

Full-size CPU Card

SBC-860

SBC-860 Rev. A

Socket 478 based Intel®

Pentium® 4 processor

Full-size CPU Card

With Integrated Intel®

82845GV chipset, DDR,

4 USBs, Dual Ethernet

& CompactFlash.

SBC-860 Rev. A Manual 6th Ed.

Jan. 2004

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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 SBC-860 Full-Size CPU Card
- 1 Quick Installation Guide
- 1 CD-ROM for manual (in PDF format), and drivers
- 1 HDD Cable
- 1 FDD Cable
- 1 Audio and COM Port Cable with bracket
- 1 LPT and COM Port Cable with bracket
- 1 Y-Cable (Keyboard and Mouse)
- 1 USB Cable with bracket

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

Contents

Chapter 1 General Information

1.1 Introduction	1-2
1.2 Features	1-4
1.3 Specifications.....	1-5

Chapter 2 Quick Installation Guide

2.1 Safety Precautions	2-2
2.2 Location of Connectors and Jumpers.....	2-3
2.3 Mechanical Drawing	2-5
2.4 List of Jumpers.....	2-7
2.5List of Connectors.....	2-8
2.6 Setting Jumpers.....	2-10
2.7 Front Panel (JP1).....	2-11
2.8 COM2 RS-232/422/485 Selection - 1 (JP2)	2-11
2.9 COM2 RI / +5V / +12V Selection (JP3)	2-11
2.10 COM2 RS-232/422/485 Selection – 2 (JP4)	2-12
2.11 CPU FSB Setting (JP5).....	2-12
2.12 Clear CMOS (JP6).....	2-12
2.13 Watchdog Timer (JP7).....	2-12
2.14 ATX Power Connector (CN1)	2-13
2.15 System Fan Connector (CN2).....	2-13
2.16 Floppy Drive Connector (CN3)	2-14
2.17 Parallel Port 1 Connector (CN4).....	2-16

2.18 ATX PWM 4P Power Connector (CN5).....	2-16
2.19 Primary IDE Hard Drive Connector (CN6).....	2-17
2.20 Serial Port COM 2 (CN7).....	2-18
2.21 Serial Port COM 1 (CN8).....	2-19
2.22 Secondary IDE Hard Drive Connector (CN9).....	2-19
2.23 Wake on LAN Connector (CN10).....	2-20
2.24 IrDA Connector (CN11)	2-20
2.25 USB 2.0 Port 2 Connector (CN12).....	2-21
2.26 USB 2.0 Port 1 Connector (CN13).....	2-21
2.27 CRT Display Connector (CN14).....	2-22
2.28 Ethernet 10/100/1000BaseT RJ-45 Phone Jack (CN15)	2-23
2.29 Ethernet 10/100 BaseT RJ-45 Phone Jack (CN17)	2-23
2.30 Audio Input/Output Connector (CN18)	2-24
2.31 Mini-DIN PS/2 Connector (CN19).....	2-25
2.32 CPU Fan Connector (CN20)	2-25
2.33 Internal Keyboard Connector (CN21)	2-25
2.34 Internal Mouse Connector (CN22).....	2-26
2.35 Compact Flash Disk Connector (CN23)	2-26
2.36 External 5V SB/PWRGD Connector (CN24)	2-27

Chapter 3 Award BIOS Setup

3.1 System Test and Initialization.	3-2
3.2 Award BIOS Setup.....	3-4
3.2.1 Main Setup	3-7
3.2.2 Advanced Features Setup.....	3-11
3.2.3 Default Setup.....	3-36

3.2.4 Security Setup	3-37
3.2.5 PC Health Setup.....	3-38
3.2.6 Clk/Voltage Setup.....	3-40
3.2.7 Exit Setup.....	3-42

Chapter 4 Driver Installation

4.1 Installation 1	4-3
4.2 Installation 2.....	4-4
4.3 Installation 3.....	4-5

Appendix A Programming the WatchDog Timer

A.1 How to program the watchdog timer	A-2
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Chapter

1

General Information

1.1 Introduction

Introducing AAEON's new SBC-860, powered by Intel Pentium® 4 processor, full size form factor single board computer (SBC) with an onboard CompactFlash Type II and four USB 2.0!

SBC-860 successfully deployed Intel® most advanced 82845GV chipset, which supports high CPU frequency up to 3.06 GHz with front side bus running at 400MHz /533MHz. SBC-860 supports Intel Hyper-Threading Technology gives you the best overall Pentium 4 processor performance available. SBC-860 also provides high memory capacity up to 2 GB DDR DRAM (DDR 200/266).

In addition to its powerful computing engine, the full functional design of the board includes features such as chipset integrated 2D/3D graphics engine with AGP 4x bandwidth, built-in USB2.0 and on board CompactFlash Type II socket. SBC-860 delivers super graphic performance without additional cost on integrated Intel 82845GV chipset, and provides unique Intel®Extreme Graphics architecture to maximize VGA performance capability.

Four USB 2.0 ports provide an expandable, Plug and Play serial interface that ensures a standard low-cost connection for peripheral devices. Industrial applications will benefit from the four USB2.0 by two

pin-headers, offering 480Mbps high-speed efficiency and value without compromising performance.

Moreover, SBC-860 is also equipped with Dual Intel Ethernet controllers. One of these provides superior 1Giga Mbps networking access ability for high speed networking applications such as gateway, VPN, Mini server.

In short, this product is a versatile P4 level compact board with the best cost-performance for CTI, networking, and mini-server markets.

1.2 Features

- Supports Intel® Pentium® 4 mSocket 478 CPU
- Integrated AC-97 2.3 codec PCI 3D Audio
- Supports type II CompactFlash
- 4 USB ports onboard
- High Drive design to enhance the ISA driving capacity
- Supports H/W status monitoring
- Support 1 IrDA
- Onboard 2 IDE connectors (Support 4 devices)
- Supports Ultra DMA 100
- Dual Ethernet (1 Intel® 82562 phy, 1 82551QM/ER or 82540EM)
for option

1.3 Specifications

System

- CPU Supports Intel® 478 pin Pentium® 4 (400/533 MHz FSB).
- Chipset Intel® 82845GV
Intel® 82801DB (ICH4)
- IO Chipset ITE-8712. Fully 16-bit I/O decoded
- BIOS Award 4 Mb Flash BIOS.
- System Memory Onboard Two 184-pin DDR DRAM slot, supports up to 2.0Gbyte DDR 200/266
- Enhanced IDE Interface Supports Four IDE devices. Supports Ultra DMA/100 mode with data transfer rate up to 100MB/sec. Connector: Two (20x2) 2.54mm pin header with box
- FDD Interface Supports up to two floppy disk drives, 5.25" (360KB and 1.2MB) and /or 3.5" (720KB, 1.44MB and 2.88MB) Connector: One (17x2) 2.54 mm pin header with box
- USB Ports 4 USB 2.0 ports
Connector: Two (5x2) 2.00mm pin header
- Serial Ports Two RS-232 serial ports, can be configured as COM1, COM2, or disabled individually and one RS-232/422/485(COM2). COM2 provide the option to select 12V/5V/RING function by

- Parallel port

jumper setting, (16C550 equivalent) Connector: Two (5x2) 2.00mm pin header

One bi-directional parallel port. Supports SPP, ECP, and EPP modes. Connector: One (13x2) 2.00mm pin header
- Keyboard/ PS2 Mouse connector

A 6-pin mini-DIN connector supports PC/AT KBD and PS/2 mouse, Addition 5-pin (wafer) and 4-pin (wafer) supports PC/AT KBD and mouse for IPC applications. Supports WakeOn KBD and Mouse
- Watchdog Timer

Generate a system reset. Software selectable time-out interval
- SSD

CompactFlash slot onboard support type 2 CFD.
- IRDA Port

Support SIR and CIR

Connector: One 6 pin 2.54mm header
- DMA

7 DMA channels (8237 equivalent)
- Interrupt

15 interrupt levels (8259 equivalent)
- Power Management

Supports ATX power supply. ACPI 2.0 compliant.
- H/W status monitoring

Embedded in ITE8712 supports power supply voltages and temperature monitoring.

Audio Interface

- Chipset

ALC655
- Codec

AC-97 2.3 SoundBlaster compatible PCI 3D

Audio

- Interface One (7x2) 2.0mm pin header for Microphone In, Line In/Out, CD-In

Display

- Chipset Intel® 82845GV
- Display Memory Share up to 8MB with Dynamic Video Memory Technology
- Display Type Supports non-interlaced CRT
- Resolution Up to 1600 x 1200 @ 16.7M colors

Ethernet Interface

- Chipset Dual 10/100 Ethernet (1 Intel® 82562 Phy and one Intel®82551QM/ER) or one Intel®82540EM 10/100/1000 Gigabit Ethernet (1 Intel® 82562 Phy and 1 Kenai-32)
- Interface Two RJ45 connector 1x10/100 and 1xGbE. LAN LED support. Support WOL and optional support for AOL

Expansion Interface

- PCIMG
- ISA Bus ITE IT'8888 PCI to ISA bridge
- High Drive Support 64mA high driving capability for ISA-bus slot on backplane

Mechanical and Environment

- Dimension 13.3"(L) x 4.8"(W)
- Weight 1.2lb (0.5kg)
- Operating Temperature 0~60 (32~140)
- Power Supply Voltage +5V, +12V, +3.3V, +5VSB.
ATX/ATX12V Power Supply version 1.2

Chapter

2

Quick Installation Guide

Notice:

The Quick Installation Guide is derived from Chapter 2 of user manual. For other chapters and further installation instructions, please refer to the user manual CD-ROM that came with the product.



2.1 Safety Precautions

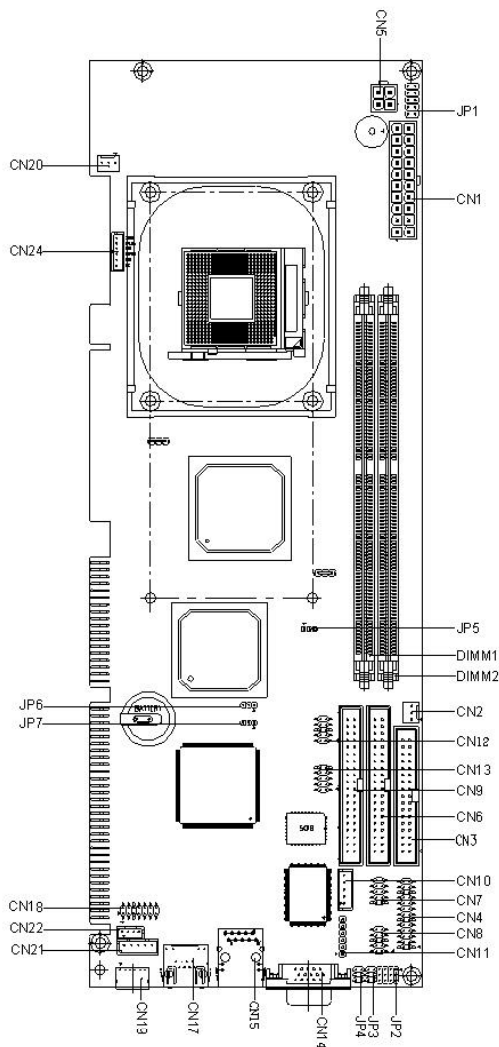
Warning!

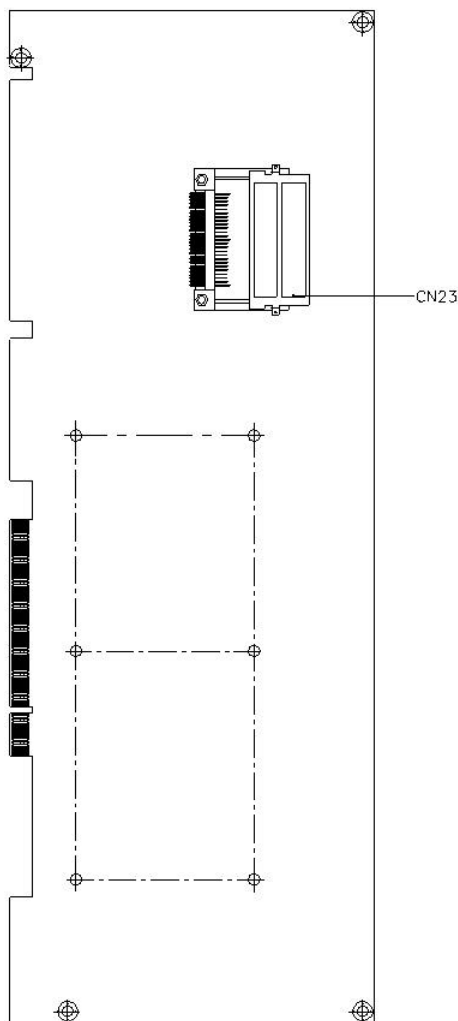
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

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

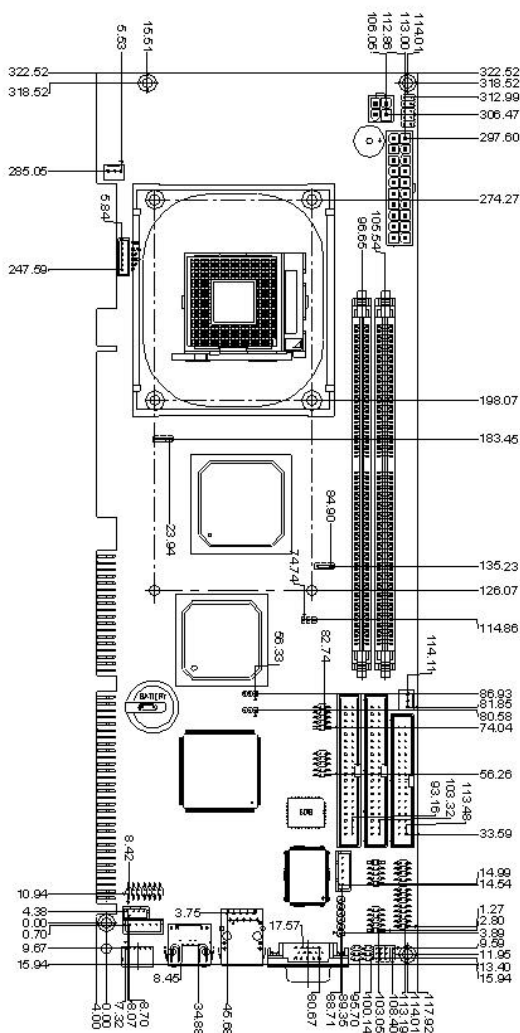
Locating connectors and jumpers (component side)

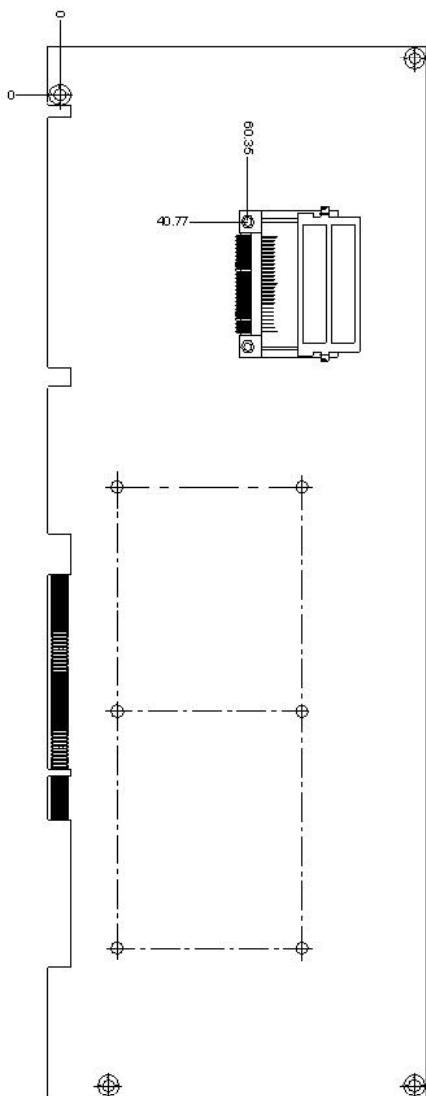


Locating connector (solder side)

2.3 Mechanical Drawing

Mechanical drawing (component side)



Mechanical Drawing (solder side)

2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the jumpers of the board:

Jumpers

Label	Function
JP1	Front Panel
JP2	COM2 RS232/422/485 Mode Selection – 1
JP3	COM2 RI / +5V / +12V Selection
JP4	COM2 RS232/422/485 Mode Selection – 2
JP5	CPU FSB Setting
JP6	Clear CMOS
JP7	Watchdog Timer

2.5 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application.

The table below shows the function of each of the connectors of the board:

Connectors

Label	Function
CN1	ATX Power Connector
CN2	System Fan Connector
CN3	Floppy Drive Connector
CN4	Parallel Port 1 Connector
CN5	ATX_PWM 4P Power Connector
CN6	Primary IDE Hard Drive Connector
CN7	Serial Port COM2 Connector
CN8	Serial Port COM1 Connector
CN9	Secondary IDE Hard Drive Connector
CN10	Wake on LAN Connector
CN11	IrDA Connector
CN12	USB 2.0 Port 2 Connector
CN13	USB 2.0 Port 1 Connector
CN14	CRT Display Connector
CN15	Ethernet 10/100/1000 BaseT RJ-45 Phone Jack
CN17	Ethernet 10/100 BaseT RJ-45 Phone Jack
CN18	Audio Input/Output Connector
CN19	Mini-Din PS/2 Connector
CN20	CPU Fan Connector
CN21	Internal Keyboard Connector
CN22	Internal Mouse Connector

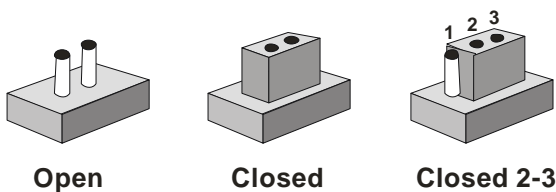
Full-size CPU Card	SBC-860
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CN23	Compact Flash Disk Connector
CN24	External 5VSB/PWRGD Connector

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



A pair of needle-nose pliers may be helpful when working with jumpers.

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

Generally, you simply need a standard cable to make most connections.

2.7 Front Panel (JP1)

Pin	Signal	Pin	Signal
1	GND	2	Power Button
3	HDD LED	4	VCC
5	External Speaker	6	VCC
7	Power LED	8	GND
9	Reset Button	10	GND

2.8 COM2 RS-232/422/485 Selection – 1 (JP2)

JP2	Function
1-2, 4-5, 7-8, 10-11	RS-232 (Default)
2-3, 5-6, 8-9, 11-12	RS-422
2-3, 8-9	RS-485

2.9 COM2 RI / +5V / +12V Selection (JP3)

JP3	Function
5-6	RI (Default)
3-4	+5Volt.
1-2	+12Volt.

2.10 COM2 RS-232/422/485 Selection - 2 (JP4)

JP4	Function
1-2	RS-232 (Default)
3-4	RS-422
5-6	RS-485

2.11 CPU FSB Setting (JP5)

JP5	Function
1-2	CPU Auto Detect (Default)
2-3	400MHz
Open	533MHz

2.12 Clear CMOS (JP6)

JP11	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.13 Watchdog Timer (JP7)

JP7	Function
1-2	Select Hardware Reset for WDT (Default)
Open	Select Keyboard Reset for WDT

2.14 ATX Power Connector (CN1)

Pin	Signal	Pin	Signal
1	3.3 Volt.	11	3.3 Volt.
2	3.3 Volt.	12	-12 Volt.
3	GND	13	GND
4	5 Volt.	14	PS_ON
5	GND	15	GND
6	5 Volt.	16	GND
7	GND	17	GND
8	ATXPWRGD	18	-5 Volt.
9	5 Volt. Stand By	19	5 Volt.
10	12 Volt.	20	5 Volt.

2.15 System Fan Connector (CN2)

Pin	Signal
1	GND
2	+12 Volt.
3	FAN Sense

2.16 Floppy Drive Connector (CN3)

With two options on floppy drive you could simply adopt any of the combinations of 5.25" (360 KB and 1.2 MB) and/or 3.5" (720 KB, 1.44 MB, and 2.88 MB) drives onto the mainboard.

A 34-pin daisy-chain drive connector cable is required for a dual-drive system. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of floppy disk drive connectors. Each set consists of a 34-pin flat-cable connector (usually used for 3.5" drives) and a printed-circuit board connector (usually used for 5.25" drives).

Wire number 1 on the cable is normally red or blue, and the other wires are usually gray.

Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into CN3. Make sure that the red or blue wire corresponds to pin 1 on the connector.
2. Attach the appropriate connector on the other end of the cable to the floppy drive(s). You can use only one connector in the set. The set on the end (after the twist in the cable) connects to the A: drive. The set in the middle connects to the B: drive.
3. If you are connecting a 5.25" floppy drive, line up the slot in the printed circuit board with the blocked-off part of the cable connector.

If you are connecting a 3.5" floppy drive, you may have trouble determining which pin is pin number 1. Look for a number printed on the circuit

board indicating pin number 1. Also, the connector on the floppy drive connector may have a slot. When the slot is up, pin number 1 should be on the right. Check the documentation that came with the drive for more information.

Floppy (CN3)

Pin	Signal	Pin	Signal
1	GND	2	DENSEL#
3	GND	4	N.C
5	GND	6	N.C
7	GND	8	INDEX#
9	GND	10	MTRA#
11	GND	12	DRVB#
13	GND	14	DRVA#
15	GND	16	MTRB#
17	GND	18	DIR#
19	GND	20	STEP#
21	GND	22	WDATA#
23	GND	24	WGATE#
25	GND	26	TRK0#
27	GND	28	WPT#
29	N.C	30	RDATA#
31	GND	32	HDSEL#
33	N.C	34	DSKCHG#

2.17 Parallel Port 1 Connector (CN4)

Pin	Signal	Pin	Signal
1	STBX	2	AFD#
3	PTD0	4	ERR#
5	PTD1	6	PINIT#
7	PTD2	8	SLIN#
9	PTD3	10	GND
11	PTD4	12	GND
13	PTD5	14	GND
15	PTD6	16	GND
17	PTD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	N.C

2.18 ATX PWM 4P Power Connector (CN5)

Pin	Signal
1	GND
2	GND
3	+12 Volt.
4	+12 Volt.

2.19 Primary IDE Hard Drive Connector (CN6)

Pin	Signal	Pin	Signal
1	PRI_IDERST#	2	GND
3	PDD7	4	PDD8
5	PDD6	6	PDD9
7	PDD5	8	PDD10
9	PDD4	10	PDD11
11	PDD3	12	PDD12
13	PDD2	14	PDD13
15	PDD1	16	PDD14
17	PDD0	18	PDD15
19	GND	20	N.C
21	PDREQ	22	GND
23	PDIOW#	24	GND
25	PDIOR#	26	GND
27	PIORDY	28	GND
29	PDDACK#	30	GND
31	IRQ14	32	N.C
33	PDA1	34	P66DET
35	PDA0	36	PDA2
37	PDCS#1	38	PDCS#3
39	IDEACTP#	40	GND

2.20 Serial Port COM2 (CN7)

COM 2 supports RS-232/422/485 mode, which allows you to connect serial devices (mouse, printer, etc.)

COM 2/RS-232 Mode (CN7)

Pin	Signal	Pin	Signal
1	DCDB	2	RXB
3	TXB	4	DTRB
5	GND	6	DSRB
7	RTSB	8	CTSB
9	RIB	10	N.C

COM 2/RS-422 Mode (CN7)

Pin	Signal	Pin	Signal
1	TXD-	2	RXD+
3	TXD+	4	RXD-
5	N.C	6	N.C
7	N.C	8	N.C
9	GND	10	N.C

COM 2/RS-485 Mode (CN7)

Pin	Signal	Pin	Signal
1	TXD-	2	N.C
3	TXD+	4	N.C
5	N.C	6	N.C
7	N.C	8	N.C
9	GND	10	N.C

2.21 Serial Port COM1 (CN8)

Pin	Signal	Pin	Signal
1	DCDA	2	RXA
3	TXA	4	DTRA
5	GND	6	DSRA
7	RTSA	8	CTSA
9	RIA	10	N.C

2.22 Secondary IDE Hard Drive Connector(CN9)

Pin	Signal	Pin	Signal
1	SEC_IDERST#	2	GND
3	SDD7	4	SDD8
5	SDD6	6	SDD9
7	SDD5	8	SDD10
9	SDD4	10	SDD11
11	SDD3	12	SDD12
13	SDD2	14	SDD13
15	SDD1	16	SDD14
17	SDD0	18	SDD15
19	GND	20	N.C
21	SDREQ	22	GND
23	SDIOW#	24	GND
25	SDIOR#	26	GND
27	SIORDY	28	GND
29	SDDACK#	30	GND
31	IRQ15	32	N.C
33	SDA1	34	S66DET
35	SDA0	36	SDA2
37	SDCS#1	38	SDCS#3
39	IDEACTS#	40	GND

2.23 Wake on LAN Connector (CN10)

Pin	Signal
1	5VSB
2	GND
3	RI/PCI_PME#
4	SMBDATA
5	SMBCLK

2.24 IrDA Connector (CN11)

Pin	Signal	Pin	Signal
1	Vcc		
2	CIR_Tx		
3	GND		
4	IR_RX		
5	IR_TX		
6	CIR_RX		

2.25 USB 2.0 Port 2 Connector (CN12)

SBC-860 provides four USB (Universal Serial Bus) interfaces, which give complete plug and play, hot attach/detach for up to 127 external devices. The USB interfaces comply with USB specification Rev. 2.0, and can be disabled in the system BIOS setup.

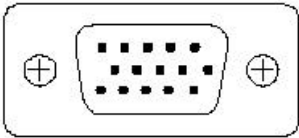
Pin	Signal	Pin	Signal
1	USBVDD2-3	2	USBGND
3	USBD2-	4	USBGND
5	USBD2+	6	USBD3+
7	USBGND	8	USBD3-
9	USBGND	10	USBVDD2-3

2.26 USB 2.0 Port 1 Connector (CN13)

Pin	Signal	Pin	Signal
1	USBVDD0-1	2	USBGND
3	USBD0-	4	USBGND
5	USBD0+	6	USBD1+
7	USBGND	8	USBD1-
9	USBGND	10	USBVDD0-1

2.27 CRT Display Connector (CN14)

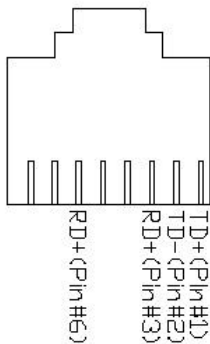
Pin	Signal	Pin	Signal
1	CRT_RED	9	5 Volt.
2	DRT_GREEN	10	VGA GND
3	DRT_BLUE	11	N.C
4	N.C	12	CRT_SDA
5	VGA GND	13	CRT_HSYNC
6	VGA GND	14	CRT_VSYNC
7	VGA GND	15	CRT_VSYNC
8	VGA GND		



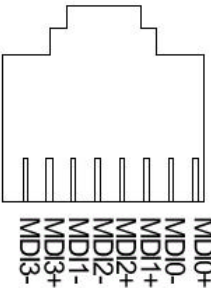
2.28 Ethernet 10/100/1000 BaseT RJ-45 Phone Jack (CN15)

SBC-860 supports dual 10/100 Ethernet (1 Intel 82562 Phy and 1 Lavon) or One 10/100 and one Giga bit Ethernet (1 Intel 82562 Phy and 1 Kenai-32). The high-speed Ethernet connectors provide complete plug and play 10Mb/s, 100 Mb/s and 1000Activity LED of the Giga bit Ethernet are as follows:

Orange: Gigabit Green: 100M No light: 10M

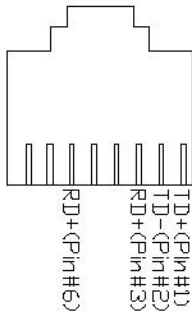


10/100Base-Tx RJ-45 Connector



10/100/1000Base-Tx RJ-45 Connector

2.29 Ethernet 10/100 BaseT RJ-45 Phone Jack (CN17)



CN17 is the RJ-45 connector based on the chipset integrated LAN. The figure at the left side shows the pin out assignments of the connector and its corresponding input jack.

2.30 Audio Input/Output Connector (CN18)

2 Channel Audio Output Mode (Default)

Pin	Signal	Pin	Signal
1	MIC_in	2	MIC_Vcc
3	GND	4	CD_GND
5	LINE_in Left	6	CD_in Left
7	LINE_in Right	8	CD_GND
9	GND	10	CD_in Right
11	LINE_out Left	12	LINE_out Right
13	GND	14	GND

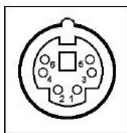
5 Channel Audio Output Mode

Pin	Signal	Pin	Signal
1	Center Out	2	MIC_Vcc
3	GND	4	CD_GND
5	Rear Left Out	6	CD_in L
7	Rear Right Out	8	CD_GND
9	GND	10	CD_in R
11	Front Left Out	12	Front Right Out
13	GND	14	GND

Note: If you would like to transfer the mode from 2 Channel to 5 Channel, you will set up through the driver. The further transferring procedure will be shown in the Chapter 4 Driver Installation. When you set it as 5 Channel mode, Mic_in and Line_in will be disable.

2.31 Mini-DIN PS/2 Connector (CN19)

Pin	Signal	Pin	Signal
1	Mouse Clock	2	Keyboard Clock
3	Vcc	4	GND
5	Keyboard Data	6	Mouse Data



2.32 CPU Fan Connector (CN20)

Pin	Signal
1	GND
2	+12 Volt.
3	FAN Sense

2.33 Internal Keyboard Connector (CN21)

Pin	Signal
1	Keyboard clock
2	Keyboard data
3	N.C
4	GND
5	Vcc

2.34 Internal Mouse Connector (CN22)

Pin	Signal
1	Mouse clock
2	Mouse data
3	GND
4	Vcc

2.35 Compact Flash Disk Connector (CN23)

Pin	Signal	Pin	Signal
1	GND	26	GND
2	SDD3	27	SDD11
3	SDD4	28	SDD12
4	SDD5	29	SDD13
5	SDD6	30	SDD14
6	SDD7	31	SDD15
7	SDCS#1	32	SDCS#3
8	GND	33	GND
9	GND	34	SDIOR#
10	GND	35	SDIOW#
11	GND	36	Vcc
12	GND	37	IRQ15
13	Vcc	38	Vcc
14	GND	39	CSEL
15	GND	40	N.C
16	GND	41	SEC_IDERST#
17	GND	42	SIORDY
18	SDA2	43	N.C
19	SDA1	44	Vcc

Full-size CPU Card		SBC-860	
20	SDA0	45	DASP#
21	SDD0	46	PDIAG#
22	SDD1	47	SDD8
23	SDD2	48	SDD9
24	N.C	49	SDD10
25	GND	50	GND

2.36 External 5V SB/PWRGD Connector (CN24)

Pin	Signal	Pin	Signal
1	N.C		
2	GND		
3	PWRGD		
4	GND		
5	PS_ON		
6	5VSB		

Chapter

3

Award BIOS Setup

3.1 System test and initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence.

When you should encounter fatal errors, please contact your distributor or sales representative.

System configuration verification

These routines check the current system configuration the values stored in the CMOS memory of the board. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

You are starting your system for the first time

You have changed the hardware attached to your system

The CMOS memory has lost power and the configuration information has

been erased.

The SBC-860 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 Award BIOS CMOS setup

Awards BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS memory so that it retains the Setup information when the power is turned off.

Some items in the BIOS are programmed to auto detect your system. The presence or the values of these items vary with the corresponding hardware specification of your system.

A. Entering setup

Power on the computer and press immediately. This will allow you to enter Setup. The top menu offers users various functions to configure the system. The default page after entering the BIOS setup is [Main – Standard CMOS setup].

B. Major Setup Features

Main – Standard CMOS Features

Use this menu for basic system configuration. (Date, time, IDE, etc.)

C. Advanced Features Setup

Use this menu to set the advanced features available on your system.

- **Advanced BIOS Features**

Use this menu to set the advanced features available on your system.

- **Advanced Chipset Features**

Use this menu to change the values of the chipset registers and optimize your system performance.

- **Integrated Peripherals**

Use this menu to specify your settings for integrated peripherals. (USB, Serial port, Parallel port, keyboard, mouse etc.)

- **Power Management Setup**

Use this menu to specify your settings for power management. (HDD power down, power on by events, KB wake up, etc.)

- **PnP/PCI Configurations**

This entry appears if your system supports PnP/PCI.

D. Default – Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While AWARD has designated the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Security – Set/Change Password

Use this menu to set Supervisor/User Passwords.

E. Clk/Voltage Setup

Use this menu to specify your settings for auto detect DIMM/PCI clock and spread spectrum.

F. PC Health Setup

This menu allows you to set the shutdown temperature for your system.

Exit Setup

G. Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

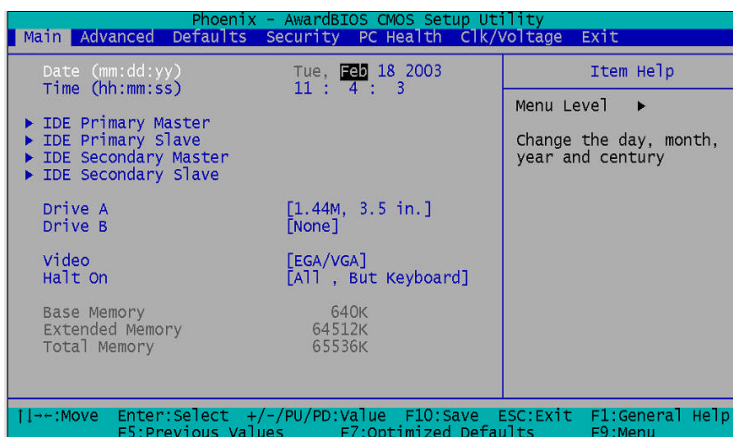
H. Exit Without Saving

Abandon all CMOS value changes and exit setup.

3.2.1 Main Setup

- **Standard CMOS setup**

Select [Main] for STANDARD CMOS SETUP option from the top menu, the screen shown below is displayed. This standard Setup Menu allows users to configure system components such as date, time, hard disk drive, floppy drive and display. Once a field is highlighted, on-line help information is displayed in the right box of the Menu screen.



Date and Time Configuration

The BIOS determines the day of the week from the other date information. This field is for information only.

Press the left or right arrow key to move to the desired field (date, month, year). Press the PgUp/- or PgDn/+ key to change the setting, or type the desired value into the field.

The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00 hours. Press the left or right arrow key to move to the desired field. Press the PgUp/- or PgDn/+ key to change the setting, or type the desired value into the field.

✓ **IDE Primary/Secondary Master/Slave**

IDE HDD Auto-Detection

This section does not show information about other IDE devices, such as a CD-ROM drive, or other hard drive types, such as SCSI drives.

NOTE: We recommend that you select type AUTO for all drives.

The BIOS can automatically detect the specifications and optimal operating mode of almost all IDE hard drives. When you select AUTO for a hard drive, the BIOS will detect its specifications

✓ **IDE Primary/Secondary Master/Slave**

If you do not want to select "AUTO", other methods of selecting the drive type are available:

1.NONE: No drive type to be selected.

2.Manual: This will allow you to manually set the drive type you are using in your system. (See as below)

Drive A**Drive B**

Select the correct specifications for the diskette drive(s) installed in the computer.

■	None	No diskette drive installed
■	360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
■	1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
■	720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
■	1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 mega byte capacity
■	2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 mega byte capacity

✓ **Video**

This function setting allows you to select the video type.

The choices: EGA/VGA, CGA 40, CGA 80, MONO

✓ **Halt On**

During the power-on-self-test (POST), the computer will stop if the BIOS detects a hardware error. You can tell BIOS to ignore certain errors during POST and continue the boot-up process.

The choices: All, But Keyboard; All, But Diskette; All, But Disk/Key; All Errors; No Errors.

✓ **Base Memory**

Typically 640 KB. Also called conventional memory.
The DOS operating system and conventional applications use this area.

✓ **Extended Memory**

Above the 1-MB boundary. Early IBM personal computers could not use memory above 1 MB, but current PCs and their software can use extended memory.

✓ **Total Memory**

The fields show the total installed random access memory (RAM).

3.2.2 Advanced Features Setup

- Advanced BIOS Features

By choosing the [Advanced BIOS Feature] option from the initial setup menu, the screen below is displayed.

Phoenix - AwardBIOS CMOS Setup Utility		
Main	Advanced	Defaults Security PC Health Clk/Voltage Exit
▶ Advanced BIOS Features ▶ Advanced Chipset Features ▶ Integrated Peripherals ▶ Power Management Setup ▶ PnP/PCI Configurations		Item Help Menu Level ▶ Virus Protection, Boot Sequence...
--:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F7:Optimized Defaults F9:Menu		
Phoenix - AwardBIOS CMOS Setup Utility		
Advanced		
Advanced BIOS Features		Item Help
Virus Warning [Disabled] Hyper-Threading Technology [Enabled] Quick Power On Self Test [Enabled] First Boot Device [Floppy] Second Boot Device [HDD] Third Boot Device [CDROM] 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] APIC Mode [Enabled] Silent POST [Enabled]		Menu Level ▶▶ Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
--:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F7:Optimized Defaults F9:Menu		

Virus Warning

When enabling this item, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an anti-virus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

NOTE: Many disk diagnostic programs that access the boot sector table can trigger the virus-warning message. If you plan to run such a program, we recommend that you first disable the virus warning. Before installing Microsoft Windows, please disable this function.

The choices: Enabled, Disabled.

✓ **Hyper Threading Technology**

If your Pentium 4 processor supports this function, you can select Enabled for Windows XP and Linux 2.4x OS optimized for Hyper Threading Technology. Select Disabled for other OS which does not optimize for Hyper Threading Technology. If your processor can't support this function, this item will be hidden.

The choices: Enabled, Disabled

✓ **Quick Power On Self Test**

Select Enabled to reduce the amount of time required to run the power-on-self-test (POST) while system booting.

The choices: Enabled, Disabled.

✓ **First/Second/Third Boot Device**

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

The choices: Floppy, LS120, HDD, SCSI, CDROM, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, ISA-FDD, Disabled.

✓ **Boot Other Device**

If your boot device, such as SCSI/RAID, is not included in the following choices “Floppy, LS120, HDD, SCSI, CDROM, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, ISA-FDD”, you may set First/Second/Third Boot devices to "Disabled" and enable the BOOT Other Device function. The system will automatically boot the other device.

The choices: Enabled, Disabled.

✓ **Swap Floppy Drive**

This field is effective only in systems with two floppy drives. Selecting enabled assigns physical drive B to logical drive A, and vice-versa.

The choices: Enabled, Disabled.

✓ **Boot Up Floppy Seek**

When Enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360-KB floppy drives have 40 tracks; drives with 720 KB, 1.2 MB, and 1.44 MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend you to choose "Disabled" to save time.

The choices: Enabled, Disabled.

✓ **Boot Up NumLock Status**

Toggle between On or Off to control the state of the NumLock key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operations.

The choices: On, Off.

✓ **Gate A20 Option**

Gate A20 refers to the way the system addresses memory above 1 MB (extended memory). When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to fast improves system speed, particularly with OS/2 and Windows.

The choices: Fast, Normal.

✓ **Typematic Rate Setting**

Keystrokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.

The choices: Enabled/Disabled.

✓ **Typematic Rate**

When the typematic rate setting is enabled, you can select a typematic rate, at which character repeats when you hold down a key.

The choices: 6, 8, 10, 12, 15, 20, 24, 30.

✓ **Typematic Delay**

When the typematic rate setting is enabled, you can select a typematic delay, at which before keystrokes begin to repeat.

The choices: 250, 500, 750, 1000 (milliseconds).

✓ **Security Option**

If you have set a password, select whether the password is required every time the System boots, or only when you enter Setup.

The choices: Setup, System.

✓ **APIC Mode**

Advanced programmable interrupt controller, it can be used for either uni-processor or multi-processor.

The choices: Enabled, Disabled

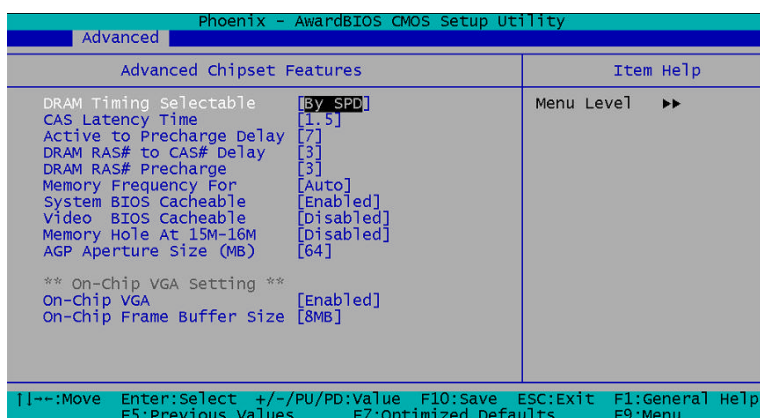
✓ **Silent Post**

This feature allows you to enable the system to show AAEON's logo when power is on.

The choices: Enabled, Disabled

- **Advanced Chipset features setup**

By choosing the [Advanced Chipset Features Setup] option from the INITIAL SETUP SCREEN menu, the screen below is displayed.



- ✓ **DRAM Timing Selectable**

This function stores information about Memory Module setting. Therefore, it can auto detect the best frequency that the memory module should use.

The Choices: By SPD, Manual.

- ✓ **CAS Latency Time**

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value

specified by the system designer. The values of the choice may vary with different RAM types.

The choices: 1.5, 2, 2.5, 3

✓ **Active to Precharge Delay**

This function identifies the minimum active to precharge time

The choices: 5, 6, 7

✓ **DRAM RAS# to CAS# Delay**

This function controls the number of clocks that are inserted between a row activate command and a read or write command to that row.

The choices: 2, 3

✓ **DRAM RAS# Precharge**

This function controls the number of clocks that are inserted between a row precharge command and an active command to the same row.

The choices: 2, 3

✓ **Memory Frequency For**

This item allows you to select the memory frequency.

The choices: Auto, DDR200, DDR266.

✓ **System BIOS Cacheable**

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance.

The choices: Enabled, Disabled.

✓ **Video BIOS Cacheable**

Selecting Enabled allows caching of the video BIOS ROM at C0000-C8000, resulting in better video performance.

The choices: Enabled, Disabled.

✓ **Memory Hole At 15M-16M**

Enable this function to allow ISA ROM to map to 15-16M and support Legacy ISA devices. If you don't utilize legacy ISA devices in your system, you are recommended to disable this function to enhance graphic performance.

The choices: Enabled, Disabled.

✓ **AGP Aperture Size (MB)**

Aperture size will ensure that all writes posted in the global write buffer to the graphics aperture are retired to DRAM before initiating any CPU-PCI cycle. This can be used to ensure synchronization between the CPU and AGP master.

The choices: 4, 8, 16, 32, 64, 128, 256.

✓ **On Chip VGA Setting**

*** On-Chip VGA**

This allows users to select to Enable or Disable the onboard VGA function.

The choices: Enabled, Disabled

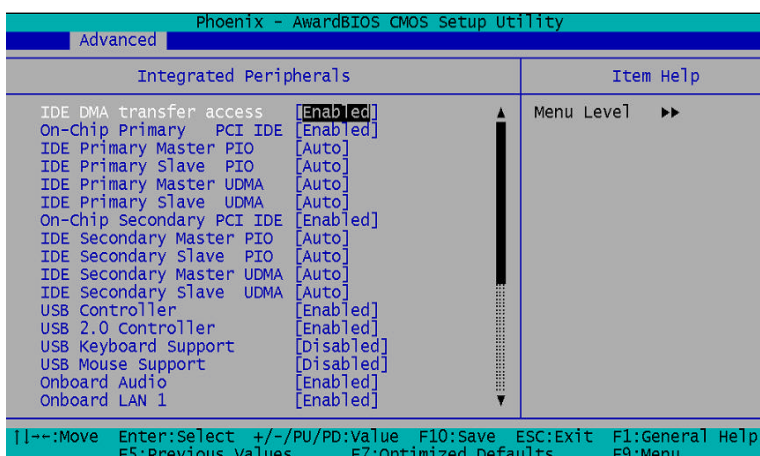
*** On-Chip Frame Buffer Size**

This function is used to select the amount of main memory that is pre-allocated to support the internal graphics device.

The choices: 1MB, 8MB

- **Integrated Peripherals**

By choosing the [Integrated Peripherals] option from the INITIAL SETUP SCREEN menu, the screen below is displayed.



- ✓ **IDE DMA transfer access**

This function to enable/disable IDE DMA transfer in DOS mode.

The choices: Enabled, Disabled

- ✓ **On-Chip Primary/Secondary PCI IDE**

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.

The choices: Disabled, Enabled.

- ✓ **IDE Primary or Secondary Master/Slave PIO**

The four IDE PIO (Programmable Input/Output) fields let you set a PIO mode (0-1) for each of the two IDE devices and the two storage devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically chooses the best mode for each device.

The choices: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

✓ **IDE Primary or Secondary Master/Slave UDMA**

Ultra DMA100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If both your hard drive and IDE cable support Ultra DMA 100 select Auto to enable BIOS support.

The choices: Auto, Disabled.

✓ **USB/ USB 2.0 Controller**

USB controller: This function is used to enable/disable onboard USB controller

USB 2.0 controller: This function is used to enable/disable high speed USB 2.0 device

The choices: Disabled, Enabled.

✓ **USB Keyboard/Mouse Support**

Select Enabled when you use a Universal Serial Bus (USB) keyboard/Mouse under DOS mode.

The choices: Disabled, Enabled.

✓ **Onboard Audio/LAN 1/LAN 2**

The default setting for this item is "Enabled". If you don't utilize onboard LAN / Audio function, just configure it as "Disabled" without any efforts on jumper setting.

The choices: Disabled, Enabled.

✓ **Init Display First**

You can select Onboard/AGP or PCI slot to initialize it as the primary display before initializing any other display device on the system.

The choices: Onboard/AGP, PCI Slot,

✓ **IDE HDD Block Mode**

Block mode is also called "block transfer", "multiple commands", or "multiple sector read/write". If your IDE hard drive supports block mode (most new drives do), please select "Enabled" for automatic detection of the optimal number of block read/writes per sector the drive can support.

The choices: Disabled, Enabled.

✓ **Power on Function**

Despite the power on switch, all the devices listed below could be defined as power on methods.

The choices: Any key, Button only, Keyboard 98, Password, Hot key, Mouse move, Mouse click.

✓ **KB Power On Password**

If you select **Password** in the above power on function, you have to press Enter here to set the password so that you can power on the system by typing the password.

✓ **Hot key power on**

If you select **Hot key** as the power on method, you have to define the Hot key in this section.

The choices: Ctrl-F1, Ctrl-F2, ..., Ctrl-F12.

Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.

The choices: Disabled, Enabled.

✓ **Onboard Serial Port 1/2**

Normally, the boards' I/O chips will occupy a certain portion of memory space. For each I/O device the

computer provides an I/O address. The more devices attached the more address needed to organize the memory storage areas. If all the I/O devices were running through the same address, your devices would come to a near halt. Also the corresponding interrupt needs to be selected.

The choices: Disabled, Auto, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, 3F8/IRQ4.

✓ **UART Mode Select**

If you don't disable Onboard Serial Port 2, you will have to select an operating mode for the second serial port:

Normal: RS-232C serial port

IrDA: IrDA-compliant serial infrared port

ASKIR: Amplitude shift keyed infrared port

SCR: Smart Card Reader

The choices: Normal, IrDA, ASKIR, SCR.

✓ **UR2 Duplex Mode**

Select the value required by the IR device connected to the IR port. Full-duplex mode permits simultaneous two-direction transmission. Half-duplex mode permits transmission in one direction only at a time.

The choices: Half, Full.

✓ **Onboard Parallel Port**

Select a logical LPT port address and corresponding interrupt for the physical parallel port.

The choices: Disabled, 378/IRQ7, 278/IRQ5, 3BC/IRQ7.

✓ **Parallel Port Mode**

Two bi-directional parallel ports. Supports ECP, EPP, ECP+EPP, SPP.

The choices: SPP, EPP, ECP, ECP+EPP.

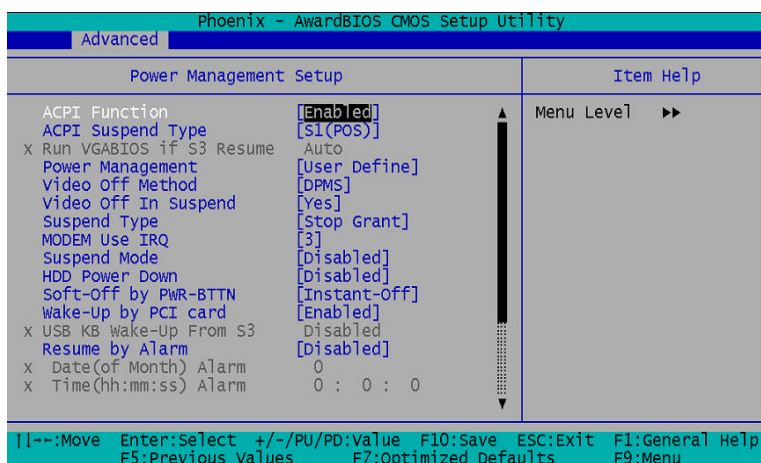
✓ **ECP Mode Use DMA**

Select a DMA channel for the port.

The choices: 1, 3.

- **Power Management Setup**

By choosing the [Power Management Setup] option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the SBC-860's default values for the SBC-860.



- ✓ **ACPI Function**

This item allows you to enable/disable the Advanced Configuration and Power Interface (ACPI).

The choices: Enable, Disable

- ✓ **ACPI Suspend Type**

This configuration responds the suspend mode to operating system.

*** S1 (POS): Power on Suspend**

*** S3 (STR): Suspend to RAM**

The choices: S1 (POS), S3 (STR), S1&S3

✓ **Run VGA BIOS if S3 Resume**

This feature assigns the OS to enable/disable/auto running VGABIOS after resume from S3 mode.

The choices: Yes, No, Auto

✓ **Power Management**

Select Max Saving mode or Min Saving mode or define desired Doze Mode, Standby Mode, Suspend Mode, HDD Power Down functions by User Define.

This category allows you to select the type (or degree) of power

saving and is directly related to the following modes:

1. User Define
2. Min Saving
3. Max Saving

Disable (Default)	No power management. Disable all four modes.
Min. Power Saving	Minimum power management. Suspend mode = 1 hour

	HDD Power Down =15 minutes.
Max.Power Saving	Maximum power management-- ONLY AVAILABLE FOR SL CPU'S. Suspend mode = 1-2 min HDD Power Down = 1
User Defined	Allow you to set each mode individually. When not disabled, each of the tinges is from 1 min. to 1 hour except for HDD Power Down, which ranges from 1 min. to 15 min. and disable.

✓ **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.

DPMS: Display power management system.

Blank Screen: This option only writes blanks to the video buffer.

✓ **Video Off In Suspend**

After the selected period of system inactivity, the chipset enters hardware suspend mode, stopping the CPU clock

and possibly causing other system devices to enter power management modes.

In this case the video hardware can be selected to shut off after a period of system inactivity. This determines the manner in which the monitor is blanked.

The choices: Yes, No

✓ **Suspend Type**

This item lets you select two types of suspend.

Stop Grant: Halts CPU's instruction stream (stop clock) at ACPI C2 state.

PwrOn Suspend: CPU sleeps at ACPI S1 state.

The choices: Stop Grant, PwrOn Suspend

✓ **Modem Use IRQ**

Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

The choices: NA, 3, 4, 5, 7, 9, 10, 11.

✓ **Suspend Mode**

Disable this function or select 1 min, 2 min, 4 min, 8 min, 12 min, 20min, 30 min, 40 min, 1 hour.

Please refer to power management section for more information.

✓ **HDD Power Down**

Disable this function or select from 1 to 15 minutes.

Please refer to power management section for more information.

✓ **Soft-Off by PWR-BTTN**

If you select "Instant -Off", pushing the on/off button will instantly shut down the system. If you select " Delay 4 sec", you have to push the on/off button lasting for 4 seconds to shut down the system. In this mode, one touch on the on/off button won't shut down the system but place it in a very low-power-usage state, with only enough circuitry receiving power to detect power button activity or Resume by Ring activity.

The choices: Instant-Off, Delay 4 Sec.

✓ **Wake-Up by PCI Card**

The Choices: Enabled, Disabled

✓ **USB KB Wake-Up From S3**

The choices: Enabled, Disabled

✓ **Resume by Alarm**

Enable this item to set up power up timer.

The Choices: Enabled, Disabled

✓ **Date (of Month) Alarm**

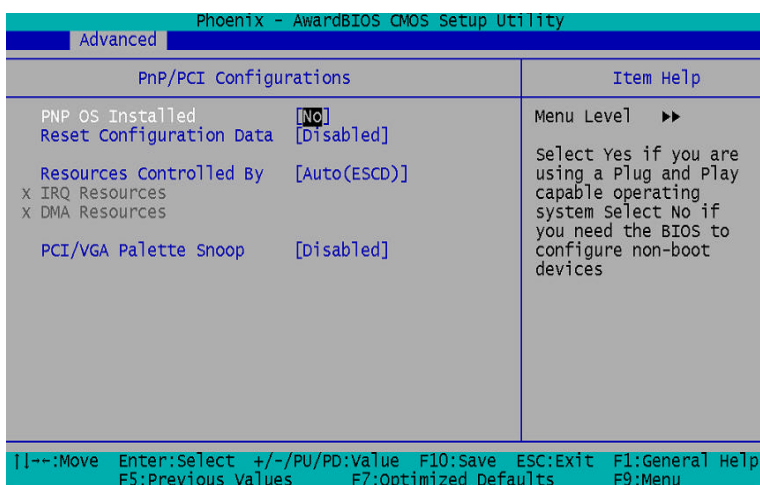
- ✓ **Time (hh:mm:ss) Alarm**
- ✓ **Reload Global Timer Events**

When this item is enabled, an event occurring on each listed device resets the global timer to prevent the system from entering Suspend mode. These devices include:

Primary/Secondary IDE 1/0, FDD/COM/LPT Port, and PCI PIRQ[A-D]#.

- **PnP/PCI Configuration**

By choosing the PnP/PCI Configuration option from the INITIAL SETUP SCREEN menu, the screen below is displayed.



✓ **PNP OS Installed**

Select Yes if the system operating environment is Plug and Play aware, for example Windows 9x, Windows 2000, and Windows XP. Hardware resource will be distributed by OS.

Select No if you need the BIOS to configure non-boot devices.

The choices: No, Yes.

✓ **Reset Configuration Data**

Normally, you leave this field disabled. Select enabled to reset Extended System Configuration Data (ESCD) when serious conflict is caused by add-on device or system reconfiguration.

The choices: Enabled, Disabled

✓ **Resources Controlled By**

The Award Plug and Play BIOS has the capacity to automatically configure all the boot and Plug and Play devices. If you choose Auto, you cannot select IRQ DMA and memory base address fields, since BIOS automatically assigns them.

The choices: Auto (ESCD), Manual.

✓ **IRQ Resources**

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt. There are two types for choice: Legacy ISA and PCI/ISA PnP.

Legacy ISA: Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1)

PCI/ISA PnP: Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus

architecture.

✓ **DMA Resources**

When resources are controlled manually, assign each DMA channel a type, depending on the type of device using the DMA channel. There are two types for choice: Legacy ISA and PCI/ISA PnP.

Legacy ISA: Devices compliant with the original PC AT bus specification, requiring a specific DMA channel

PCI/ISA PnP: Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

✓ **PCI/VGA Palette Snoop**

Enabling this item informs the PCI VGA card to keep silent (and to prevent conflict) when palette register is updated (i.e., accepts data without responding any communication signals). This is useful only when two display cards use the same palette address and plugged in the PCI bus at the same time (such as MPEG or Video capture card). In such case, PCI VGA is silent while MPEG/Video capture card is set to function normally.

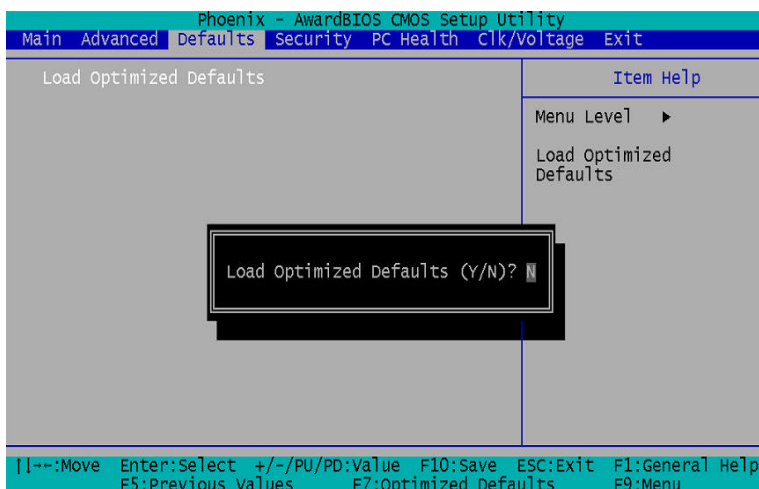
The Choices: Enabled, Disabled

3.2.3 Default Setup

- **Load Optimized Defaults**

Select [Defaults] to Load Optimized Defaults setting from the top menu, the screen shown below is displayed.

Pressing “Y” loads the default values that are factory settings for optimal performance system operations.

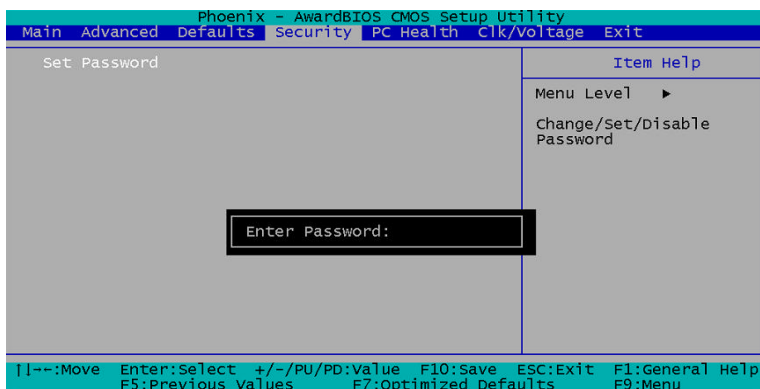


When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N)?

Pressing "Y" loads the default values that are factory settings for optimal performance system operations.

3.2.4 Security Setup



- **Set/Change password**

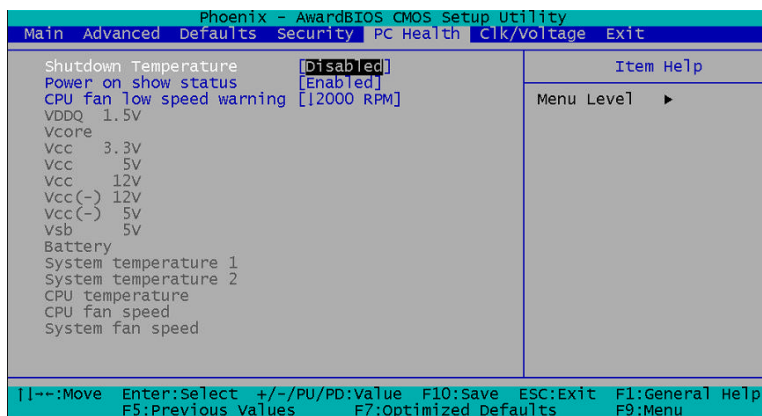
You can set the password to restrict unauthorized access to enter or change the options of the setup menus.

To abort the process at any time, press Esc.

NOTE: To clear the password, simply press Enter when asked to enter a password. Then the password function is disabled.

3.2.5 PC Health Setup

By choosing the [PC Health] option from the top menu, the screen below is displayed.



- **Shutdown Temperature**

You can set the shutdown temperature. When the temperature of your system reaches the limitation, the system will shut down automatically to prevent damage caused by overheat.

The choices: Disabled, 60 /140 , 65 /149 , 70 /158

.

- **Power on show status**

Enable this function to show hardware monitor listing after powering on the system.

The choices: Enabled, Disabled

- **CPU fan low speed warning**

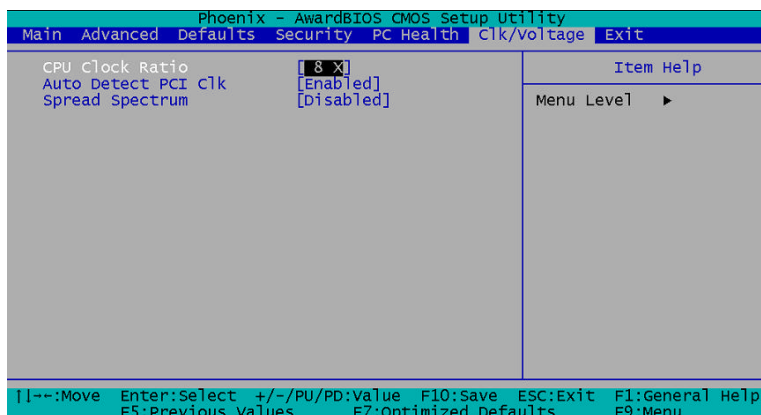
Select the speed figure limits for the CPU speed. When CPU

speed drop down to the limitation, the system would send out the warning signal.

The choices: 2000RPM, 3000RPM, 4000RPM, Disabled.

3.2.6 Clk/Voltage Setup

By choosing the [Clk/Voltage] option from the top menu, the screen below is displayed.



- **CPU Clock Ratio**

You may set the CPU Clock Ratio for your selection. However, if the CPU you adopts reserves no flexibility for clock ratio modification, this item will be hidden or can't work.

The choices: 8X, 9X, ..., 50X.

- **Auto Detect DIMM/PCI CLK**

This item allows you to enable/disable auto detect DIMM/PCI clock.

The choices: Enabled, Disabled.

- **Spread Spectrum**

When the system clock generator pulses, the extreme values of

the pulse generate excess EMI. Enabling pulse spectrum spread modulation changes the extreme pulse spikes to flat curves thus reducing EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

The choices: 0.25%, 0.50%, Disabled

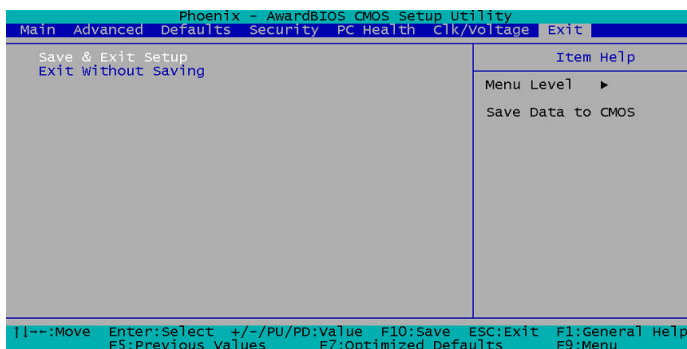
3.2.7 Exit Setup

- **Save & Exit Setup**

If you select this option and press <Enter> from the top menu, the values entered in the setup utilities will be recorded in the chipset's CMOS memory. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

- **Exit without saving**

Selecting this option and pressing <Enter> lets you exit the Setup program without recording any new values or changing old ones.



Chapter

4

Driver Installation

The SBC-860 comes with a CD-ROM which contains most of drivers and utilities of your needs.

There are several installation ways depends on the driver package under different Operating System application.

If you utilize Windows NT series OS, you are strongly recommended to download the latest version Windows NT Service Pack from Microsoft website and install it before installing any driver.

Please follow the sequence below to install the drivers:

Step 1 – Install Intel INF Update for Windows 95-XP

Step 2 – Install Intel 845G Graphic Driver

Step 3 – Install Intel LAN Driver

Step 4 – Install Realtek 2CH AC97 codec Driver

For installation procedures of each driver, you may refer to section 4.1-4.3.

4.1 Installation 1:

Applicable for Windows 2000/98/ME/NT 4.0

1. Insert the SBC-860 CD-ROM into the CD-ROM Drive.
2. From the CD-ROM, select the desired component Driver folder, select the desired Operation System folder to double click on the Setup.exe icon. A driver installation screen will appear.
(Notice: take VGA driver installation under Windows 98 for example, choose the corresponding folder depending on your OS)
3. A driver installation screen will appear, please follow the onscreen instructions to install the driver in sequence and click on the Next button.
(Notice: In some cases the system will ask you to insert Windows 98 CD Diskette and key in its path. Then click on the OK button to key in path.)
4. Click on the **Finish** button to finish installation process. And allow the system to reboot.

4.2 Installation 2:

Applicable for Windows 2000/ 98/ME

1. Insert the **SBC-860 CD-ROM** into the CD-ROM Drive.
2. Click on **Start** button, select the **Settings**, then click on the **Control Panel** icon.
3. Double click on the **Add/Remove Hardware** icon and **Add New Hardware Wizard** will appear. Click on the **Next** button.
4. Select **Search for the best driver for your device (Recommended)** and click on the **Next** button.
5. Select **Specify a location**, click on **Have Disk** button then key in the CD-ROM path and specify component drivers and OS folders. Then click on the **Next** button.
6. The Wizard shows that Windows driver file search for the device. Click on the **Next** button.
7. The system will ask you to insert Windows 98 CD Diskette. Click on the **OK** button to insert Diskette and key in path.
8. Click on the **OK** button.
9. Click on the **Finish** button to finish installation process. And allow the system to reboot.

4.3 Installation 3:

Applicable for Windows NT 4.0

1. Insert the **SBC-860 CD ROM** into the CD-ROM Drive.
2. Start system with Windows NT 4.0 installed.
IMPORTANT: When the "Please select the operating system to start..." message is displayed, select "Windows NT Workstation Version 4.00 [VGA mode]".
3. From **Start**, select the **Settings group**, then click on the **Control Panel** icon.
4. In the **Control Panel**, select the desired device and click on the icon.
5. Follow the step-by-step instruction and click on **OK** button.
6. Click on the **Have Disk...** button.
7. Key in CD-ROM path and specify component drivers, then click on the **OK** button.
8. From the list of displayed devices, select your desired device.
9. If a message appears stating the driver is already installed on the system, and asks if you want to use the current or new drivers, be sure to select the **New** button.
10. If prompted for the driver diskette a second time, click on the **Continue** button.
(Notice: In some cases the system will ask you to insert **Windows NT CD ROM**. Follow its instructions to complete the setup procedures.)
11. When the message **"The drivers were successfully installed"** is displayed, remove the display driver diskette, then click on the **OK** button.
12. Reboot the system.

Appendix

A

Programming the Watchdog Timer

A.1 How to program the watchdog timer

SBC-860 utilizes ITE 8712 chipset as its watchdog timer controller.

Please follow the procedures below to complete its configuration.

1. Enter the MB PnP mode
2. Select logical device
3. Configure the watchdog timer controller registers
4. Exit the MB PnP mode

To enter the MB PnP mode is to write value 87h, 1h, 55h, 55h to configuration port - 2Eh.

To exit the MB PnP mode is to set bit 1 of configure control register (index 02h) to 1.

The AAEON initial watchdog timer program is illustrated below. This program is applied only to DOS and Win 9x.

Example :

```

;=====
; Enter the MB PnP mode
;=====

    mov     al, 87h
    out     2eh, al
    mov     al, 1
    out     2eh, al
  
```

```
mov    al, 55h
```

```
out    2eh, al
```

```
mov    al, 55h
```

```
out    2eh, al
```

```
;=====
```

```
; Select logical device
```

```
;=====
```

```
mov    al, 7          ;index 7 for logical device
```

```
out    2eh, al
```

```
mov    al, 7
```

```
out    2fh, al
```

```
;=====
```

```
; Configure the watchdog timer controller registers
```

```
;=====
```

```
mov    al, 73h
```

```
out    2eh, al
```

```
mov    al, 0ah        ;index 73h for watchdog timer  
                        time-out value
```

```
out    2fh, al
```

```
mov    al, 72h
```

```
out    2eh, al
```

```
mov    al, 0c0h       ;time-out value use second &  
                        enable WDT' output through  
                        KRST'
```

```
out    2fh, al
```

```
;=====
```

```
; Exit the MB PnP mode
```

```
;=====
```

```
        mov     al, 2  
        out     2eh, al  
        out     2fh, al
```