1,2.
Base + 36 : Counter 3 input/output buffer.
Base + 37 : Counter 4 input/output buffer.
Base + 38 : Counter 5 input/output buffer.
Base + 39 : Counter control register for counter 3,4,5.

4.2 DIP Switch



The switch is used to identify card number, default setting is card 1. There are two methods to set the card number:

a. PnP mode

Just plug in PCI bus adapter into PCI slot, the PCI BIOS will allocate I/O address to each adapter automatically and assign card number start from 0 to each adapter. However, if you plug in more than one adapter, please set whole adapters to card number 1 (default setting), then use software tools to distinguish port id.

b. manual mode

Set card number by card identifier switch, the PCI BIOS will assign pre-allocated I/O address to each adapter. Please set different card number to each adapter (do not duplicate card number setting).

1	2	3	4	Card Number
ON	OFF	OFF	OFF	1
OFF	ON	OFF	OFF	2
ON	ON	OFF	OFF	3
OFF	OFF	ON	OFF	4

☞ The card number starts from 0 to 15.

4.3 Pin Assignments

The signals are assigned in the IDC-40 and IDC-50 connectors.

The assignment for the pin-connentor on the card, the flat-cable and the DB-50 is different!

When you like to connect by a flat-cable direct to the card, please use assignment A for the flatcable.

When you like to connect direct to the card please use B for the pin-connection.

When you like to connect by DB-50, please use DB

Sample:

DB	A	B	Function		DB	A	B	Function
1	1	2	P5A1		34	2	1	P5A0
18	3	4	P5A3		2	4	3	P5A2

The pin assignments are shown in the next pages.



1. Connector Pin Assignments (JP1) U1/U2

DB	A	B	Funcio		DB	A	B	Funcio
1	1	2	P1A1		2	2	1	P1A0
3	3	4	P1A3		4	4	3	P1A2
5	5	6	P1A5		6	6	5	P1A4
7	7	8	P1A7		8	8	7	P1A6
9	9	10	P1B1		10	10	9	P1B0
11	11	12	P1B3		12	12	11	P1B2
13	13	14	P1B5		14	14	13	P1B4
15	15	16	P1B7		16	16	15	P1B6
17	17	18	P1C1		18	18	17	P1C0
19	19	20	P1C3		20	20	19	P1C2
21	21	22	P1C5		22	22	21	P1C4
23	23	24	P1C7		24	24	23	P1C6
25	25	26	GND		26	26	25	GND
27	27	28	P2A1		28	28	27	P2A0
29	29	30	P2A3		30	30	29	P2A2
31	31	32	P2A5		32	32	31	P2A4
33	33	34	P2A7		34	34	33	P2A6
35	35	36	P2B1		36	36	35	P2B0
37	37	38	P2B3		38	38	37	P2B2
39	39	40	P2B5		40	40	39	P2B4
41	41	42	P2B7		42	42	41	P2B6
43	43	44	P2C1		44	44	43	P2C0
45	45	46	P2C3		46	46	45	P2C2

47	47	48	P2C5		48	48	47	P2C4
49	49	50	P2C7		50	50	49	P2C6

2. Connector Pin Assignments (JP2) U3/U4

DB	A	B	Funcio		DB	A	B	Funcio
1	1	2	P3A1		2	2	1	P3A0
3	3	4	P3A3		4	4	3	P3A2
5	5	6	P3A5		6	6	5	P3A4
7	7	8	P3A7		8	8	7	P3A6
9	9	10	P3B1		10	10	9	P3B0
11	11	12	P3B3		12	12	11	P3B2
13	13	14	P3B5		14	14	13	P3B4
15	15	16	P3B7		16	16	15	P3B6
17	17	18	P3C1		18	18	17	P3C0
19	19	20	P3C3		20	20	19	P3C2
21	21	22	P3C5		22	22	21	P3C4
23	23	24	P3C7		24	24	23	P3C6
25	25	26	GND		26	26	25	GND
27	27	28	P4A1		28	28	27	P4A0
29	29	30	P4A3		30	30	29	P4A2
31	31	32	P4A5		32	32	31	P4A4
33	33	34	P4A7		34	34	33	P4A6
35	35	36	P4B1		36	36	35	P4B0
37	37	38	P4B3		38	38	37	P4B2
39	39	40	P4B5		40	40	39	P4B4
41	41	42	P4B7		42	42	41	P4B6
43	43	44	P4C1		44	44	43	P4C0



45	45	46	P4C3		46	46	45	P4C2
47	47	48	P4C5		48	48	47	P4C4
49	49	50	P4C7		50	50	49	P4C6



Connector Pin Assignments (JP3) U5/U6

DB	A	B	Function		DB	A	B	Function
1	1	2	P5A1		2	2	1	P5A0
3	3	4	P5A3		4	4	3	P5A2
5	5	6	P5A5		6	6	5	P5A4
7	7	8	P5A7		8	8	7	P5A6
9	9	10	P5B1		10	10	9	P5B0
11	11	12	P5B3		12	12	11	P5B2
13	13	14	P5B5		14	14	13	P5B4
15	15	16	P5B7		16	16	15	P5B6
17	17	18	P5C1		18	18	17	P5C0
19	19	20	P5C3		20	20	19	P5C2
21	21	22	P5C5		22	22	21	P5C4
23	23	24	P5C7		24	24	23	P5C6
25	25	26	GND		26	26	25	GND
27	27	28	P6A1		28	28	27	P6A0
29	29	30	P6A3		30	30	29	P6A2
31	31	32	P6A5		32	32	31	P6A4
33	33	34	P6A7		34	34	33	P6A6
35	35	36	P6B1		36	36	35	P6B0
37	37	38	P6B3		38	38	37	P6B2
39	39	40	P6B5		40	40	39	P6B4
41	41	42	P6B7		42	42	41	P6B6
43	43	44	P6C1		44	44	43	P6C0
45	45	46	P6C3		46	46	45	P6C2
47	47	48	P6C5		48	48	47	P6C4



49	49	50	P6C7		50	50	49	P6C6
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3. Connector Pin Assignments (JP4) U7/U8

DB	A	B	Funcio		DB	A	B	Funcio
1	1	2	P7A1		2	2	1	P7A0
3	3	4	P7A3		4	4	3	P7A2
5	5	6	P7A5		6	6	5	P7A4
7	7	8	P7A7		8	8	7	P7A6
9	9	10	P7B1		10	10	9	P7B0
11	11	12	P7B3		12	12	11	P7B2
13	13	14	P7B5		14	14	13	P7B4
15	15	16	P7B7		16	16	15	P7B6
17	17	18	P7C1		18	18	17	P7C0
19	19	20	P7C3		20	20	19	P7C2
21	21	22	P7C5		22	22	21	P7C4
23	23	24	P7C7		24	24	23	P7C6
25	25	26	GND		26	26	25	GND
27	27	28	P8A1		28	28	27	P8A0
29	29	30	P8A3		30	30	29	P8A2
31	31	32	P8A5		32	32	31	P8A4
33	33	34	P8A7		34	34	33	P8A6
35	35	36	P8B1		36	36	35	P8B0
37	37	38	P8B3		38	38	37	P8B2
39	39	40	P8B5		40	40	39	P8B4
41	41	42	P8B7		42	42	41	P8B6
43	43	44	P8C1		44	44	43	P8C0
45	45	46	P8C3		46	46	45	P8C2
47	47	48	P8C5		48	48	47	P8C4



49	49	50	P8C7		50	50	49	P8C6
----	----	----	------	--	----	----	----	------





Connector Pin Assignments (JP5) U16/U17

DB	A	B	Funcio		DB	A	B	Funcio
1	1	2	CLK0		2	2	1	GND
3	3	4	OUT0		4	4	3	GATE0
5	5	6	CLK1		6	6	5	GND
7	7	8	OUT1		8	8	7	GATE1
9	9	10	CLK2		10	10	9	GND
11	11	12	OUT2		12	12	11	GATE2
13	13	14	CLR3		14	14	13	GND
15	15	16	OUT3		16	16	15	GATE3
17	17	18	CLK4		18	18	17	GND
19	19	20	OUT4		20	20	19	GATE4
21	21	22	CLK5		22	22	21	GND
23	23	24	OUT5		24	24	23	GATE5
25	25	26	+5V		26	26	25	GND
27	27	28	-12V		28	28	27	GND
29	29	30	+12V		30	30	29	GND
31	31	32	-12V		32	32	31	GND
33	33	34	GND		34	34	33	GND
35	35	36	1MHZ		36	36	35	5MHZ
37	37	38	GND		38	38	37	GND
39	39	40	100KHZ		40	40	39	500KHZ
47					31			
15					48			
32					16			
49					33			





CHAPTER 5

DII DEVICE DRIVER

To install DII (Decision Industrial Interface) for Windows 95 and Windows NT, you may start the installation by running SETUP.EXE supplied on this distribution CD. During installation, the Setup application will install an icon into a new program group in your start menu (default name: "Decision Industrial Interface"). After DII is installed, please select "Start" menu, then "Settings", then "Control Panel", then "Add New Hardware" menu, then select PCI multi-8255 card on the "Industrial I/O Devices" hardware group.

The DII provides DLL, OCX, ... etc. components for further programming. For more details, please refer DII manual.





CHAPTER 6

DIAGNOSTIC

In the following, we assume PCI BIOS allocates I/O address is 1B0.

6.1 PASCAL Programming

```
program diagnostic(input, output);
uses Crt;
var a, i, test : integer;
procedure subtest;
begin
    for i := 0 to 2 do
        port[test+i] := a;
    end;
begin
    { 8255 I/O Card Testing Program }
    clrscr;
    gotoxy(10, 10);
    writeln('8255 I/O CARD TESTING');
    gotoxy(10, 12);
    writeln("TWO 8255 PORT A,B,C OUTPUT SQUARE
WAVE");
    gotoxy(10, 14);
    writeln('8253 COUNTER 0 DIVIDE BY 2');
    gotoxy(10, 16);
    writeln('    COUNTER 1 DIVIDE BY 50');
    gotoxy(10, 18);
    writeln('    COUNTER 2 DIVIDE BY 100');
```



{ 8253 Testing }

test := \$1B0;

port[test+11] := \$36;

port[test+11] := \$76;

port[test+11] := \$B6;

port[test+ 8] := \$02; port[test+ 8] := \$0;

port[test+ 9] := \$32; port[test+ 9] := \$0;

port[test+10] := \$64; port[test+10] := \$0;

repeat

 test := \$1B0;

 port[test+3] := \$80;

 a := 0; subtest;

 for i := 0 to 1000 do;

 a := \$ff; subtest;

 test := test + 4;

 port[test+3] := \$80;

 a := 0; subtest;

 for i := 0 to 1000 do;

 a := \$ff; subtest

until keypressed;

end.

6.2 C Programming

```
#include <stdio.h>
#include <conio.h>
int test,i,a;
void subtest()
{
    for(i=0;i<=2;i++) outportb(test+i,a);
}
main()
{
    clrscr();
    gotoxy(10,10);
    puts("8255 I/O CARD TESTING");
    gotoxy(10,12);
    puts("TWO 8255 PORT A,B,C OUTPUT SQUARE WAVE");
    gotoxy(10,14);
    puts("8253 COUNTER 0 DIVIDE BY 2");
    gotoxy(10,16);
    puts("8253 COUNTER 1 DIVIDE BY 50");
    gotoxy(10,18);
    puts("8253 COUNTER 2 DIVIDE BY 100");

    test = 0x1b0;
    outportb(test+11,0x36);
    outportb(test+11,0x76);
    outportb(test+11,0xb6);
    outportb(test+ 8,0x02);
    outportb(test+ 8,0x00);
    outportb(test+ 9,0x32);
    outportb(test+ 9,0x00);
    outportb(test+10,0x64);
    outportb(test+10,0x00);

    do {
        test = 0x1b0;
        outportb(test+3,0x80);
        a = 0;
        subtest();
        for(i=0;i<=1000;i++);
        a = 0xff;
        subtest();
    }
```



```
    } while(!kbhit());
}
```





APPENDIX A

WARRANTY INFORMATION

A.1 Copyright

Copyright 2002, 2003 DECISION COMPUTER INTERNATIONAL CO., LTD. All rights reserved. No part of PCI bus 8255 adapter 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.

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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 PCI bus 8255 adapter 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.



APPENDIX B

DATA SHEET

Please put the data sheet that copy from DCI Smartlab 8255/8253 I/O card.