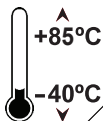


**Wide Operating
Temperature**



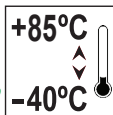
EasyBoard-800E

**Wide Range Temperature
3.5" Miniboard**

User's Manual

Version 1.0

2009.10



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Chapter 1

Introduction

1.1 Copyright Notice

All Rights Reserved.

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Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

1.2 About this User's Manual

This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this User's Manual, please consult your vendor before further handling.

1.3 Warning

Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside.
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry.
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that came with the Single Board Computer, whenever components are separated from the system.

1.4 Replacing the Lithium Battery

Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.

Do not throw lithium batteries into the trashcan. It must be disposed of in accordance with local regulations concerning special waste.

1.5 Technical Support

If you have any technical difficulties, please do not hesitate to call or e-mail our customer service.

<http://www.arbor.com.tw>

E-mail: info@arbor.com.tw

1.6 Warranty

This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

1.7 Packing List



1 x EasyBoard-800E 3.5" Miniboard



1 x Driver CD



1 x Quick Installation Guide

If any of the above items is damaged or missing, contact your vendor immediately.

1.8 Ordering Information

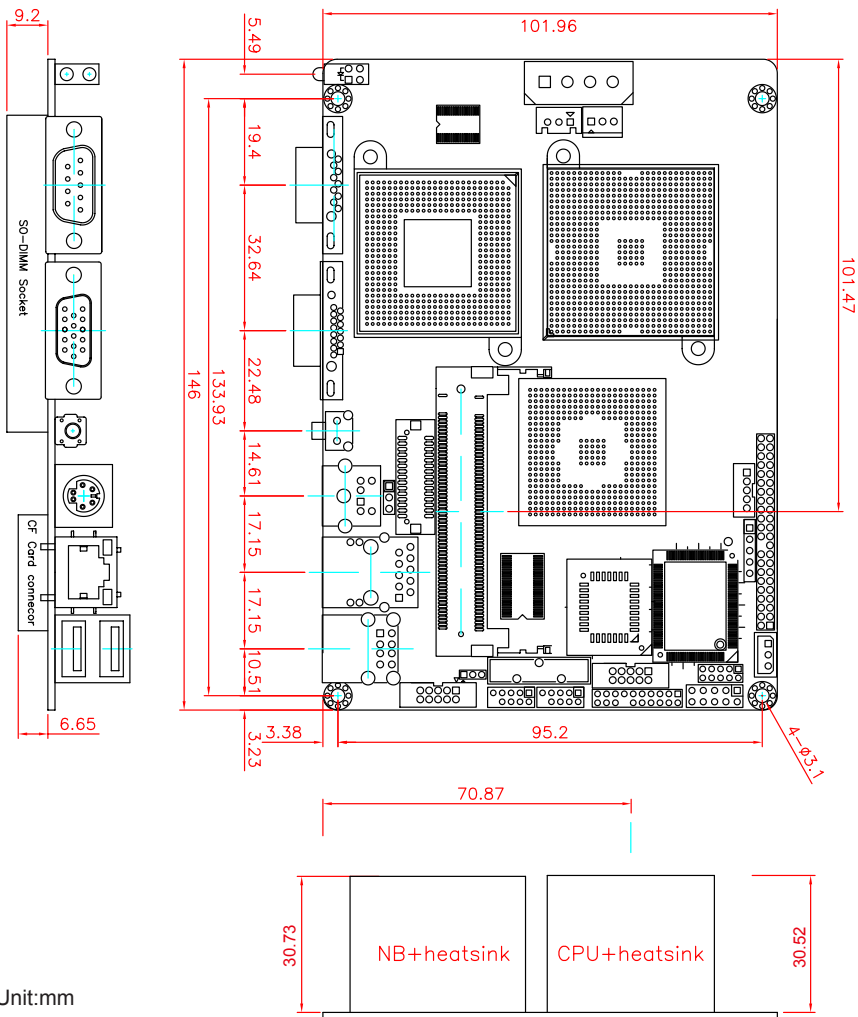
EasyBoard-800E/ CM1000	Intel® Celeron M 1.0GHz zero cache CPU 3.5" Miniboard
CBK-09-0762-00	Cable Kit 2 x USB Cables 1 x LPT Cable 1 x IDE Cable 1 x LPT to FDD Cable 1 x ATX Power Cable 1 x Audio Cable 1 x COM Port Cable 1 x Keyboard & Mouse Y-Cable

1.9 Specifications

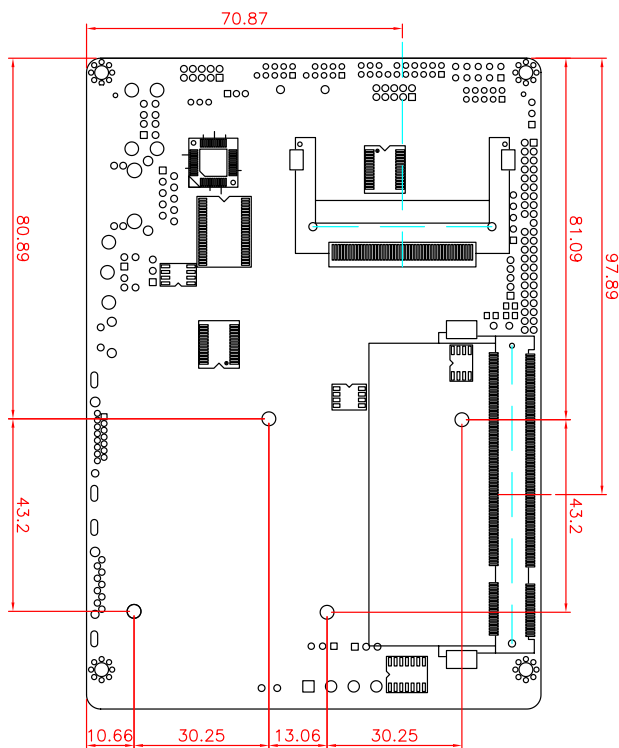
Form Factor	3.5" Miniboard
CPU	µFC-BGA Intel® Celeron M 1.0GHz (Zero cache)
Chipset	Intel® 852GM + Intel® ICH4
System Memory	1 x 200-pin DDR SO-DIMM up to 1GB 200/266 SDRAM
VGA/ LCD Controller	Intel® 852GM Extreme Graphics 2 (2D/3D) up to 64MB w/ Analog RGB/ LVDS (Dual independent display)
Ethernet	1 x Intel® 82562ET 10/100 Base-T Ethernet
I/O Chips	WINBOND W83627HG
BIOS	Phoenix-Award PnP Flash BIOS
Audio	ALC655 AC'97 CODEC, Line-in/out, Mic-in
IDE Interface	1 x Ultra ATA, supports 2 IDE devices
Serial Port	2 x COM ports (RS-232)
Parallel Port/ Floppy	1 x SPP/EPP/ECP mode 1 x Floppy connector, shared with Parallel Port
KBMS	Standard PS/2 Keyboard Mouse via Y-Cable
Universal Serial Bus	6 x USB 2.0 ports
DIO	8-bit programmable Digital Input/ Output
LCD	Dual Channels 18/24-bit LVDS
Expansion Interface	1 x CompactFlash Type II Socket 1 x Mini-PCI Socket
RTC	Real Time Clock
Operation Temp.	-40°C ~ +85°C (-40°F ~ +185°F)
Watchdog Timer	1~255 levels Reset
Dimension (L x W)	146 x 102 mm (5.7" x 4")

1.10 Board Dimensions

Layout Top View

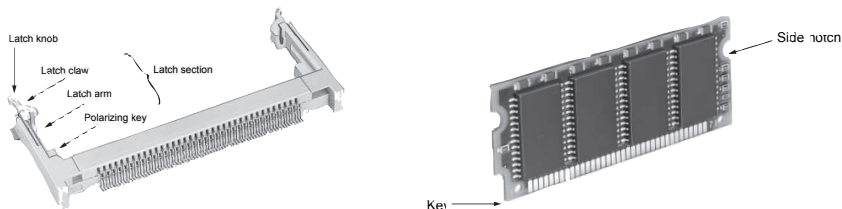


Layout Bottom View



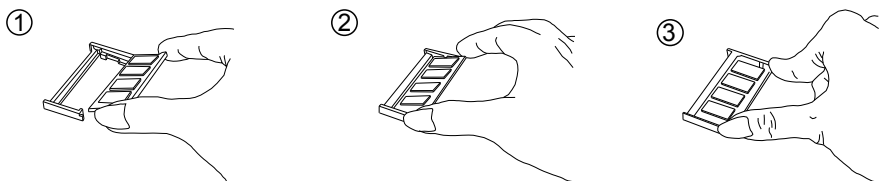
Unit:mm

1.11 Installing the Memory



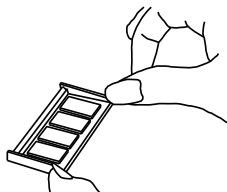
To install the Memory module, locate the Memory SO-DIMM slot on the board and perform as below:

1. Adjust the socket polarizing key and the board key to the same direction.
2. Insert the board obliquely. Moreover, lay the board in parallel to the opening at angle of 20° to 30° , and softly insert the board so as to hit the socket bottom. Stopping insertion halfway will result in improper insertion.
3. Applying the board side notch in parallel to the socket bottom so that the board position cannot be displaced, press the board side notch up, and fix it to the latch portion at both socket edges. Press the board side notch, and release the notch with a snap “click” tone, if the printed board exceeds the latch claw head.



Procedures for board extraction

Apply the thumb nail to the latch knob at both socket edges. Forcibly widen the latch knobs to right and left ways, and release the latch. Then draw the board out along an angle where the board is raised.



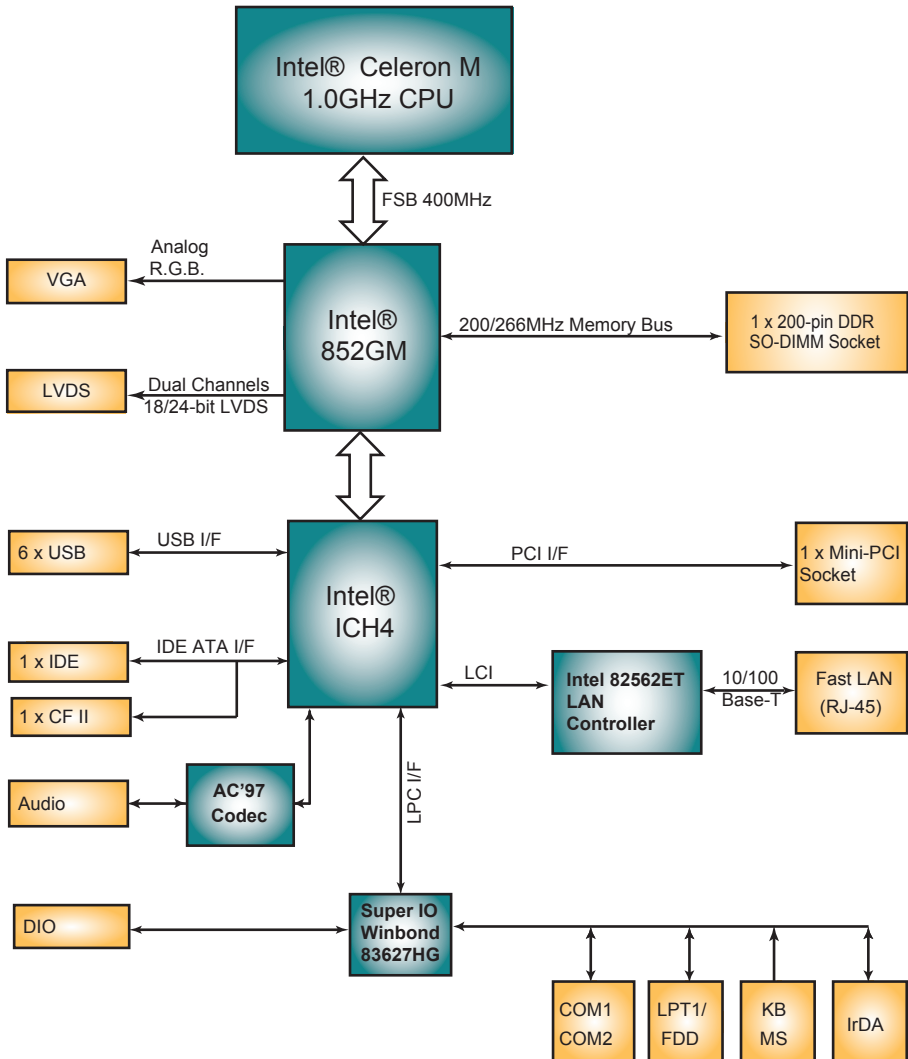
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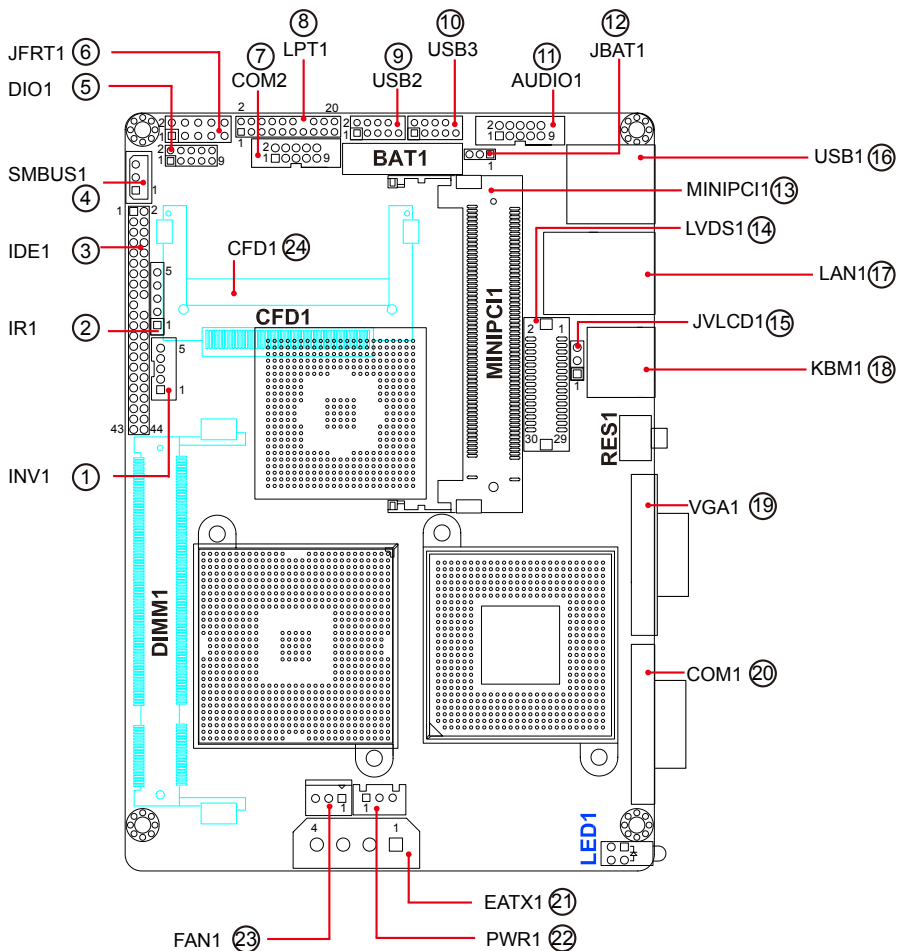
Chapter 2

Installation

2.1 Block Diagram



2.2 Jumpers and Connectors





Jumpers

JBAT1: Clear CMOS Setting (12)

If the board refuses to boot due to inappropriate CMOS settings here is how to proceed to clear (reset) the CMOS to its default values.

Connector type: 2.00mm pitch 1x3 -pin headers

Pin	Mode	
1-2	Keep CMOS (Default)	
2-3	Clear CMOS	

You may need to clear the CMOS if your system cannot boot up because you forgot your password, the CPU clock setup is incorrect, or the CMOS settings need to be reset to default values after the system BIOS has been updated.

Refer to the following solutions to reset your CMOS setting:

Solution A:

1. Power off the system and disconnect the power cable.
2. Place a shunt to short pin 1 and pin 2 of JBAT1 for five seconds.
3. Place the shunt back to pin 2 and pin 3 of JBAT1.
4. Power on the system.

Solution B:

If the CPU Clock setup is incorrect, you may not be able to boot up. In this case, follow these instructions:

1. Turn the system off, then on again. The CPU will automatically boot up using standard parameters.
2. As the system boots, enter BIOS and set up the CPU clock.

Note:

If you are unable to enter BIOS setup, turn the system on and off a few times.

JVLCD1: LCD Panel Voltage Selection (15)

The voltage of LCD panel could be selected by JVLCD1 in +5V or +3.3V.

Connector type: 2.54 mm pitch 1x3-pin header

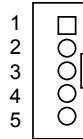
Pin	Voltage	
1-2	+5V	
2-3	+3.3V (Default)	

Connectors

INV1: LCD Inverter Connector (1)

Connector type: 2.00mm pitch 1x5-pin box wafer connector.

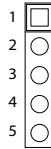
Pin	Description
1	+12V
2	GND
3	Backlight on/off
4	Brightness control
5	GND



IR1: Infrared Connector (2)

Connector type: 2.54mm pitch 1x5-pin headers

Pin	Voltage
1	+5V
2	N/C
3	IRRX
4	GND
5	IRTX



The IR connector can be configured to support wireless infrared module, user can transfer files to or from notebooks, PDA and printers.

Install infrared module onto IrDA connector and enable infrared function from BIOS setup and make sure to have correct orientation when you plug onto IrDA connector.

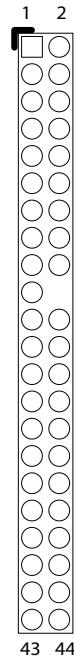
IDE1: IDE Connector (3)

An IDE drive ribbon cable has two connectors to support two IDE devices. If a ribbon cable connects to two IDE drives at the same time, one of them has to be configured as Master and the other has to be configured as Slave by setting the drive select jumpers on the drive.

Consult the documentation that came with your IDE drive for details on jumper locations and settings. You must orient the cable connector so that the pin 1 (color) edge of the cable corresponds to pin 1 of the IDE connector.

Connector type: 2.00mm pitch 2x22-pin headers

Pin	Description	Pin	Description
1	IDE RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	N/C (Key)
21	REQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO READY	28	N/C
29	DACK	30	GND
31	IRQ14	32	N/C
33	ADDR1	34	ATA66 DETECT
35	ADDR0	36	ADDR2
37	CS#2	38	CS#3
39	IDEACTP	40	GND
41	+5V	42	+5V
43	GND	44	N/C



SMBUS1: External SMBUS Connector (4)

Connector type: 2.5mm pitch 1x3 box wafer connector.

Pin	Description
1	Data
2	Clock
3	GND

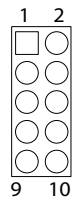


DIO1: Digital I/O Connector (5)

DIO1 is a 8-bit programmable Digital Input/ Output.

Connector type: 2.00 mm pitch 2x5-pin headers

Pin	Description	Pin	Description
1	DIO1	2	DIO2
3	DIO3	4	DIO4
5	DIO5	6	DIO6
7	DIO7	8	DIO8
9	+5V	10	GND

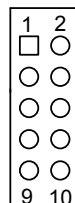


JFRT1: Switches and Indicators (6)

It provides connectors for system indicators that provides light indication of the computer activities and switches to change the computer status.

Connector type: 2.54 mm pitch 2x5-pin headers

Pin	Description	Pin	Description
1	RESET+	2	RESET-
3	Power LED+	4	Power LED-
5	HDD LED+	6	HDD LED-
7	SPEAKER+	8	SPEAKER-
9	PSON+	10	PSON-



RES: Reset Button, pin 1-2.

This 2-pin connector connects to the case-mounted reset switch and is used to reboot the system.

PLED: Power LED Connector, pin 3-4.

This 2-pin connector connects to the case-mounted power LED. Power LED can be indicated when the CPU card is on or off. And keyboard lock can be used to disable the keyboard function so the PC will not respond by any input.

HLED: HDD LED Connector, pin 5-6.

This 2-pin connector connects to the case-mounted HDD LED to indicate hard disk activity.

SPK: External Speaker, pin 7-8.

This 2-pin connector connects to the case-mounted speaker.

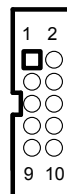
PWRBTN: ATX soft power switch, pin 9-10.

This 2-pin connector connects to the case-mounted Power button.

COM2: RS-232 Connector (7)

Connector type: 2.00mm pitch 2x5 box header.

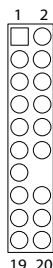
Pin	Description	Pin	Description
1	DCD#	2	RXD
3	TXD	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	N/C



LPT1: Parallel Port or FDD Connector (8)

LPT1 is shared with FDD1. Connector type: 2.00mm pitch 2x10-pin headers.

Pin	Description	Pin	Description
1	STROBE	2	AFD
3	PTD0	4	ERROR
5	PTD1	6	INIT
7	PTD2	8	SLIN
9	PTD3	10	GND
11	PTD4	12	GND
13	PTD5	14	GND (Key)
15	PTD6	16	BUSY
17	PTD7	18	PE
19	ACK	20	SELECT



LPT1 can be configured as a connector floppy disk drive interface through BIOS setup.

Pin	Description	Pin	Description
1	GND	2	Drive density Select 0
3	GND	4	N/C
5	GND	6	Drive Density Select 1
7	Write Data#	8	Index#
9	Write Gate#	10	Motor Enable A#
11	Track 0#	12	Driver Select B#
13	Write Protect#	14	Driver Select A#
15	Read Data#	16	Motor Enable B#
17	Head Select#	18	Direction#
19	Disk Change#	20	Step#

BIOS Setup

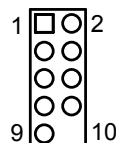
The default is to set LPT1 as FDD connector. To change the value, get into BIOS setup --> Integrated Peripheral --> Super IO Device.

BIOS Option	Setting	Description
External FDD Controller	Enabled	Set as FDD connector
Onboard Parallel Port	Disabled	
External FDD Controller	Disabled	
Onboard Parallel Port	378/IRQ7	Set as Parallel Port

USB2/ USB3: USB Connector (9), (10)

USB2/ USB3 supports two USB 2.0 w/ 480Mb/s by pin header

Pin	Description	Pin	Description
1	+5V	2	+5V
3	USBD-	4	USBD-
5	USBD+	6	USBD+
7	GND	8	GND
9	GND	10	N/C (Key)



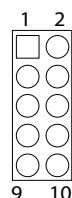
AUDIO1: Front Panel AUDIO Connector (11)

Connect a tape player or another audio source to the light blue Line-in connector to record audio on your computer or to play audio through your computer's sound chip and speakers.

Connect a micro-phone to the pink microphone connector to record audio to your computer.

Connector type: 2.00mm pitch 2x5-pin headers.

Pin	Description	Pin	Description
1	Line-in Left	2	Line-in Right
3	GND	4	GND
5	MIC1	6	N/C
7	GND	8	GND
9	Line-out Left	10	Line-out Right



MINIPCI1: MiniPCI slot (13)



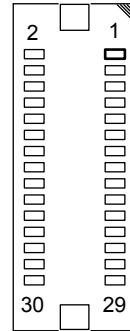
LVDS1: LVDS LCD Connector (14)

The LVDS connector supports Dual Channels 18/24-bit LVDS.

VDD could be selected by JVLCD1 in +5V or +3.3V.

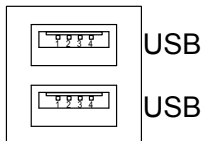
Connector type: DF-13-30DP-1.25V

Pin	Description	Pin	Description
1	VDD	2	VDD
3	TXLCLK+	4	TXUCLK+
5	TXLCLK-	6	TXUCLK-
7	GND	8	GND
9	TXL0+	10	TXU0+
11	TXL0-	12	TXU0-
13	GND	14	GND
15	TXL1+	16	TXU1+
17	TXL1-	18	TXU1-
19	GND	20	GND
21	TXL2+	22	TXU2+
23	TXL2-	24	TXU2-
25	GND	26	GND
27	TXL3+	28	TXU3+
29	TXL3-	30	TXU3-



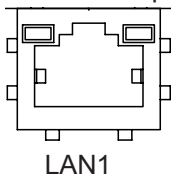
USB1: USB Stack Connector (16)

USB1 supports two USB 2.0 w/ 480Mb/s by USB connector type A.



LAN1: 10/100 RJ-45 (17)

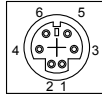
LAN1 supports 10/100 Mbps Fast Ethernet



KBM1: Keyboard & Mouse (18)

Mini-Din Keyboard & Mouse connector

Pin	Description
1	KB Data
2	MS Data
3	GND
4	+5V
5	KB Clock
6	MS Clock

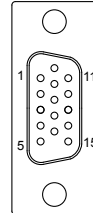


Note: KBM1 supports PS/2 keyboard directly, and PS/2 mouse supported with the additional PS/2 1-to-2 cable in standard packing.

VGA1: Analog RGB Connector (19)

Connector type: D-Sub 15-pin female.

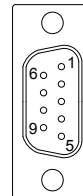
Pin	Description	Pin	Description
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	D-DATA
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	D-DCLK
8	GND		



COM1: RS-232 Connector (20)

Connector type: D-Sub 9-pin male.

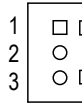
Pin	Description	Pin	Description
1	DCD#	6	DSR#
2	RXD	7	RTS#
3	TXD	8	CTS#
4	DTR#	9	RI#
5	GND		



EATX1: ATX Feature Connector (21)

Connector type: 2.00mm pitch 1x3-pin box wafer connector

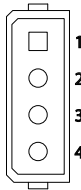
Pin	Description
1	PS-ON
2	GND
3	5V_SB



PWR1: Power Supply Connector (22)

Connector type: Big 4-pin 5.08mm pitch connector

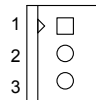
Pin	Description
1	+12V
2	GND
3	GND
4	+5V



FAN1: CPU Fan Connector (23)

CPUF1 is 3-pin headers for the system fan. The fan must be a +12V fan.

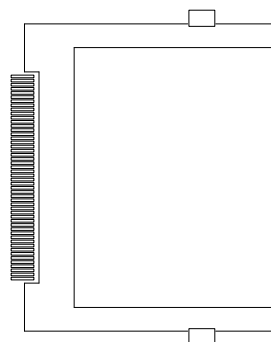
Pin	Description
1	GND
2	+12V
3	FAN_Detect



CFD1: Compact Flash II Socket (24)

Connector type: 50-pin compact flash connector

Pin	Description	Pin	Description
1	PDD3	26	GND
2	PDD4	27	PDD11
3	PDD5	28	PDD12
4	PDD6	29	PDD13
5	PDD7	30	PDD14
6	PDCS1#	31	PDD15
7	GND	32	PDCS3#
8	GND	33	GND
9	GND	34	PDIOR#
10	GND	35	PDIOW#
11	GND	36	+5V
12	GND	37	PIDEIRQ
13	+5V	38	+5V
14	GND	39	CSEL#
15	GND	40	N/C
16	GND	41	IDERST#
17	GND	42	PIORDY
18	PDA2	43	PDDREQ
19	PDA1	44	PDDACK#
20	PDA0	45	HD_LED1#
21	PDD0	46	PDIAG#
22	PD1	47	PDD8
23	PD2	48	PDD9
24	N/C	49	PDD10
25	GND	50	GND



The interface of Compact Flash socket is designated to use IDE1.

Installation instructions

Compact Flash (CF) card is “not hot-swap”. If the CF card is swapped in the condition of system power-on, it will damage the CF card.

1. Make sure the Single Board Computer is powered OFF.
2. Plug the Compact Flash Type II device into its socket. Verify the direction is correct.
3. Power up the system.

2.3 The Installation Paths of CD Driver

Driver	Path
CHIPSET	\CHIPSET\INTEL\INF 7.2
VGA	\GRAPHICS\INTEL\85X
AUDIO	\AUDIO\REALTEK\AC97
LAN	\ETHERNET\INTEL\PRO 10 &100

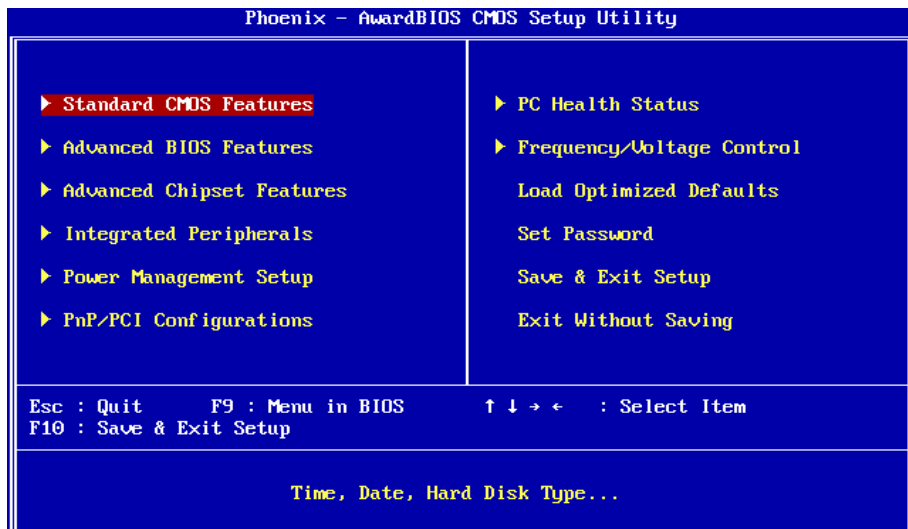
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Chapter 3

BIOS

3.1 BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's. The BIOS provides for a standard device such as disk drives, serial ports and parallel ports. It also adds password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.



3.2 BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility.

When you turn on the computer, the Award BIOS is immediately activated. Pressing the key immediately allows you to enter the Setup utility. If you a little bit late press the key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup.

If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again.

The following message will appear on the screen:

Press to Enter Setup

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit. When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

3.3 Standard CMOS Features

Phoenix - AwardBIOS CMOS Setup Utility		
Standard CMOS Features		
Date (mm:dd:yy)	Mon, Feb 4 2008	Item Help Menu Level ▶ Change the day, month, year and century
Time (hh:mm:ss)	9 : 40 : 47	
▶ IDE Primary Master		
▶ IDE Primary Slave		
▶ IDE Secondary Master		
▶ IDE Secondary Slave		
Drive A	[None]	
Video	[EGA/UGA]	
Halt On	[All Errors]	
Base Memory	640K	
Extended Memory	15360K	
Total Memory	16384K	
↑↓←→:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F7: Optimized Defaults		

“Standard CMOS Features” allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the CPU card is already installed in a working system, you will not need to select this option.

You will need to run the Standard CMOS option, however, if you change your system hardware configurations, such as onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Date

The date format is:

Day : Sun to Sat
Month : 1 to 12
Date : 1 to 31
Year : 1999 to 2099

Time

The time format is:

Hour : 00 to 23
Minute : 00 to 59
Second : 00 to 59

To set the date & time, highlight the “Date” & “Time” and use the <PgUp>/<PgDn> or +/- keys to set the current time.

IDE Primary HDDs / IDE Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices.

Each channel can support up to two hard disks; the first is the “Master” and the second is the “Slave”.

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select ‘Manual’ to define the drive information manually. You will be asked to enter the following items.

Cylinder:	Number of cylinders
Head:	Number of read/write heads
Precomp:	Write precompensation
Landing Zone:	Landing zone
Sector:	Number of sectors

The Access Mode selections are as follows:

CHS	(HD < 528MB)
LBA	(HD > 528MB and supports Logical Block Addressing)
Large	(for MS-DOS only)
Auto	

Drive A / Drive B

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

None	360K, 5.25 in.	1.2M, 5.25 in.
720K, 3.5 in.	1.44M, 3.5 in.	2.88M, 3.5 in.

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

All errors (default)	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
No errors	The system boot will not be halted for any error that may be detected.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

First/ Second/ Third Boot Device

These fields determine the drive that the system searches first for an operating system. The options available include

Setting: Floppy, LS120, HDD-0, SCSI, CDROM, HDD-1, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN and Disabled.

Boot Other Device

It allows the system to search for an OS from other devices other than the ones selected in the First/ Second/ Third Boot Device.

Setting: Disabled, Enabled (Default).

Boot Up Floppy Seek

This feature controls whether the BIOS checks for a floppy drive while booting up. If it cannot detect one (either due to improper configuration or its absence), it will flash an error message.

Setting: Disabled (Default), Enabled.

Gate A20 Option

It allows you to select how the Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Setting: Normal, Fast (Default).

Typematic Rate Setting

When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed at the next.

Setting: Disabled (Default), Enabled.

Typematic Rate (Chars/Sec)

When the typematic rate is enabled, the system registers repeated keystrokes speeds.

Setting: 6 to 30 characters per second.

Typematic Delay (Msec)

When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters.

Setting: 250 (Default), 500, 750, 1000.

Security Option

It allows you to limit access to the System and Setup.

When you select System, the system prompts for the User Password every time you boot up.

When you select Setup, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

Setting: Setup (Default), System.

APIC Mode

APIC stands for Advanced Programmable Interrupt Controller.

Setting: Disabled, Enabled (Default).

MPS Version Control For OS

It specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability.

Setting: 1.1, 1.4 (Default).

OS Select For DRAM > 64MB

It allows the system to access greater than 64MB of DRAM memory when used with OS/2 than depends on certain BIOS calls to access memory.

Setting: Non-OS2 (Default), OS2.

Small Logo(EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up.

Setting: Disabled, Enabled (Default).

3.5 Advanced Chipset Features

Phoenix - AwardBIOS CMOS Setup Utility		
Advanced Chipset Features		
DRAM Timing Selectable		[By SPD]
CAS Latency Time		[2.5]
Active to Precharge Delay		[7]
DRAM RAS# to CAS# Delay		[3]
DRAM RAS# Precharge		[3]
System BIOS Cacheable		[Enabled]
Video BIOS Cacheable		[Disabled]
Memory Hole At 15M-16M		[Disabled]
Delayed Transaction		[Enabled]
Delay Prior to Thermal		[16 Min]
AGP Aperture Size (MB)		[64]
** On-Chip UGA Setting **		
On-Chip UGA		[Enabled]
On-Chip Frame Buffer Size		[8MB]
Boot Display		[CRT]
Panel Number		[1024x768 18bit]
Item Help		
Menu Level ▶		
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help		
F5:Previous Values F7: Optimized Defaults		

DRAM Timing Selectable

It refers to the method by which the DRAM timing is selected.

Setting: Manual, By SPD (Default).

CAS Latency Time

It allows CAS latency time in HCLKs as 5, 4, 3, 6 and Auto. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or CPU.

Setting: 2, 2.5 (Default).

Active to Precharge Delay

Delay that results when two different rows in a memory chip are addressed one after another.

Setting: 7 (Default), 6, 5.

DRAM RAS# to CAS# Delay

It allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Reducing the delay improves the performance of the SDRAM.

Setting: 2, 3 (Default).

DRAM RAS# Precharge

It sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes.

Setting: 2, 3 (Default).

The setting of Enabled allows caching of the system BIOS ROM at F000h-FFFFFh for better system performance. However, if any program writes to this memory area, a system error may result.

Setting: Disabled, Enabled (Default).

Video BIOS Cacheable

The Setting Enabled allows caching of the video BIOS ROM at C0000h-F7FFFh for better video performance. However, if any program writes to this memory area, a system error may result.

Setting: Disabled (Default), Enabled.

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB.

Setting: Disabled (Default), Enabled.

Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

Setting: Disabled (Default), Enabled.

Delay Prior to Thermal

Controls the activation of the Thermal Monitor's automatic mode. It allows you to determine when the Pentium 4's Thermal Monitor should be activated in automatic mode after the system boots. For example, with the default value of 16 Minutes, the BIOS activates the Thermal Monitor in automatic mode 16 minutes after system starts booting up.

Setting: 4 Min, 8 Min, 16 Min (Default), 32 Min.

AGP Aperture Size (MB)

This option selects the size of the AGP aperture. The aperture is a portion of the PCI memory address range dedicated as graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without need for translation. The size also determines the maximum amount of system RAM that can be allocated to the graphics card for texture storage.

AGP Aperture size is set by the formula: maximum usable AGP memory size x 2 plus 12MB. That means that usable AGP memory size is less than half of the AGP aperture size. That's because the system needs AGP memory (uncached) plus an equal amount of write combined memory area and an additional 12MB for virtual addressing. This is address space, not physical memory used. The physical memory is allocated and released as needed only when Direct3D makes a "create non-local surface" call.

Setting: 4, 8, 16, 32, 64, 128 (Default), 256.

On-Chip VGA Setting >>>

On-Chip VGA

Setting: Enabled (Default), Disabled.

On-Chip Frame Buffer Size

Setting: 1MB, 4MB, 8MB (Default), 16MB, 32MB.

Boot Display

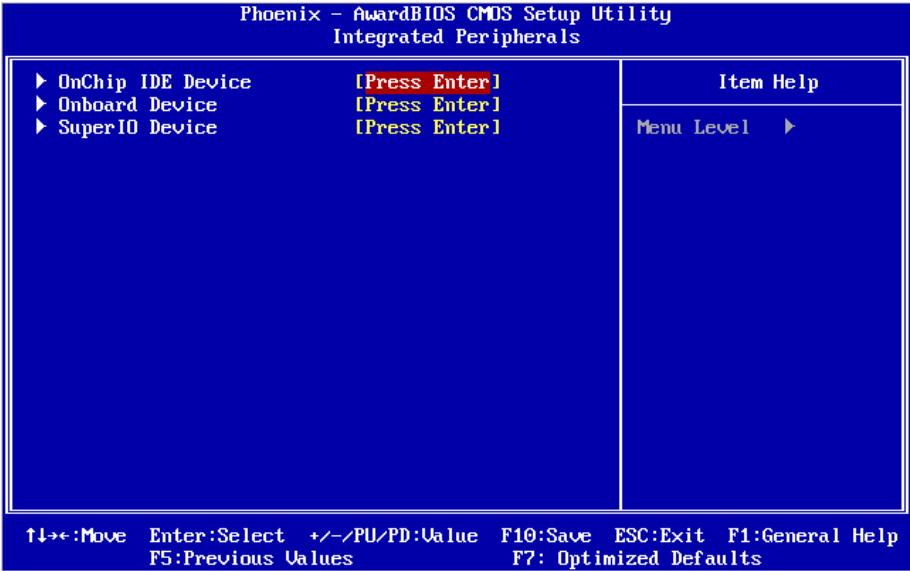
Setting: VBIOS Default, CRT(Default), LFP, CRT+LFT.

Panel Number

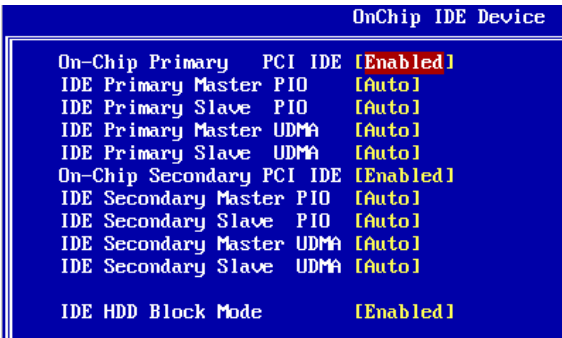
It allows you to select the LCD Panel type as below ---

Setting:	640x480	18bit
	800x600	18bit
	1024x768	18bit (Default)
	1280x1024	18bit
	1400x1050	18bit 2CH
	1400x1050	18bit 2CH
	1600x1200	18bit 2CH
	1024x768	24bit
	1280x768	24bit 2CH
	1400x1050	24bit 2CH
	1600x1200	24bit 2CH

3.6 Integrated Peripherals



OnChip IDE Devicev >>>



On-Chip IDE Channel 0/1

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.
Setting: Disabled, Enabled (Default).

IDE Primary Master/Slave PIO

It allows your system HDD controller to run faster.

Rather than having the BIOS issue with a series of commands that transferring to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

When Auto is selected, the BIOS will select the best available mode.

Setting: Auto (Default), Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary Master/Slave UDMA

It allows your system to improve disk I/O throughput to 33MB/sec with the Ultra DMA33 feature.

Setting: Disabled, Auto.

IDE DMA Transfer Access

Setting: Disabled, Enabled (Default).

IDE HDD Block Mode

It allows your HDD controller to use the fast block mode to transfer data to and from your HDD drive.

Setting: Disabled, Enabled (Default).

Onboard Device >>>

Onboard Device	
USB Controller	[Enabled]
USB 2.0 Controller	[Enabled]
USB Keyboard Support	[Disabled]
USB Mouse Support	[Disabled]
AC97 Audio	[Auto]
Init Display First	[PCI Slot]
Onboard LAN	[Enabled]

USB Controller

Setting: Enabled (Default), Disabled.

USB 2.0 Controller

For using USB 2.0, it is necessary OS drivers must be installed first. Please update your system to at least Windows 2000 SP4 or Windows XP SP2.

Setting: Enabled (Default), Disabled.

USB Keyboard Support

Setting: Disabled, Enabled (Default).

USB Mouse Support

Setting: Disabled, Enabled (Default).

AC97 Audio

Setting: Auto (Default), Disabled.

Init Display First

It allows the system to initialize first the VGA on chip, display card on the PCI Slot.

Setting: PCI Slot (Default), Onboard/AGP..

Onboard LAN

Setting: Disabled, Enabled (Default).

SuperIO Device >>>

SuperIO Device	
Extrnal FDD Controller	[Disabled]
Onboard Serial Port 1	[3F8/IRQ4]
Onboard Serial Port 2	[2F8/IRQ3]
UART Mode Select	[Normal]
RxD , TxD Active	[Hi,Lo]
IR Transmission Delay	[Enabled]
UR2 Duplex Mode	[Half]
Use IR Pins	[IR-Rx2Tx2]
Onboard Parallel Port	[378/IRQ7]
Parallel Port Mode	[SPP]
EPP Mode Select	[EPP1.7]
ECP Mode Use DMA	[3]
PWRON After PWR-Fail	[Off]

Onboard FDC Controller

Select "Enabled" if your system has a floppy disk controller (FDC) installed and you wish to use it. Select "Disabled" if your system has an add-in FDC or has no floppy drive.

Setting: Disabled, Enabled (Default).

Onboard Serial/Parallel Port

It allows you to select the onboard serial and parallel ports with their addresses.

Setting:	Serial Port 1	3F8/IRQ4	(Default)
	Serial Port 2	2F8/IRQ3	(Default)
	Parallel Port	378/IRQ7	(Default)

UART Mode Select

It determines the UART 2 mode in your computer.

Setting: IrDA, ASKIR, Normal (Default).

RxD, TxD Active

Setting: Hi,Hi , Hi,Lo (Default) , Lo,Hi , Lo,Lo.

IR Transmission Delay

Setting: Disabled, Enabled (Default).

UR2 Duplex Mode

Setting: Full, Half (Default).

Use IR Pins

Setting: RxD2,TxD2 , IR-Rx2Tx2 (Default).

Parallel Port Mode

Setting:	SPP (Default)
	EPP
	ECP
	ECP+EPP
	Normal

EPP Mode Select

Setting: EPP1.9, EPP1.7 (Default)

ECP Mode Use DMA

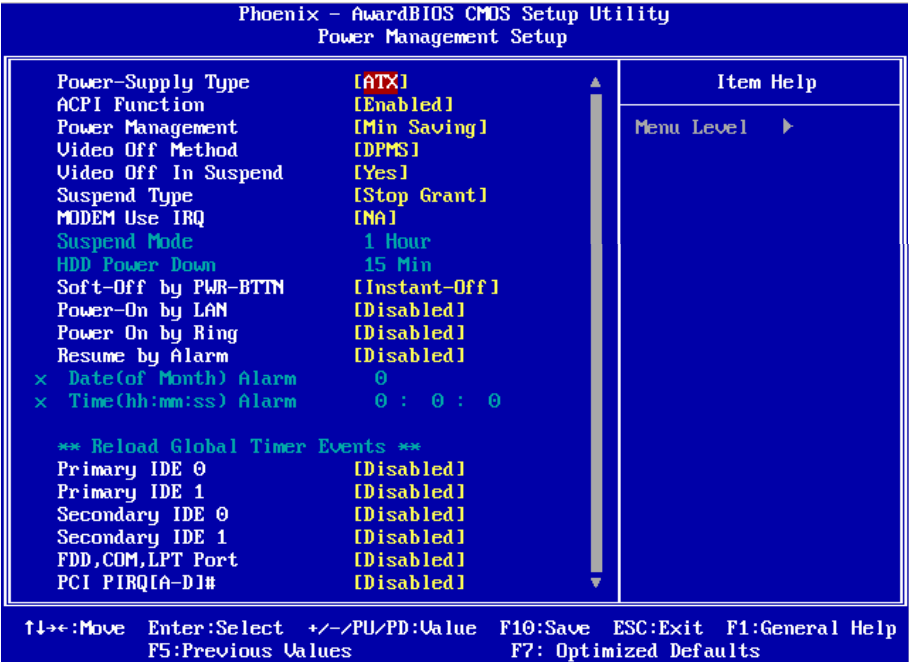
Setting: 1, 3 (Default).

PWRON After PWR-Fail

It sets the system power status whether on or off when power returns to the system from a power failure situation.

Setting: Off (Default), On, Former-Sts.

3.7 Power Management Setup



Power-Supply Type

Setting: ATX (Default), AT.

ACPI Function

It supports ACPI (Advance Configuration and Power Interface).

Setting: Enabled (Default), Disabled.

Power Management

It allows you to select the type of power saving management modes.

Setting: User Define (Default) Each of the ranges is from 1 min. to 1hr.
Except for HDD Power Down which ranges from 1 min. to 15 min

Min Saving	Minimum power management
Max Saving	Maximum power management

Video Off Method

It defines the Video Off features.

Setting: Blank Screen	Writes blanks to the video buffer
V/H SYNC + Blank	blank the screen and turn off vertical and horizontal scanning
DPMS (Default)	Allowing BIOS to control the video display.

Video Off In Suspend

When enabled, the video is off in suspend mode.

Setting: No, Yes (Default).

Suspend Type

Setting: Stop Grant (Default), PwrOn Suspend.

Modem Use IRQ

It sets the IRQ used by the Modem.

Setting: NA, 3 (Default), 4, 5, 7, 9, 10, 11.

Suspend Mode

When “Enabled”, after the set time of system inactivity, all devices except the CPU will be shut off as the set time.

Setting: Disabled (Default), 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, 1 Hour.

HDD Power Down

When “Enabled”, after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Setting: Disabled (Default), 1 Min - 15 Min.

Soft-Off by PWR-BTTN

It defines the power-off mode when using an ATX power supply.

In the Instant Off mode, It allows powering off immediately upon pressing the power button.

In the Delay 4 Sec mode, the system powers off when the power button is pressed for more than 4 seconds or enters the suspend mode when pressed for less than 4 seconds.

Setting: Instant-off (Default), Delay 4 Sec. .

Power On by Ring

It enables or disables the power on of the system through the modem connected or LAN.

Setting: Disabled (Default), Enabled.

Resume by Alarm

It enables or disables the resumption of the system operation. When enabled, the user is allowed to set the Date and Time.

Setting: Disabled (Default), Enabled.

Reload Global Timer Events

The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events that can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

3.8 PNP/PCI Configurations

Phoenix - AwardBIOS CMOS Setup Utility		Item Help
PMP OS Installed	[No]	Menu Level ▶ Select Yes if you are using a Plug and Play capable operating system Select No if you need the BIOS to configure non-boot devices
Reset Configuration Data	[Disabled]	
Resources Controlled By	[Auto(ESCD)]	
× IRQ Resources	Press Enter	
× DMA Resources	Press Enter	
× Memory Resources	Press Enter	
PCI/UGA Palette Snoop	[Disabled]	
PCI IRQ Activd By	[Level]	

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

PNP OS Installed

It allows you to enable the PNP OS Install option if it is supported by the OS installed.

Setting: No (Default), Yes.

Reset Configuration Data

It allows you to determine whether to reset the configuration data or not.

Setting: Disabled (Default), Enabled.

Resources Controlled By

This PnP BIOS can configure all of the boot and compatible devices with the use of a PnP operating system.

Setting: Auto(ESCD) (Default), Manual.

IRQ Resources

It allows you to configure the IRQ Resources.

DMA Resources

It allows you to configure the DMA Resources.

Memory Resources

It allows you to configure the Memory Resources.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly.

It allows you to set whether or not MPEG ISA/VESA VGA cards can display with PCI/VGA.

When "Enabled", a PCI/VGA can display with an MPEG ISA/VESA VGA card.

When "Disabled", a PCI/VGA can not display with an MPEG ISA/VESA VGA card.

Setting: Disabled (Default), Enabled.

PCI IRQ Activated By

Setting: Edge, Level (Default)

3.9 PC Health Status

Phoenix - AwardBIOS CMOS Setup Utility	
PC Health Status	
Shutdown Temperature	[Disabled]
CPU Temperature	
Vcore	
+2.5 V	
+3.3 V	
+5 V	
+1.5 V	
CPUFAN Speed	
	Item Help
	Menu Level ▶

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

 F5:Previous Values F7: Optimized Defaults

Shutdown Temperature

It allows you to set the temperature by which the system automatically shuts down once the threshold temperature is reached.

The setting can help prevent damage to the system that is caused by overheating.

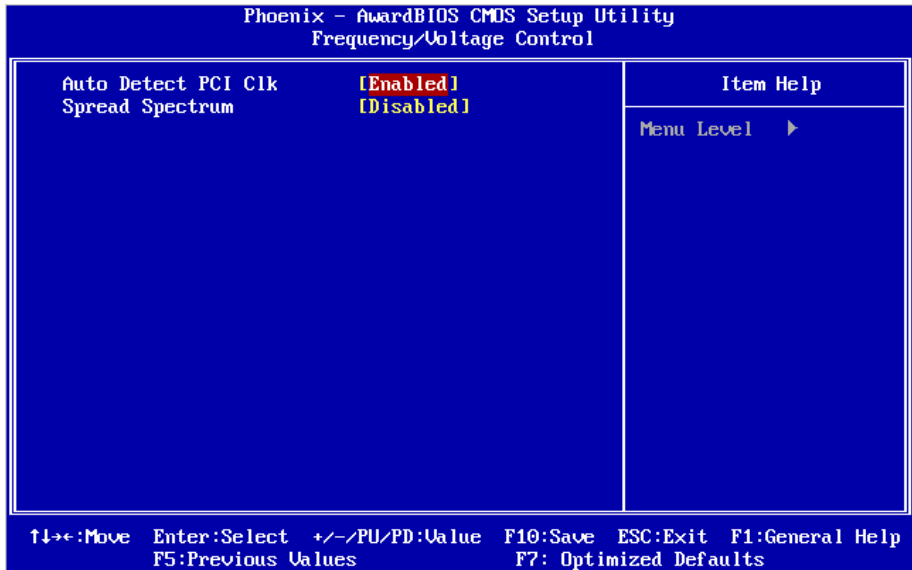
Setting: 60°C/140°F, 65°C/149°F, 70°C/158°F, Disabled (Default).

CPU Temperature

VCore/ 2.5V/ 3.3V/ +5V/ 1.5V/ VBAT(V)/ 5VSB

CPUFAN Speed

3.10 Frequency/Voltage Control



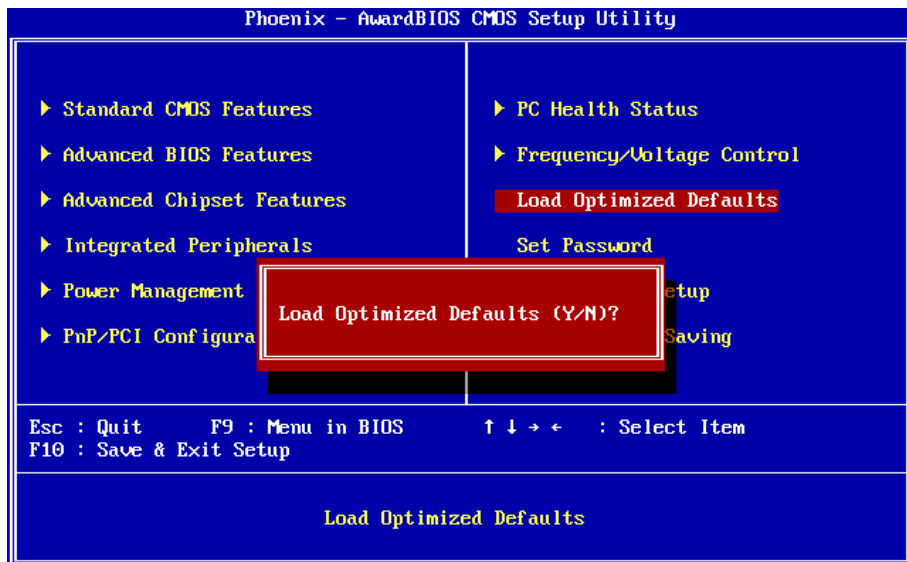
CPU Clock Ratio

The Ratio of some latest Intel Corporation fixes CPUs and VIA so the Ration cannot be changed with the setting. If it did not fix by CPU manufacturer, it may be changed with the setting. Over specification operations are not recommended.

Spread Spectrum

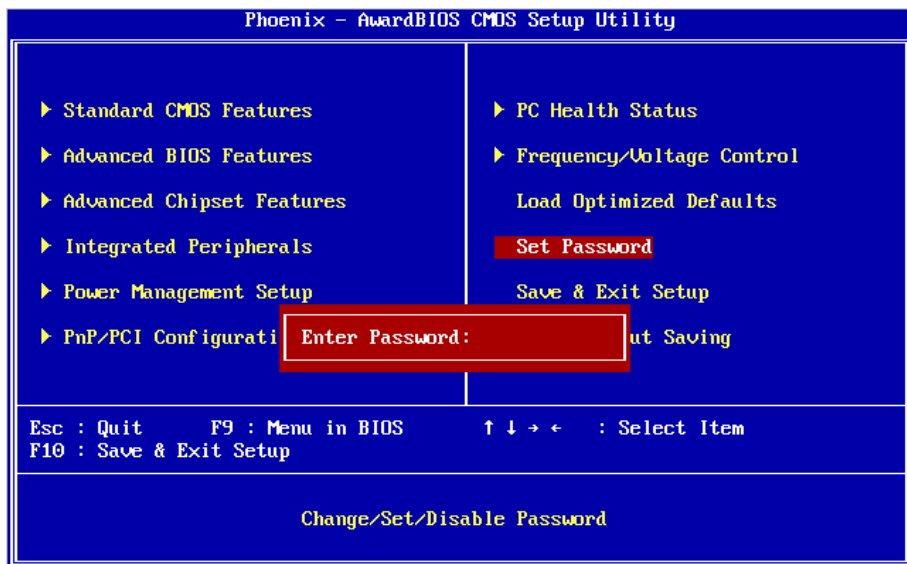
It sets the value of the spread spectrum. It is for CE testing use only.
Setting: Disabled (Default), Enabled.

3.11 Load Optimized Defaults



It allows you to load the default values to your system configuration. The default setting is optimal and enabled all high performance features.

3.12 Set Password

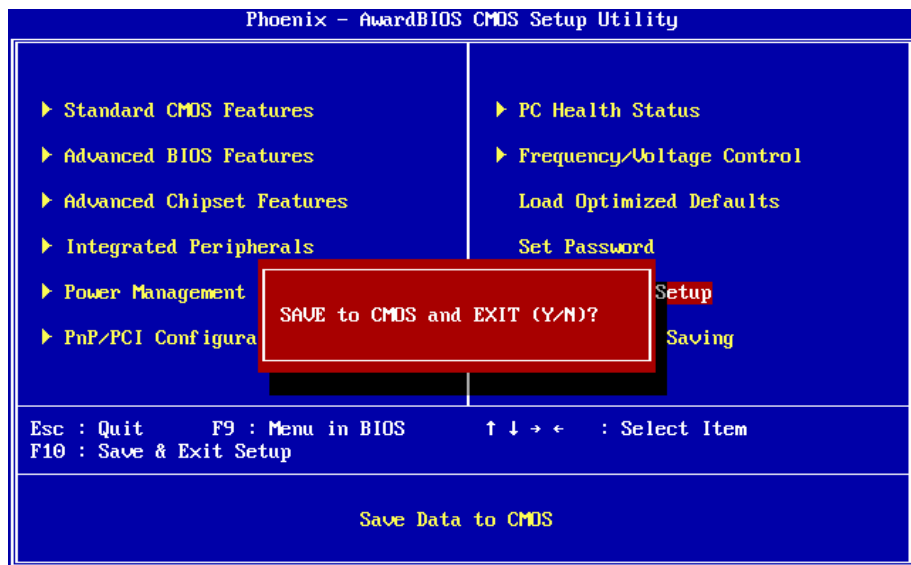


Using Password to set a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>.

The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. And the system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot, then you can enter BIOS Setup freely.

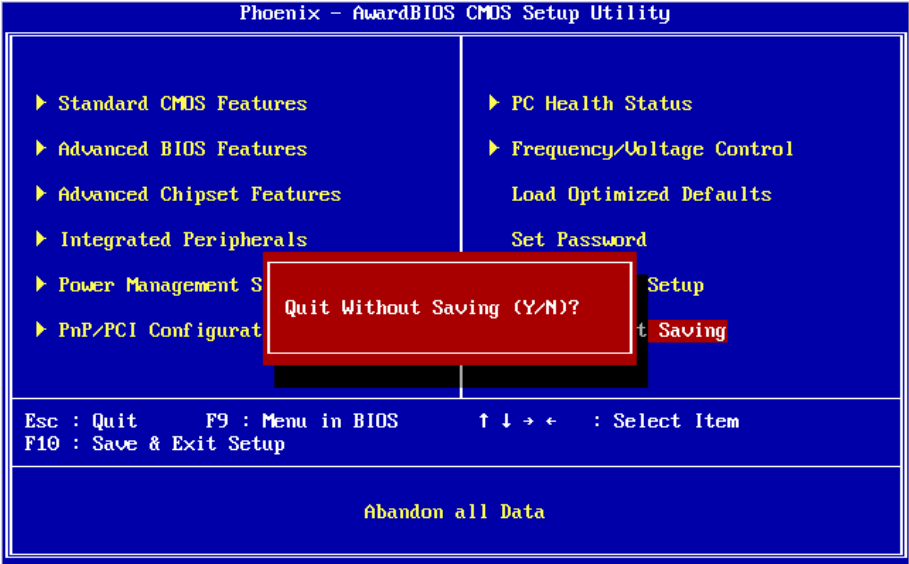
3.13 Save & Exit Setup



Typing “Y”, you will quit the setup utility and save all the changes into the CMOS memory.

Typing “N”, you will return to Setup utility.

3.14 Exit Without Saving



Typing “Y” will quit the Setup utility without saving the modifications.
Typing “N” will return you to Setup utility.

3.15 BIOS memory mapping

Address	Device Description
E000:0000h - F000:FFFFh	System BIOS Area
D000:2000h - D000:FFFFh	Free space
D000:0000h - D000:1FFFh	LAN ROM
C000:E000h - CF00:FFFFh	Free space
C000:0000h - C000:DFFFh	VGA BIOS
A000:0000h - B000:FFFFh	VGA RAM
0000:0000h - 9000:FFFFh	DOS 640K

3.16 Award BIOS POST Codes

CFh	Test CMOS read/write functionality
C0h	Early chipset initialization: Disable shadow RAM, L2 cache (socket 7 and below), program basic chipset registers
C1h	Detect memory: Auto detection of DRAM size, type and ECC, auto detection of L2 cache (socket 7 and below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM
01h	Expand the Xgroup codes located in physical memory address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch
04h	Reserved
05h	Blank out screen; Clear CMOS error flag
06h	Reserved
07h	Clear 8042 interface; Initialize 8042 self test
08h	Test special keyboard controller for Winbond 977 series Super I/O chips; Enable keyboard interface
09h	Reserved
0Ah	Disable PS/2 mouse interface (optional); Auto detect ports for keyboard & mouse followed by a port & interface swap (optional); Reset keyboard for Winbond 977 series Super I/O chips
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is read/write capable or not. If test fails, keep beeping the speaker
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash read/write codes into the run time area in F000 for ESCD & DMI support
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real time clock power status and then check for override
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686)
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)

20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	Check validity of RTC value; Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead; Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information; Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots; Early PCI initialization - Enumerate PCI bus number, assign memory & I/O resource, search for a valid VGA device & VGA BIOS, and put it into C000:0
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	Program CPU internal MTRR (P6 & PII) for 0-640K memory address; Initialize the APIC for Pentium class CPU; Program early chipset according to CMOS setup; Measure CPU speed; Invoke video BIOS
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	Initialize multilanguage; Put information on screen display, including Award title, CPU type, CPU speed, etc...
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1
3Fh	Reserved
40h	Test 9259 interrupt mask bits for channel 2
41h	Reserved
42h	Reserved
43h	Test 8259 functionality
44h	Reserved
45h	Reserved
46h	Reserved

47h	Initialize EISA slot
48h	Reserved
49h	Calculate total memory by testing the last double last word of each 64K page; Program writes allocation for AMD K5 CPU
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	Program MTRR of M1 CPU; initialize L2 cache for P6 class CPU & program cacheable range; Initialize the APIC for P6 class CPU; On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	Display PnP logo; Early ISA PnP initialization and assign CSN to every ISA PnP device
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code
5Ah	Reserved
5Bh	Show message for entering AWDFLASH.EXE from FDD (optional feature)
5Ch	Reserved
5Dh	Initialize Init_Onboard_Super_IO switch; Initialize Init_Onboard_AUDIO switch
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-Configuration table
6Ch	Reserved
6Dh	Assign resources to all ISA PnP devices; Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO"
6Eh	Reserved
6Fh	Initialize floppy controller; Setup floppy related fields in 40:hardware

70h	Reserved
71h	Reserved
72h	Reserved
73h	Enter AWDFLASH.EXE if: AWDFLASH.EXE is found in floppy drive and ALT+F2 is pressed
74h	Reserved
75h	Detect and install all IDE devices: HDD, LS120, ZIP, CDROM...
76h	Reserved
77h	Detect serial ports and parallel ports
78h	Reserved
79h	Reserved
7Ah	Detect and install coprocessor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	Switch back to text mode if full screen logo is supported: if errors occur, report errors & wait for keys, if no errors occur or F1 key is pressed continue - Clear EPA or customization logo
80h	Reserved
81h	Reserved
82h	Call chipset power management hook: Recover the text font used by EPA logo (not for full screen logo), If password is set, ask for password
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	Final USB initialization; NET PC: Build SYSID structure; Switch screen back to text mode; Set up ACPI table at top of memory; Invoke ISA adapter ROM's; Assign IRQ's to PCI devices; Initialize APM; Clear noise of IRQ's
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	Enable L2 cache; Program boot up speed; Chipset final initialization; Power management final initialization; Clear screen and display summary table; Program K6 write allocation; Program P6 class write combining
95h	Program daylight saving; Update keyboard LED and typematic rate
96h	Build MP table; Build and update ESCD; Set CMOS century to 20h or 19h; Load CMOS time into DOS timer tick; Build MSIRQ routing table
FFh	Boot attempt (INT 19h)

Chapter 4

Appendix

4.1 I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device.

The following table lists the I/O port addresses used.

Address	Device Description
00000000 - 0000000F	DMA Controller
00000080 - 0000009F	DMA Controller
000000C0 - 000000DF	DMA Controller
00000020 - 00000021	Programmable Interrupt Controller
000000A0 - 000000A1	Programmable Interrupt Controller
00000040 - 00000043	System Timer
00000044 - 00000047	System Timer
00000060 - 00000064	Keyboard Controller
00000070 - 00000073	System CMOS/Real Time Clock
000000F0 - 000000FF	Math Co-processor
000001F0 - 000001F7	Primary IDE
00000274 - 00000277	ISAPNP Read Data Port
00000279, 00000A79	ISAPNP Configuration
000002F8 - 000002FF	Communications Port (COM2, If use)
00000378 - 0000037A	Parallel Port (If use)
000003B0 - 000003BF	MDA/MGA
000003C0 - 000003CF	EGA/VGA
000003D4 - 000003D9	CGA CRT register
000003F0 - 000003F7	Floppy Diskette
000003F6 - 000003F6	Primary IDE
000003F8 - 000003FF	Communications Port (COM1, If use)
00000500 - 0000051F	South Bridge SMB
000004D0 - 000004D1	IRQ Edge/Level Control Ports
00000480 - 000004BF	South Bridge GPIO
00000400 - 0000047F	ACPI
00000A00 - 00000A07	PME

00000A10 - 00000A17	Hardware Monitor
00000CF8	PCI Configuration Address
00000CFC	PCI Configuration Data

4.2 Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 0	System Timer
IRQ 1	Keyboard Controller
IRQ 2	VGA and Link to Secondary PIC
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 5	PCI Device
IRQ 6	Standard Floppy Disk Controller
IRQ 7	Parallel Port
IRQ 8	System CMOS/real time clock
IRQ 9	Microsoft ACPI-Compliant System
IRQ 10	PCI Device
IRQ 11	PCI Device
IRQ 12	PS/2 Compatible Mouse
IRQ 13	FPU Exception
IRQ 14	IDE Controller
IRQ 15	PCI Device

4.3 BIOS memory mapping

Address	Device Description
00000h - 9FFFFh	DOS Kernel Area
A0000h, BFFFFh	EGA and VGA Video Buffer (128KB)
C00000h - CFFFFh	EGA/VGA ROM
D0000h - DFFFFh	Adaptor ROM
E00000h - FFFFFh	System BIOS

4.4 Watchdog Timer (WDT) Setting

WDT is widely used for industry application to monitoring the activity of CPU. Application software depends on its requirement to trigger WDT with adequate timer setting. Before WDT time out, the functional normal system will reload the WDT. The WDT never time out for a normal system. Then, WDT will time out and reset the system automatically to avoid abnormal operation.

This board supports 255 levels watchdog timer by software programming. Below are the source codes written in assembly & C, please take them for WDT application examples.

Assembly Code

```

;-- Initial W83627hf --
    mov     AX, 2Eh
    mov     DX, AX
    mov     AL, 87h
    out     DX, AX          ;
    out     DX, AX          ; initial W83627HF start
;--
    mov     AX, 2Eh
    mov     DX, AX
    mov     AL, 2Bh
    out     DX, AL          ; Select CR2B
    mov     AL, 00h
    inc     DX
    out     DX, AL          ; Set CR2B bit 4=0, PIN89=WDTO
;--
    mov     AX, 2Eh
    mov     DX, AX
    mov     AL, 07h

```

```

        out    DX, AL          ; Point to Logical Device Selector
        mov    AL, 08h
        inc    DX
        out    DX, AL          ; Select Logical Device 8
;--
        mov    AX, 2Eh
        mov    DX, AX
        mov    AL, 30h
        out    DX, AL          ; select CR30
        mov    AL, 01h
        inc    DX
        out    DX, AL          ; update CR30 to 01h
;--
        mov    AX, 2Eh
        mov    DX, AX
        mov    AL, 0F0h
        out    DX, AL          ; select CRF0
        mov    AL, 00h
        inc    DX
        out    DX, AL          ; set CRF0=00h, output
;--
        mov    AX, 2Eh
        mov    DX, AX
        mov    AL, 0F5h
        out    DX, AL          ; select CRF5, WDT Timer unit
        mov    AL, 00h          ; bit2 =0 ->second ; bit2 =1 -> minute
        inc    DX
        out    DX, AL          ; update CRF5 bit2 to 00h
;--
        mov    AX, 2Eh
        mov    DX, AX
        mov    AL, 0F6h
        out    DX, AL          ; select CRF6, WDT Timer
        mov    AL, 05h
        inc    DX
        out    DX, AL          ; update CRF6 to 5 unit
;--
        mov    AX, 2Eh
        mov    DX, AX
        mov    AL, AAh
        out    DX, AX
;-- end

```

C language Code

```

/*----- Include Header Area -----*/
#include "math.h"
#include "stdio.h"
#include "dos.h"

/*----- routing, sub-routing -----*/

void main()

{
    outportb(0x2e, 0x87);    /* initial IO port twice */
    outportb(0x2e, 0x87);

    outportb(0x2e, 0x2B);    /* select CR2B */
    outportb(0x2e+1, 0x00);  /* update CR2B bit4 to 00h */
                             /* Set PIN89 as WDIO */

    outportb(0x2e, 0x07);    /* point to logical device selector */
    outportb(0x2e+1, 0x08);  /* select logical device 8 */
    outportb(0x2e, 0x30);    /* select CR30 */
    outportb(0x2e+1, 0x01);  /* update CR30 to 01h */
    outportb(0x2e, 0xf0);    /* select CRF0 */
    outportb(0x2e+1, 0x00);  /* update CRF0 to 00h */
    outportb(0x2e, 0xf5);    /* select CRF5 to set timer unit */
    outportb(0x2e+1, 0x00);  /* update CRF5 bit2, 0:sec; 1:Min. */
    outportb(0x2e, 0xF6);    /* select CRF6 */
    outportb(0x2e+1, 0x05);  /* update CRF6 to 05h (5 sec) */

    outportb(0x2e, 0xAA);    /* stop program W83627HF, Exit */
}

```

4.5 Digital I/O Setting

Below are the source codes written in assembly & C, please take them for Digital I/O application examples.

Assembly Code

```

;-- Initial W83627hf --
    mov     AX, 2Eh
    mov     DX, AX
    mov     AL, 87h
    out     DX, AX          ;
    out     DX, AX          ; initial W83627HF start
;--
    mov     AX, 2Eh
    mov     DX, AX
    mov     AL, 2Ah
    out     DX, AL          ; Select CR2A
    mov     AL, 0FCh
    INC     DX
    out     DX, AL          ; Set CR2A bit 7=1 as GPIO port 1
;--
    mov     AX, 2Eh
    mov     DX, AX
    mov     AL, 07h
    out     DX, AL          ; Point to Logical Device Selector
    mov     AL, 07h
    inc     DX
    out     DX, AL          ; Select Logical Device 7
;--
    mov     AX, 2Eh
    mov     DX, AX
    mov     AL, 30h
    out     DX, AL          ; select CR30
    mov     AL, 01h
    inc     DX
    out     DX, AL          ; set bit0=1, GPIO port 1 active
;--
    mov     AX, 2Eh
    mov     DX, AX
    mov     AL, 0F0h
    out     DX, AL          ; select CRF0, GP I/O select
    mov     AL, 00h

```

```
inc    DX
OUT    DX, AL          ; bit7~bit0 0:output 1:input
;--
mov     AX, 2Eh
mov     DX, AX
mov     AL, 0F1h
out     DX, AL          ; select CRF1, Data Register
mov     AL, 0FFh
inc     DX
out     DX, AL          ; set all GPIO pin output 1
;--
mov     AX, 2Eh
mov     DX, AX
mov     AL, 0F1h
out     DX, AL          ; select CRF1, Data Register
mov     AL, 000h
inc     DX
out     DX, AL          ; set all GPIO pin output 0
;---
mov     AX, 2Eh
mov     DX, AX
mov     AL, AAh
out     DX, AX
;-- end
```

C language Code

```
/*----- Include Header Area -----*/
#include "math.h"
#include "stdio.h"
#include "dos.h"

/*----- routing, sub-routing -----*/

void main()

{
    outportb(0x2e, 0x87);    /* initial IO port twice */
    outportb(0x2e, 0x87);

    outportb(0x2e, 0x2a);    /* Select CR2A */
    outportb(0x2e+1, 0xfc);  /* set CR2A bit7=1 as GPIO port 1*/

    outportb(0x2e, 0x07);    /* point to logical device */
    outportb(0x2e+1, 0x07);  /* select logical device 7 */

    outportb(0x2e, 0x30);    /* select CR30 */
    outportb(0x2e+1, 0x01);  /* set bit0=1, GPIO port 1 active */

    outportb(0x2e, 0xf0);    /* select CRF0, GP I/O select */
    outportb(0x2e+1, 0x00);  /* bit7~bit0 0:output 1:input */

    outportb(0x2e, 0xf1);    /* select CRF1, Data Register */
    outportb(0x2e+1, 0xff);  /* set all GPIO pin output 1 */

    outportb(0x2e, 0xf1);    /* select CRF1, Data Register */
    outportb(0x2e+1, 0x00);  /* set all GPIO pin output 0 */

    outportb(0x2e, 0xAA);    /* stop program W83627HF, Exit */
}
```

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