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## PCI BUS 8255/8253 ADAPTER

## OPERATION MANUAL

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# CHAPTER 1

## INTRODUCTION

The PCI bus 8255 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 8255 adapter provides total 6 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. The 8253 on board chip provides programmable interval timer/counter functions. The signal assignments of PCI bus 8255 adapter is designed as a standard configurations, so that it can be used to connect to the 8255 terminator board for several applications.



### The features of the PCI bus 8255 adapter are:

- 32 bits PCI bus with Plug and Play (PnP) features.
- Programmable I/O control functions.
- Up to 48 I/O lines.
- 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 8255 package includes the following items:**

- PCI bus 8255 adapter.
- Demo Program.
- Data Capture Software Manual with CD.
- 8255 terminator board (option).
- Two expansion flat cables (option).
- DII device driver.
- User manual.
- Warranty form.



## CHAPTER 3

### HARDWARE INSTALLATION

Your PCI bus 8255 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 8255 adapter.
2. Remove the cover of the computer.
3. Insert the 8255 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 8255 adapter.

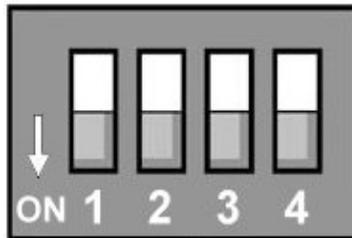
## CHAPTER 4

### 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 : Counter 0 input/output buffer.  
 Base + 9 : Counter 1 input/output buffer.  
 Base + A : Counter 2 input/output buffer.  
 Base + B : Counter control register.

#### 4.2 DIP Switch



The switch is used to identify card number, default setting is card 15. 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. **You may set any card number at PnP mode, and you need use software tools to distinguish port id. Almost all of the operating systems run at PnP mode.**

##### b. manual mode

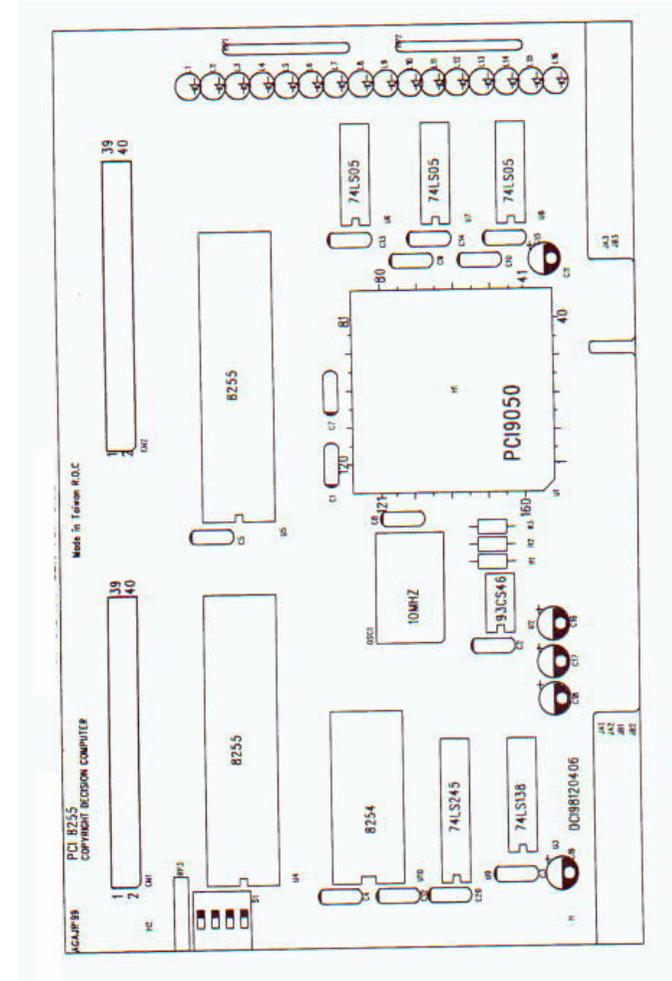
Set card number by card identifier switch, the PCI BIOS will assign pre-allocated I/O address to each adapter. Please set different card number to each adapter (do not duplicate card number setting).

1	2	3	4	Card Number
OFF	OFF	OFF	OFF	15
ON	OFF	OFF	OFF	14
OFF	ON	OFF	OFF	13
ON	ON	OFF	OFF	12
OFF	OFF	ON	OFF	11
ON	OFF	ON	OFF	10
OFF	ON	ON	OFF	9
ON	ON	ON	OFF	8
OFF	OFF	OFF	ON	7
ON	OFF	OFF	ON	6
OFF	ON	OFF	ON	5
ON	ON	OFF	ON	4
OFF	OFF	ON	ON	3
ON	OFF	ON	ON	2

OFF	ON	ON	ON	1
ON	ON	ON	ON	0

☞ The card number starts from 0 to 15.

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### 4.3 Pin Assignments

#### 1. Pin Assignments for CN1 Connector

Pin	Function	Pin	Function
1	GND	2	GND
3	GND	4	P1A3
5	P1A1	6	P1A2
7	CLK0	8	P1A0
9	GATE0	10	OUT0
11	OUT2	12	CLK2
13	CLK1	14	GATE2
15	OUT1	16	GATE1
17	P1A5	18	P1A4
19	P1A7	20	P1A6
21	P1C6	22	P1C7
23	P1C4	24	P1C5
25	P1C1	26	P1C0
27	P1B7	28	P1C2
29	P1B6	30	P1C3
31	P1B5	32	P1B0
33	P1B4	34	P1B1
35	P1B3	36	P1B2
37	+5V	38	-5V
39	+12V	40	-12V

#### 2. Pin Assignments for CN2 Connector

Pin	Function	Pin	Function
1	GND	2	GND
3	GND	4	GND
5	GND	6	GND
7	GND	8	GND
9	GND	10	GND
11	GND	12	GND
13	P2A0	14	P2A1
15	P2A2	16	P2A3
17	P2A4	18	P2A5
19	P2A6	20	P2A7
21	P2C7	22	P2C6
23	P2C5	24	P2C4
25	P2C0	26	P2C1
27	P2C2	28	P2B7
29	P2C3	30	P2B6
31	P2B0	32	P2B5
33	P2B1	34	P2B4
35	P2B2	36	P2B3
37	+5V	38	-5V
39	+12V	40	-12V

## 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 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

### TERMINATOR BOARD

The 8255 terminator board provides expansion signal connection for convenience purpose. When power control on the normal condition, the LED will light. To connect 8255 adapter to terminator board, please plug in CN1 connector (at 8255 adapter) to J1 (at terminator board). The similar method will be used to connect CN2 to J2. The signal assignment is shown in the follows.

#### 1. TB1

PORT 1	PA0
PORT 1	PA1
PORT 1	PA2
PORT 1	PA3
PORT 1	PA4
PORT 1	PA5
PORT 1	PA6
PORT 1	PA7
PORT 1	PB0
PORT 1	PB1
PORT 1	PB2
PORT 1	PB3
PORT 1	PB4
PORT 1	PB5
PORT 1	PB6
PORT 1	PB7

#### 2. TB2

PORT 1	PC0
PORT 1	PC1
PORT 1	PC2
PORT 1	PC3
PORT 1	PC4
PORT 1	PC5
PORT 1	PC6
PORT 1	PC7
PORT 2	PA0
PORT 2	PA1
PORT 2	PA2
PORT 2	PA3
PORT 2	PA4
PORT 2	PA5
PORT 2	PA6
PORT 2	PA7

#### 3. TB3

PORT 2	PB0
PORT 2	PB1
PORT 2	PB2
PORT 2	PB3
PORT 2	PB4
PORT 2	PB5
PORT 2	PB6
PORT 2	PB7
PORT 2	PC0
PORT 2	PC1
PORT 2	PC2
PORT 2	PC3
PORT 2	PC4
PORT 2	PC5
PORT 2	PC6
PORT 2	PC7

## 4. TB4

CLK0
GATE0
OUT0
CLK1
GATE1
OUT1
CLK2
GATE2
OUT2
GND1
GND2
+5V
-5V
GND1
GND1
GND2

**APPENDIX B****WARRANTY INFORMATION*****B.1 Copyright***

Copyright 1999, 2000 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.

Each piece of PCI bus 8255 adapter package permits user to use PCI bus 8255 adapter 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.

## ***B.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 PCI bus 8255 adapter 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 PCI bus 8255 adapter 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 PCI bus 8255 adapter.

To ensure that your PCI bus 8255 adapter 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 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 C

### DATA SHEET

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

