BCT-PICMG-P4

Full Length PICMG Single Board PC

RoHS version

User Guide

Document Reference	Product User Guide
Document Issue Level	1.0

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Introduction

Company Profile

Blue Chip Technology is a leading specialist PC product manufacturer in Europe, providing innovation with quality design and manufacturing from a single source.

Based in the North West of England, our purpose built complex contains both advanced research and development facilities, and manufacturing facilities.

Specialising in the provision of industrial computing and electronic solutions for a wide range of UK and European organisations, Blue Chip Technology has one of the UK's largest portfolios of industrial PCs, Single Board Computers, peripherals and data acquisition cards. This extensive range of products, coupled with our experience and expertise, enables Blue Chip Technology to offer an industrial processing solution for any application. This is one of the products from our portfolio, providing you with a cost effective product development and volume production tool.

A unique customisation and specialised system integration service is also available, delivering innovative solutions to customers problems. The company's success and reputation in this area has led to a number of large design and manufacturing projects for major companies.

British Standards Institute approval (BS EN 9001) means that all of Blue Chip Technology's design and manufacturing procedures are strictly controlled, ensuring the highest levels of quality, reliability and performance.

Blue Chip Technology are committed to the single European market, and continue to invest in the latest technology and skills to provide high performance computer and electronic solutions for a world-wide customer base.

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MSDOS and WINDOWS are registered trademarks of the Microsoft Corporation.

Regulatory Statements

CE

This product meets the essential protection requirements of the European EMC Directive (89/336/EEC) and its amending Directives, and the Low Voltage Directive 73/23/EEC, and is eligible to bear the CE mark.

Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC

NOTE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING:

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Safety Warning for North America

If the power lead (cord) is not supplied with the computer, select a power lead according to your local electrical regulations. In the USA use a 'UL listed' lead. In Canada use a CSA approved or 'cUL listed' lead.

Si le cordon secteur n'est pas livré avec l'ordinateur, utiliser un cordon secteur en accord avec votre code electrique nationale. En l'Etat Unis utiliser un cordon secteur 'UL listed'. En Canada utiliser un cordon secteur certifié CSA, ou 'cUL listed'.

User Guide Organisation

Manual Organisation

This manual describes in detail the Product range of Form Factor.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of the product.

The manual is sectioned as follows:

Overview

Specification

Precautions

Quick Start Guide

Installation, including Layout, showing where the various connectors are located, and their pin-out details;

Software Updates

Bios Setup

Maintenance details.

We strongly recommend that you study this manual carefully before attempting to interface with the VARIO ELITE or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance. ***IT IS PARTICULARLY IMPORTANT THAT YOU READ THE SECTION 'PRECAUTIONS' BEFORE HANDLING ANY COMPONENTS INSIDE THE UNIT.***

If you have any suggestions or find any errors concerning this manual and want to inform us of these, please contact our Technical Services department with the relevant details.

Overview

The Blue Chip Technology BCT-PICMG-P4 Single Board PC sets new standards for integration of the latest advances in processor, graphics, memory, and I/O technologies. The BCT-PICMG-P4 complies with the PICMG form factor providing ISA and PCI bus interfaces on a single PC/AT plug-in card. The PICMG single board PC is an ideal platform for the increasing requirements of today and tomorrow's embedded applications.

This Full-length PICMG design is optimized for socket 478 FC-PGA processor, supporting 533/400MHz Front Side Bus. The memory sub-system is designed to support up to 2Gb DDR SDRAM

The BCT-PICMG-P4 single board PC uses the Intel 845GV AGP chipset to provide outstanding graphics performance and increased integration over other single board PC designs.

The BCT-PICMG-P4 provides PCI Bus Mastering IDE DMA Mode2 controller with two high performance Enhanced IDE interfaces allowing up to four IDE devices (such as hard drives, CD-ROM readers, etc.)

Networking capability is provided by on board Intel® 82562EM Ethernet device, which supports 10/100 Mbps. This device can auto-negotiate network speeds and comes complete with drivers for most network environments.

Four USB ports provide easy IO expansion to USB Specification Rev 2.0 compliant devices.

The Other I/O Function include: floppy interface, two serial ports, Watch Dog Timer, parallel port, keyboard and mouse (PS/2) controller.

The BCT-PICMG-P4 also provides for driving up to four external PCI local bus non bridged slots. These provide a high bandwidth data path for data-movement intensive functions such as frame grabbing or networking. Larger numbers of PCI slots can be supported through PCI bridged backplanes. The BCT-PICMG-P4 provides a buffered ISA bus. This permits up to Five ISA slots to be driven to complete the I/O capability. The BCT-PICMG-P4 should only be used in PICMG back-planes. ISA only back-planes are not recommended for use with BCT-PICMG-P4 as power should be drawn from both the PCI and ISA connectors of the PICMG connectors.

In addition to the superior hardware capabilities, a full set of software drivers and utilities are available to allow advanced operating systems such as Windows™ 2000/ Xp to take full advantage of the hardware capabilities. Features such as bus mastering and Advanced Power Management (APM) are available for the BCT-PICMG-P4.

Specification

CPU:	Socket 478 Intel Pentium 4 / Celeron Processors
	Front Side Bus 400 / 533 Mhz
Chipset:	Intel 845GV
	Intel ICH4 South Bridge Controller
BIOS:	Award Plug and Play BIOS
Graphics Controller:	Integrated AGP (x4) Graphics Controller
Memory:	184 DIMM x 2 for DDR SDRAM up to 2Gb
	Supports 266/333 DDR SDRAM
Ethernet:	10/100 Base-TX Ethernet using Intel 82562EM
System Management:	Winbond W83627HF IC with provision for System and thermal monitoring, CPU and Chassis Fan speed, Vcore and other Power rails
	Hardware Watchdog timer with configurable timeout
Audio:	Optional AC97 Interface via IP-ALCS20 Audio Card
Storage:	ATA100/66/33 EIDE HDD (quad drives, dual connectors) provided by South Bridge.
Communications:	PS/2 compatible keyboard and mouse port
	Two 16C550 compatible serial ports at TTL level signaling
	Note: Com1 is dedicated RS232, Com2 can be configurable as RS 232/422/485
	25-way Parallel port connector (SPP, EPP, and ECP).
	Quad USB 2.0 connectors.
	Floppy Interface with support for dual 1.44MB FDD

Power Requirements:	ATX power supply required	
Power Consumption:	56W (12V)	P4 2.4ghz, 256Mb SDRAM
(typical)	8.5W (5V)	40Gb HDD, 52X CD-R
Environmental Conditions:	Operating temperature range +0 °C to +60 °C in free air.	
	Storage temperature range -20 °C to +80 °C	
	Shock and vibration compatible with light industrial usage.	
Dimensions:	338 x 122mm (13.3” x 4.8”)	

Precautions

General Precautions

Before attempting to fit or replace the BCT-PICMG-P4, please read the following sections carefully. Certain precautions are necessary when handling circuit boards and equipment containing them. Failure to observe the precautions could result in being unable to operate the equipment, damage to the product, or in extreme cases, personal injury. It is imperative that precautions are taken at all stages to avoid electro-static discharges, which will damage boards. Boards fitted with an on-board lithium battery must be handled carefully to avoid maltreatment of the battery that could create a hazard.

PS/2 Devices

It is important that PS/2 devices (mouse and keyboard) are not connected or disconnected with the unit powered on. Damage or data corruption may occur if this precaution is not observed.

Electro-Static Discharges

If you are going to open up the unit, it is important to realise that the devices on the cards within this unit can be damaged by static electricity. Bear in mind that the damage caused by static electricity may vary from total destruction to partial damage, which may not be immediately obvious. This could have an effect on the product's reliability and warranty. Before opening the chassis, ensure that you take necessary static precautions. Ideally you should work at an anti-static bench and wear an approved wrist strap or if that is not possible, touch a suitable ground to discharge any static build up before touching the electronics. This should be repeated if the handling continues for any length of time.

If it is necessary to remove a board or electronic assembly, place it into an anti-static bag. This will prevent any static electricity build up damaging the board. Metallised bags are preferred. Do not use black anti-static bags for any item containing a battery because these tend to be conductive and will discharge the battery.

On-Board Battery

The processor board is fitted with a Lithium battery. Great care should be taken with this type of battery. If the battery is mistreated in any way there is a very real possibility of fire, explosion, and personal harm. Under NO circumstances should it be short-circuited, exposed to temperatures in excess of 100 ?C or burnt, immersed in water, recharged or disassembled.

Expired batteries remain hazardous and must be disposed of in a safe manner, according to local regulations.

Le panneau de processeur est équipé d’une batterie de lithium. Le grand soin devrait être pris avec ce type de batterie. Si la batterie est mistreated il y a de dans de toute façon un possibility très vrai du feu, d’expolosion et de mal personnel. Dans au cunes circonstances il est sous peu circuité, exposé aux températures au dessus de 100 degrés de centrigrade ou brûlé, immergé dans l’eau, rechargée ou dissassambled.

Les batteries expirées restent dazaedous et doivent être reejetées d’une façon sûre, selon des règlements locaux.

BIOS & CMOS Memory

Please be aware that with personal computer products, it is possible to create configurations within the CMOS memory that make booting impossible. If this should happen, clear the CMOS settings; (see the description of the Jumper Settings for details).

Electromagnetic Compatibility

This product meets the requirements of the European EMC Directive (89/336/EEC) and its amending Directives, and the Low Voltage Directive 73/23/EEC. It is eligible to bear the CE mark.

It has been assessed operating in a Blue Chip Technology Industrial PC. However, because the board can be installed in a variety of computers, certain conditions have to be applied to ensure that the compatibility is maintained. Subject to those conditions, it meets the requirements for an industrial environment (Class A product).

The board must be installed in a computer system chassis that provides screening suitable for an industrial environment.

- Any recommendations made by the computer system manufacturer/supplier must be complied with regarding earthing and the installation of boards.
- Any metal back plate must be securely screwed to the chassis of the computer to ensure good metal-to-metal (i.e. earth) contact.
- Connector bodies must be securely connected to the enclosure.
- The external cabling to boards causes most EMC problems. It is imperative that any external cabling to the board is totally screened, and that the screen of the cable connects to the metal end bracket of the board or the enclosure and hence to earth. It is recommended that round, screened cables with a braided wire screen are used in preference to those with a foil screen and drain wire. Use metal connector shells that connect around the full circumference of the cable screen: they are far superior to those that earth the screen by a simple “pig-tail”.
- The keyboard and mouse will play an important part in the compatibility of the processor card since they are ports into the board. Similarly, they will affect the compatibility of the complete system. Fully compatible peripherals must be used otherwise the complete system could be degraded. They may radiate or behave as if keys/buttons are pressed when subject to interference. Under these circumstances it may be beneficial to add a ferrite clamp on the leads as close as possible to the connector. A suitable type is the Chomerics type H8FE-1004-AS.
- USB cables should be high quality screened types.
- Ensure that the screens of any external cables are bonded to a good RF earth at the remote end of the cable.

Failure to observe these recommendations may invalidate the EMC compliance.

Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Quick Start Guide

First ensure that you are familiar with the contents of the section "Precautions". It contains important information to avoid damage to the unit.

Installing Your Processor and Memory

If your Single Board Computer is supplied with a processor and/or memory they are packed separately, to avoid any possible damage during transportation. Before proceeding further please read the whole of this sheet.

Fitting the Processor and Fan

Place the BCT-PICMG-P4 on the bench with the gold fingers towards you. Remove any memory fitted to the board. Pull the handle on the processor socket slightly to the right and lift it to the vertical. Place the processor into the socket, carefully matching the chamfered or identified corner of the processor to the socket (top right). Lower the handle to lock the processor into place.

Apply a thin smear of thermal grease to the top of the processor chip. Place the fan / heatsink assembly onto the processor and ensure that it is securely fastened. Connect the fan to the adjacent plug labelled “FAN 1” on the board.

Under no circumstances should the board be powered without fitting a fan-heatsink assembly.

Fitting the Memory

Do not attempt to fit the memory until the processor is fitted. Insert the first DIMM (memory module) into the DIMM socket nearest the processor, observing the polarisation slots in the DIMM. Press it firmly into place ensuring that the retaining clips lock into position. If a second DIMM is required, fit it to the remaining socket using the same technique.

Installing the Board

The board is now ready to be installed in a backplane. However, the board is now very heavy and could be damaged by holding it in such a way as to allow it to flex the circuit board. Handle it carefully.

Transportation

If the processor board is to be transported, it is strongly recommended that the fan-heatsink and memory are removed from the board and packed separately. (Removal is a reversal of the above). It is not necessary to remove the actual processor. This should avoid damage due to the weight of the heatsink and the vulnerability of the DIMMs. The units should be enclosed in anti-static bags.

Avoid the black conductive plastic type of anti-static bags for the processor - they will discharge the on-board battery. Use the clear metallised type as supplied.

Installation

CPU Installation

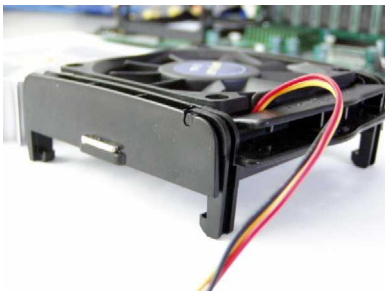
The BCT-PICMG-P4 board supports a single PGA (pin grid array) Pentium 4 / Celeron Processor. The processor connects to the board using a 478 pin levered ZIF socket.

Before installing the processor, raise the lever on the side of ZIF socket 478, perpendicular to the board. Rotate the processor to the correct orientation and then insert it into the socket. When fully seated, lower the lever to secure the processor. Apply Heatsink Thermal compound to the top of the CPU ensuring an even distribution.

The BCT-PICMG-P4 has a Heatsink Retention module to facilitate the attachment of a Fan /Heatsink assembly. Fit the Fan /Heatsink assembly to the retention module ensuring that there is good contact between the CPU and heatsink.

Caution: Insufficient contact, incorrect types of Fans, Heatsinks or Thermal Compound used, or improper amounts of Thermal compound applied, can cause the processor to overheat and may result in the System crashing.

Retention Module



Example of Fan

Example of Heatsink

Memory Installation

The BCT-PICMG-P4 supports two 184 pin, DDR SDRAM modules providing up to 2Gb of System Memory.

The Memory Modules are fitted, by placing them vertically into the socket, in the correct orientation, and pressing down firmly until it is locked in place by the tabs at either end.

Jumper Settings

The BCT-PICMG-P4 has a number of jumpers to allow the user to configure the board to suit specific applications. The functions of these jumpers is listed below:

JP2: CMOS Clearing Link

This jumper is used to clear the contents of the battery backed CMOS memory. The CMOS memory retains the system settings such as drive information, boot sequence and certain peripheral device information. To clear the contents, move the jumper from the normal operating position "Pins 1-2" to the clear position "Pins 2-3". Wait 5 seconds, and then return the jumper to the normal position.

JP3: Watchdog Timer Setting Select

Refer to the Watchdog Facility section for more details

Function	JP2
NMI	1-2
Reset System (Default)	2-3

JP1: COM Port Setting

The following jumper positions relate to the output of COM2, which is accessed via Header CN8

Function	JP1					
	1-2	3-4	5-6	7-8	9-10	11-12
RS-232	Off	Off	Off	Off	Off	On
RS-422	On (Term.)	On (Term.)	Off	On	On	Off
RS-485	On (Term.)	On (Term.)	Off	Off	On	Off

Connectors

There are three sets of connectors included on the BCT-PICMG-P4 PC board. These provide connections to standard external peripherals available through the back panel connectors (network, serial ports, monitor, keyboard, etc.), in-chassis peripherals (floppy disk, EIDE, etc.), and bus devices i.e. ISA and PCI.

Back panel connectors

The back panel provides external access to the UTP Ethernet, VGA, PS/2 keyboard/mouse, and the first serial communications port interfaces. All the connectors follow the industry standard.

100/10 Base-t UTP Ethernet, CN13

8-way RJ45 socket. Mating connector: 8-way RJ45 plug.

PIN NO.	SIGNAL	PIN NO.	SIGNAL
1	TX Data +ve	2	TX Data –ve
3	RX Data +ve	4	75R to UTP ground
5	75R to UTP ground	6	RX Data –ve
7	75R to UTP ground	8	75R to UTP ground

Video Connector, CN17

15-way Condensed D-type. Mating connector: standard monitor D-type connector.

PIN NO.	SIGNAL	PIN NO.	SIGNAL
1	Analogue RED	2	Analogue GREEN
3	Analogue BLUE	4	1K pull up
5	0 Volts (Ground)	6	0 Volts (Ground)
7	0 Volts (Ground)	8	0 Volts (Ground)
9	DDC +ve supply (SC protected)	10	0 Volts (Ground)
11	1K pull up	12	DDC Data
13	Horizontal Sync	14	Vertical Sync
15	DDC Clock		

Combined PS/2 Mouse and keyboard Port, CN19

6-way mini-DIN socket. Mating connector: 6-way mini-DIN keyboard plug.

PIN NO.	SIGNAL	PIN NO.	SIGNAL
1	Keyboard Data	2	Mouse Data
3	Ground	4	+5 Volts
5	Keyboard Clock	6	Mouse Clock

RS232 Serial Port 1, CN11

9-way D-type plug. Mating connector: 9-way D-type socket.

PIN NO.	SIGNAL	PIN NO.	SIGNAL
1	Data Carrier Detect	6	-Data Set Ready
2	-Receive Data	7	-Ready To Send
3	-Transmit Data	8	-Clear To Send
4	-Data Terminal Ready	9	Ringing Indicator
5	Ground		

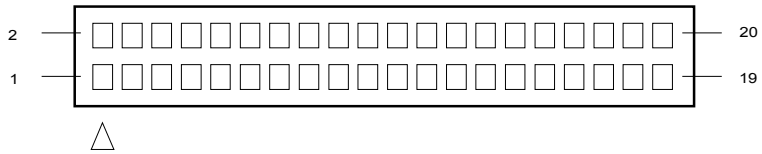
On-board connectors

There are connectors on-board for dual EIDE, Floppy Disk Drive, a second serial port (RS232/422/485), a parallel port, USB, internal mouse header, utilities header, ATX Connector and sensing fan connectors.

Utility Connector CN1

Note: This header has changed form the previous non-RoHS version

20-way boxed pin header. Mating connector: 20-way 0.1" (IDC) socket.

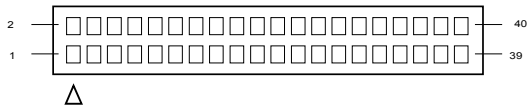


PIN NO	ASSIGNMENT	PIN NO	ASSIGNMENT
Power LED		SPEAKER	
1	+5V	2	SPKR(default)
3	N/C	4	BUZZ(Default)
5	PWLED (GND)	6	N/C
KEYLOCK		8	+5V
7	KBLOCK	RESET	
9	Ground	10	RESET
ATX PWR ON		12	GND
11	GND	HDD LED	
13	N/C	14	HDDLED
15	PSON	16	+5V
17	5VSB	PWR ON	
19		18	PWRBT+
		20	PWRBT-

Primary EIDE Connector, CN2

40-way boxed pin header with housing. Mating connector: 40-way 0.1" IDC socket.

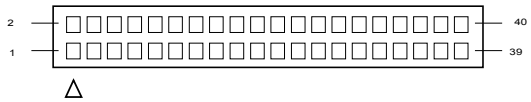
A suitable cable is supplied in the optional standard cable kit.



PIN NO.	SIGNAL	PIN NO.	SIGNAL
1	-Reset	2	Ground
3	Data bit 7 (HD)	4	Data bit 8 (HD)
5	Data bit 6 (HD)	6	Data bit 9 (HD)
7	Data bit 5 (HD)	8	Data bit 10 (HD)
9	Data bit 4 (HD)	10	Data bit 11 (HD)
11	Data bit 3 (HD)	12	Data bit 12 (HD)
13	Data bit 2 (HD)	14	Data bit 13 (HD)
15	Data bit 1 (HD)	16	Data bit 14 (HD)
17	Data bit 0 (HD)	18	Data bit 15 (HD)
19	Ground	20	Key
21	Drive Request	22	Ground
23	-IO Write (HD)	24	Ground
25	-IO Read (HD)	26	Ground
27	Drive Ready	28	ALE
29	Drive Acknowledge	30	Ground
31	IRQ14	32	Not Used
33	Address 1 (HD)	34	Not Used
35	Address 0 (HD)	36	Address 2 (HD)
37	-Chip Select 0 (HD)	38	-Chip Select 1 (HD)
39	IDE LED Drive	40	Ground

SECONDARY IDE Connector, CN5

40-way boxed pin header with housing. Mating connector: 40-way 0.1" IDC socket.

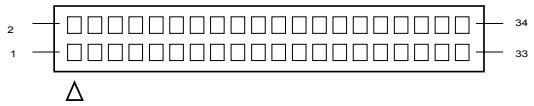


PIN NO.	SIGNAL	PIN NO.	SIGNAL
1	-Reset	2	Ground
3	Data bit 7 (HD)	4	Data bit 8 (HD)
5	Data bit 6 (HD)	6	Data bit 9 (HD)
7	Data bit 5 (HD)	8	Data bit 10 (HD)
9	Data bit 4 (HD)	10	Data bit 11 (HD)
11	Data bit 3 (HD)	12	Data bit 12 (HD)
13	Data bit 2 (HD)	14	Data bit 13 (HD)
15	Data bit 1 (HD)	16	Data bit 14 (HD)
17	Data bit 0 (HD)	18	Data bit 15 (HD)
19	Ground	20	Key
21	Drive Request	22	Ground
23	-IO Write (HD)	24	Ground
25	-IO Read (HD)	26	Ground
27	Drive Ready	28	ALE
29	Drive Acknowledge	30	Ground
31	IRQ15	32	Not Used
33	Address 1 (HD)	34	Not used
35	Address 0 (HD)	36	Address 2 (HD)
37	-Chip Select 0 (HD)	38	-Chip Select 1 (HD)
39	IDE LED Drive	40	Ground

FLOPPY DISK DRIVE CONNECTOR, CN3

34-way boxed pin header with housing. Mating connector: 34-way 0.1" (IDC) socket.

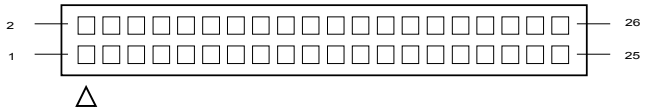
A suitable cable is supplied in the optional standard cable kit.



PIN NO	SIGNAL	PIN NO	SIGNAL
1	Ground	2	RPM/Low Current
3	Ground	4	Key
5	Ground	6	+Rate
7	Ground	8	-Index
9	Ground	10	-Motor 0
11	Ground	12	-Drive select 1
13	Ground	14	-Drive select 0
15	Ground	16	-Motor 1
17	Ground	18	+Direction
19	Ground	20	-Step
21	Ground	22	-Write Data
23	Ground	24	-Write Gate
25	Ground	26	-Track 0
27	Ground	28	-Write Protect
29	Ground	30	-Read Data
31	Ground	32	+Head Select
33	Ground	34	+Disk Change

ECP/EPP PARALLEL PORT, CN6

26-way boxed pin header with housing. Mating connector: 26-way 0.1" (IDC) socket.



PIN NO	SIGNAL	PIN NO	SIGNAL
1	-Strobe	2	Data bit 0
3	Data bit 1	4	Data bit 2
5	Data bit 3	6	Data bit 4
7	Data bit 5	8	Data bit 6
9	Data bit 7	10	ACK
11	BUSY	12	Paper Empty
13	Select	14	Auto Feed
15	Error	16	Initialize
17	Select	18	Ground
19	Ground	20	Ground
21	Ground	22	Ground
23	Ground	24	Ground
25	Ground	26	Key

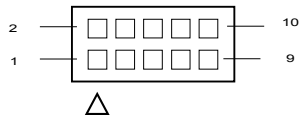
COM2 RS-232/422/485 SERIAL PORT, CN8

14-way boxed pin header with housing. Mating connector: 14-way 0.1" (IDC) socket.

PIN NO	SIGNAL	PIN NO	SIGNAL
1	DCD Data Carrier Detect	2	RXD Receive Data
3	TXD Transmit Data	4	DTR Data Terminal Ready
5	Ground	6	DSR Data Set Ready
7	RTS Request To Send	8	CTS Clear To send
9	RI Ring Indicator	10	Ground
11	TXD+ Transmit Data+	12	TXD- Transmit Data-
13	RXD+ Receive Data+	14	RXD- Receive Data-

USB connector, CN15

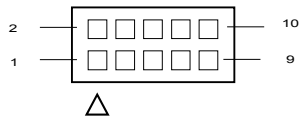
10-way boxed pin header. Mating connector: 10-way 0.1" (IDC) socket.



PIN NO	SIGNAL	PIN NO	SIGNAL
1	+5V	2	+5V
3	Port 0 -ve	4	Port 1 -ve
5	Port 0 +ve	6	Port 1 +ve
7	Ground	8	Ground
9	Key	10	NC

USB connector, CN16

10-way boxed pin header. Mating connector: 10-way 0.1" (IDC) socket.



PIN NO	SIGNAL	PIN NO	SIGNAL
1	+5V	2	+5V
3	Port 2 -ve	4	Port 3 -ve
5	Port 2 +ve	6	Port 3 +ve
7	Ground	8	Ground
9	Key	10	NC

ATX 12V Power Connector: CN4

Note: Without power applied to this connector, the BCT-PCIMG-P4 will not boot up.

PIN NO	SIGNAL	PIN NO	SIGNAL
1	Ground	2	Ground
3	+12V	4	+12V

ATX Control Power Connector: CN7

PIN NO	SIGNAL
1	PME
2	5VSB
3	PWRON
4	Ground

Extension Audio: CN14

PIN NO	SIGNAL
1	+12v
2	3.3v
3	ac_sync
4	ac_sdout
5	gnd
6	ac_bclk
7	gnd
8	ac_rst#
9	ac_sdin0

Software Configuration

Some operating systems provide in-built support for the chipset used on this board. A CD-ROM is supplied with each board, containing most common operating system drivers. Bear in mind that suppliers continually update their drivers, so it is always a good idea to check on the Internet for later ones. The following websites are good starting points:

www.intel.com

For example for a fresh install of Windows Xp operating systems, drivers can be installed as follows

Drivers are located on the BCT CD in the following Directory

\drivers\sbpc\picmgp4

First install the Intel Chipset drivers. This is done, by running the Setup.exe program, from the ..\chipset directory on the BCT Support CD.

Next the Video Device Drivers can be installed in a similar manner from the ..\VGA directory.

The Ethernet drivers, can then be installed from the ..\Lan directory.

If the optional Audio card is fitted, then the audio drivers can be found in the audio directory

BIOS Setup

The board contains an implementation of Award's ROM BIOS, which provides a built-in Setup program, which allows user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will stay unchanged unless there is a configuration change in the system, such as hard drive replacement or a device is added. It is possible for the CMOS battery to fail, this will cause data loss in the CMOS only. If this does happen you will need to reconfigure your BIOS settings.

Certain combinations of BIOS settings may prevent the BCT-PICMG-P4 from working correctly. If problems or lock-ups are experienced on boot-up, clear the CMOS memory and restart. The default settings will usually work in most instances. The CMOS memory is cleared using the jumper on the base board. To clear the CMOS, switch off the power to the board, then move the jumper to the Pins 2-3 for a few seconds, and then return it to its original position. The power may then be restored.

Press the keyboard <DEL> key during the boot-up operation to enter the BIOS set-up screen. Various information is available on the set-up and interpretation of the BIOS in the following files

Main Menu

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

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Standard CMOS Feature	Frequency/Voltage Control
Advanced BIOS Feature	Load Fail-Safe Defaults
Advanced Chipset Feature	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
Esc: Quit	↑↓←→: Select Item
F6: Save CMOS To BIOS	F7: Load CMOS From BIOS
F10: Save & Exit Setup	
Time, Date, Hard Disk Type….	

Note: that a brief description of each highlighted selection appears at the bottom of the screen.

Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

Standard CMOS Features

		Item Help
Date (mm:dd:yy):	Mon, Aug 5 2002	
Time (hh:mm:ss):	16:19:20	
➢ IDE Primary Master	2557 MB	Menu Level ➢
➢ IDE Primary Slave	None	
➢ IDE Secondary Master	None	Change the day, month, year and century
➢ IDE Secondary Slave	None	
Drive A	1.44M, 3.5 in.	
Drive B	None	
Video	EGA/VGA	
Halt On	All, But Keyboard	
Based Memory	640K	
Extended Memory	64512K	
Total Memory	65536K	

↑↓←→Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

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Advanced BIOS Features

		Item Help
Virus Warning	Enabled	
CPU L1 & L2 Cache	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	Menu Level ➢
Second Boot Device	HDD-0	
Third Boot Device	LS-120	Allow you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Enabled	
Boot Up NumLock Status	On	
Gate A20 Option	Normal	
Typematic Rate Setting	Disabled	
X Typematic Rate (Chars/Sec)	6	
X Typematic Delay (Msec)	250	
Security Option	Setup	
APIC Mode	Disabled	
X MPS Version Control For OS	1.1	
OS Select For DRAM > 64MB	Non-OS2	
Report No FDD For Win 95	No	

↑↓←→Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

Advanced Chipset Features

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also co-ordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

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Advanced Chipset Features

		Item Help
DRAM Timing Selectable	By SPD	
X CAS Latency Time	2.5	
X Active to Precharge Delay	6	
X DRAM RAS# to CAS# Delay	2	Menu Level ➢
X DRAM RAS# Precharge	3	
Memory Frequency For	Auto	
System BIOS Cacheable	Enabled	
Video BIOS Cacheable	Disabled	
Memory Hole At 15M-16M	Disabled	
Delayed Transaction	Enabled	
Delay Prior to Thermal	16Min	
AGP Aperture Size (MB)	64	
On-Chip VGA Setting		
On-Chip VGA	Enabled	
On-Chip Frame Buffer Size	8MB	

↑↓←→Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help

F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

Integrated Peripherals

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Integrated Peripherals

		Item Help
On-Chip Primary PCI IDE	Enabled	Menu Level ➢
IDE Primary Master PIO	Auto	If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/write per sector the drive can support
IDE Primary Slave PIO	Auto	
IDE Primary Master UDMA	Disabled	
IDE Primary Slave UDMA	Disabled	
On-Chip Secondary PCI IDE	Enabled	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Secondary Master UDMA	Disabled	
IDE Secondary Slave UDMA	Disabled	
USB Controller	Enabled	
USB 2.0 Controller	Enabled	
USB Keyboard Support	Disabled	
USB Mouse Support	Disabled	
AC97 Audio	Auto	
Init Display First	PCI Slot	
IDE HDD Block Mode	Disabled	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
X RxD, TxD Active	Hi, Lo	
X IR Transmission Delay	Enabled	
X UR2 Duplex Mode	Half	
X Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
X EPP Mode Select	EPP1.9	
X ECP Mode Use DMA	3	
PWRON After PWR-Fail	**Off**	

Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

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Power Management Setup

		Item Help
ACPI Function	Enabled	
Power Management	User Define	
Video Off Method	Blank Screen	
Video Off In Suspend	No	Menu Level ➢
Suspend Type	Stop Grant	
MODEM Use IRQ	3	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
CPU THRM-Throttling	87.5%	
Wake-Up by PCI card	Enabled	
Power On By Ring	Disabled	
Resume by Alarm	Disabled	
X Date (of Month) Alarm	0	
X Time (hh:mm:ss) Alarm	0 0 0	
Reload Global Timer Events		
Primary IDE 0	Disabled	
Primary IDE 1	Disabled	
Secondary IDE 0	Disabled	
Secondary IDE 1	Disabled	
FDD, COM, LPT Port	Disabled	
PCI PIRQ [A-D]#	Disabled	

↑↓←→Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help

F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

PnP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system, which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

Reset Configuration Data:

Normally, you leave this field Disabled. Select "Enabled" to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on card

The choice: Enabled, Disabled.

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PnP/PCI Configurations

		Item Help
Reset Configuration Data	Disabled	
Resources Controlled By	Auto (ESCD)	Menu Level ➢
X IRQ Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	Default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot

↑↓←→Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

PC Health Status

PC Health Status

		Item Help
CPU Warning Temperature	Disabled	
Current System Temp.	33°C / 91°F	
Current CPU1 Temperature	38°C / 100°F	
Current CPU Fan Speed	3835 RPM	Menu Level ➢
Current Chassis Fan Speed	4725RPM	
VDimm (V)	2.48V	
Vcore (V)	1.45V	
VCC3.3V	3.37V	
+ 5 V	5.08V	
+12 V	11.91V	
-12 V	-12.44	
-5V	-4.99V	
VBAT (V)	3.24V	
5VSB (V)	4.80	
Shutdown temperature	Disabled	

↑↓←→Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

Maintenance

The only regular maintenance required is to ensure that the cooling airflow remains unrestricted. Generally the enclosure design and the wiring layout of the system unit will influence this.

After a period of several years, it may be necessary to replace the battery on the processor board, if it cannot maintain the CMOS memory whilst the AC power is disconnected.

Replacing the Processor Battery

The processor board includes a small 3V lithium battery (type CR-2032) to retain the BIOS settings in the CMOS memory. Before attempting to replace the battery, please read the precautions detailed in the introductory section. Remember that even discharged batteries can present a real personnel hazard if mistreated.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instruction.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur.

Mettre au rébut les batteries usagées conformément aus instructions du fabricant.

Do NOT under any circumstances try to remove the battery with metallic tools (pliers, tweezers etc.). They will short out the battery with possible disastrous results.

Replace the battery by one of the same type, ensuring that it is fitted with the positive terminal facing the CPU, and that the clip is fully engaged. When the battery has been replaced, the BIOS settings will revert to their default settings. Reset them as necessary to suit your application.

Fuses

There are no user-serviceable or replaceable fuses within the unit.

Amendment History

Issue Level	Issue Date	Author	Amendment Details
1.0			First release

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