CB-7960

Networking Control Board

Model Number CB-7960

Intel® Pentium® 4(D)/Celeron® (D) Networking Control Board with six GbE LAN

User's Manual

Version 1.0

User's Manual

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For more information on CB-7960 or other AEWIN products, please visit our website http://www.aewin.com.tw.

For technical supports or free catalog, please send your inquiry to info@aewin.com.tw

User's Manual

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Chapter 1. General Information

1.1 Introducing

The CB-7960 is a scalable networking control board based on Intel Pentium-4 architecture with Intel 945G and ICH7R chipsets.

The CB-7960 is equipped with six GbE LAN ports, with bypass function in four ports. With good cost and performance ratio, it is suitable for SMB/Enterprise segments. It can match various applications, including Firewall, VPN, Load Balancing, UTM, IPS, IDS, etc.

1.2 Specification

- CPU: LGA775 Intel Pentium 4(D)/Celeron (D) processor (533/800/1066MHz FSB)
- BIOS: Award® 4Mb Flash BIOS
- Chipset: Intel 945G + ICH7R
- I/O Chipset: Winbond® 83627HG
- Memory: Two 240pin DDR2 DIMM socket at 400/533/667MHz support up to 4GB
- SATA: Onboard two SATA connectors
- Enhanced IDE: One 40/44-pin IDE connector support up to two devices
- Serial port: Two RS-232 serial ports (one RJ45 connector, one pin header)
- Parallel port: One pin header for parallel port
- USB: Two USB2.0 ports (one connector, one pin header)
- KB/Mouse: Supports PS/2 keyboard and mouse
- Expansion slot: One Mini PCI socket and one PCI golden edge fingers support two PCI slots
- Ethernet: Six Intel® 82573L PCI-E×1 Ethernet controllers
- Digital I/O: Four digital input and four digital output
- SSD interface: One 50-pin CompactFlash^{TM} TYPE I/II socket
- Watchdog timer: Can generate a system reset, support software selectable timeout interval
- System Monitoring: Built in W83627HG; support temperatures, voltage monitoring function
- Power supply: Standard ATX power supply
- Max. Power Requirements: 350W
- Operating temperature: 32 to 140℉ （0 to 60℃ ）
- Board size: 11.45"(L) x 10.6"(W) (291mm x 270mm)

1.3 Order Information

We offer some accessories for CB-7960 control board for customer use.

Model	Description
CB-7960A	Intel® Pentium® 4(D) Celeron® (D) Networking Control Board with six GbE LAN
AW-R049A	Riser card with two PCI slots
MB-06018	VGA test card
46L-IUSB2B-00	USB CABLE W/BRACKET 2mm/ ROHS
46L-ICOM00-00	COM PORT CABLE 20CM/ ROHS
46L-IPS200-00	KB/MS CABLE 15CM/ RoHS
46L-ATA660-00	ATA-66 CABLE 46cm/ RoHS
46L-I00IDE-00	IDE CABLE (2mm) 45cm/ RoHS
46L-ILPT01-00	PRINTER CABLE (2mm) 26cm/ ROHS
46L-SATA00-00	S-ATA CABLE 50CM /RoHS

1.4 Packaging

Please make sure that the following items have been included in the package before installation.

1. CB-7960 Control Board
2. Quick Installation Guide (Optional)
3. Cables (Optional)
4. CD-ROM that contains the following folders:
(1) Manual
(2) System Driver
(3) Ethernet Driver
(4) Utility Tools

If any item of above is missing or damaged, please contact your dealer or retailer from whom you purchased the CB-7960. Keep the box and carton when you probably ship or store CB-7960 in near future. After you unpack the goods, inspect and make sure the packaging is intact. Do not plug the power adapter to the main board of CB-7960 if you already find it appears damaged. **Note: Keep the CB-7960 in the original packaging until you start installation.**

1.5 Precautions

Please make sure you properly ground yourself before handling the CB-7960 control board or other system components. Electrostatic discharge can be easily damage the CB-7960 control board.

Do not remove the anti-static packing until you are ready to install the CB-7960 control board.

Ground yourself before removing any system component from it protective anti-static packaging. To ground yourself, grasp the expansion slot covers or other unpainted parts of the computer chassis.

Handle the CB-7960 control board by its edges and avoid touching the components on it.

1.6 Board Layout
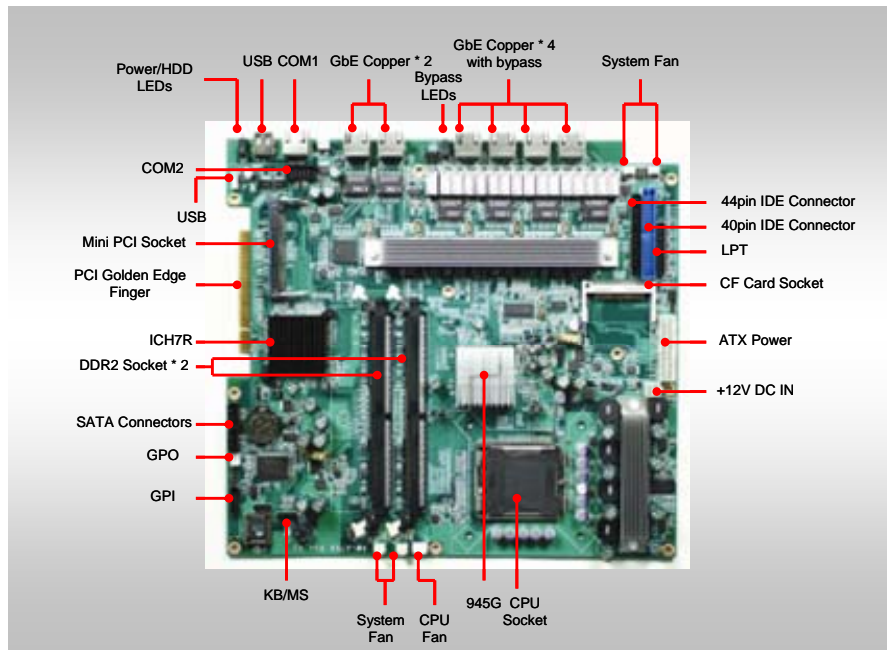
1.7 Board Dimension
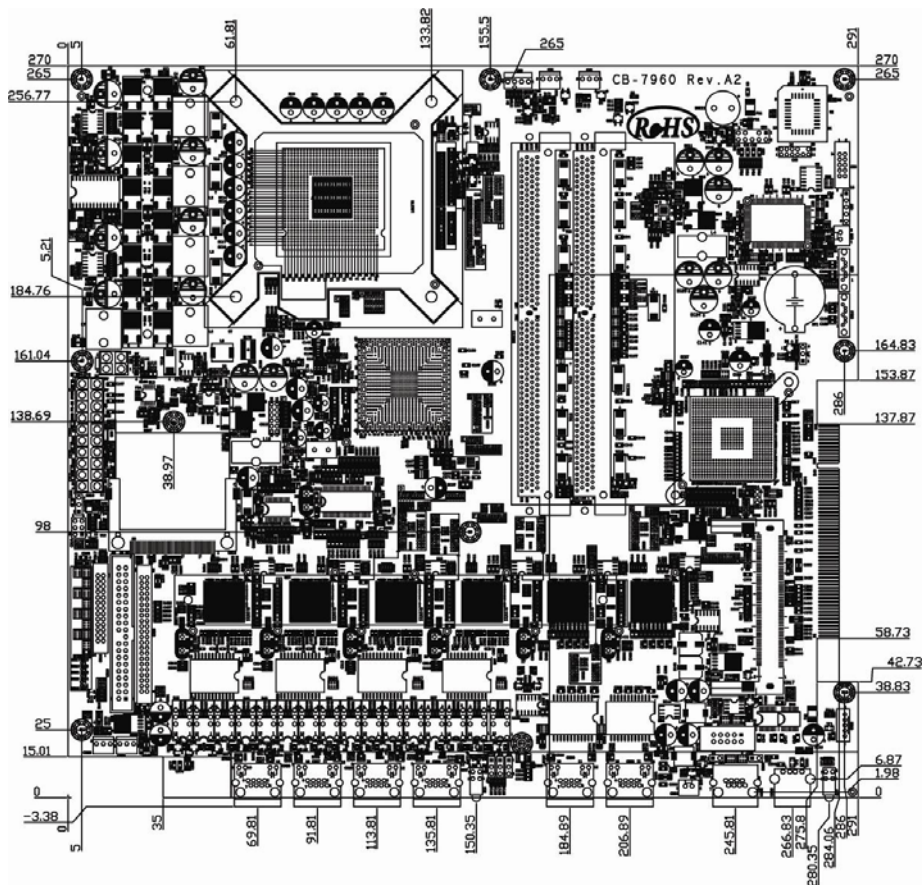
Chapter 2. Connector/Jumper Configuration

2.1 Connector/Jumper Location and Definition

Connector	Define	Connector	Define
CN1	FAN Connector	CN31	Giga LAN RJ45 Connector
CN2	FAN Connector	CN32	COM1 RJ45 Connector
CN3	FAN Connector	CN33	USB0 Connector
CN4	KB/MS Pin Header	CN34	PCI Golden Finger
CN6	GPIO Pin Header	CN35	CTS#1 & RTS#1 Header
CN7	GPIO Pin Header	CN36	DSR#1 & DTR#1 Header
CN9	SATA0 Connector	Buzz1	Speak Buzzer
CN10	SATA1 Connector	JP1	Clear CMOS
CN11	+12V Power Connector	JP2	Slect CF Master or Slave
CN12	VGA Pin Header	JP3	Bypass Always Enabled Select
CN13	ATX Power Connector	JP4	Bypass Always Enabled Select
CN15	Compact Flash Connector	JP5	Watch Dog or Bypass Select
CN16	Front Panel Header		
CN17	Mini PCI		
CN18	Parallel Connector		
CN19	IDE(2.54mm) 40 Pin		
CN20	IDE(2mm) 44 Pin		
CN21	LCM Backlight Connector		
CN22	USB1 Pin Header		
CN23	COM2 Box Header		
CN24	FAN Connector		
CN25	FAN Connector		
CN26	Giga LAN RJ45 Connector		
CN27	Giga LAN RJ45 Connector		
CN28	Giga LAN RJ45 Connector		
CN29	Giga LAN RJ45 Connector		
CN30	Giga LAN RJ45 Connector		
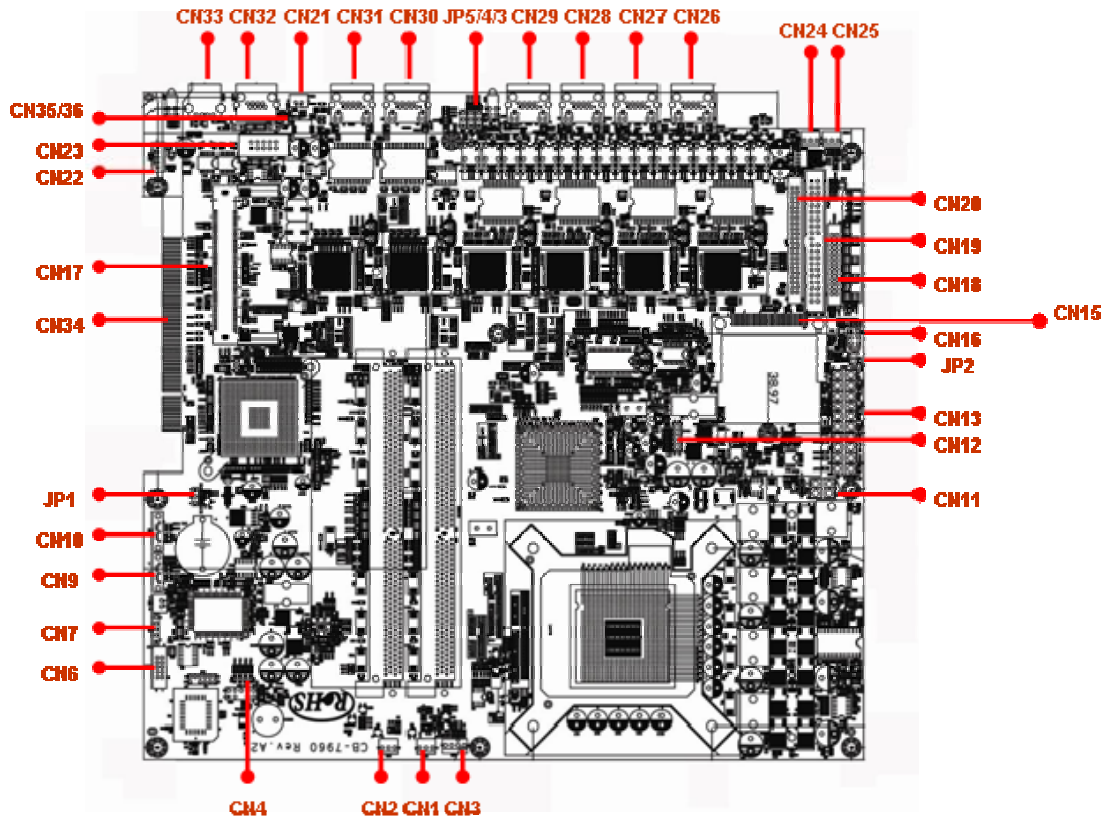
2.2 Connector and Jumper Setting

CN1/2/3/24/25: Fan connector

Pin	Define
1	Ground
2	+12V
3	Speed Detect

CN4: Keyboard/Mouse pin header
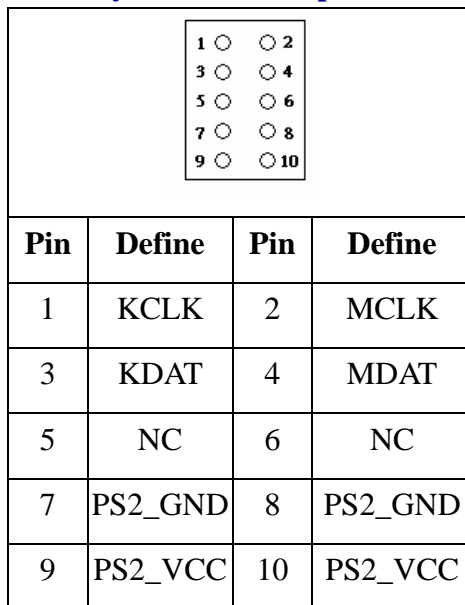
Pin	Define	Pin	Define
1	KCLK	2	MCLK
3	KDAT	4	MDAT
5	NC	6	NC
7	PS2_GND	8	PS2_GND
9	PS2_VCC	10	PS2_VCC

CN6: GPIO pin header

Pin	Define	Pin	Define
1	GPO4-	2	GPO4+
3	GPO5-	4	GPO5+
5	GPO6-	6	GPO6+
7	GPO7-	8	GPO7+

9	Ground	10	VCC

CN7: GPIO pin header

Pin	Define
1	GPIO1
2	GPIO2
3	GPIO3
4	GPIO4
5	Ground

CN9/10: SATA 0, 1 connector

Pin	Define
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground
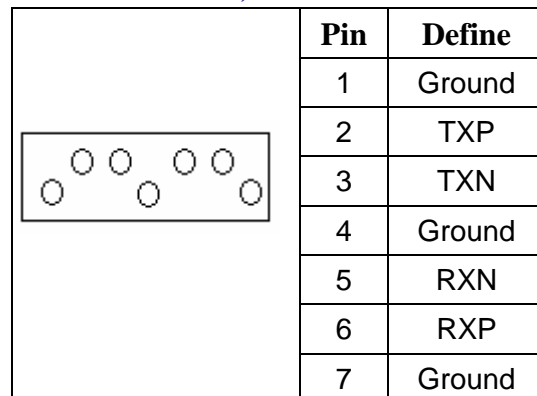
CN11: +12V power connector
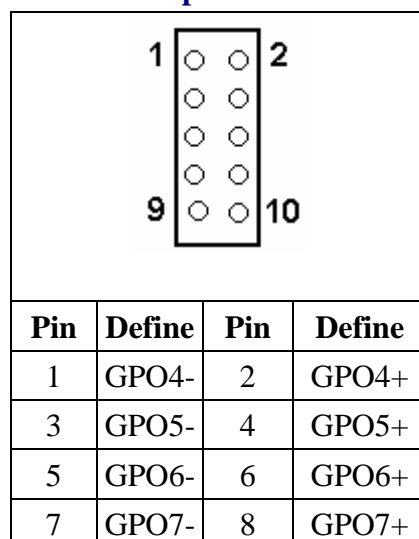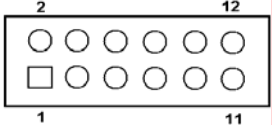
Pin	Define
1	Ground
2	Ground
3	+12V
4	+12V
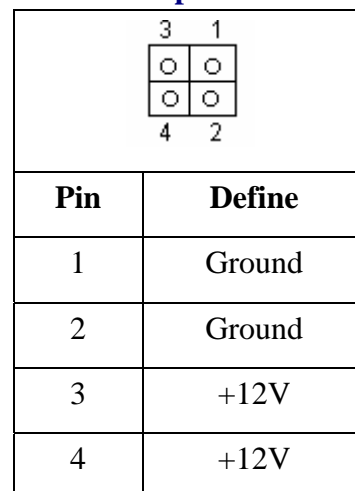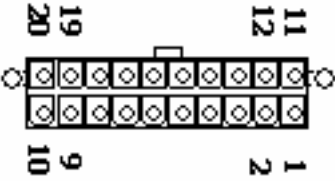
CN12: VGA pin header
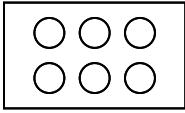
Pin	Define	Pin	Define
1	RED	2	Ground
3	GREEN	4	+3.3V
5	BLUE	6	Ground
7	Ground	8	DDCDATA
9	DDCCLK	10	HSYNC
11	VSYNC	12	+5V

CN13: ATX power connector

Pin	Define	Pin	Define
11	+3.3V	1	+3.3V
12	-12V	2	+3.3V
13	Ground	3	Ground
14	PS_ON*	4	+5V
15	Ground	5	Ground
16	Ground	6	+5V
17	Ground	7	Ground
18	-5V	8	POWER GOOD
19	+5V	9	5VSB
20	+5V	10	+12V
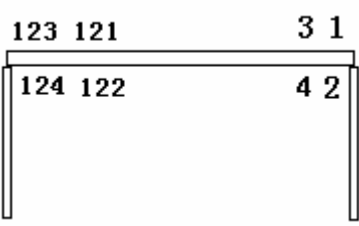
CN16: Front panel header

Pin	Define	Pin	Define
1	PWR_LED+	2	PWR_LED-
3	HDD_LED+	4	HDD_LED-
5	Reset+	6	Reset-

CN17: Mini PCI
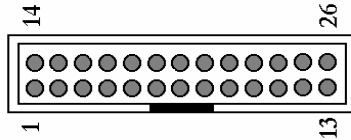
Pin	Define	Pin	Define
1	NC	2	NC
3	NC	4	NC
5	NC	6	NC
7	NC	8	NC
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	NC	16	RESERVED
17	INTB/D#	18	5V
19	3.3V	20	INTA/C#
21	RESERVED	22	RESERVED
23	GND	24	3.3VAUX
25	CLK	26	RST#
27	GND	28	3.3V
29	REQ#	30	GNT#
31	3.3V	32	GND
33	AD{31}	34	PME#
35	AD{29}	36	RESERVED
37	GND	38	AD{30}
39	AD{27}	40	3.3V
41	AD{25}	42	AD{28}
43	RESERVED	44	AD{26}
45	C/BE[3]#	46	AD{24}

47	AD{23}	48	IDSEL
49	GND	50	GND
51	AD{21}	52	AD{22}
53	AD{19}	54	AS{20}
55	GND	56	PAR
57	AD{17}	58	AD{18}
59	C/BE[2]#	60	AD[16]
61	IRDY#	62	GND
63	3.3V	64	FRAME#
65	CLKRUN#	66	TRDY#
67	SERP#	68	STOP#
69	GND	70	3.3V
71	PERP	72	DEVSEL#
73	CB/E[1]	74	GND
75	AD[14]	76	AD[15]
77	GND	78	AD[13]
79	AD[12]	80	AD[11]
81	AD[10]	82	GND
83	GND	84	AD[09]
85	AD[06]	86	C/BE[0]#
87	AD[07]	88	3.3V
89	3.3V	90	AD[06]
91	AD[05]	92	AD[04]
93	RESERVED	94	AD[02]
95	AD[03]	96	AD[00]
97	5V	98	RESERVED_WIP4
99	AD[01]	100	RESERVED_WIP4
101	GND	102	GND
103	NC	104	M66EN
105	NC	106	NC
107	NC	108	NC
109	NC	110	NC
111	NC	112	NC
113	NC	114	GND
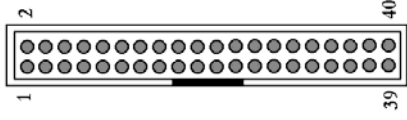
115	NC	116	NC
117	NC	118	NC
119	NC	120	NC
121	RESERVED	122	NC
123	VCC5VA	124	3.3VAUX

CN18: Parallel port box header

Pin	Define	Pin	Define
1	STROBE	14	AUTOFD
2	PD0	15	ERR
3	PD1	16	INT
4	PD2	17	SLCTIN
5	PD3	18	Ground
6	PD4	19	Ground
7	PD5	20	Ground
8	PD6	21	Ground
9	PD7	22	Ground
10	ACK*	23	Ground
11	BUSY	24	Ground
12	PE	25	Ground
13	SLCT	26	Ground

CN19: IDE (2.54mm) 40 pin header

Pin	Define	Pin	Define
1	RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12

Pin	Define	Pin	Define
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	KEY PIN
21	DREQ	22	GND
23	DIOW*	24	GND
25	DIOR*	26	GND
27	IOCHRDY	28	GND
29	DACK*	30	GND
31	IRQ14	32	N/C
33	A1	34	DETECT
35	A0	36	A2
37	PDCS#1	38	PDCS#3*
39	ACTIVE*	40	GND

Pin	Define	Pin	Define
25	DIOR*	26	Ground
27	IOCHRDY	28	Ground
29	DACK*	30	Ground
31	IRQ14	32	NC
33	A1	34	DETECT
35	A0	36	A2
37	HD SELECT 0*	38	HD SELECT 0*
39	ACTIVE*	40	Ground
41	+5V	42	+5V
43	Ground	44	NC

CN20: IDE (2mm) 44 pin header
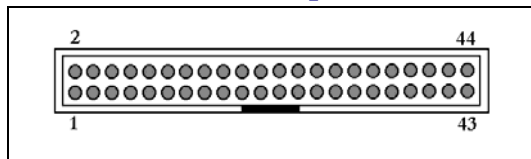
Pin	Define	Pin	Define
1	RESET*	2	Ground
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	Ground	20	NC
21	DREQ*	22	Ground
23	DIOW*	24	Ground

CN22: USB pin header
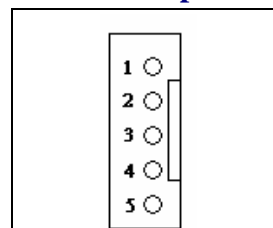
Pin	Define
1	USBVCC
2	USBP1N
3	USBP1P
4	Ground
5	Ground

CN23: COM2 box header
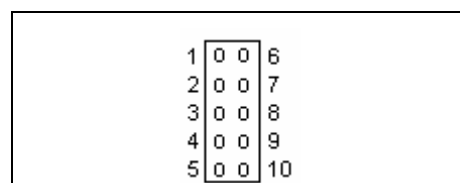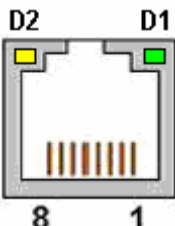
Pin	Define	Pin	Define
1	DCD#	6	DSR#

2	RXD#	7	RTS#
3	TXD#	8	CTS#
4	DTR#	9	RI#2
5	Ground	10	NC
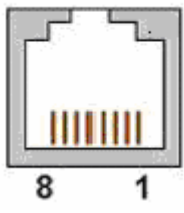
CN26~CN31: Gigabit LAN connector

Pin	Define
1	TX0+
2	TX0-
3	RX0+
4	N/C
5	N/C
6	RX0-
7	N/C
8	N/C
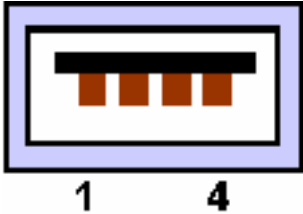
LED:

D1 :Bi-Color Speed LED	
10 Mbps	Off
100 Mbps	Yellow
1000Mbps	Green
D2 :Link/Activity LED	
Link	Green
Activity	Blinking

CN32: COM1 RJ45 connector

Pin	Define
1	CTS#
2	DTR#
3	TXD#
4	GPIO
5	Ground
6	RXD#
7	DSR#
8	RTS#

CN33: USB connector

Pin	Define
1	+5V
2	Data0-
3	Data1+
4	Ground

JP1: Clean CMOS

Pin		Setting
1 3	1-2	Hold Data (Default)
1 3	2-3	Clear CMOS

JP2: Compact Flash Select

Pin		Setting
1 3	1-2	Master
1 3	2-3	Slave (Default)

JP3/JP4: Bypass Always Enabled Select

Pin		Setting
1 3	1-2	Normal (Default)
1 3	2-3	Bypass Always Enabled

JP5: Watchdog or Bypass Select

Pin		Setting
1 3	1-2	Bypass Mode (Default)
1 3	2-3	Watch Dog

2.3 CompactFlash^{TM} Card Socket Pin Define

CompactFlash^{TM} card is a small removable mass storage device.   It can provide complete PCMCIA-ATA functionality and compatibility plus True IDE functionality compatible with ATA/ATAPI-4.

CompactFlash^{TM} storage products are solid state form factor, it means they contain no moving parts.   Thus, it provides users with much greater protection of the data than conventional magnetic disk device.

Pin	Assignment	Pin	Assignment	Pin	Assignment	Pin	Assignment	Pin	Assignment
1	Ground	11	Ground	21	D00	31	D15	41	RESET
2	D03	12	Ground	22	D01	32	CS	42	ORDY
3	D04	13	VCC	23	D02	33	NC	43	DREG
4	D05	14	Ground	24	WP	34	IOR	44	DACK
5	D06	15	Ground	25	NC	35	IOW	45	LED
6	D07	16	Ground	26	NC	36	WE	46	BVD
7	CS	17	Ground	27	D11	37	RDY/BSY	47	D08
8	Ground	18	A02	28	D12	38	VCC	48	D09
9	Ground	19	A01	29	D13	39	SCSE	49	D10
10	Ground	20	A00	30	D14	40	NC	50	Ground
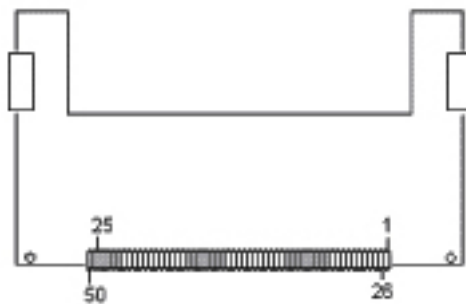
Chapter 3 BIOS Setup

The ROM chip of your CB-7960 board is configured with a customized Basic Input/Output System (BIOS) from Phoenix-Award BIOS.   The BIOS is a set of permanently recorded program routines that give the system its fundamental operational characteristics.   It also tests the computer and determines how the computer reacts to instructions that are part of programs.

The BIOS is made up of code and programs that provide the device-level control for the major I/O devices in the system.   It contains a set of routines (called POST, for Power-On Self Test) that check out the system when you turn it on.   The BIOS also includes CMOS Setup program, so no disk-based setup program is required CMOS RAM stores information for:

- Date and time
- Memory capacity of the main board
- Type of display adapter installed
- Number and type of disk drives

The CMOS memory is maintained by battery installed on the CB-7960 board. By using the battery, all memory in CMOS can be retained when the system power switch is turned off.   The system BIOS also supports easy way to reload the CMOS data when you replace the battery of the battery power lose.

3.1 Quick Setup

In most cases, you can quickly configure the system by choosing the following main menu options:

1. Choose "Load Optimized Defaults" from the main menu.   This loads the setup default values from the BIOS Features Setup and Chipset Features Setup screens.
2. Choose "Standard COS Features" from the main menu.   This option lets you configure the date and time, hard disk type, floppy disk drive type, primary display and more.
3. In the main menu, press F10 ("Save & Exit Setup") to save your changes and reboot the system.

3.2 Entering the CMOS Setup Program

Use the CMOS Setup program to modify the system parameters to reflect the options installed in your system and to customize your system.　For example, you should run the Setup program after you:

- Received an error code at startup
- Install another disk drive
- Use your system after not having used it for a long time
- Find the original setup missing
- Replace the battery
- Change to a different type of CPU
- Run the Phoenix-Award Flash program to update the system BIOS

Run the CMOS Setup program after you turn on the system.　On-screen instructions explain how to use the program.

⇩ **Enter the CMOS Setup program's main menu as follows:**

1. Turn on or reboot the system.　After the BIOS performs a series of diagnostic checks, the following message appears:
   "Press DEL to enter SETUP"
2. Press the <DEL> key to enter CMOS Setup program.　The main menu appears:

```
             Phoenix - AwardBIOS CMOS Setup Utility
  ┌──────────────────────────────┬──────────────────────────────┐
  │ ▶ Standard CMOS Features     │ ▶ Frequency/Voltage Control   │
  │                              │                              │
  │ ▶ Advanced BIOS Features     │    Load Fail-Safe Defaults    │
  │                              │                              │
  │ ▶ Advanced Chipset Features  │    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       F9 : Menu in BIOS      ↑ ↓ → ←   : Select Item │
  │ F10 : Save & Exit Setup                                       │
  ├──────────────────────────────────────────────────────────────┤
  │               Time, Date, Hard Disk Type...                  │
  └──────────────────────────────────────────────────────────────┘
```

3. Choose a setup option with the arrow keys and press <Enter>.　See the following sections for a brief description of each setup option.

In the main menu, press F10 ("Save & Exit Setup) to save your changes and reboot the system. Choosing "EXIT WITHOUT SAVING" ignores your changes and exits the program. Pressing <ESC> anywhere in the program returns you to the main menu.

3.3 Menu Options

The main menu options of the CMOS Setup program are described in the following and the following sections of this chapter.

STANDARD CMOS FEATURES:

Configure the date & time, hard disk drive type, floppy disk drive type, primary display type and more

ADVANCED BIOS FEATURES:

Configure advanced system options such as enabling/disabling cache memory and shadow RAM

ADVANCED CHIPSET FEATURES:

Configure advanced chipset register options such DRAM timing

INTEGRATED PERIPHERALS:

Configure onboard I/O functions

POWER MANAGEMENT SETUP:

Configure power management features such as timer selects

PNP/PCI CONFIGURATION:

Configure Plug & Play IRQ assignments and PCI slots

PC HEALTH STATUS:

Configure the CPU speed and, if the optional system monitor IC is installed, view system information

FREQUENCY / VOLTAGE CONTROL:

Configure the CPU and PCI clock, if the optional system monitor IC is installed, view system information

LOAD FAIL-SAFE DEFAULT:

Loads BIOS default values.   Use this option as diagnostic aid if your system behaves erratically

LOAD OPTIMIZED DEFAULTS:

Loads optimized BIOS settings

SET SUPERVISORS & USER PASSWORD:

Configure the system so that a password is required when the system boots or you attempt to enter the CMOS setup program.   When you log in with this password, you will be able to enter the CMOS Setup main menu, but you can not enter other menus in the CMOS Setup program.

SAVE & EXIT SETUP:

Save changes of values to CMOS and exit the CMOS setup program

EXIT WITHOUT SAVING:

Abandon all CMOS changes and exit the CMOS setup program

3.4 Standard CMOS Features Setup

⇩ **Use the Standard CMOS Setup option as follows:**

1. Choose "Standard CMOS Features" from the main menu.   The following screen appears:
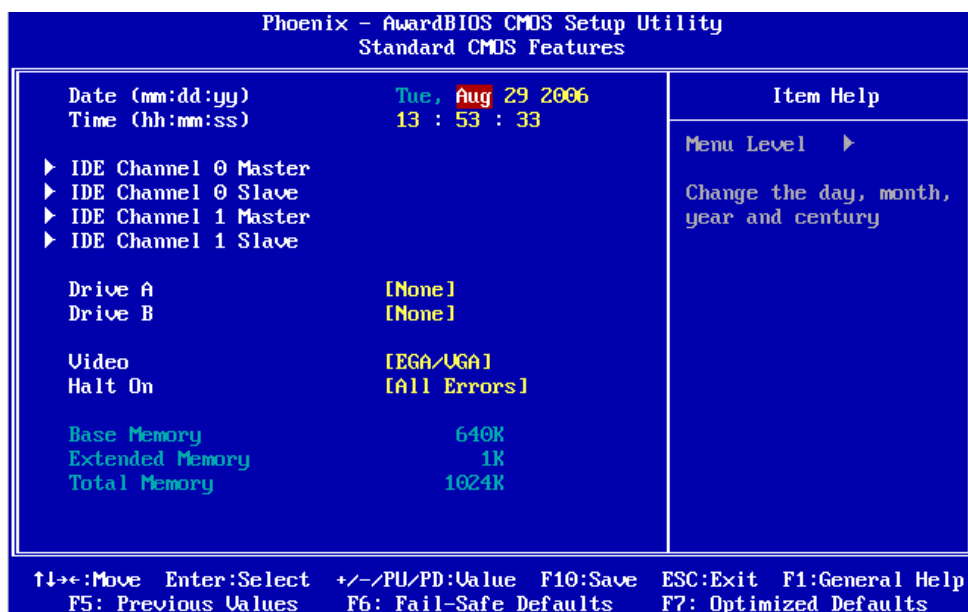
2. Use the arrow keys to move between fields. Modify the selected field using the PgUP/PgDN/+/- keys. Some fields let you enter numeric values directly.

Option	Description
Date (mm:dd:yy)	Type the current date
Time (hour:min:sec)	Type the current time (24-hour clock)
IDE channel	Select from "Auto", "User", or "None" If your drive is not one of the predefined types, choose "User" and enter the following drive specifications: Cylinders, heads, Wpcom, L-Zone, sectors, and mode Consult the documentation received with the drive for the values that will give you optimum performance.
Video	Select the default video device: EGA/VGA, CGA 40, CGA 80, Mono
Halt On	Select the situation what you want BIOS to stop power on self test process and notice you. Choose: <All Errors> <No Errors/ All> <But Keyboard > <All, But Diskette> <All, But Disk/Key>

3. After you have finished with the Standard CMOS Features program, press the <ESC> key to return to the main menu.

3.5 Advanced BIOS Features Setup

⇩ **Use the Advanced BIOS Features Setup option as follows:**

1. Choose "Advanced BIOS Features Setup" from the main menu. The following screen appears:

```
            Phoenix - AwardBIOS CMOS Setup Utility
                    Advanced BIOS Features
 ┌─────────────────────────────────────────┬─────────────────────┐
 │ ▶ CPU Feature              [Press Enter] │    Item Help        │
 │ ▶ Hard Disk Boot Priority  [Press Enter] │                     │
 │   Virus Warning            [Disabled]    │ Menu Level    ▶     │
 │   CPU L1 & L2 Cache        [Enabled]     │                     │
 │   CPU L3 Cache             [Enabled]     │                     │
 │   Hyper-Threading Technology[Enabled]    │                     │
 │   Quick Power On Self Test [Enabled]     │                     │
 │   First Boot Device        [Floppy]      │                     │
 │   Second Boot Device       [Hard Disk]   │                     │
 │   Third Boot Device        [LS120]       │                     │
 │   Boot Other Device        [Enabled]     │                     │
 │   Swap Floppy Drive        [Disabled]    │                     │
 │   Boot Up Floppy Seek      [Enabled]     │                     │
 │   Boot Up NumLock Status   [On]          │                     │
 │   Gate A20 Option          [Fast]        │                     │
 │   Typematic Rate Setting   [Disabled]    │                     │
 │ x Typematic Rate (Chars/Sec) 6           │                     │
 │ x Typematic Delay (Msec)    250          │                     │
 │   Security Option          [Setup]     ▼ │                     │
 ├─────────────────────────────────────────┴─────────────────────┤
 │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help │
 │ F5: Previous Values   F6: Fail-Safe Defaults   F7: Optimized Defaults │
 └────────────────────────────────────────────────────────────────┘
```

2. Use the arrow keys to move between items and to select values. Modify the selected fields using the PgUP/PgDN keys. Press the <F1> "Help" key for information on the available options:

Option	Description
CPU Feature	Configure the settings relevant to CPU feature.
Hard Disk Boot Priority	Set up the hard disk boot sequence.
Virus Warning	When enabled, anything attempts to access the boot sector and partition table, the BIOS will show a warning message on screen and alarm beep.
CPU L1 & L2 Cache	Allow to enable L1 & L2 cache feature. It can speed up memory access.
CPU L3 Cache	Allow to enable L3 cache feature. It can speed up memory access.
Hyper-Threading Technology	Allow to enable or disable CPU Hyper-Threading Technology future. Note the future is only working for the operation system with multi processors mode supported.
Quick Power On Self Test	Skip some checking items and speed up the power on process.
First/Second/Third Boot Device	The BIOS attempts to load the operating system from the devices in the sequence selected in these items. Choose: HDD-0,

	LS-120, USB FDD…..
Boot Other Device	Set up other device to be bootable.
Swap Floppy Drive	If the system has two floppy drives, choose enable to assign physical drive B to logical drive A and vice-versa.
Boot Up Floppy Seek	Set whether to test floppy drives to determine whether they have 40 or 80 tracks.
Boot Up NumLock Status	Select power on status of NumLock.
Gate A20 Option	Gate A20 is a device used to address memory above 1 MB. Fast (Default): Select chipset controller to control Gate 20. Normal: Select Keyboard controller to control Gate 20.
Typematic Rate Setting	The rate to click the keyboard is defined by keyboard controller. When enabled, you can configure the Typematic Rate and Typematic Delay. The default is Disabled. Typematic Rate: Set the rate keyboard can repeat per second, from 6~30 char/sec. Typematic Delay: Set the delay time before keyboard can repeat, from 250~1000ms.
Security Option	Select whether the password is required for system boot or enter Setup menu. System: the system will not boot and not access Setup menu if the password is wrong. Setup: the system can boot, but not allow to access Setup menu if the password is wrong.
APIC Mode	Select <enable> will expand available IRQ resources for the system.
MPS Version Control For OS	The filed allow you to select MPS (Multi Processor Specification) version to be used for the Operation System. Select 1.1, 1.4. Default is 1.4.
OS Select for DRAM > 64MB	Select OS/2 if your system is using OS/2 and has a memory size of more than 64MB. Default is Non-OS2.

Console Redirection	Choose <enabled> allowing connecting the server of hyper terminal to monitor client side. It has to be worked under DOS mode, and the client terminal doesn't need graphic function.
Baud Rate	The data transfer rate (bit per second) to agent. Choose 9600/19200/38400/57600/115200 item.
Agent Connect via	Select <Null> to let agent connect directly.
Agent wait time (min)	Agent negotiate time, choose 1/2/4/8 min.
Agent after boot	Choose <enabled> for agent to administrate the system after boot.
Report No FDD For WIN95	This field enables the option to run the system without a floppy drive. If you are running a system without FDD and using Win95, select <YES>. Otherwise, select <NO>.
Small Logo (EPA) Show	Allow EPA logo appears during boot up.

3.6 Advanced Chipset Features Setup

⇩ **Use the Advanced Chipset Features Setup option as follows:**

1. Choose "Advanced Chipset Features Setup" from the main menu.   The following screen appears;
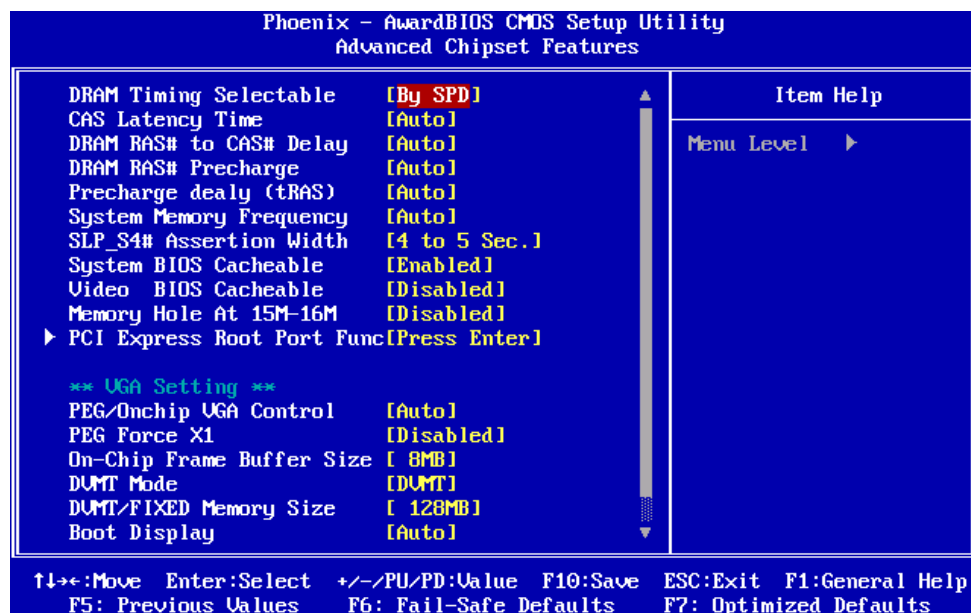
2. Move between items and select values by using the arrow keys. Modify the selected fields using the PnUP/PgDN Keys. For information on the various options, press

<F1> key .

Option	Description
DRAM Timing Selectable	Choose 'SPD' to set the DRAM access timing by EPROM on the DRAM module. Choose 'Manual' to set "CAS latency time", "DRAM RAS# to CAS# delay", and "DRAM RAS# precharge time", "Precharge delay", "System Memory Frequency" by manual.
CAS Latency Time	Allow to determine the timing delay (in clock cycle) that elapses before DRAM carries out a read command after receiving it.
DRAM RAS# to CAS# Delay	Allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. The delay occurs when the DRAM is written to, read from or refreshed.
DRAM RAS# Precharge	Allow you to set the number of cycles required for the RAS to accumulate its charge before the DRAM refreshes.
Precharge Delay	The field specifies the idle cycles before precharging an idle bank.
System Memory Frequency	Select "Auto" to be set by hardware. The other options are 533MHz and 667MHz.
SLP_S4# Assertion Width	When removing and reapplying power to the DRAM, the DRAMs need to see the power supply down for a minimum period of time before it may be treated as a "cold reset" and safely power up.
System BIOS Cacheable	Select Enabled or Disabled. When enabled, caching of the system BIOS at F0000h-FFFFFh, enhancing system performance. However, if any program writes to this memory area, a system error may result.
Video BIOS Cacheable	Select Enabled or Disabled. When Enable this

	option to allow caching of the Video BIOS.
Memory Hole at 15M-16M	Select Enabled or Disabled. You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it can not be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirement.
PCI-Express Root Port Func	Allow to set up the PCI-Express slots enabled or disabled.
PEG/Onchip VGA Control	Allow you to select whether to use the onboard graphics processor or the PCI Express card. When select "Auto", the BIOS will choose the PCI-Express card first. When select "Onchip VGA", the BIOS will boot up using onboard graphic processor. When select "PEG", the BIOS will boot up using PCI-Express card.
PEG Force X1	Allow to select the onboard VGA's frame buffer size that is shared from the system memory.
DVMT Mode	When select "DVMT", the driver of the graphics core uses the system memory like any other OS component or application does. When select "Fixed", a fixed-size fragment of the system memory is allocated to the graphics core. When select "Both", the graphics processor gets a fixed-size chunk of 64MB of memory (preallocated memory included) and up to 64MB of dynamically-allotted memory.
DVMT/Fixed Memory Size	When select "Both", This mode guarantees that at least 64MB of memory is available to the graphics core, with a possibility to increase this amount to 128MB/224MB.
Write protect	When select Enabled, the BIOS can't be written data.

3.7 Integrated Peripherals

⇩ **Use the Integrated Peripherals Setup option as follows:**

User's Manual

1. Choose "Integrated Peripherals Setup" from the main menu.   The following screen appears:
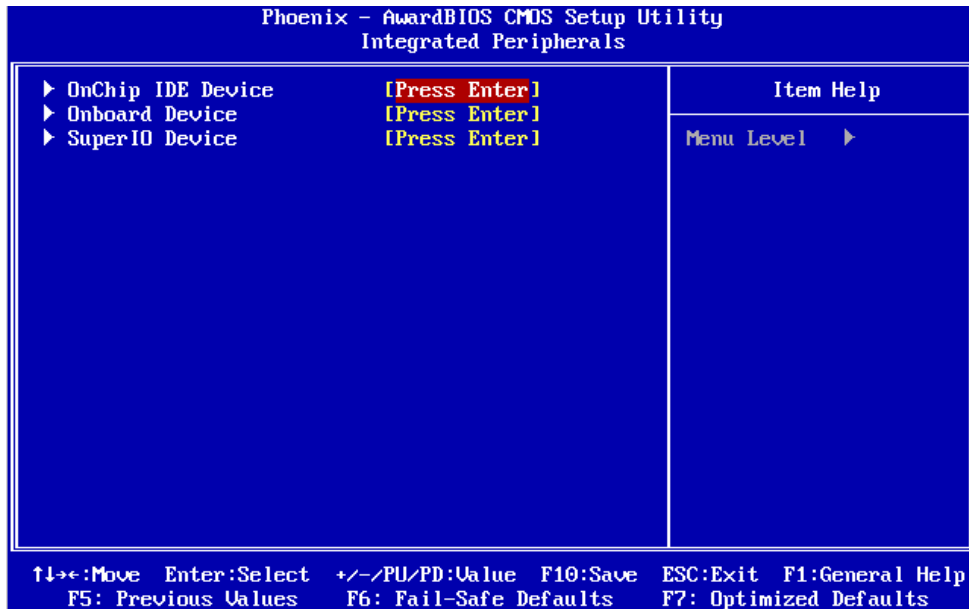
```
               Phoenix - AwardBIOS CMOS Setup Utility
                       Integrated Peripherals
   ┌──────────────────────────────────────────┬──────────────────┐
   │  ▶ OnChip IDE Device       [Press Enter]  │     Item Help    │
   │  ▶ Onboard Device          [Press Enter]  │                  │
   │  ▶ SuperIO Device          [Press Enter]  │  Menu Level   ▶  │
   │                                           │                  │
   │                                           │                  │
   └──────────────────────────────────────────┴──────────────────┘
   ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
      F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults
```

2. Move between items and select values by using the arrow keys.   Modify the selected fields using the PgUP/PgDN keys.   Please press the <F1> key for information on the various options.

Option	Description
Onboard Device	
OnChip IDE Device	Select and set up the SATA, IDE devices
Onboard Device	Select and set up the PCI devices
Super I/O Device	Select and set up the super I/O devices

Super IO Device

Onboard Serial Port 1	3F8/IRQ4、2F8/IRQ3、3E8/IRQ4、2E8/IRQ3、AUTO
Onboard Serial Port 2	3F8/IRQ4、2F8/IRQ3、3E8/IRQ4、2E8/IRQ3、AUTO
Onboard Parallel Port	378/IRQ7, 278/IRQ5, 3BC/IRQ7
Parallel Port Mode	<SPP>, <EPP>, <ECP>, <EPP+ECP>, <Normal>
EPP Mode Select	<EPP1.9>, <EPP1.7>
ECP Mode Use DMA	<1>, <3>

3.8 Power Management Setup

The Power Management Setup controls the board's "green" features. To save energy these features shut down the video display and hard disk drive.

⇩ **Use the Power Management Setup option as follows:**

1. Choose "Power Management Setup" from the main menu. The following screen appears.

```
             Phoenix - AwardBIOS CMOS Setup Utility
                     Power Management Setup

   ACPI Function              [Enabled]              Item Help
   Power Management           [Min Saving]
   Video Off Method           [DPMS]           Menu Level    ▶
   Video Off  In Suspend      [Yes]
   Suspend Type               [Stop Grant]
   MODEM Use IRQ              [3]
   Suspend Mode               Disabled
   HDD Power Down             Disabled
   Wake-Up by PCI card       [Enabled]
   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]

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

2. Move between items and select values by using the arrow keys. Modify the selected field the PgUP/PgDN keys. For information on the various options, press <F1> key.

Option	Description
ACPI Function	Allow to enable or disable ACPI function. ACPI enable the PC system to turn its peripherals on and off to improve power management. It also allows to turn on or off the external devices.
Power Management	This field allows you to select the type (or degree) of power saving by changing the length of idle time that elapses before the "Suspend Mode" and "HDD Power Down" field is activated. Min Saving

	Minimum power saving time for the " Suspend Mode" and "HDD Power Down" =15min. Max Saving Maximum power saving time for the "Suspend Mode" and "HDD Power Down"=1 min. User Define Allows you to set the power saving time in the "Suspend Mode" and "HDD Power Down" field.
Video Off Method	This determines the manner in which the monitor is blanked. V/H SYNC + Blank This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Video Off In Suspend	Determine if the video power down when the system is put into suspend mode.
Suspend Type	Determine if the CPU goes into Idle Mode during power saving mode.
MODEN Use IRQ	Determine the Interrupt Request Line (IRQ) that is used by modem. It allows you to have an incoming call on a modem to automatically resume the system from power-saving mode.
Suspend Mode	When the system enters the Suspend mode, the CPU and onboard peripherals will be shut off.
HDD Power Down	This is selectable only when the power management filed is set to user define. When the system enters the HDD power down mode according to the power saving time selected, the hard disk drive will be powered down while all other devices remain active.
Wake-Up by PCI card	Allow PCI activity to wake up the system from a power-saving mode.
Resume by Alarm	Allow you to set the date, hour, minute, second to turn on your system.
Primary/Secondly IDE 0/1	When the filed is enabled, the system will restart the power-saving timeout counter when the activity is detected on any drives on the primary or secondly IDE channel.
FDD, COM, LPT Port	When the filed is enabled, the system will restart

	the power-saving timeout counter when the activity is detected on floppy disk drive, serial port or printer port.
PCI PIRQ[A-D]#	When the filed is enabled, PCI device set as the Master will power on the system.

3. After you have finished with the Power Management Setup, press the <ESC> key to return to the main menu.

3.9 PNP/PCI Configuration

This option is used to configure Plug and Play assignments and route PCI interrupts to designated ISA interrupts.

⇓ **Use the PNP/PCI Configuration Setup option as follows:**

1. Choose "PNP/PCI Configuration Setup" from the main menu, the following screen appears.

```
            Phoenix - AwardBIOS CMOS Setup Utility
                    PnP/PCI Configurations

   Init Display First        [PCI Slot]            Item Help
   Reset Configuration Data  [Disabled]
                                              Menu Level    ▶
   Resources Controlled By   [Auto(ESCD)]
 × IRQ Resources             Press Enter

   PCI/VGA Palette Snoop     [Disabled]
   INT Pin 1 Assignment      [Auto]
   INT Pin 2 Assignment      [Auto]
   INT Pin 3 Assignment      [Auto]
   INT Pin 4 Assignment      [Auto]
   INT Pin 5 Assignment      [Auto]
   INT Pin 6 Assignment      [Auto]
   INT Pin 7 Assignment      [Auto]
   INT Pin 8 Assignment      [Auto]

   ** PCI Express relative items **
   Maximum Payload Size      [4096]

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

2. Move between items and select values by using the arrow keys. Modify the selected fields using the PgUP/PgDN keys. For information on the various options, please press <F1> key.

Option	Description

Init Display First	Allow to choose the priority of PCI VGA card or onboard. Default is <PCI slot>.
Reset Configuration Data	Enabled The BIOS will reset the Extended System Configuration Data (ESCD) once automatically. It will then recreate a new set of configure data Disabled The BIOS will not reset the configuration data
Resources Controlled By	Resources controlled by the Award plug and play BIOS has the capability to automatically configure all of the boot and plug and play compatible devices. Auto (ESCD): The system will automatically detect the settings for you. Manual: Choose the specific IRQ in the "IRQ Resources" field.
PCI/VGA Palette Snoop	This field determines whether the MPEG ISA/VESA VGA cards a work with PCI/VGA or not Enable MEPG ISA/VESA VGA cards work with PCI/VGA Disabled MPEG ISA/VESA VGA card does not work with PCI/VGA
Maximum Payload Size	Allows you to set the PCI Express Maximum TLP payload size. You can select <128>, <256>, <512>, <1024>, <2048> or <4096>.

3. Please press the <ESC> key to return the main menu after finishing with the PNP/PCI Configuration Setup.

3.10 PC Health Status Configuration Setup

Choose "PC Health Status Configuration Setup" from the main menu, the following screen appears:

```
                Phoenix - AwardBIOS CMOS Setup Utility
                          PC Health Status

   CPU Warning Temperature    [Disabled]              Item Help
   Current System Temp.
   Current CPU1 Temperature                      Menu Level    ▶
   Fan1 Speed
   Fan2 Speed
   Fan3 Speed
   Vcore
   VTT
   3.3V
   + 5 V
   +12 V
   VBAT(V)
   5VSB(V)
   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
```
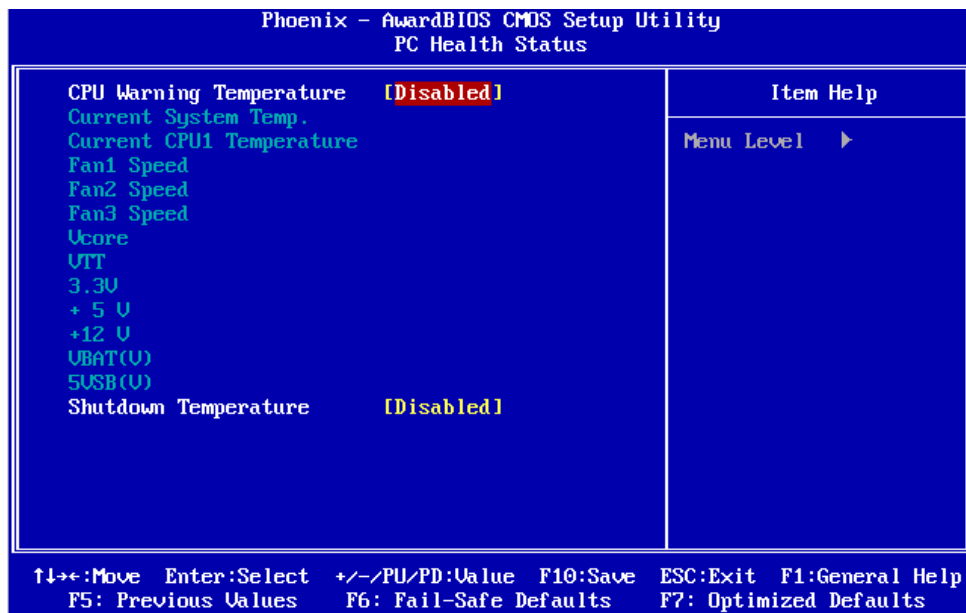
Option	Description
CPU Warning Temperature	An alarm will beep when the CPU temperature is higher than the maximum limit. The default is <Disabled> and alarm will not beep.
Shutdown Temperature	The system will shutdown when the CPU temperature is higher than the maximum limit. The default is <Disabled> .

3.11 Frequency/Voltage Control

The item enabled you to set up the clock speed and system bus for your system.   The clock speed and system bus are determined by the kind of processor you have installed in the system.

```
              Phoenix - AwardBIOS CMOS Setup Utility
                    Frequency/Voltage Control
 ┌───────────────────────────────────────────┬──────────────────────────┐
 │  CPU Clock Ratio          [ 8 X]           │      Item Help           │
 │  Auto Detect PCI Clk      [Enabled]        │                          │
 │  Spread Spectrum          [Disabled]       │  Menu Level    ▶         │
 │                                            │                          │
 │                                            │                          │
 │                                            │                          │
 │                                            │                          │
 │                                            │                          │
 │                                            │                          │
 │                                            │                          │
 │                                            │                          │
 │                                            │                          │
 │                                            │                          │
 └────────────────────────────────────────────┴─────────────────────────┘
  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults
```
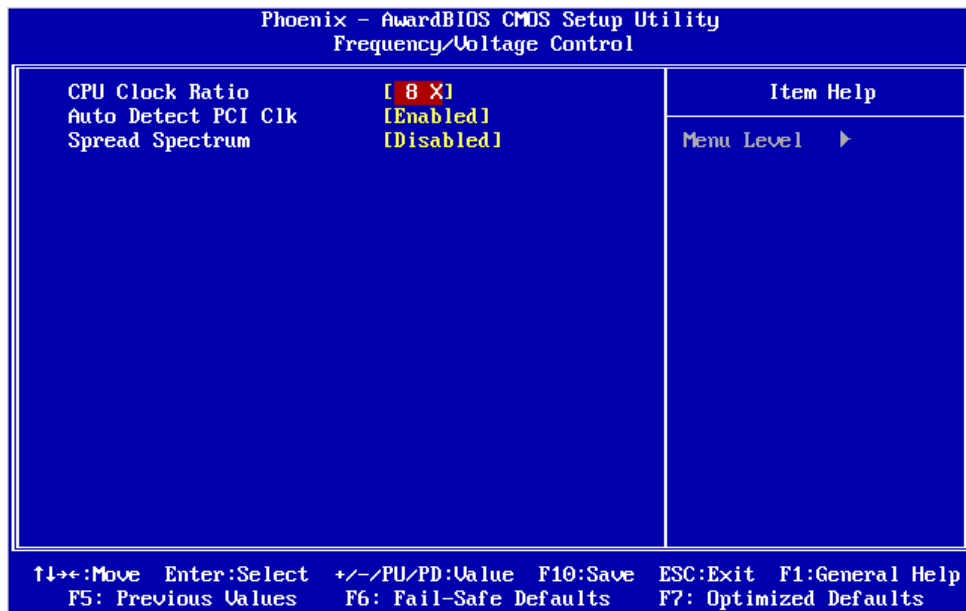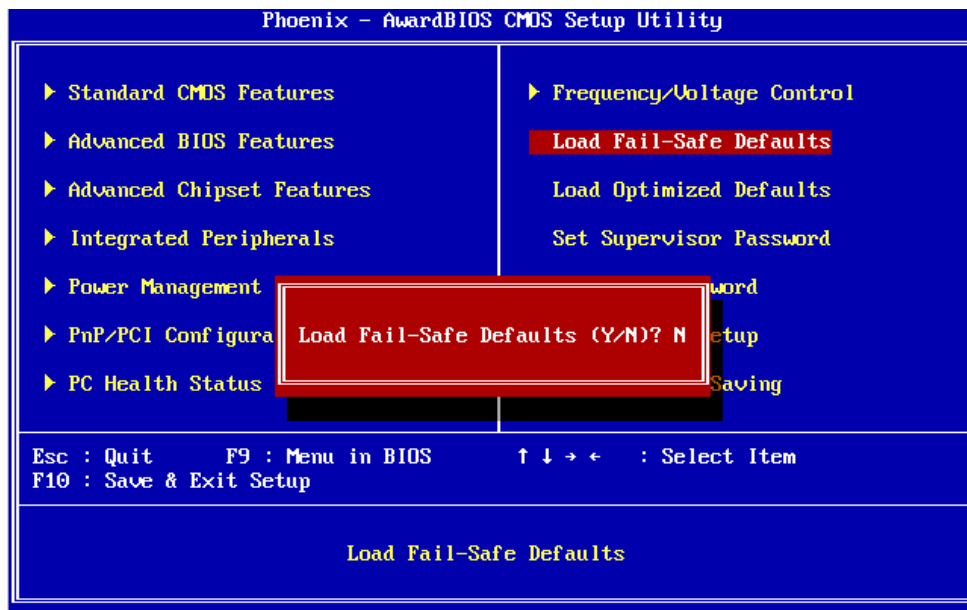
Option	Description
CPU Clock	Allow to adjust the CPU Clock.
Auto Detect PCI Clk	When the field is enabled, BIOS will disable the clock signal of unpopulated DIMM/PCI slots. It can reduce the power consumption.
Spread Spectrum	If you enable the item, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.

3.12 Load Fail-Safe Defaults

This option loads the troubleshooting default values permanently stored in the BIOS ROM. This is useful if you are having problems with the main board and need to debug or troubleshoot the system. The loaded default settings do not affect the Standard CMOS Setup screen.
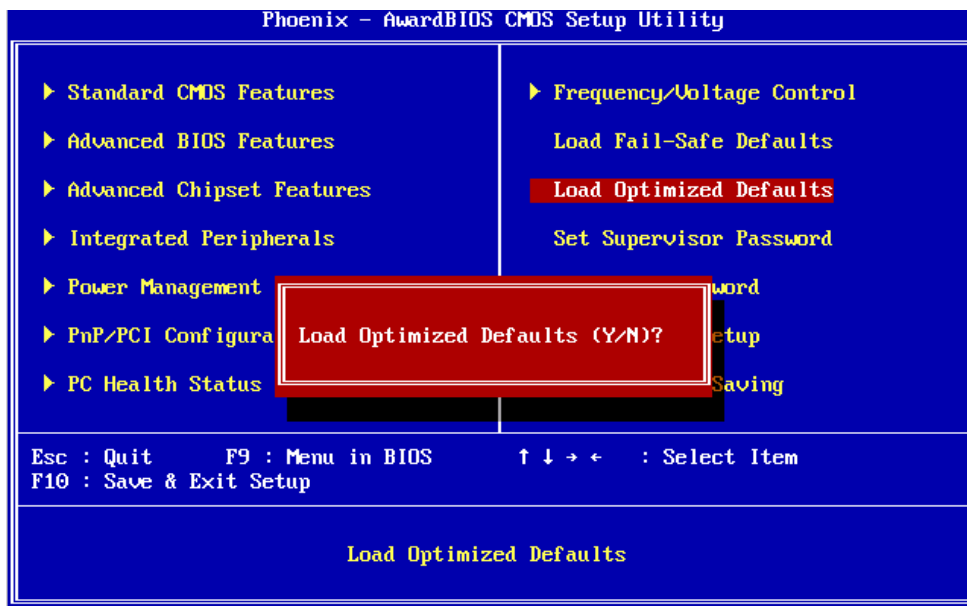
```
            Phoenix - AwardBIOS CMOS Setup Utility

   ▶ Standard CMOS Features        ▶ Frequency/Voltage Control

   ▶ Advanced BIOS Features            Load Fail-Safe Defaults

   ▶ Advanced Chipset Features         Load Optimized Defaults

   ▶ Integrated Peripherals            Set Supervisor Password

   ▶ Power Management           ┌──────────────────────────┐ word
                                │                          │
   ▶ PnP/PCI Configura          │ Load Fail-Safe Defaults (Y/N)? N │ etup
                                │                          │
   ▶ PC Health Status           └──────────────────────────┘ Saving

   Esc : Quit        F9 : Menu in BIOS        ↑↓→←   : Select Item
   F10 : Save & Exit Setup

                      Load Fail-Safe Defaults
```

To use this feature, highlight it on the main screen and press <Enter>.   A line will appear on the screen asking if you want to load the BIOS default values. Pres the <Y> key and then press <Enter> if you want to load the BIOS default.

3.13 Load Optimized Defaults

This option loads optimized settings stored in the BIOS ROM.   The auto-configured settings do not affect the Standard CMOS Setup screen.

```
            Phoenix - AwardBIOS CMOS Setup Utility

   ▶ Standard CMOS Features        ▶ Frequency/Voltage Control

   ▶ Advanced BIOS Features            Load Fail-Safe Defaults

   ▶ Advanced Chipset Features         Load Optimized Defaults

   ▶ Integrated Peripherals            Set Supervisor Password

   ▶ Power Management           ┌──────────────────────────┐ word
                                │                          │
   ▶ PnP/PCI Configura          │ Load Optimized Defaults (Y/N)? │ etup
                                │                          │
   ▶ PC Health Status           └──────────────────────────┘ Saving

   Esc : Quit        F9 : Menu in BIOS        ↑↓→←   : Select Item
   F10 : Save & Exit Setup

                      Load Optimized Defaults
```

To use this feature, highlight it on the main screen and press <Enter>.   A line will appear on the screen asking if you want to load the Optimized Default
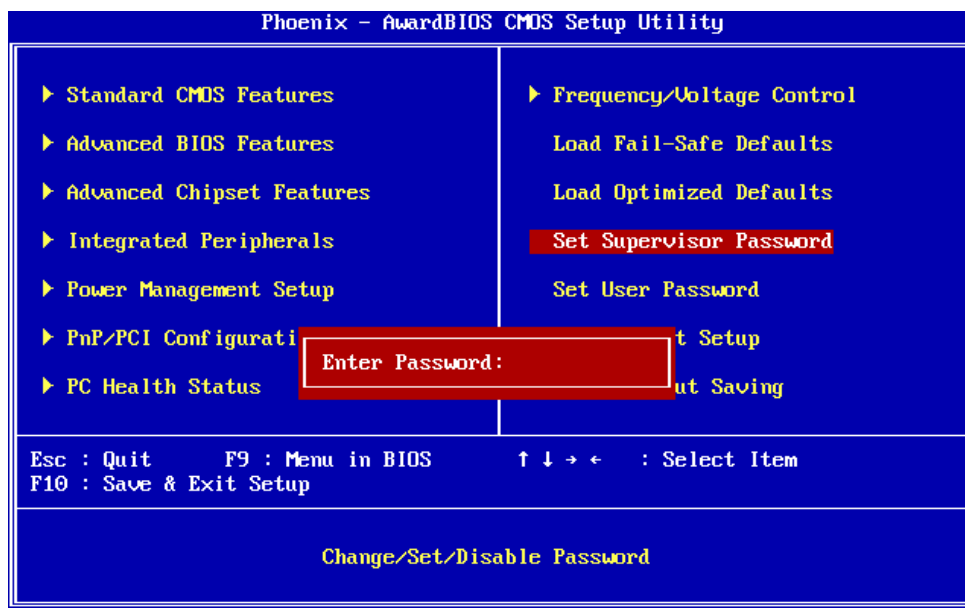
Values.   Press the <Y> key and then press <Enter> if you want to load the SETUP default.

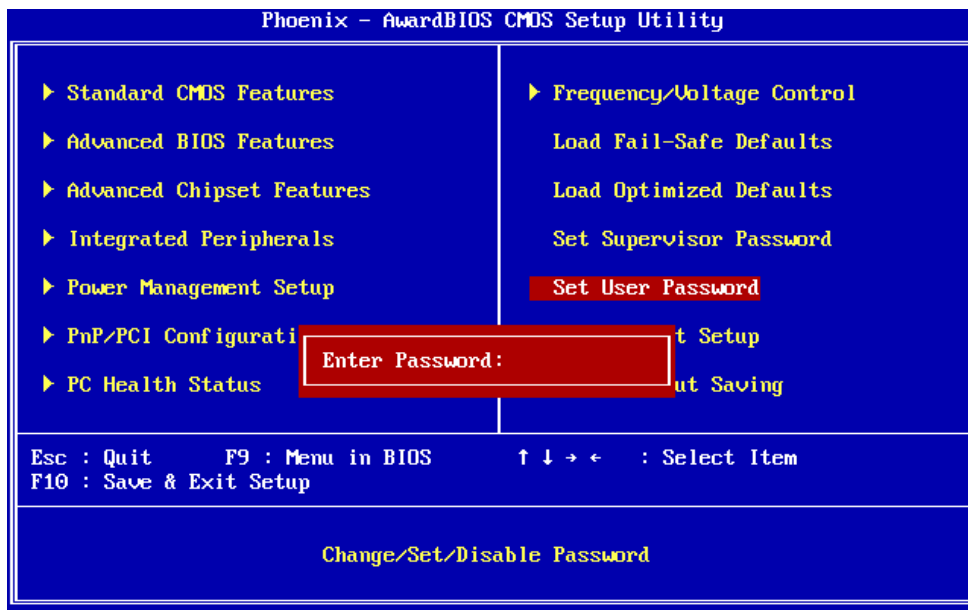## **3.14 Supervisor/User Password**

The password options let you prevent unauthorized system boot-up or unauthorized use of CMOS setup.   The Supervisor Password allows both system and CMOS Setup program access; the User Password allows access to the system and the CMOS Setup Utility main menu.

The password functions are disabled by default.   You can use these options to enable a password function or, if a password function is already enabled, change the password.

To change a password, first choose a password option from the main menu and enter the current password.   Then type your new password at the prompt. The password is case sensitive and you can use up to 8 alphanumeric characters.   Press <Enter> after entering the password.   At the Next Prompt, confirm the new password by typing it and pressing <Enter> again.

```
           Phoenix - AwardBIOS CMOS Setup Utility

    ► Standard CMOS Features          ► Frequency/Voltage Control

    ► Advanced BIOS Features             Load Fail-Safe Defaults

    ► Advanced Chipset Features          Load Optimized Defaults

    ► Integrated Peripherals             Set Supervisor Password

    ► Power Management Setup             Set User Password

    ► PnP/PCI Configurati┌──────────────────────┐t Setup
                         │ Enter Password:      │
    ► PC Health Status   └──────────────────────┘ut Saving

    Esc : Quit        F9 : Menu in BIOS      ↑ ↓ → ←   : Select Item
    F10 : Save & Exit Setup

                     Change/Set/Disable Password
```

After you use this option to enable a password function, use the "Security Option" in "BIOS Feature Setup" to specify whether a password is required every time the system boots or only when an attempt is made to enter the CMOS Setup program.
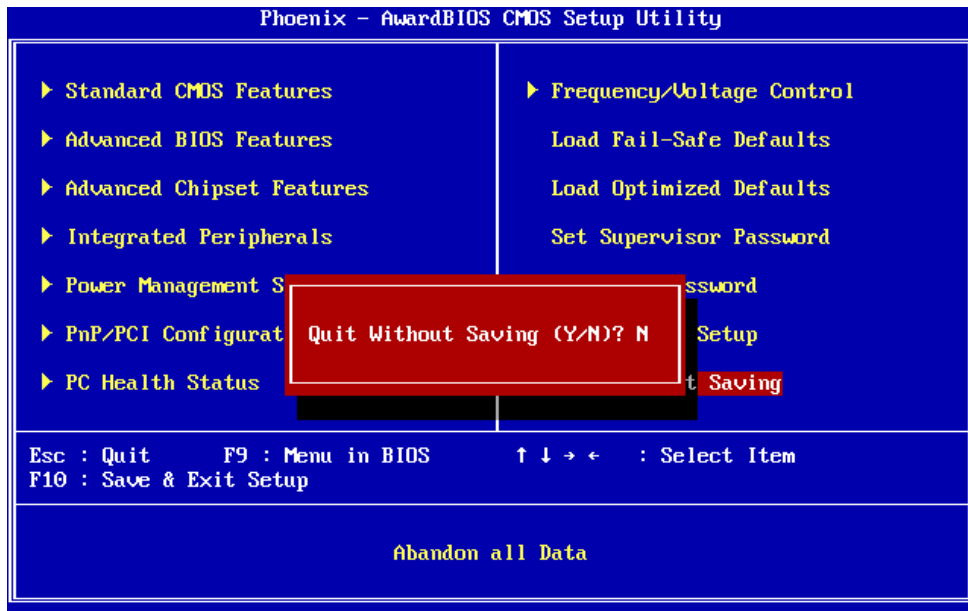
3.15 Save and Exit Setup

This function automatically saves all CMOS values before exiting Setup.
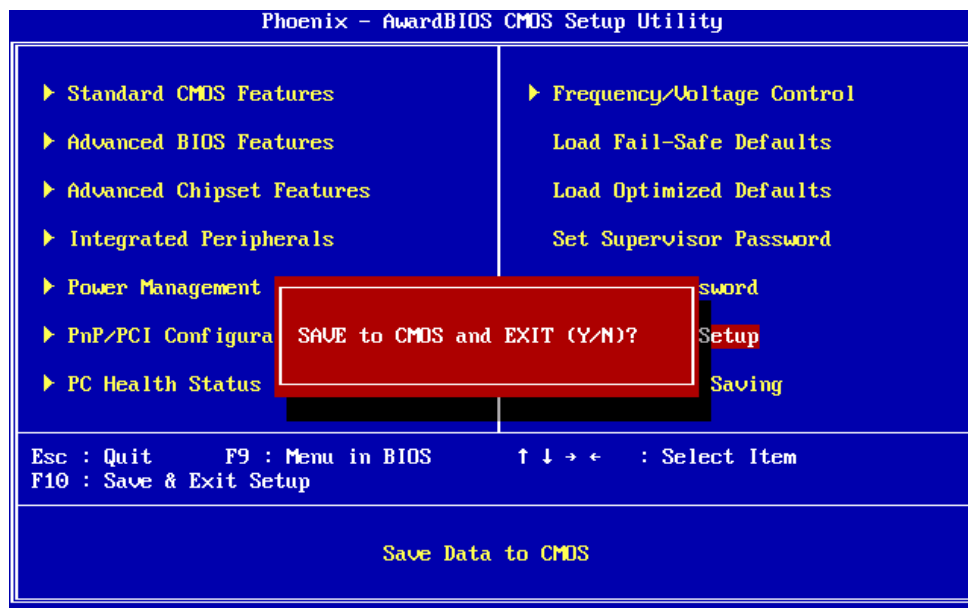
3.16 Exit Without Saving

Use this function to exit Setup without saving the CMOS value.

Chapter 4. Utility & Driver Installation

4.1 Operation System Supporting

CB-7960 can support Windows® and Linux® operation system as follows.   Before installation, please check your OS version.   If your OS is not in the following list, please upgrade your OS version.

OS	Version
Windows®	Windows® 2000 SP4/Windows® XP SP2
Linux®	Fedora Core 2/Linux® 2.6 or above

4.2 System Driver Installation

CB-7960 offers the system driver in the setup CD.   Please install the driver following the procedures.
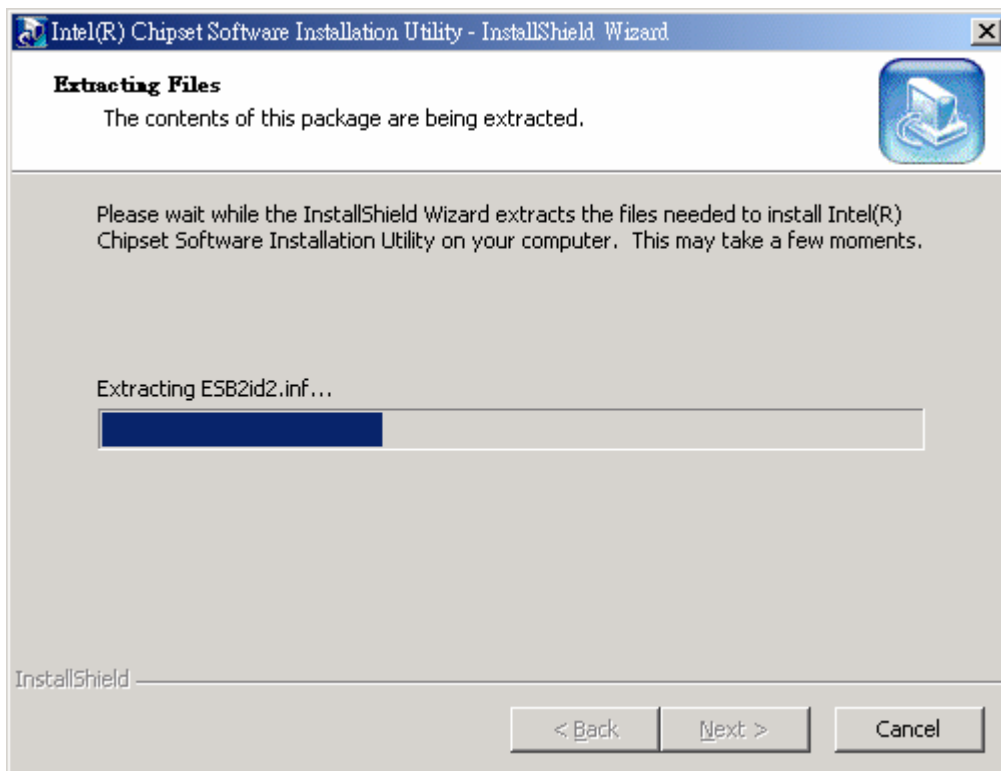
4.3 VGA Driver Installation

CB-7960 offers the VGA driver in the setup CD.   Please click the Autorun file and

install the driver following the procedures.
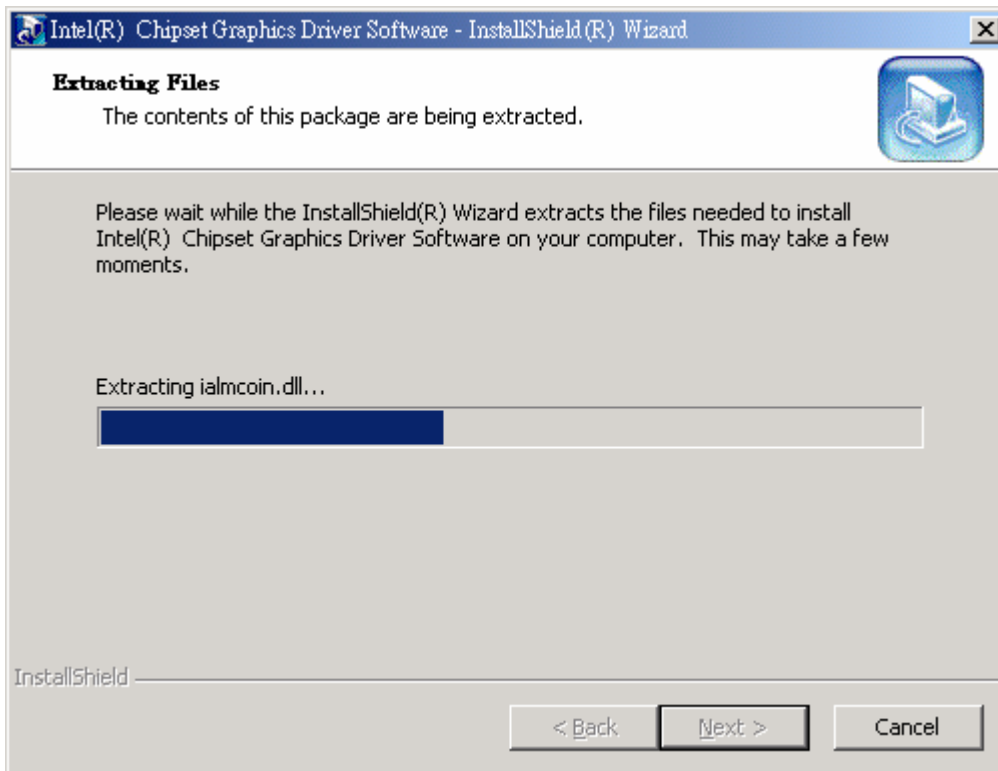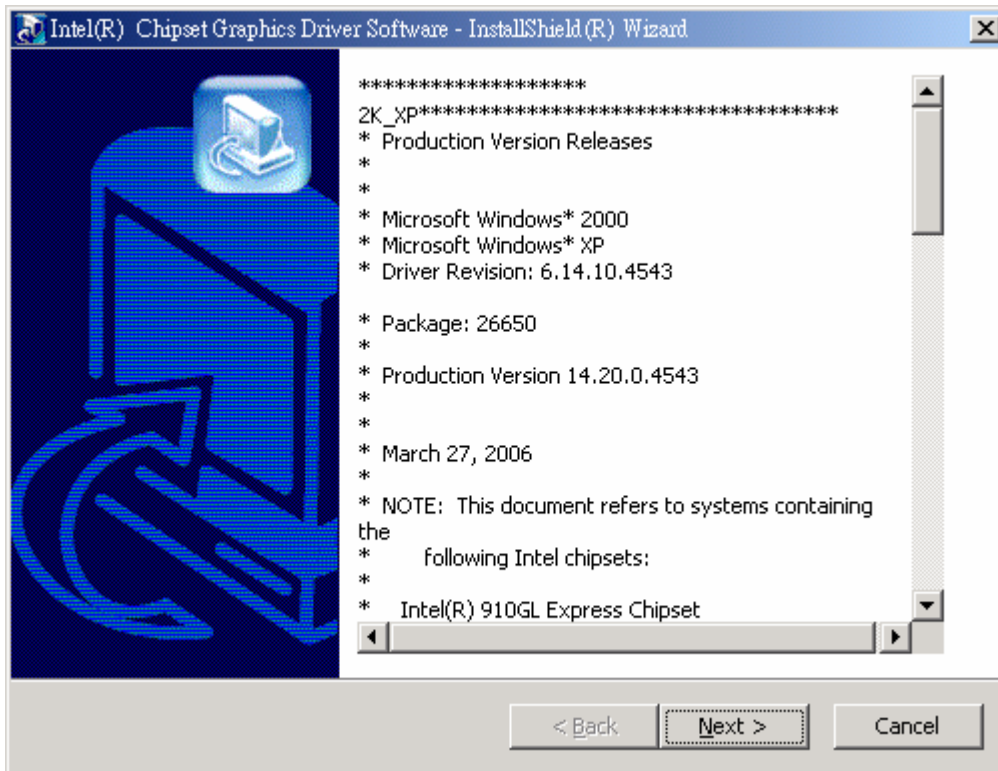
4.4 LAN Driver Installation

CB-7960 offers the LAN driver in the setup CD.   Please click the Autorun file and install the driver following the procedures.
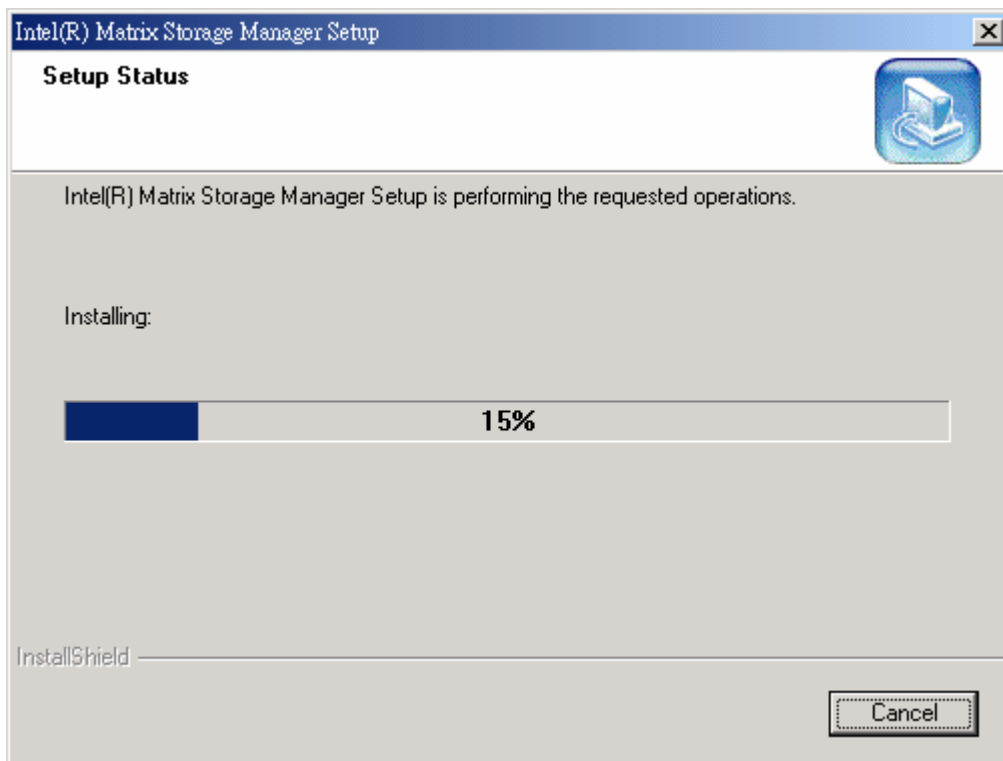
1. Insert the setup CD of CB-7960 into your CD-ROM drive.
2. Choose the Drivers file to click the Autorun icon.
3. Follow the procedures to finish the installation.

4.5 SATA Driver Installation

CB-7960 offers the SATA driver in the setup CD.   Please click the Autorun file and install the driver following the procedures.
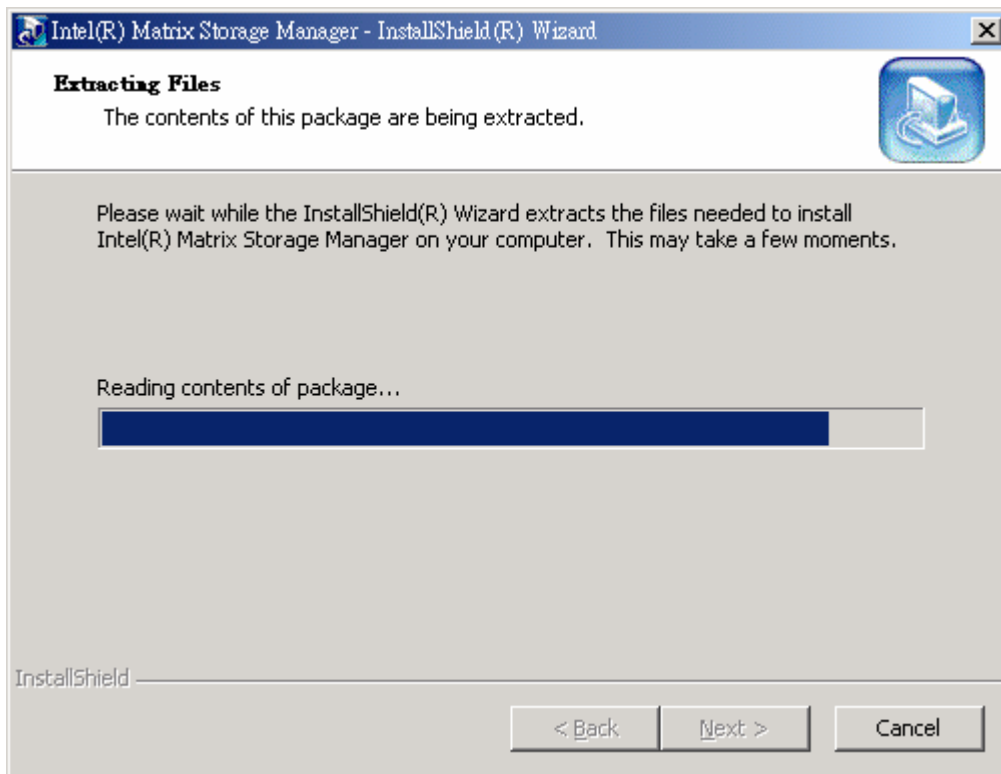
Appendix A: Programming the Watchdog Timer

The CB-7960 provides a watchdog timer that resets the CPU or generates an interrupt if processing comes to a stop. This function ensures greater system reliability in industrial stand-alone and unmanned environments.

In order to enable the watchdog timer, you have to output the value of the watchdog timer interval to the controller. The value range is from 01H to FFH, and the related time watchdog timer interval is 1 sec to 255 sec.

Data	Timer interval
00	0 sec
01	1 sec
02	2 sec
*	*
*	*
FF	255 sec

If you want to disable the watchdog timer, just set the timer interval value to 00H.

After setting the timer interval value, the watchdog timer begins to count down. You have to refresh the watchdog timer, so that the watchdog timer will return to its initial value; otherwise, your system will reset after a time-out. The following program shows how to set the watchdog timer:

ASSEMBLY LANGUAGE   DOS DEBUG

Program 1: Initializing the watchdog controller

```
MOV DX,2EH                          O 2E 87
MOV AL,87H                          O 2E 87
OUT DX,AL
OUT DX,AL
MOV AL,07H                          O 2E 07
OUT DX,AL                           O 2F 08
MOV DX,2FH
MOV AL,08H
OUT DX,AL
```

Program 2: Writing a watchdog timer interval value

```
MOV DX,2EH                                    O 2E F6
MOV AL,F6H                                    O 2F XX
OUT DX,AL                                     O 2E AA
MOV DX,2FH
MOV AL,XXH        ; Timer interval *** see note ***
OUT DX,AL
MOV DX,2EH
MOV AL,AAH
OUT DX,AL
```

Note: This XX value range is from 01H to FFH, and the related watchdog timer interval is 1 sec. to 255 sec. (as in the previous description).

Using the Demo Program

Update the System BIOS as follows:

1. Run Program 1
2. Run Program 2 (load the timer interval of 1EH, 30 seconds)
3. Run your Application Program #1 (**Be sure your Application Program will finish within 30 seconds**)
4. Run Program 1
5. Run Program 2 (change the timer interval value to 3CH, 60 seconds)
6. Run your Application Program#2 (**Be sure your Application Program will be finished within 60 seconds**)
7. Run Program 1
8. Run Program 2 (reload the timer interval value of 3CH, 60 seconds)
9. Run Program 1

Run Program 3 (**Load the timer interval of 00H, and disable the watchdog timer function**)

Appendix B: Optional Riser Card

In order to support extra PCI card, the CB7960 offers one PCI slot riser card R-049A. It needs to insert into PCI edge golden finger of the board and can be extended for two PCI slots.

For testing purpose, the CB-7960 provides a VGA test card MB-06018.　It can be connected to VGA pin header of the board for display use.

AW-R049A	Riser card with two PCI slots
MB-06018	VGA test card

AW-R049A
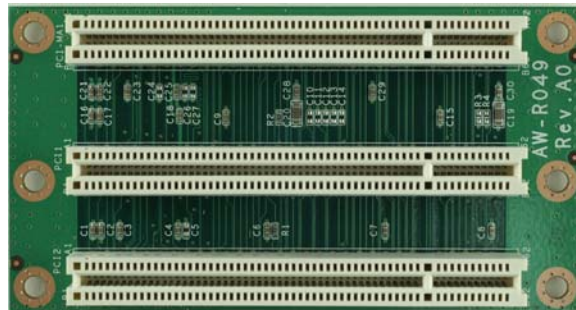
MB-06018

Appendix C: Optional Cables

The CB7960 is equipped with some optional cables for customers' test and verify.

Part No.	Item	Connector	Description
46L-IUSB2B-00	USB CABLE	CN22	W/BRACKET 2mm/ ROHS
46L-ICOM00-00	COM PORT CABLE	CN23	20CM/ ROHS
46L-IPS200-00	KB/MS CABLE	CN4	15CM/ RoHS
46L-ATA660-00	ATA-66 CABLE	CN19	46cm/ RoHS
46L-I00IDE-00	IDE CABLE	CN20	(2mm) 45cm/ RoHS
46L-ILPT01-00	PRINTER CABLE	CN18	(2mm) 26cm/ ROHS
46L-SATA00-00	S-ATA CABLE	CN9, 10	50CM /RoHS