

cPCI-8586

All-in-One Pentium

w/Flash Disk

CompactPCI 3U CPU Card

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Introduction

The cPCI-8586 is a Pentium base high performance and accurate 3U form factor *CompactPCI* standard single board computer. It's sited on 100.00mm by 160.00mm space, 20.32mm(0.8 inch) thickness with a 2mm-pitch HM (IEC-1076) compatible connector for interfacing the *Compact PCI* back plane. It's designed to provide a system optimized for all of rugged applications by 8 HP thickness with hard disk driver or 12 HP with both of hard disk and floppy disk drivers as an option.

The cPCI-8586 supports Intel Pentium MMX processor up to 266 MHz or it's compatible with eliminating of heat in whole system operating, its system memory can support up to 128 MB (by single SO DIMM socket) or 256 MB as maximum when dual SO DIMM is equipped. The 512KB pipeline burst cache is also equipped to generate great computing power. And SMC 37C669 I/O integrates the features of floppy controller, two serial and one parallel interfaces with one selectable RS-232/RS-422/RS-485 serial interface, this allows system for longer distance communication. A 32 pin DIP flash disk socket is equipped for *DiskOnChip* expansion, this socket supports from 2 MB up to 72 MB capacity, it will allow system to work independent from hard disk or floppy disk drives.

The cPCI-8586 single board computer unit provides an aluminum front plate consistent with Eurocard packaging for front I/O accesses, one ejector handles is available for convenience of installation and removal of the unit from system.

The cPCI-8586 complies with the newly *CompactPCI* industry standard which is approved by the *PICMG* (PCI Industrial Computer Manufacturers Group) and is an adaptation of PCI specification for industrial and/or embedded application requiring a robust mechanical form factor on the space limited and crucial environments. It's believed to be the main stream of industrial standard in the years of 2000.

1.1. Specifications

- . **CPU:** INTEL P54C/P55C, AMD K5/K6, CRYIX MI/M2 Processor
up to 233MHz
- . **Cache:** 512KB 2nd level Burst cache memory
- . **Memory :** Support FPM/EDO DRAMs. Support one 144-pin
SO-DIMM sockets. Accept 2,4,8,16, 32, 64 and 128MB,
3.3V 144 pin SO-DIMM.
- . **Chipset :** System Chipset : INTEL TRITON II / HX
I/O Chipset : SMC37C669
- . **S.S.D.:** Socket for M-system Disk on Chip
- . **USB port :** Two Universal Serial Bus port mount on the bracket
- . **IDE :** Supports up to two PCI mode 4 enhance IDE hard disk
interfaces
- . **Floppy :** Supports up to two floppy disk drivers, 3.5" and/or 5.25"
- . **Parallel port :** Enhanced Bi-directional EPP/ECP parallel port
- . **Serial port :** One RS-232 port and One RS-232/RS-422/RS-485 port.
- . **Watchdog Timer :** Can generate a system RESET. The timer interval is
0 - 64 sec(14 level)
- . **PS/2 Mouse / Keyboard Connector :**
Two 6 pins Mini-Din connector located on the mounting
bracket.
- . **Expansion Bus :**
Meet PICMG Compact PCI 3U standard bus interface
- . **Power Supply Voltage :** +5V 4.0A
- . **Operating Temperature :** 32 to 140°F (0 to 60°C)
- . **Board Size :** 160mm(L) X 100mm(W)

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Jumpers and Connectors

2.1 Jumpers setting

CPU CORE/BUS RATIO (JP1, 13-18)

Core/Bus ratio	JP1 13-18	Jumper Illustration
2.0x	13-14	
2.5x	13-14,15-16	
3.0x	15-16	
3.5x (P55C)	OPEN	
4.0x	13-14,17-18	
4.5x	13-14,15-1617-18	
5.0x	15-16,17-18	
1.5x (P54C)	OPEN	

CPU BASE SPEED SELECT (JP2, 15-18)

	JP2 15-18	Jumper Illustration
50 MHz	15-16,17-18	
55 MHz	OPEN	
66 MHz	15-16	
60 MHz	17-18	

CPU VCC3 Select (JP2, 1-6)

	JP2 1-6	Jumper Illustration
P54C	1-3, 2-4	
P55C	3-5, 4-6	

USB connector (USB1, USB2)

	USB1,2
VCC	1
USB -	2
USB +	3
GROUND	4

Watchdog/Power detect (JP1, 9-10)

	JP1
Watchdog time out gen. system reset	9-10

CPU VCORE Select (JP2, 7-14)

CPU CORE VOLTAGE	JP2 7-14				Jumper Illustration
	13-14	11-12	9-10	7-8	
2.0V	OPEN	OPEN	OPEN	OPEN	
2.1V	OPEN	OPEN	OPEN	CLOSE	
2.2V	OPEN	OPEN	CLOSE	OPEN	
2.3V	OPEN	OPEN	CLOSE	CLOSE	
2.4V	OPEN	CLOSE	OPEN	OPEN	
2.5V	OPEN	CLOSE	OPEN	CLOSE	
2.6V	OPEN	CLOSE	CLOSE	OPEN	
2.7V	OPEN	CLOSE	CLOSE	CLOSE	
2.8V	CLOSE	OPEN	OPEN	OPEN	
2.9V	CLOSE	OPEN	OPEN	CLOSE	
3.0V	CLOSE	OPEN	CLOSE	OPEN	
3.1V	CLOSE	OPEN	CLOSE	CLOSE	
3.2V	CLOSE	CLOSE	OPEN	OPEN	

3.3V	CLOSE	CLOSE	OPEN	CLOSE	
3.4V	CLOSE	CLOSE	CLOSE	OPEN	
3.5V	CLOSE	CLOSE	CLOSE	CLOSE	

Disk On Chip (M-System) Address Select (JP1, 1-8)

	JP1 1-8	Jumper Illustration
C0000-C7FFF	1-2	
C8000-CFFFF	3-4	
D0000-D7FFF	5-6	
D8000-DFFFF	7-8	

CMOS Clear (JP1,11-12)

JP1
<ol style="list-style-type: none"> 1. Power off and short jumper on 11-12 OF JP1, 2. Remaining power on 1 min, then power off, 3. Remove jumper on 11-12 OF JP1

COM2 Type Select (JP3, JP4)

	JP4	JP3 1-12	Jumper Illustration
RS232	5-6	3-5,4-6,9-11,10-12	
RS422	3-4	1-3, 2-4, 7-9, 8-10	
RS485	1-2	1-3, 2-4, 7-9, 8-10	

2.2 Connectors

The connectors allow the CPU card to connect with other parts of the system. Some problems encountered with your system may be caused by loose or improper connections. Ensure that all connectors are in place and firmly attached.

Component	Label
HDD (IDE) connector	IDE
FDD connector	FDC
Parallel port	PRN
USB connector	USB
Keyboard connectors	K/B
Mouse connector	MOUSE
Reset switch connector	RESET
HDD LED	HDD LED
Serial port1	COM1
Serial port2	COM2
CMOS RAM clear	J1,11-12

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Installation

This chapter describes the procedures for installing the cPCI-8586 CPU card into your system.

The following is a list of typical peripherals required to build a minimum system:

- Power supply and 3U Compact PCI backplane
- IBM PC/AT keyboard
- Display card
- Display monitor
- Floppy or hard disk with MS-DOS or Flash Disk emulator

3.1 Installing the SO-DIMMs

You can install from 2MB up to 128MB memory on board using 2,4,8,16,32 or 64MB 144-pin 3.3V FPM/EDO SO-DIMMs.

1. Ensure that all power supplies to the system are switched Off.
2. Insert the first SO-DIMM edge connector at a slight angle into the socket of DIMM 1 close to the center of the board. Note that the SO-DIMM is keyed and will only go in one direction.
3. Push the SO-DIMM back into the connector carefully until it snaps into place.
4. Check to make sure the SO-DIMM is inserted securely.

3.2 Installing the CPU

1. Match pin one (white dot) on the CPU with pin one of the PGA socket. Note pin one is marked on the board. In addition, the PGA socket has a diagonal corner or may have an arrow marked on the base of the socket denoting the side containing pin one.

2. To complete the installation, gently press the CPU onto place.
3. Double check the insertion and orientation of the CPU before applying power. Improper installation will result in permanent damage to the CPU.

3.3 Completing the Installation

To complete the installation, the following steps should be followed:

1. Make sure the power is off.
2. Set the configuration jumpers in accordance with Chapter 2.
3. Install the Cpci_3586 CPU card into the system slots marks with triangle on the 3U passive back plane.
4. Install the VGA display card to add on card slot.
5. Connect the applicable I/O cables and peripherals, i.e. floppy disk, hard disk, monitor, keyboard, power supply and etc.
6. Turn on the power.

NOTE: the color of pin one is usually red or blue, while others are gray.

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Award' s BIOS Setup

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backup RAM (CMOS RAM). When the power is off, it will retain the Setup information.

4.1 Entering Setup

Power on the computer and press immediately will allow you to enter Setup. The other way to enter Setup is to power on the computer, when the message below appears briefly at the bottom of the screen during the POST (Power On Self Test). Press key or simultaneously press <Ctrl>, <Alt>, and <Esc> Keys.

TO ENTER SETUP BEFORE BOOT PRESS <CTRL-ALT-ESC> OR
 KEY

Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time, and the system does not boot up, an error message display If this message disappears before you respond and you still wish to enter s.

PRESS <F1> TO CONTINUE, <CTRL-ALT-ESC> OR TO
ENTER SETUP

4.2 Control Keys

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp/ “+” key	Increase the numeric value or make changes
PgDn/ “-“ key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift)F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Reserved
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the Setup default, only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.3 Getting Help

Main Menu

The on-line description of the highlighted setup function displays at the bottom of the screen.

Status Page Setup Menu/Option Page Setup Menu

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <F1> or <Esc> key.

4.4 The Main Menu

Once you enter Award' s BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from ten setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION SETUP	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Time, Date, Hard Disk Type...	

For the more details of the AWARD' s BIOS CMOS Setup Utility, please refer to the “AWDBIOS.DOC” in the “Manual and Software Utility CD Disk”.

Appendix A Watchdog Timer

Watchdog Timer Configuration

The watchdog timer would reset the system automatically if the system program didn't refresh the watchdog timer during the watchdog time out interval. It is defined at I/O port **0443H** and **043H** to enable/disable the watchdog time out function.

Regarding to the watchdog function, user must have a program to set the watchdog time out value, and refresh the watchdog timer cycle. If the system program goes into a dead loop or goes into an abnormal cycle, the watchdog timer cannot be refreshed immediately. Meanwhile, the system will be reset by watchdog timer automatically. The watchdog timer will be refreshed by “disable watchdog output” then “enable watchdog output”.

The following flowchart shows the normal structure of system program.

Watchdog timer examples:

(1) Setup watchdog timer time out value:

```
mov al,0ah
mov dx,70h
out dx,al
jmp short $+2
mov dx,71h
in al,dx
jmp short $+2
and al,0f0h
add ax,TimeValue           ; TimeValue= 00h..0fh, reference as following
                           ; watchdog time out table

out dx,al
jmp short $+2
mov al, 0bh
mov dx, 70h
out dx, al
jmp short $+2
mov dx, 71h
in al, dx
jmp short $+2
or al, 08h
```



```
out dx, al
jmp short $+2
```

Watchdog Time Out Table:

Time Value	Time Out (sec)	Time Value	Time Out (sec)
0	None	8	0.5
1	0.5	9	1
2	1	A	2
3	0.015	B	4
4	0.03	C	8
5	0.06	D	16
6	0.125	E	32
7	0.25	F	64

(2) **Enable watchdog output:**

```
mov dx, 443h      ; SET WATCH DOG ENABLE
in al, dx
jmp short $+2
```

(3) **Disable watchdog output:**

```
mov dx, 043h     ; SET WATCH DOG DISABLE
in al, dx
jmp short $+2
```

Appendix B Connectors' Pin Assignment

Parallel/Printer connector (PRN)

Pin no.	Signal	Pin no.	Signal
1	Strobe	10	-Acknowledge
2	Data 0	11	Busy
3	Data 1	12	Paper Empty
4	Data 2	13	+ Select
5	Data 3	14	- Auto Feed
6	Data 4	15	- Error
7	Data 5	16	- INIT Printer
8	Data 6	17	- Select Input
9	Data 7	18-25	Ground

HDD Connector (IDE)

Pin no.	Signal	Pin no.	Signal
1	- RST	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	N.C.
21	DRQ.	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	N.C.
29	DACK	30	GND
31	IRQ	32	-IO CS16
33	A1	34	N.C.
35	A0	36	A2
37	CS0	38	CS1
39	-ACT	40	GND
41	VCC	42	VCC
43	GND	44	N.C.

FDD Connector (FDD)

Pin no.	Signal
15,17,23,25	GND
7,11,13,19,21	Unused
2	Index
4	Driver Select A
6	Disk Change
8	High Density 1
9	High Density 0
10	Motor Enable A
12	Direction
14	Step Pulse
16	Write Data
18	Write Enable
20	Track 0
22	Write Protect
24	Read Data
26	Select Head

RS-232 Connector (COM1)

Pin no.	Signal	Pin no.	Signal
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

RS-232/422/485 Connector (COM2)

Pin no.	RS232	RS422	RS485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	
4	DTR	RX-	
5	GND	GND	
6	DSR		
7	RTS		
8	CTS		
9	RI		

Keyboard connector (Mini_Din)

Pin no.	Signal
1	KB data
2	NC
3	GND
4	VCC
5	KB clock
6	NC

PS/2 mouse (Mini_Din)

Pin no.	Signal
1	MS data
2	NC
3	GND
4	VCC
5	MS clock
6	NC

Compact PCI 64-Bit Connector(P2) Pin Assignments

22	GND	GA4	GA3	GA2	GA1	GA0	GND	P2 / J2
21	GND	CLK6	GND	RSV	RSV	RSV	GND	
20	GND	CLK5	GND	RSV	GND	RSV	GND	
19	GND	GND	GND	RSV	RSV	RSV	GND	
18	GND	RSV	RSV	RSV	GND	RSV	GND	
17	GND	RSV	GND	PRST#	REQ6#	GNT6#	GND	
16	GND	RSV	RSV	DEG#	GND	RSV	GND	
15	GND	RSV	GND	RSV	REQ5#	GNT5#	GND	
14	GND	NC	NC	NC	GND	NC	GND	
13	GND	NC	GND	V(I/O)	NC	NC	GND	
12	GND	NC	NC	NC	GND	NC	GND	
11	GND	NC	GND	V(I/O)	NC	NC	GND	
10	GND	NC	NC	NC	GND	NC	GND	
9	GND	NC	GND	V(I/O)	NC	NC	GND	
8	GND	NC	NC	NC	GND	NC	GND	
7	GND	NC	GND	V(I/O)	NC	NC	GND	
6	GND	NC	NC	NC	GND	NC	GND	
5	GND	NC	GND	V(I/O)	NC	NC	GND	
4	GND	V(I/O)	RSV	NC	GND	NC	GND	
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND	
2	GND	CLK2	CLK3	SYSEN	GNT2#	REQ3#	GND	
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND	
PIN	Z	A	B	C	D	E	F	C O N N E C T O R

Compact PCI 64-Bit Connector (P1) Pin Assignments

25	GND	5V	DECR4#	ENIIM#	2.2V	5V	GND	P1 / J1	
24	GND	AD1	5V	V(I/O)	AD0	ACK64#	GND		
23	GND	3.3V	AD4	AD3	5V	AD2	GND		
22	GND	AD7	GND	3.3V	AD6	AD5	GND		
21	GND	3.3V	AD9	AD8	GND	C/BE0#	GND		
20	GND	AD12	GND	V(I/O)	AD11	AD10	GND		
19	GND	3.3V	AD15	AD14	GND	AD13	GND		
18	GND	SERR#	GND	3.3V	PAR	C/BE1#	GND		
17	GND	3.3V	SDONE	SBO#	GND	PERR#	GND		
16	GND	DEVSEL	GND	V(I/O)	STOP#	LOCK#	GND		
15	GND	3.3V	FRAME#	IRDY#	GND	TRDY#	GND		
14-12	KEY								C O N N E C T O R
11		AD18	AD17	AD16	GND	C/BE2#	GND		
10	GND	AD21	GND	3.3V	AD20	AD19	GND		
9	GND	C/BE3#	IDSEL	AD23	GND	AD22	GND		
8	GND	AD26	GND	V(I/O)	AD25	AD24	GND		
7	GND	AD30	AD29	AD28	GND	AD27	GND		
6	GND	REQ#	GND	3.3V	CLK	AD31	GND		
5	GND	RSV	RSV	RST#	GND	GNT#	GND		
4	GND	RSV	GND	V(I/O)	INTP	INTS	GND		
3	GND	INTA#	INTB#	INTC#	5V	INTD#	GND		
2	GND	TCK	5V	TMS	TDO	GND	GND		
1	GND	5V	-12V	TRST#	+12V	5V	GND		
PIN	Z	A	B	C	D	E	F		

Appendix C Installing DiskOnChip of M-systems

On the cPCI-8586 board, you can find the socket, location U7, for DiskOnChip of M-systems. Please follow the procedures as below to install the DiskOnChip you bought:

I. For 32-pin DiskOnChip

1. Align the notched end of the chip with the notched end of the socket.
2. Align the chip' s pins with the socket holes.
3. Gently press the chip into the socket.

II. For 28-pin DiskOnChip

1. Align the non-notched end of the chip with the non-notched end of the socket.
2. Align the chip' s pins with the socket' s holes.
3. (chip' s pin28 with the socket' s hole32)
4. Gently press the chip into the socket.

For further technical information of DiskOnChip , please see the attached manual in the DiskOnChip package or contact the agent of M-systems.

Appendix D Updating BIOS

You should find one diskette for updated BIOS program in the package. The updating procedures are as the following:

1. Insert the diskette(There is a file “ AWDFLASH.EXE’) in drive A or B.
2. Type AWDFLASH under the prompt A or B.
3. The screen will ask you to enter the file name for programming. Please enter the ‘filename’ for the updating BIOS that is from your agent. Meanwhile, please type ‘ N’ to answer the question ‘ Do you want to save BIOS (y/n)?’ under the bottom of the screen.
4. After that, please type ‘ Y’ to answer the question ‘ Are you sure to program (y/n)?’ on the bottom line of the current screen.
5. Turn off the power after the system updates the BIOS.
6. Turn on the power again.