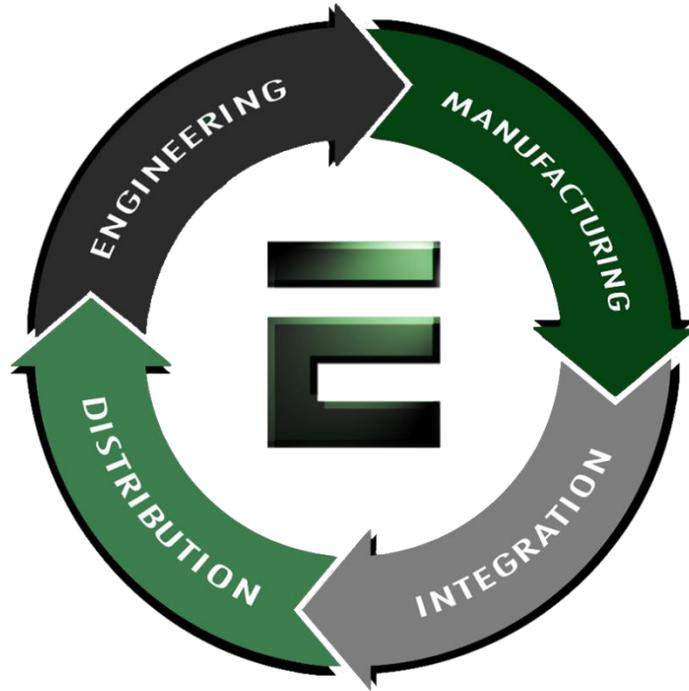


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CPC-2400

Mini Biscuit PC Development Board

User's Manual

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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Packing list

Before installing your board, make sure that the following materials have been received:

- 1 CPC-2400 development board for CPC-2245 mini biscuit PC
- 1 warranty certificate
- This user's manual
- 1 12-pin FPC cable (part no. 1701120320)
- 1 40-pin FPC cable (part no. 1701400140)
- 1 50-pin FPC cable (part no. 1701500320)

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Technical support and sales assistance

If you have any technical questions about the CPC-2400 or any other Advantech products, please visit our support website at:

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For more information about Advantech's products and sales information, please visit:

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Hardware Configuration

This chapter gives background information on the CPC-2400. It shows you how to configure the card to match your application and prepare it for installation into your PC.

Sections include:

- Card specifications
- Safety precautions
- Jumper settings

1.1 Introduction

The CPC-2400 is a development board designed with a SODIMM socket for a mini biscuit and connectors for functions such as VGA, LCD, LAN, FDD, IDE, PC/104, ISA and a printer port. The CPC-2400 can help users to design their own board easier.

1.2 Specifications

- Three ISA-bus expansion slots
- DB-15 VGA connector
- RJ-45 Ethernet connector
- DB-9 COM1 serial port connector
- 10-pin COM2 serial port box header
- 104-pin PC/104 connector
- LCD connector
- DB-25 printer port connector
- One FDD connector
- 40-pin HDD connector
- 6-pin PS/2 KB/mouse connector
- Size: 183 x 183 mm

1.3 Safety precautions

The following sections tell how to make each connection. In most cases, you will simply need to connect a standard cable. All of the connector pin assignments are shown in Appendix A.

Warning!



Always completely disconnect the power cord from your chassis whenever you are working on it. Do not make connections while the power is on. Sensitive electronic components can be damaged by a sudden rush of power. Only experienced electronics personnel should open the PC chassis.

Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

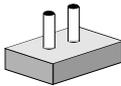
1.4 Jumper settings

This section tells how to set the jumpers to configure your card. It gives the card default configuration and your options for each jumper. After you set the jumpers and install the card, you will also need to run your BIOS Setup program to configure the serial port addresses, floppy/hard disk drive types and system operating parameters. Connections, such as hard disk cables, appear in Chapter 2. For the locations of each jumper, see the board layout diagram depicted earlier in this chapter.

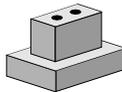
You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal cap (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the cap. To "open" a jumper you remove the cap. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you connect either pins 1 and 2 or 2 and 3.

You may find a pair of needle-nose pliers useful for setting the jumpers.

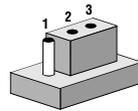
If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.



Open



Closed



Closed 2 - 3

1.4.1 LCD shift clock select (J1)

This jumper is used to decide clock phase. "Shift clock -" is the negative phase of "Shift clock".

Table 1-1: LCD shift clock select (J1)

Function	Pins 1-2	Pins 2-3
Shift clock	Closed	Open
Shift clock -	Open	Closed

1.4.2 LCD 3.3/5 V select (J2)

This jumper is used to decide LCD supply voltage.

Table 1-2: LCD 3.3/5 V select (J2)

Function	Pins 1-2	Pins 2-3
5 V	Closed	Open
3.3 V	Open	Closed

1.4.3 Reset switch (J4)

Momentarily pressing the switch will activate a reset.

1.4.4 VGA source select (S1)

This switch is used to decided VGA signal source. When the CPC-2520 is not plugged into the CPC-2245, the switch must be set to "STPC". If the CPC-2520 is plugged into the CPC-2245, the switch must be set to "69K".

Table 1-3: VGA source select (S1)

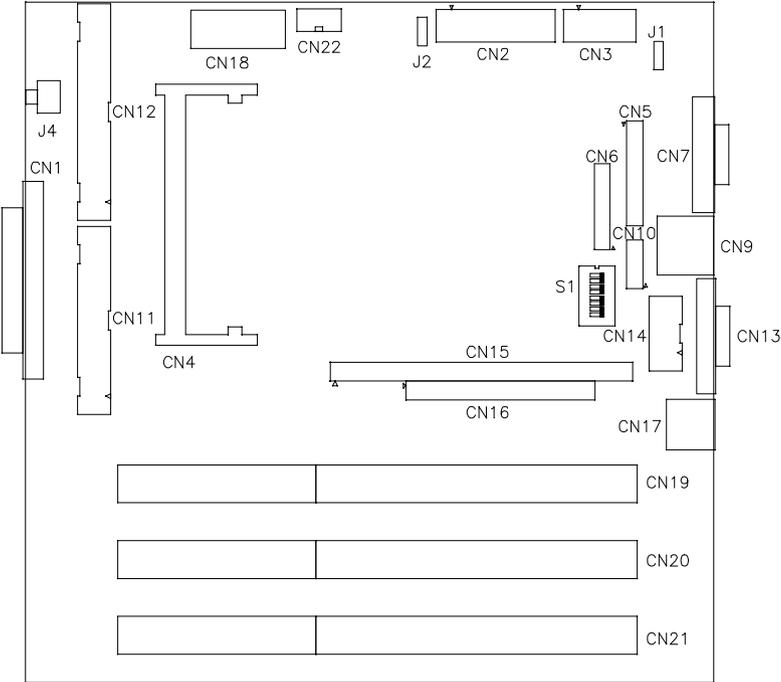
Function	Pins 1 ~ 8
From CPC-2245 (STPC)	ON
From CPC-2520 (69K)	OFF

CHAPTER
2

Connecting Peripherals

This chapter tells how to set up the CPC-2400 hardware, including connecting peripherals, switches and indicators.

2.1 Board layout: connector locations



The following table lists the connectors on the CPC-2400.

Table 2-1: Connectors

Number	Function
CN1	Parallel port connector
CN2	LCD 24-bit connector
CN3	LCD 36-bit connector
CN4	SODIMM socket
CN5	LCD FPC connector
CN6	VGA/COM/KB/MS FPC connector
CN7	VGA connector
CN8	N/A
CN9	Ethernet connector
CN10	VGA FPC connector
CN11	FDD connector
CN12	IDE connector
CN13	COM1 RS-232 connector
CN14	COM2 RS-232 connector
CN15	PC/104 connector
CN16	PC/104 connector
CN17	Keyboard and PS/2 mouse connector
CN18	Power connector
CN19	ISA slot connector
CN20	ISA slot connector
CN21	ISA slot connector
CN22	LCD inverter connector

2.2 Floppy drive connector (CN11)

You can attach up to two floppy disk drives to the CPC-2400 on-board connector. You can use any combination of 5.25" (360 KB / 1.2 MB) and/or 3.5" (720 KB / 1.44 / 2.88 MB) drives.

The card comes with a 34-pin daisy-chain drive connector cable. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of floppy disk drive connectors. Each set consists of a 34-pin flat-cable connector (usually used for 3.5" drives) and a printed-circuit-board connector (usually used for 5.25" drives). You can use only one connector in each set. The set on the end (after the twist in the cable) connects to the A: floppy. The set in the middle connects to the B: floppy.

2.3 Parallel port connector (CN1)

The parallel port is normally used to connect the CPU card to a printer. The CPC-2400 includes an on-board parallel port, accessed through a 25-pin DB-25 connector. The parallel port is designated as LPT1, and can be disabled.

2.4 24-bit LCD display connector (CN2)

CN5 is a 40-pin dual inline header and is used to connect an LCD display to the CPC-2400. The CPC-2400 has bias control which can be used to control the LCD signal voltage. Pin 7 of CN2 is for LCD contrast adjustments.

2.5 36-bit LCD display connector (CN3)

The CPC-2400 supports 36-bit LCD that must be connected to both CN2 (40-pin) and CN3 (20-pin).

The pin assignments for both CN2 and CN3 can be found in *Appendix A*.

2.6 LCD inverter connector (CN22)

The LCD inverter is connected to CN22 via a 5-pin connector to provide +12 V power to the LCD display. Pin 4 of CN22 provides LCD brightness control and can be adjusted via R6 or R7.

2.7 VGA display connector (CN7)

The CPC-2400 provides a VGA controller for a high resolution VGA interface. The CPC-2400's CN7 is a DB-15 connector for VGA monitor input. Pin assignments for the CRT display are detailed in Appendix A.

2.8 PC/104 connectors (CN15/16)

The CPC-2400 is equipped with a 16-bit ISA signal PC/104 connector for future expansion.

2.9 Ethernet configuration (CN9)

The CPC-2400 is equipped with a high performance 32-bit PCI-bus Fast Ethernet interface which is fully compliant with IEEE 802.3u 100/10Base-T specifications. It is supported by all major network operating systems.

2.10 Serial ports (CN13: COM1/RS-232; CN14: COM2/RS-232)

The CPC-2400 offers two serial ports: COM1 in RS-232 and COM2 (CN13: RS-232, CN14:RS-232). These ports let you connect to serial devices (a mouse, printers, etc.) or a communication network.

You can select the address for each port (for example, 3F8H [COM1], 2F8H [COM2]) or disable each port..

The development board mounting bracket holds the serial port connector for the one port. The DB-9 connector on the bottom of the bracket is the first RS-232 port, COM1. The 10 -pin header is the second serial port, COM2.

2.10.1 RS-232 connection (COM1-CN13)

Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.10.2 RS-232 connection (COM2-CN14)

COM2 is an RS-232 serial port. The IRQ and address range for both ports are fixed. However, if you wish to disable the port or change these parameters later, you can do this in the system BIOS setup. The table below shows the settings for the CPC-2400 board's ports:

Table 2-2: CPC-2400 serial port default settings

Port	Address	Interrupt	Default
COM1	3F8, 3E8	IRQ4	3F8
COM2	2F8, 2E8	IRQ3	2F8

2.11 Power connector (CN18)

The CPC-2400's 4-pin power connector is fully compatible with PC's AT power connector. User can easily purchase AT power supply from the market.

2.12 Keyboard and PS/2 mouse connector (CN17)

The CPC-2400 board provides a keyboard connector. A 6-pin mini-DIN connector (CN17) on the board mounting bracket. The card comes with an adapter to convert from the 6-pin mini-DIN connector to a standard DIN connector and to a PS/2 mouse connector.

2.13 ISA slot (CN19 ~ 21)

The 16-bit ISA slot are used for connecting the CPC-2400 to an ISA expansion card.

2.14 Enhanced IDE connector (CN12)

You can attach two IDE (Integrated Device Electronics) drives to the CPC-2400. The CPC-2400 has an EIDE connector, CN12. Wire number 1 on the cable is red or blue, and the other wires are gray. Connect one end to connector CN12 on the CPU card. Make sure that the red (or blue) wire corresponds to pin 1 on the connector (on the right side). See "Board Layout: Connector location" in Chapter 2 for help in finding the connector.

Unlike floppy drives, IDE hard drives can connect in either position on the cable. If you install two drives, you will need to set one as the master and one as the slave. You do this by setting the jumpers on the drives. If you use just one drive, you should set it as the master. See the documentation that came with your drive for more information. Connect the first hard drive to the other end of the cable. Wire 1 on the cable should also connect to pin 1 on the hard drive connector, which is labeled on the drive circuit board. Check the documentation that came with the drive for more information.

Connect the second drive, as described above, to CN12.

Pin Assignments

This appendix contains information of a detailed or specialized nature. It includes:

- Parallel port connector
- 24-bit LCD display connector
- 36-bit LCD display connector
- CRT display connector
- Floppy drive connector
- IDE hard drive connector
- COM1 RS-232 serial port
- COM2 RS-232 serial port
- Keyboard and mouse connector
- AT power connector
- LCD power inverter

Parallel port connector (CN1)

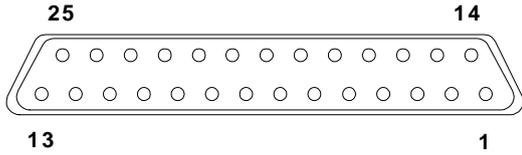


Table A-1: Parallel port connector

Pin	Signal
1	\STROBE
2	D0
3	D1
4	D2
5	D3
6	D4
7	D5
8	D6
9	D7
10	\ACK
11	BUSY
12	PE
13	SLCT
14	AUTOFD
15	ERR
16	INIT
17	SLIN
18	GND
19	GND
20	GND
21	GND
22	GND
23	GND
24	GND
25	GND

24-bit LCD display connector (CN2)

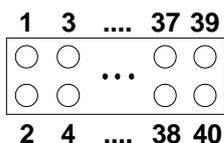


Table A-2: 24-bit LCD display connector

Pin	Signal	Pin	Signal
1	VDDSAFE5	2	VDDSAFE5
3	GND	4	GND
5	VDDSAFE3	6	VDDSAFE3
7	Vcon	8	GND
9	P0	10	P1
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	P8	18	P9
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
27	P18	28	P19
29	P20	30	P21
31	P22	32	P23
33	GND	34	GND
35	SHIFT CLOCK	36	FILM
37	M	38	LP
39	ENABKL	40	ENAVEE

Note: The model number of the CN2 socket is DF13A-40DP-1.25V (Hirose Electric Co., Ltd.)

36-bit LCD display connector (CN3)

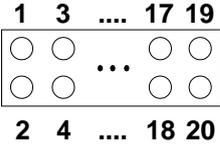


Table A-3: 36-bit LCD display connector

Pin	Signal	Pin	Signal
1	GND	2	GND
3	P24	4	P25
5	P26	6	P27
7	P28	8	P29
9	P30	10	P31
11	P32	12	P33
13	P34	14	P35
15	GND	16	GND
17	NC	18	N/C
19	N/C	20	N/C

Note: The model number of the CN3 socket is DF13A-20DP-1.25V (Hirose Electric Co., Ltd.)

CRT display connector (CN7)

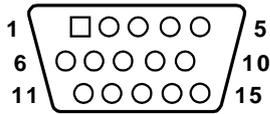


Table A-4: CRT display connector

Pin	Signal	Pin	Signal
1	RED	9	N/C
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	N/C
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	N/C
8	GND		

Floppy drive connector (CN11)

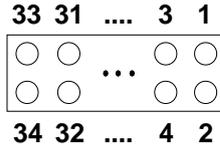


Table A-5: Floppy drive connector

Pin	Signal	Pin	Signal
1	GND	2	DENSITY SELECT*
3	GND	4	N/C
5	GND	6	N/C
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	DRIVE SELECT 1*
13	GND	14	DRIVE SELECT 0*
15	GND	16	MOTOR 1*
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE GATE*
25	GND	26	TRACK 0*
27	GND	28	WRITE PROTECT*
29	GND	30	READ DATA*
31	GND	32	HEAD SELECT*
33	GND	34	DISK CHANGE*

* low active

IDE hard drive connector (CN12)

Table A-6: IDE hard drive connector

Pin	Signal	Pin	Signal
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	N/C
21	N/C	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	N/C
29	HACKO*	30	GND
31	IRQ14	32	IOCS16
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0*	38	HARD DISK SELECT 1*
39	IDE ACTIVE*	40	GND

* low active

COM1 RS-232 serial port (CN13)

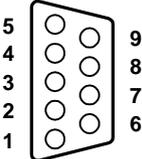


Table A-7: COM1 RS-232 serial port

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

COM2 RS-232 serial port (CN14)

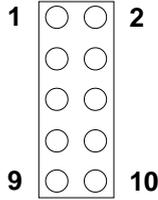


Table A-8: COM2 RS-232 serial port

Pin	RS-232 port	Pin	RS-232 port
1	DCD	6	CTS
2	DSR	7	DTR
3	RxD	8	RI
4	RTS	9	GND
5	TxD	10	N/C

Keyboard and mouse connector (CN17)

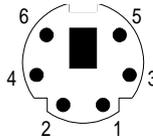


Table A-9: Keyboard and mouse connector

Pin	Signal
1	KB DATA
2	MS DATA
3	GND
4	V _{cc}
5	KB CLOCK
6	MS CLOCK

AT power connector (CN18)

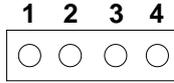


Table A-10: AT power connector

Pin	Signal
1	+5 V
2	GND
3	GND
4	+12 V

LCD power inverter (CN22)

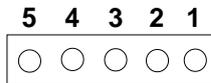


Table A-11: LCD power inverter

Pin	Signal
1	+12 V
2	GND
3	ENABKL
4	VBR
5	V_{CC}
