SBC84622 Series

AMD® Geode GX3 All-In-One Capa Board

User's Manual

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ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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MEMO

CHAPTER 1
INTRODUCTION

The **SBC84622** is a Capa board with support for AMD® LX800 CPU at FSB 500 MHz that features graphics, Fast Ethernet and an audio interface. The board can be adapted to AMD® processors with its designing for space-limited applications, and a standard format conforming to the size of a 3.5'' Hard Disk drive. To simplify the system integration, super I/Os, LCD, Ethernet and solid state disk are provided to make all on one single borad. Four serial ports (4 x RS-232) with +5V/12V power capability make a unique embedded feature to apply an extensive array of PC peripherals. The industrial-grade construction of **SBC84622 Series** allows your system to endure the continuous operation in hostile environments where most require stability and reliability. The system dependability of **SBC84622 Series** can be enhanced by its built-in watchdog timer, a special industrial feature not commonly seen on other motherboards.

1.1 Specifications

- **CPU**
  - **AMD® LX800 (GX3) processors**
- **System Chipset**
  - **CS5536AD**
- **CPU Frequency**
  - **LX800 500 MHz**
- **BIOS:**
  - Phoenix-Award BIOS, Y2K compliant
  - 4Mbit Flash, DMI, Plug and Play
  - PXE Ethernet Boot ROM
  - "Load Optimized Default" to backup customized Setting in the BIOS flash chip to prevent from CMOS battery fail
- **System Memory**
  - One 200-Pin DDR SODIMM socket
  - Maximum DDR of up to 1GB DDR333
- **Onboard IDE**
  - One PATA with 44-pin 2.0 pitch box-header
  - PATA-100 as PIO Mode 0-4, DMA Mode 0-2 and Ultra DMA/33/66/100
- **Compact Flash Socket**
  - One CompactFlash™ Type II Socket
- **Onboard Multi I/O**
  - Four RS-232
- **USB Interface**
  - Four USB ports with fuse protection and comply with USB Spec. Rev. 2.0
- **Real Time Clock**
  - Integrated CS5536AD
- **Watchdog Timer**
  - 1~255 seconds; up to 255 levels

- **Graphics/Streaming**
  - Integrate LX800
  - Unified Memory Architecture shares system memory up to 254MB
  - LCD Interface -- Supports up to 24-bit LCD (select either TTL or LVDS)
    - CRT: 1600 x 1200 x 32 bpp
    - LCD: 1600 x 1200 x 32 bpp
- **Ethernet**
  - Realtek RTL8139DL PCI Bus 10/100M Base-T
  - Wake On LAN (via ATX power supply)
  - Equipped with RJ-45 interface
- **Audio**
  - Realtek ALC203A AC'97 codec audio
  - Amplify for speaker-out with 1W for each channel
  - MIC-in, Line-in, Line-out/Speaker-out (jumper selectable)
- **Power Management**
  - ACPI (Advanced Configuration and Power Interface) without support for S3
- **Form Factor**
  - 3.5" hard disk drive form factor

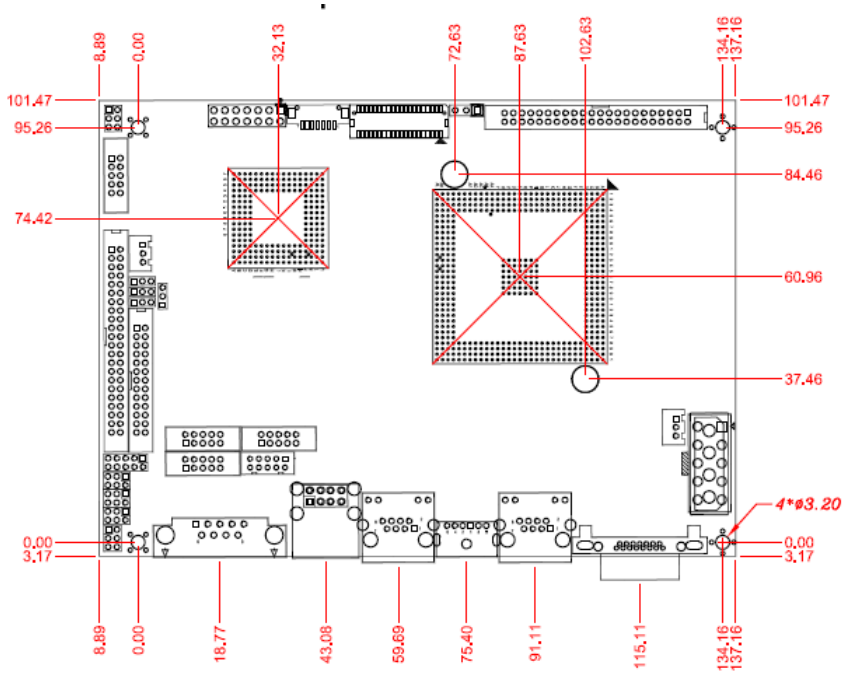
NOTE *All specifications and images are subject to change without notice.*

1.2 Utilities Supported

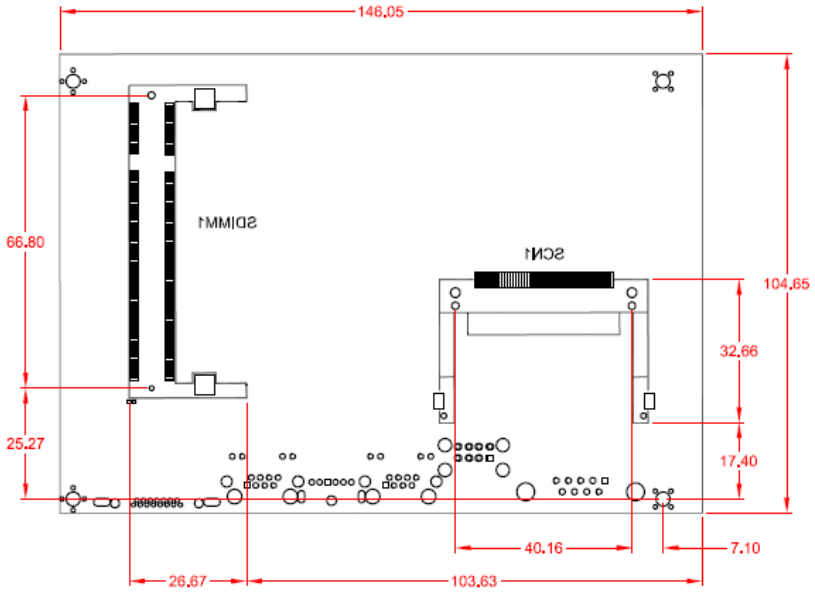
- AES Driver
- VGA Driver
- LAN Driver
- Audio Driver
- IDE Driver

CHAPTER 2
JUMPERS AND CONNECTORS

2.1 Board Dimensions and Fixing Holes

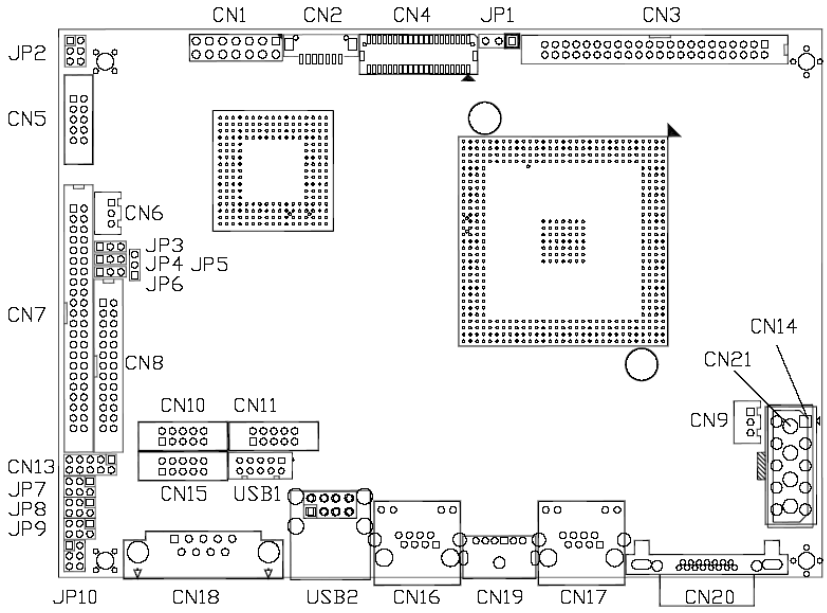


Component Side


146.05
66.80
25.27
104.65
32.66
17.40
40.16
7.10
26.67
103.63
SDIMM1
SCN1

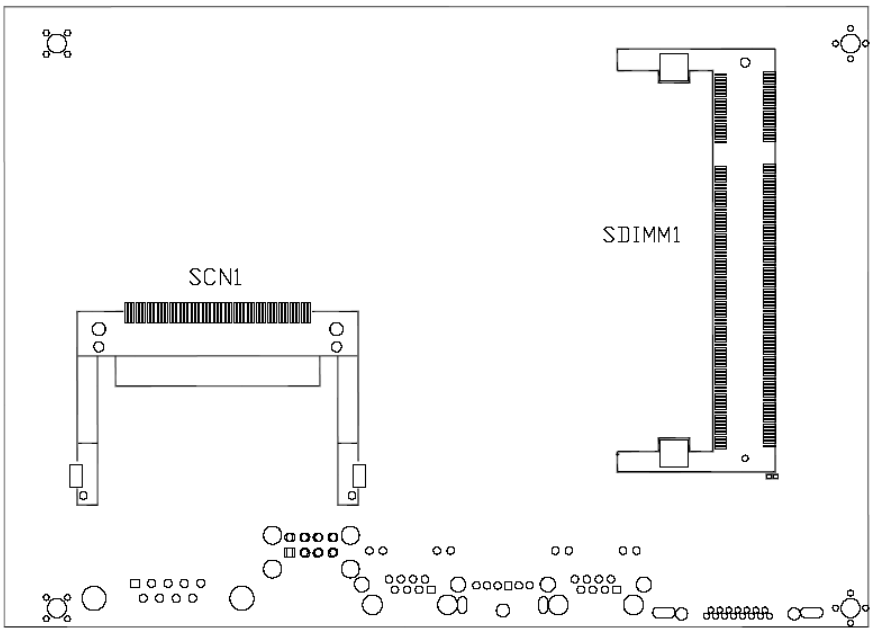
Solder Side

2.2 Board Layout



Component Side

Note *The Limited Height of Component Side is 30mm.*



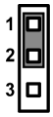
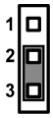
Solder Side

2.3 Jumper Settings

The **SBC84622 Series** is configured to match the needs of your application with the proper jumper settings. The table below is a summary of all the jumpers and their corresponding functions onboard the **SBC84622 Series**. The succeeding tables show the correct jumper settings for the onboard devices.

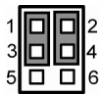
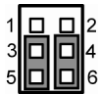
Jumper	Default Setting		Jumper Setting
JP1	LCD Voltage select : 3.3V		Short 1-2
JP2	Audio Line Out/Speaker Out: Line Out		Short 1-3, 2-4
JP3	Compact Flash Power Select : 3.3V		Short 1-2
JP4	Compact Flash Select : Slave		Short 1-2
JP5	Clear CMOS Setting : Normal		Short 1-2
JP6	Auto power on : Power off		Short 1-2
JP7	COM4 Mode Select	CN10 Pin 1: DCD	Short 3-5
		CN10 Pin 8: RI	Short 4-6
JP8	COM3 Mode Select	CN11 Pin 1: DCD	Short 3-5
		CN11 Pin 8: RI	Short 4-6
JP9	COM2 Mode Select	CN15 Pin 1: DCD	Short 3-5
		CN15 Pin 8: RI	Short 4-6
JP10	COM1 Mode Select	CN18 Pin 1: DCD	Short 3-5
		CN18 Pin 9: RI	Short 4-6

2.3.1 LCD Voltage Select Jumper (JP1)

Description	Function	Jumper Setting
LCD Voltage Select	3.3V (Default)	
	5V	

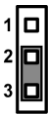
2.3.2 Audio Output Select Jumper (JP2)

This jumper makes the selection of Audio output.

Description	Function	Jumper Setting
Audio Output Selection	Line Out (Default)	
	Speak Out	

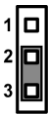
2.3.3 CompactFlash™ Power Jumper (JP3)

Connect the device's power cable to this jumper and correctly set it for the CompactFlash™ Card.

Description	Function	Jumper Setting
CompactFlash Power Select	3.3V (Default)	
	5V	

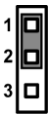
2.3.4 CompactFlash™ Setting Jumper (JP4)

Use this jumper to set Master/Slave CompactFlash™ interface.

Description	Function	Jumper Setting
Compact Flash Master/Slave Selection	Master	
	Slave (Default)	

2.3.5 CMOS Clear Jumper (JP5)

You may need to use this jumper to clear the CMOS memory if incorrect settings in the Setup Utility.

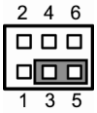
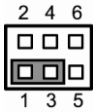
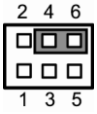
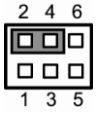
Description	Function	Jumper Setting
CMOS Clear	Normal (Default)	
	Clear CMOS	

2.3.6 Auto Power On Jumper (JP6)

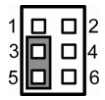
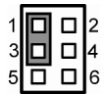
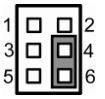
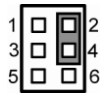
This jumper is for power on setting.

Description	Function	Jumper Setting
Auto Power On Setting	Always Power Off (Default)	
	Always Power On	

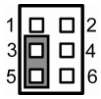
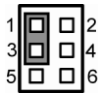
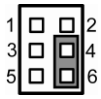
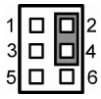
2.3.7 COM4 Mode Select Jumper (JP7)

Description	Function	Jumper Setting
COM4 (CN10)	*Pin 1=DCD (Default)	
	*Pin 1=5V	
	*Pin 8=RI (Default)	
	*Pin 8=+12V	

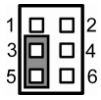
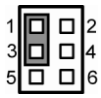
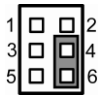
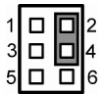
2.3.8 COM3 Mode Select Jumper (JP8)

Description	Function	Jumper Setting
COM3 (CN11)	*Pin 1=DCD (Default)	
	*Pin 1=5V	
	*Pin 8=RI (Default)	
	*Pin 8=+12V	

2.3.9 COM2 Mode Select Jumper (JP9)

Description	Function	Jumper Setting
COM2 (CN15)	*Pin 1=DCD (Default)	
	*Pin 1=5V	
	*Pin 8=RI (Default)	
	*Pin 8=+12V	

2.3.10 COM1 Mode Select Jumper (JP10)

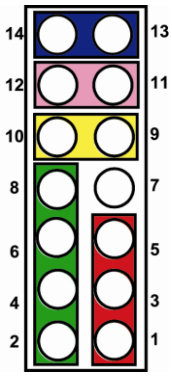
Description	Function	Jumper Setting
COM1 (CN18)	*Pin 1=DCD (Default)	
	*Pin 1=5V	
	*Pin 9=RI (Default)	
	*Pin 9=+12V	

2.4 Connectors

The connectors allow the CPU card to connect with other parts of the system. Some problems encountered by your system may be a result from loose or improper connections. Ensure that all connectors are in place and firmly attached. The following table lists the function of each connector on the **SBC84622 Series**.

Connectors	Label	Connectors	Label
Front Panel Bezel Connector	CN1	Serial Port2 Connector	CN15
LVDS Panel Backlight Connector	CN2	LAN2 Connector	CN16
TTL Panel Connector	CN3	LAN1 Connector	CN17
LVDS Panel Connector	CN4	Serial Port1 Connector	CN18
Audio Connector	CN5	6-PinMiniDim Keyboard/Mouse Connector	CN19
SMBUS Connector	CN6	VGA Connector	CN20
Parallel IDE Connector	CN7	4 Pins Power Connector	CN21
Printer Port Connector	CN8	Compact Flash Connector	SCN1
Serial Port4 Connector	CN10	USB Port2 & Port3 Connector	USB1
Serial Port3 Connector	CN11	USB Port0 & Port1 Connector	USB2
Digital I/O Connector	CN13	DDR SO-DIMM	SDIMM1
10 Pins ATX Power Connector (Option)	CN14		

2.4.1 Flat Panel Bezel Connector (CN1)



- **Power LED**

  This 3-pin connector denoted as Pin 1 and Pin 5 connects the system power LED indicator to such a switch on the case. Pin 1 is assigned as +, and Pin 5 as -. The Power LED lights up when the system is powered ON.

- **External Speaker and Internal Buzzer Connector**

  Pin 2, 4, 6 and 8 can be connected to the case-mounted speaker unit or internal buzzer. While connecting the CPU card to an internal buzzer, please short pins 2-4; while connecting to an external speaker, you need to set pins 2-4 to Open and connect the speaker cable to pin 8 (+) and pin 2 (-).

- **ATX Power On/Off Button**

  This 2-pin connector denoted as Pin 9 and 10 connects the front panel's ATX power button to the CPU card, which allows users to control ATX power supply to be power on/off.

- **System Reset Switch**
  Pin 11 and 12 can be connected to the case-mounted reset switch that reboots your computer instead of turning OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

- **HDD Activity LED**

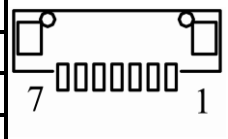
  This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14

connect the hard disk drive to the front panel HDD LED, Pin 13 assigned as -, and Pin 14 as +.

2.4.2 LVDS Panel Backlight Connector (CN2)

This is a 7-pin connector for inverter on the board that we strongly recommended you to use the matching DF13-7S-1.25C connector.

Pin	Signal
1	12V
2	12V
3	5V
4	ENAB
5	GND
6	GND
7	GND

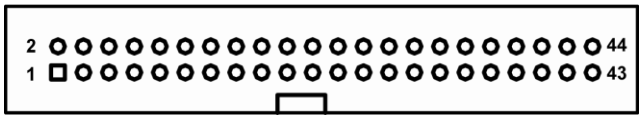


2.4.3 TTL Connector (CN3)

The LCD connector on the board supports 18/24bits TTL flat panel displays.

Pin	Signal	Pin	Signal
1	-12V	2	+12VM1
3	GND	4	GND
5	VCCM1	6	VCCM1
7	VDDEN	8	GND
9	B0 (P0)	10	B1(P1)
11	B2 (P2)	12	B3 (P3)
13	B4 (P4)	14	B5 (P5)
15	B6 (P6)	16	B7 (P7)
17	G0 (P8)	18	G1 (P9)
19	G2 (P10)	20	G3 (P11)

Pin	Signal	Pin	Signal
21	G4 (P12)	22	G5 (P13)
23	G6 (P14)	24	G7 (P15)
25	R0 (P16)	26	R1 (P17)
27	R2 (P18)	28	R3 (P19)
29	R4 (P20)	30	R5 (P21)
31	R6 (P22)	32	R7 (P23)
33	GND	34	GND
35	LCD_CLK_TTL	36	LCD_VSYNC_TTL
37	M(DE)	38	LCD_HSYNC_TTL
39	GND	40	BACKLIGHT_5V
41	GND	42	LCD_CLK_L
43	VCCM1	44	VCCM1



Note ******* *If using the 18-bit LCD panel, please refer to this table below:*

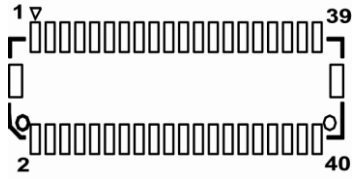
(B6,B7,G6,G7,R6,R7 is LSB)

TFT 18-Bit	TFT 24-Bit
	B0
	B1
B0	B2
B1	B3
B2	B4
B3	B5
B4	B6
B5	B7
	G0
	G1
G0	G2
G1	G3
G2	G4
G3	G5
G4	G6
G5	G7
	R0
	R1
R0	R2
R1	R3
R2	R4
R3	R5
R4	R6
R5	R7

2.4.4 LVDS Panel Connector (CN4)

The LVDS connector on the SBC is a 40-pin connector. It is strongly recommended to use the matching connector JST SHDR-40V-S-B.

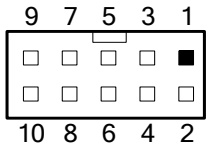
Pin	Signal	Pin	Signal
1	VCCM1	2	VCCM1
3	VCCM1	4	VCCM1
5	VCCM1	6	VCCM1
7	N.C.	8	N.C.
9	GND	10	GND
11	N.C.	12	N.C.
13	N.C.	14	N.C.
15	GND	16	GND
17	N.C.	18	N.C.
19	N.C.	20	N.C.
21	GND	22	GND
23	TXO0-	24	N.C.
25	TXO0+	26	N.C.
27	GND	28	GND
29	TXO1-	30	TXO3-
31	TXO1+	32	TXO3+
33	GND	34	GND
35	TXO2-	36	TXOC-
37	TXO2+	38	TXOC+
39	GND	40	GND



2.4.5 Audio Connector (CN5)

The **SBC84622** supports an audio interface. **CN5** is a 10-pin header connector commonly for the audio function.

Pin	Signal	Pin	Signal
1	MIC-IN	2	GND
3	Line In L	4	GND
5	Line In R	6	GND
7	Audio Out L	8	GND
9	Audio Out R	10	GND



2.4.6 SMBUS Connector (CN6)

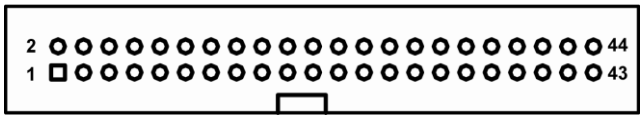
Connector **CN6** is for SMBUS interface support.

Pin	Signal
1	SMB_SCL
2	SMB_SDA
3	GND

2.4.7 Enhanced IDE Interface Connector (CN7)

There is a PCI bus enhanced IDE controller that supports master/slave mode, post write transaction mechanisms with 64-byte buffer and master data transaction.

Pin	Signal	Pin	Signal	Pin	Signal
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
13	Data 2	14	Data 13	15	Data 1
16	Data 14	17	Data 0	18	Data 15
19	GND	20	N.C.	21	DRQ#
22	GND	23	IOW #	24	GND
25	IOR #	26	GND	27	IOCHRDY
28	CSEL	29	ACK#	30	GND
31	IRQ	32	N.C.	33	SA1
34	PDIAG#	35	SA0	36	SA2
37	HDC CS0 #	38	HDC CSI #	39	HDD Active #
40	GND	41	VCC	42	VCC
43	GND	44	N.C		

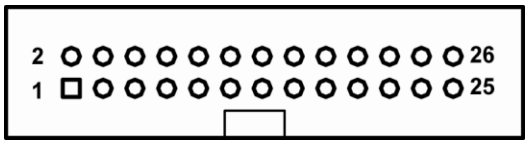


2.4.8 Parallel Port Connector (CN8)

The **SBC84622** has a multi-mode parallel port connector **CN8** to support:

1. **Standard mode:**
   IBM PC/XT, PC/AT and PS/2™ compatible with bi-directional parallel port
2. **Enhanced mode:**
   Enhance parallel port (EPP) compatible with EPP 1.7 and EPP 1.9 (IEEE 1284 compliant)
3. **High speed mode:**
   Microsoft and Hewlett Packard extended capabilities port (ECP) IEEE 1284 compliant

Pin	Signal	Pin	Signal
1	Strobe#	2	Auto Form Feed#
3	Data 0	4	Error#
5	Data 1	6	Initialize#
7	Data 2	8	Printer Select In#
9	Data 3	10	GND
11	Data 4	12	GND
13	Data 5	14	GND
15	Data 6	16	GND
17	Data 7	18	GND
19	Acknowledge#	20	GND
21	Busy	22	GND
23	Paper Empty#	24	GND
25	Printer Select	26	N.C.



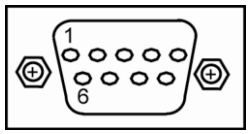
2.4.9 Serial Port Interface Connectors (CN10, CN11, CN15, CN18)

The board has four onboard serial ports. All ports supply +5V power capability on DCD, and +12V on RI (excluding 5V), depending on jumper setting.

2.4.9.1 COM1 Port Connector (CN18)

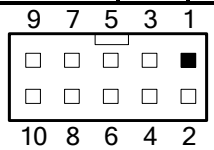
The COM 1 Port connector **CN18** is a standard DB-9 connector.

Pin	Signal
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator



2.4.9.2 COM2, COM3, COM4 Port Connectors (CN15, CN11, CN10)

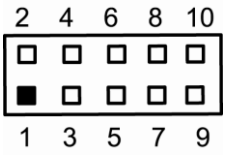
Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	N.C.



2.4.10 Digital I/O Port (DIO) Connector (CN13)

The board is equipped an 8-channel digital I/O connector **CN13** that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. The digital I/O is controlled via software programming.

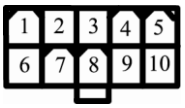
Pin	Signal	Pin	Signal
1	DIO0	2	DIO1
3	DIO2	4	DIO3
5	DIO4	6	DIO5
7	DIO6	8	DIO7
9	GND	10	N.C.



2.4.11 ATX Power Connectors (Option)(CN14)

Steady and sufficient power can be supplied to all components on the board by connecting the power connector. Please make sure all components and devices are properly installed before connecting the power connector. Align the power connector with its proper location on the board, and connect it tightly.

Pin	Signal	Pin	Signal
1	PS_ON	6	5VSB
2	GND	7	VCC5
3	GND	8	VCC5
4	VCC12*	9	-12V
5	N.C.	10	GND

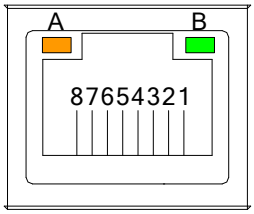


NOTE ** VCC12 is only for LCD Invreter and COM Port.*

2.4.12 Ethernet RJ-45 Connectors (CN16, CN17)

The RJ-45 connector is for Ethernet. To connect the board to a 100/10 Base-T hub, just plug one end of the cable into **LAN1(CN17)/ LAN2(CN16)**, and connect the other end (phone jack) to a 100/10 Base-T hub.

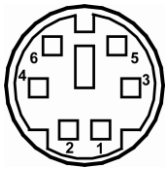
Pin	Signal
1	Tx+(Data transmission positive)
2	Tx-(Data transmission negative)
3	Rx+(Data reception positive)
4	RJ45 termination
5	RJ45 termination
6	Rx- (Data reception negative)
7	RJ45 termination
8	RJ45 termination
A	Active LED
B	100 LAN LED



2.4.13 Keyboard and PS/2 Mouse Connector (CN19)

The board supports a keyboard and Mouse interface. Connector **CN19** is a DIN connector for PS/2 keyboard Connection via "Y" Cable.

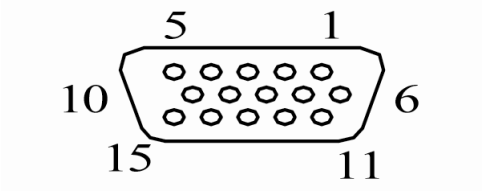
Pin	Signal
1	Keyboard Data
2	Mouse Data
3	GND
4	VCC
5	Keyboard Clock
6	Mouse Clock



2.4.14 VGA Connector (CN20)

CN20 is a slim type 15-pin D-Sub connector commonly for the CRT VGA display. The VGA interface configuration is done via the software utility, and no jumper setting is required.

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	Green	3	Blue
4	N.C.	5	GND	6	GND
7	GND	8	GND	9	VCC5
10	GND	11	N.C.	12	DDC DAT
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK



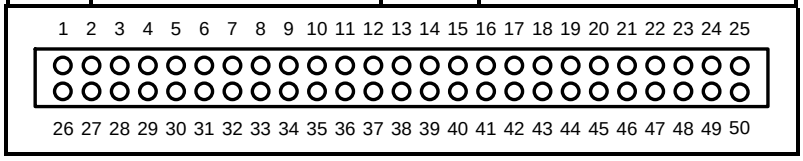
2.4.15 CompactFlash™ Connector (SCN1)

The board is equipped with a CompactFlash disk type-II socket on the solder side that supports the IDE interface CompactFlash disk card with DMA mode supported. The socket is especially designed to avoid any incorrect installation of the CompactFlash disk card.

When installing or removing the CompactFlash disk card, please make sure that the system power is off.

Pin	Signal	Pin	Signal
1	GND	26	N.C.
2	Data 3	27	Data 11
3	Data 4	28	Data 12
4	Data 5	29	Data 13
5	Data 6	30	Data 14
6	Data 7	31	Data 15
7	CS0#	32	CS1#
8	GND	33	N.C.
9	SEL#	34	IORD#

Pin	Signal	Pin	Signal
10	GND	35	IOWR#
11	GND	36	WE#
12	GND	37	INTR
13	VCC_CF	38	VCC_CF
14	GND	39	CSEL#
15	GND	40	N.C.
16	GND	41	RESET#
17	GND	42	IORDY#
18	Address 2	43	DMAREQ
19	Address 1	44	DMAACK-
20	Address 0	45	ACTIVE#
21	Data 0	46	PDIAG#
22	Data 1	47	Data 8
23	Data 2	48	Data 9
24	N.C.	49	Data 10
25	N.C.	50	GND



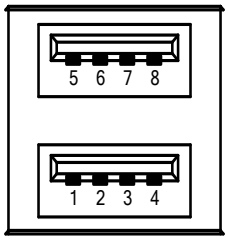
2.4.16 USB Connectors (USB1, USB2)

The board supports four Universal Serial Bus (USB) connectors compliant with USB 2.0 (480 Mbps) that can be adapted to any USB peripherals, such as monitor, keyboard, and mouse.

2.4.16.1 USB Port 0/1 Connector (USB2)

The Universal Serial Bus (USB) port connector on the board is for the installation of peripherals supporting the USB interface. **USB2** consists of two 4-pin standard USB ports.

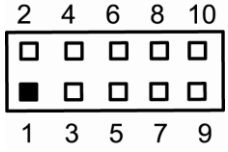
Pin	Signal	Pin	Signal
1	USB_PWR0	5	USB_PWR0
2	C_USB_PN0	6	C_USB_PN1
3	C_USB_PP0	7	C_USB_PP1
4	GND	8	GND



2.4.16.2 USB 2/3 Connector (USB1)

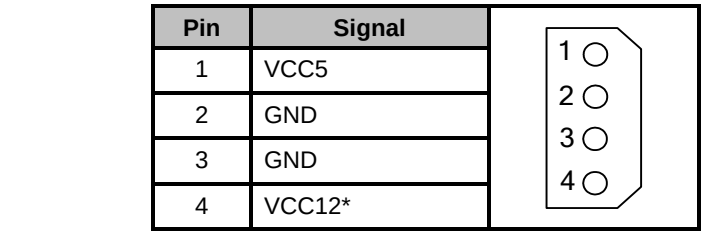
The Universal Serial Bus (USB) connector on the board is for the installation of peripherals supporting the USB interface. **USB1** is a 10-pin standard onboard USB connector.

Pin	Signal	Pin	Signal
1	USB_PWR1	2	USB_PWR1
3	C_USB_PN2	4	C_USB_PN3
5	C_USB_PP2	6	C_USB_PP3
7	GND	8	GND
9	GND	10	GND



2.4.17 4 Pins Power Connectors (CN21)

Pin	Signal
1	VCC5
2	GND
3	GND
4	VCC12*



NOTE ** VCC12 is only for LCD Invreter and COM Port.*

CHAPTER 3
HARDWARE DESCRIPTION

3.1 Microprocessors

The **SBC84622 Series** supports LX700/LX800.Systems based on these CPUs can be operated under Windows XP and Linux environments. The system performance depends on the microprocessor installed onboard. Make sure all settings are correct for the installed microprocessor to prevent any damage to the CPU.

3.2 BIOS

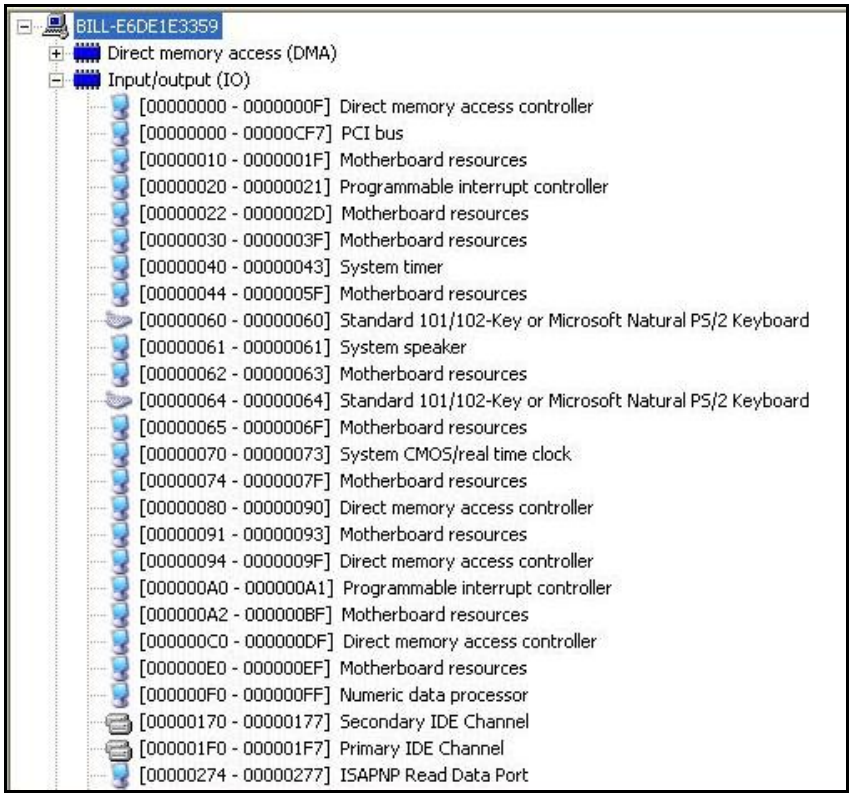
System BIOS used on the **SBC84622 Series** is Phoenix-Award Plug and Play BIOS. The **SBC84622 Series** contains a single 4Mbit Flash.

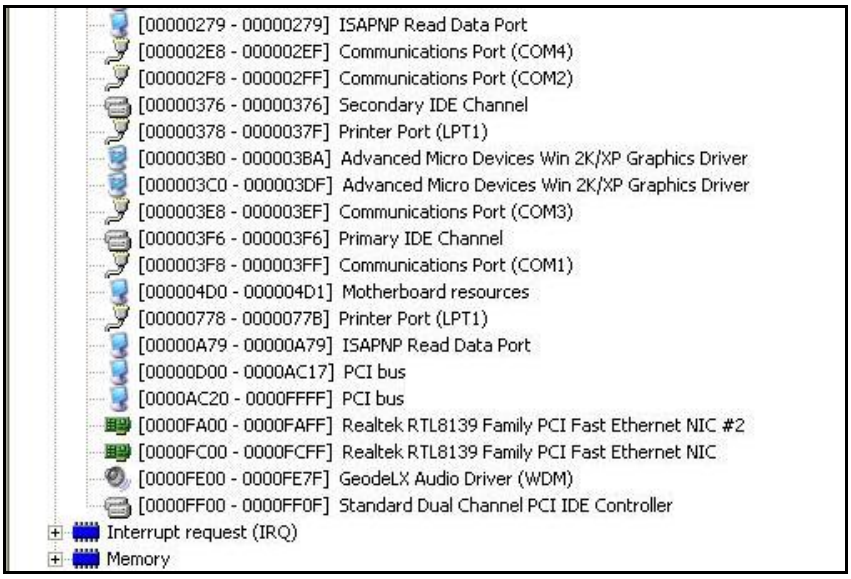
3.3 System Memory

The **SBC84622 Series** industrial CPU card supports one 200-pin DDR SODIMM socket for a maximum memory of 1GB DDR SDRAMs. The memory module can come in sizes of 64MB, 128MB, 256MB, 512MB and 1GB.

3.4 I/O Port Address Map

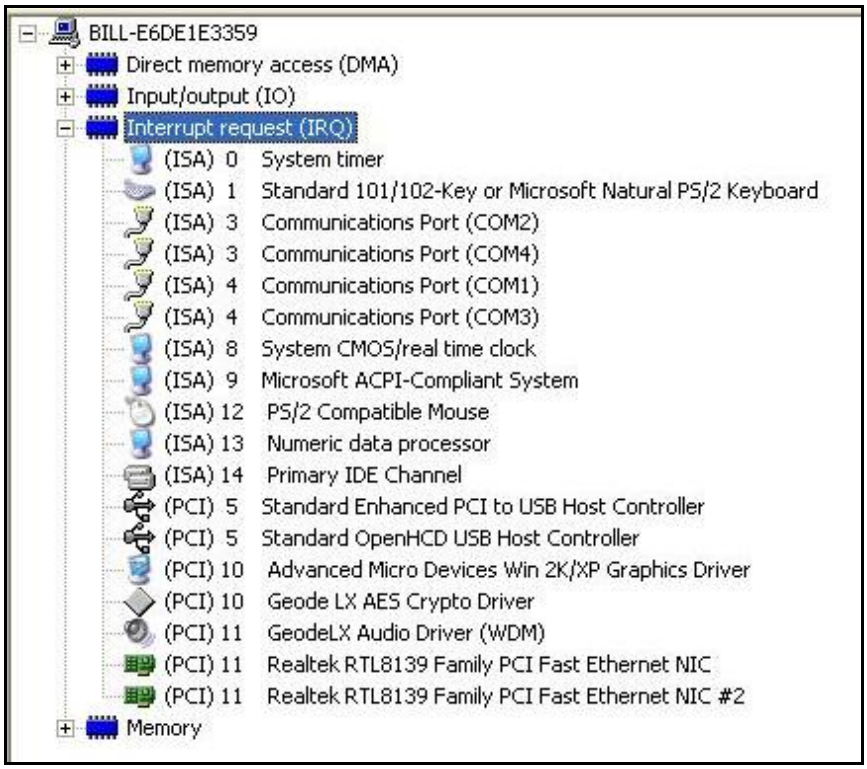
It has a total of 1KB port addresses available for assignment to other devices via I/O expansion cards.




[00000279 - 00000279] ISAPNP Read Data Port
[000002E8 - 000002EF] Communications Port (COM4)
[000002F8 - 000002FF] Communications Port (COM2)
[00000376 - 00000376] Secondary IDE Channel
[00000378 - 0000037F] Printer Port (LPT1)
[000003B0 - 000003BA] Advanced Micro Devices Win 2K/XP Graphics Driver
[000003C0 - 000003DF] Advanced Micro Devices Win 2K/XP Graphics Driver
[000003E8 - 000003EF] Communications Port (COM3)
[000003F6 - 000003F6] Primary IDE Channel
[000003F8 - 000003FF] Communications Port (COM1)
[000004D0 - 000004D1] Motherboard resources
[00000778 - 0000077B] Printer Port (LPT1)
[00000A79 - 00000A79] ISAPNP Read Data Port
[00000D00 - 0000AC17] PCI bus
[0000AC20 - 0000FFFF] PCI bus
[0000FA00 - 0000FAFF] Realtek RTL8139 Family PCI Fast Ethernet NIC #2
[0000FC00 - 0000FCFF] Realtek RTL8139 Family PCI Fast Ethernet NIC
[0000FE00 - 0000FE7F] GeodeLX Audio Driver (WDM)
[0000FF00 - 0000FF0F] Standard Dual Channel PCI IDE Controller
Interrupt request (IRQ)
Memory

3.5 Interrupt Controller

The **SBC84622 Series** is a 100% PC compatible control board. It consists of 16 interrupt request lines. Four out of the sixteen can either be programmable. The mapping list of the 16 interrupt request lines is shown on the following table.



CHAPTER 4
PHOENIX-AWARD BIOS UTILITY

The Phoenix-Award BIOS has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in a battery-backed RAM (CMOS RAM) that retains the Setup information each time the power is turned off.

4.1 Entering Setup

There are two ways to enter the Setup program. You may either turn ON the computer and press <Del> immediately, or press the <Del> and/or <Ctrl>, <Alt>, and <Esc> keys simultaneously when the following message appears at the bottom of the screen during POST (Power on Self Test).

TO ENTER SETUP PRESS DEL KEY

If the message disappears before you respond and you still want to enter Setup, please restart the system to try it again. Turning the system power OFF and ON, pressing the "RESET" button on the system case or simultaneously pressing <Ctrl>, <Alt>, and <Del> keys can restart the system. If you do not press keys at the right time and the system doesn't boot, an error message will pop out to prompt you the following information:

PRESS <F1> TO CONTINUE, <CTRL-ALT-ESC> OR <DEL> TO ENTER SETUP

4.2 Control Keys

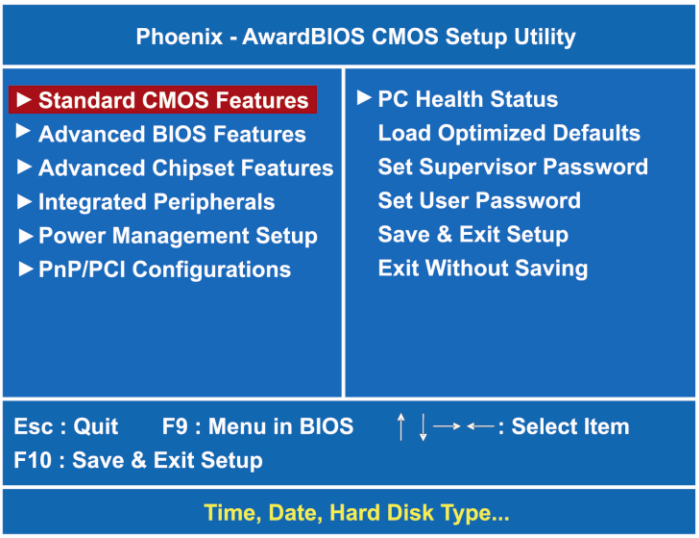
Up arrow	Moves cursor to the previous item
Down arrow	Moves cursor to the next item
Left arrow	Moves cursor to the item on the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quits and deletes changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exits current page and returns to Main Menu
PgUp/"+" key	Increases the numeric value or makes changes
PgDn/"–" key	Decreases the numeric value or makes changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Item Help
F3 key	Reserved
F4 key	Reserved
F5 key	Restores the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Reserved
F7 key	Loads the optimized default, only for Option Page Setup Menu
F8 key	Reserved
F9 key	Menu in BIOS
F10 key	Saves all the CMOS changes, only for Main Menu

4.3 Getting Help

- **Main Menu**
  The on-line description of the highlighted setup function is displayed at the bottom of the screen.
- **Status Page Setup Menu/Option Page Setup Menu**
  Press <F1> to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <F1> or <Esc>.

4.4 The Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from ten setup functions and two exit choices. Use the arrow keys to select the setup function you intend to configure then press <Enter> to accept or enter its sub-menu.

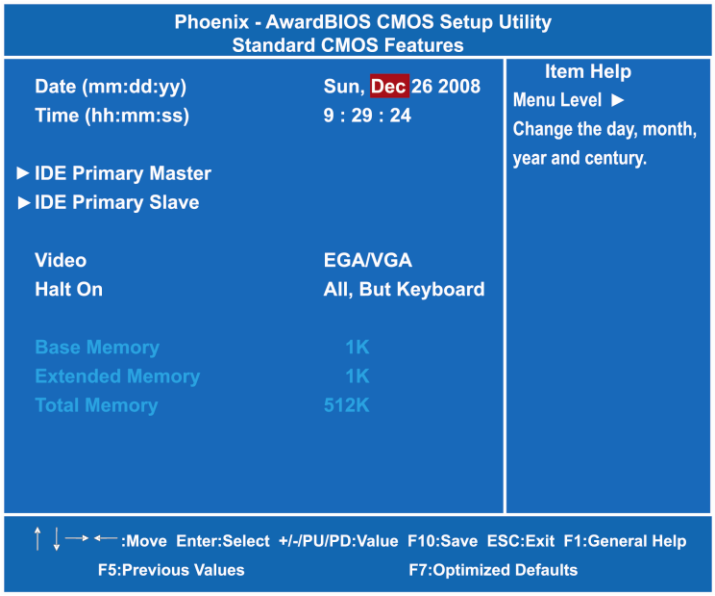


NOTE *If you find that your computer cannot boot after making and saving system changes with Setup, the Award BIOS, via its built-in override feature, resets your system to the CMOS default settings.*

We strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability.

4.5 Standard CMOS Setup Menu

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



- **Date**
  The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	The day of week, from Sun to Sat, determined by the BIOS, is read only
date	The date, from 1 to 31 (or the maximum allowed in the month), can key in the numerical / function key
month	The month, Jan through Dec.
year	The year, depends on the year of BIOS

- **Time**
  The time format is <hour> <minute> <second> accepting either functions key or numerical key. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- **IDE Primary Master / Primary Slave**
  The categories identify the types of one channel that have been installed in the computer. There are 45 predefined types and 2 users definable types are for Enhanced IDE BIOS. Type 1 to Type 45 is predefined. Type User is user-definable.
  Press <PgUp>/<+> or <PgDn>/<–> to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information within this category. If your hard disk drive type does not match or is not listed, you can use Type User to define your own drive type manually.
  If you select Type User, related information is asked to be entered to the following items. Enter the information directly from the keyboard and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.
  If the controller of HDD interface is ESDI, select "Type 1".
  If the controller of HDD interface is SCSI, select "None".
  If the controller of HDD interface is CD-ROM, select "None".

CYLS.	number of cylinders	**LANDZONE**	landing zone
HEADS	number of heads	**SECTORS**	number of sectors
PRECOMP	write precom	**MODE**	HDD access mode

  If there is no hard disk drive installed, select NONE and press <Enter>.

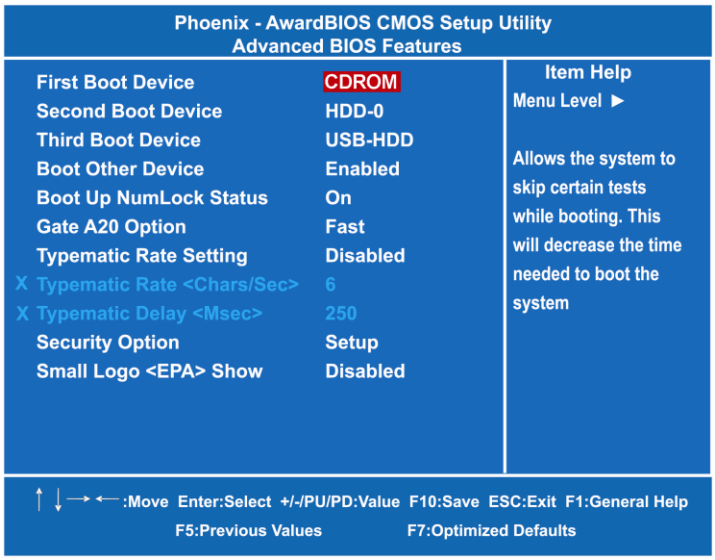
- **Halt On**
  This field determines whether the system will halt if an error is detected during power up.

No errors	The system boot will halt on any error detected. (default)
All errors	Whenever the BIOS detect a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.

Press <Esc> to return to the Main Menu page.

4.6 Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.



- **First/Second/Third Boot Device**
  These items allow the selection of the 1st, 2nd, and 3rd devices that the system will search for during its boot-up sequence. The wide range of selection includes *LS120*,*HDD0~1*,*CDROM,USB-ZIP,USB-CDROM,USB-HDD,LAN.*.

- **Boot Other Device**
  This item allows the user to enable/disable the boot device not listed on the First/Second/Third boot devices option above. The default setting is *"Enabled"*.

- **Boot Up NumLock Status**
  Selects power on state for NumLock. The default value is *"On"*.

- **Gate A20 Option**
  The default value is *"Fast"*.

Normal	The A20 signal is controlled by keyboard controller or chipset hardware.
Fast	Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

- **Typematic Rate Setting**
  This determines the typematic rate of the keyboard. The default value is *"Disabled"*.

Enabled	Enable typematic rate and typematic delay programming
Disabled	Disable typematic rate and typematic delay programming. The system BIOS will use default value of these 2 items and the default is controlled by keyboard.

- **Typematic Rate (Chars/Sec)**
  This option refers to the number of characters the keyboard can type per second. The default value is *"6"*.

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second

24	24 characters per second
30	30 characters per second

- **Typematic Delay (Msec)**
  This option sets the display time interval from the first to the second character when holding a key. The default value is *"250"*.

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

- **Security Option**
  This item allows you to limit access to the system and Setup, or just to Setup. The default value is *"Setup"*.

System	The system will not boot and access to Setup will be denied if the incorrect password is entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

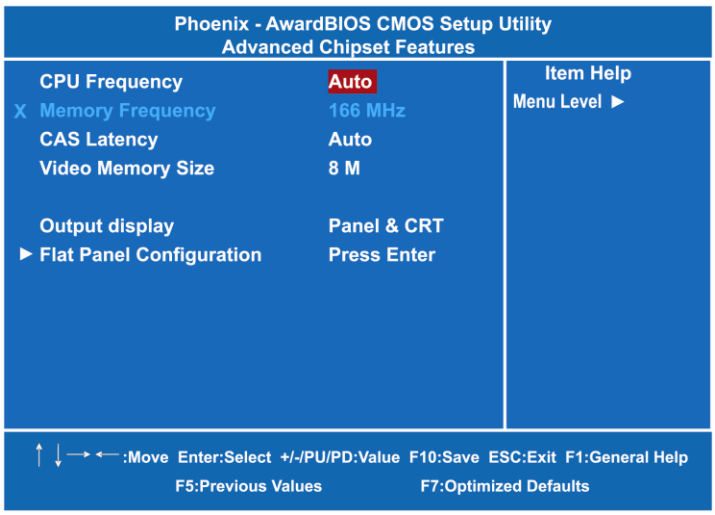
NOTE *To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything, just press <Enter> and it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.*

- **Small Logo (EPA) Show**
  If enabled, the EPA logo will appear during system booting up; if disabled, the EPA logo will not appear.

Press <Esc> to return to the Main Menu page.

4.7 Advanced Chipset Features

Since the features in this section are related to the chipset on the CPU board and are completely optimized, you are not recommended to change the default settings in this setup table unless you are well oriented with the chipset features.



- **CPU Frequency**
  Use this item to set the CPU Frequency with these options: Auto, 333MHz, 400MHz, 433MHz and 500MHz. The default setting is "*Auto*".

- **CAS Latency**
  You can select CAS latency time in 1.5, 2.0, 2.5, 3.0, 3.5, or Auto. The board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

- **Video Memory Size**
  The options available are [8M] [16M] [32M] [64M] [128M] [254M].

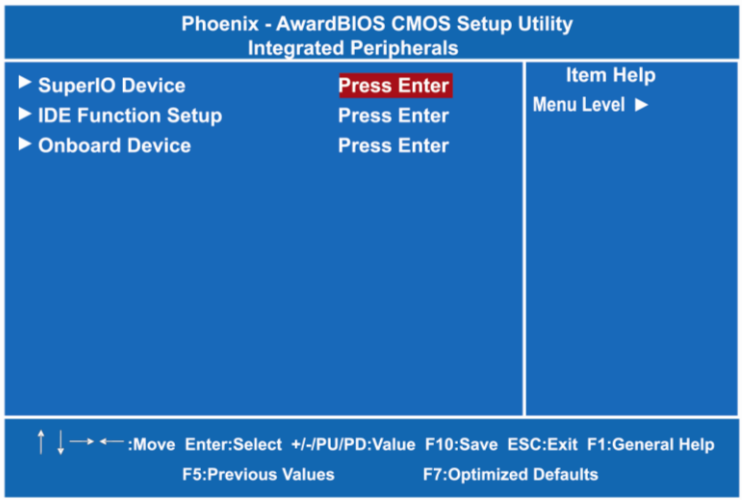
- **Output Display**
  This allows you to choose output for your system display. Configuration options: [CRT] [Flat Panel] [Panel +CRT]. The default value is "*Panel +CRT*".

- **Flat Panel Configuration**
  Press Enter to set the following items.

Press <Esc> to return to the Main Menu page.

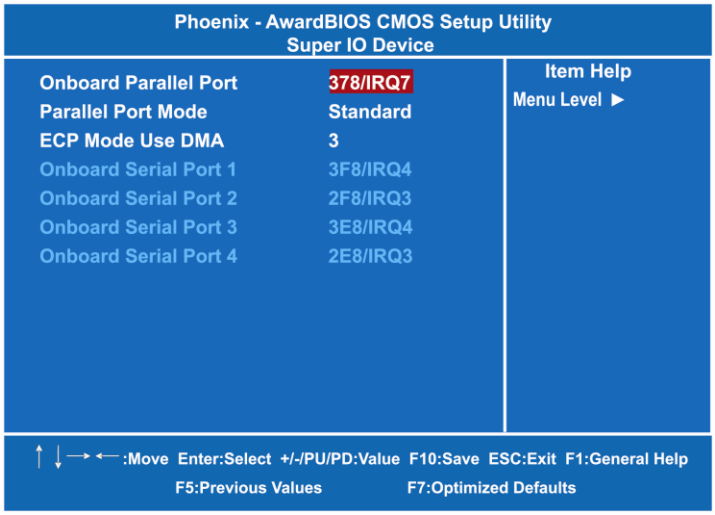
4.8 Integrated Peripherals

This section allows you to configure your SuperIO Device, IDE Function and Onboard Device.



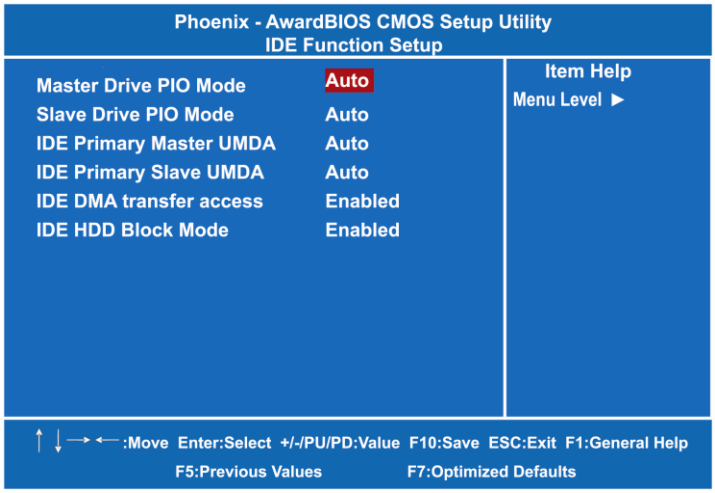
- **SuperIO Device**

  Scroll to this item and press <Enter> to view the sub menu to configure the Super IO Device.



  - **Onboard Parallel Port**
    This item allows you to determine the I/O address for onboard parallel port. There are several options for your selection, *"378H/IRQ7", "278H/IRQ5", "3BC/IRQ7", "Disabled",* etc.
  - **Parallel Port Mode**
    Select an operating mode for the onboard parallel (printer) port. Select Normal unless your hardware and software require another mode in this field. There are several options for your selection, *"EPP1.9", "ECP", "SPP", "ECPEPP1.7", "EPP1.7",* etc.
  - **ECP Mode Use DMA**
    Select a DMA channel for the parallel port while using the ECP mode.
  - **Onboard Serial Port 1/2/3/4**
    Select an address and corresponding interrupt for the serial port. There are several options for your selection, *3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3,* etc.

- **IDE Function Setup**
  Scroll to this item and press <Enter> to view the sub menu to configure the OnChip IDE Device.

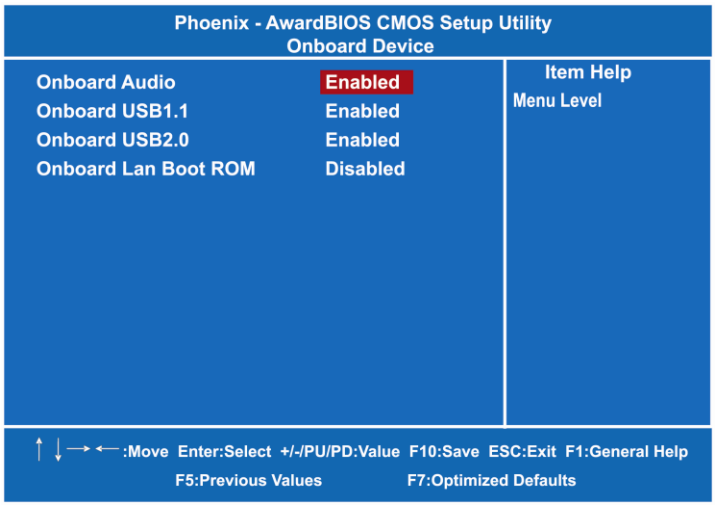


  - **Master/Slave Drive PIO**
    These items let you set a PIO mode for each IDE device that the onboard IDE interface supports. In Auto mode, the system automatically determines the best mode for each device.
  - **IDE Primary Master/Slave UDMA**
    Select the mode of operation for the IDE drive. Ultra DMA-33/66/100/133 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If the hard drive and system software both support Ultra DMA-33/66/100/133, select Auto to enable UDMA mode by BIOS.
  - **IDE DMA Transfer Access**
    Automatic data transfer between system memory and IDE device with minimum CPU intervention. This improves data throughput and frees CPU to perform other tasks.
  - **IDE HDD Block Mode**
    Block mode is also called block transfer, multiple commands, or multiple sectors read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block

read/writes per sector the drive can support.

- **Onboard Device**

  Scroll to this item and press <Enter> to view the sub menu to configure the Onboard Device.

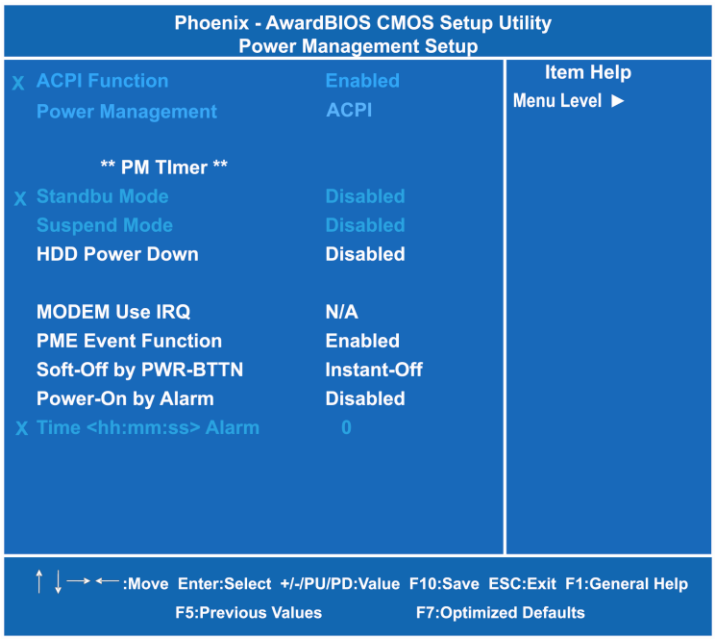


  - **Onboard Audio**
    Use this item to enable or disable the onboard audio.
  - **Onboard USB1.1**
    Enable this item if you are using the onboard USB1.1 in the system. You should disable this item if a higher-level controller is added.
  - **Onboard USB 2.0**
    Enable this item if you are using the onboard USB2.0 controller in the system.
  - **Onboard Lan Boot ROM**
    Use this item to enable or disable the Boot ROM function of the onboard LAN chip when the system boots up.

Press <Esc> to return to the Main Menu page.

4.9 Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn OFF video display after a period of inactivity.



- **ACPI Function**
  This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI). The function is always Enabled.
- **Power Management**
  This option allows you to select the type of power Management. The function is always ACPI.
- **Standby Mode**
  After the selected period of system inactivity (1 minute to 1 hour), the fixed disk drive and the video shut off while all other devices still operate at full speed. The default value is "Disabled".

Disabled	System will never enter STANDBY mode.
1/2/4/6/8/10/20/30/40 Min/1 Hr	Defines the continuous idle time before the system entering STANDBY mode. If any item defined in (J) is enabled & active, STANDBY timer will be reloaded.

- **Suspend Mode**
  After the selected period of system inactivity (1 minute to 1 hour), all devices except the CPU shut off. The default value is *"Disabled"*.

Disabled	System will never enter SUSPEND mode
1/2/4/6/8/10/ 20/30/40 Min/1 Hr	Defines the continuous idle time before the system entering SUSPEND mode. If any item defined in (J) is enabled & active, SUSPEND timer will be reloaded

- **HDD Power Down**
  If HDD activity is not detected for a specified length of time in this field, the hard disk drive will be powered down while other devices remain active.

- **Modem Use IRQ**

3, 4, 5, 7, 9, 10, 11, NA	For external modem, 3 or 4 will be used for card type modem. It is up to card definition. Default is 3.

- **Soft-Off by PWR-BTTN**
  This option only works with systems using an ATX power supply. It also allows the user to define which type of soft power OFF sequence the system will follow. The default value is *"Instant-Off"*.

Instant-Off	This option follows the conventional manner systems perform when power is turned OFF. Instant-Off is a soft power OFF sequence requiring only the switching of the power supply button to OFF
Delay 4 Sec.	Upon turning OFF system from the power switch, this option will delay the complete system power OFF sequence by approximately 4 seconds. Within this delay period, system will temporarily enter into Suspend Mode enabling you to restart the system at once.

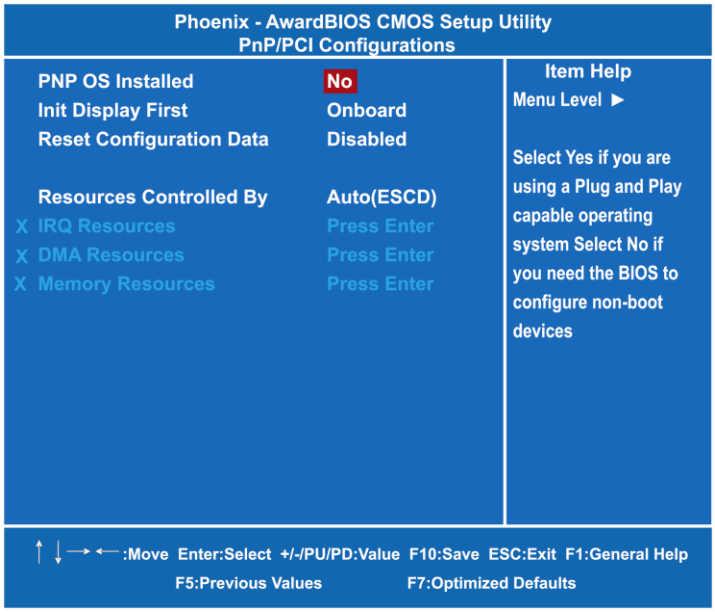
- **Power-On by Alarm**
  If enable this item, the system can automatically be powered on

after a fixed time in accordance with the system's RTC (realtime clock).

Press <Esc> to return to the Main Menu page.

4.10 PnP/PCI Configuration Setup

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



- **PNP OS Installed**
  Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 95). The default value is "*No*".
- **Init Display First**
  This item allows you to decide whether PCI Slot or AGP to be the first primary display card.

- **Reset Configuration Data**
  Normally, you leave this item Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup or if installing a new add-on cause the system reconfiguration a serious conflict that the operating system can not boot. Options are: "*Enabled*, *Disabled*".

- **Resources Controlled By**
  The Award Plug and Play BIOS can automatically configure all boot and Plug and Play-compatible devices. If you select Auto, all interrupt request (IRQ), DMA assignment, and Used DMA fields disappear, as the BIOS automatically assigns them. The default value is "*Manual*".

- **IRQ Resources**
  When resources are controlled manually, assign each system interrupt to one of the following types in accordance with the type of devices using the interrupt:
  1. Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
  2. PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

  The default value is "*PCI/ISA PnP*".

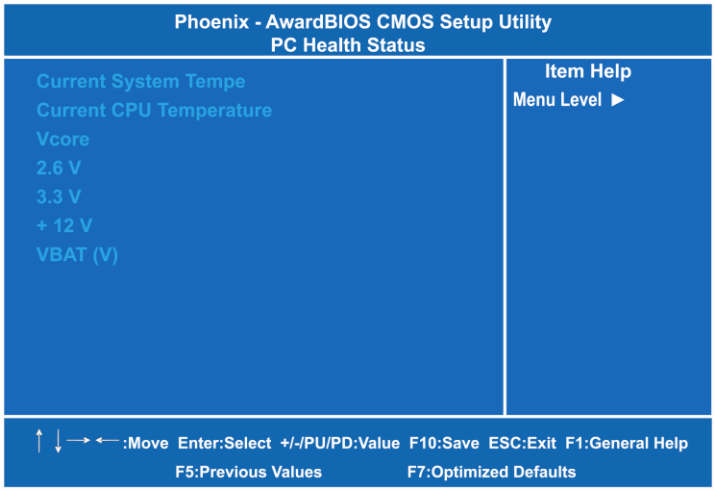
- **DMA Resources**
  When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:
  Legcy ISA Devices compliant with the original PC AT bus specification, requiring a specific DMA channel.
  PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.
  The default value is "*PCI/ISA PnP*".

- **Memory Resources**
  This sub menu can let you control the memory resource.

Press <Esc> to return to the Main Menu page.

4.11 PC Health Status

This section supports hardware monitering that lets you monitor those parameters for critical voltages, temperatures and fan speed of the board.

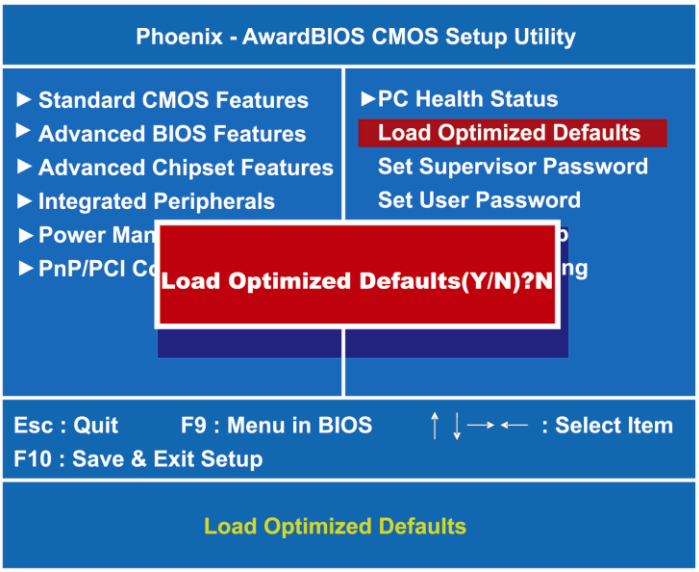


- **System Component Characteristics**
  These read-only items show you information about the system's current operating status, and the functions of the hardware thermal sensor monitoring the chipset blocks and system temperatures to ensure a stable system.
  1. System Temperature
  2. CPU Temperature
  3. CPU Voltage

Press <Esc> to return to the Main Menu page.

4.12 Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.



To load SETUP defaults value to CMOS SRAM, enter "Y". If not, enter "N".

4.13 Set Supervisor/User Password

You can set either supervisor or user password, or both of them. The differences between are:

1. **Supervisor password:** can enter and change the options of the setup menus.
2. **User password:** just can enter but do not have the right to change the options of the setup menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password with eight characters at most, and press <Enter>. The password typed will now clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

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

PASSWORD DISABLED.

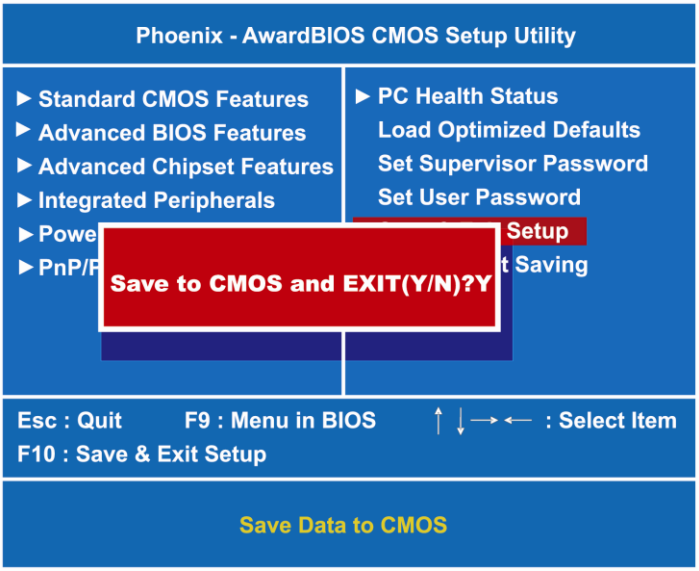
When a password is enabled, you have to type it every time you enter Setup. This prevents any unauthorized person from changing your system configuration.

Additionally when a password is enabled, you can also require the BIOS to request a password every time the system reboots. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password is required during boot up and entry into Setup. If set as "Setup", prompting will only occur prior to entering Setup.

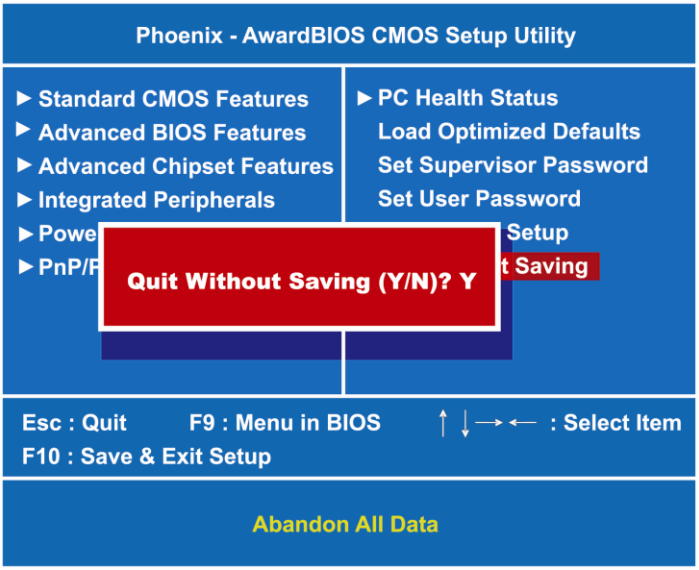
4.14 Save & Exit Setup

This allows you to determine whether or not to accept the modifications. Typing "Y" quits the setup utility and saves all changes into the CMOS memory. Typing "N" brigs you back to Setup utility.



4.15 Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.



APPENDIX A
WATCHDOG TIMER

Watchdog Timer Setting

The watchdog timer makes the system auto-reset while it stops to work for a period. The integrated watchdog timer can be setup as system reset mode by program.

Using the Watchdog Function

Start

↓

Un-Lock WDT:

O 2E 87 ; Un-lock super I/O
O 2E 87 ; Un-lock super I/O

↓

Select Logic device:

O 2E 07
O 2F 08

↓

Activate WDT:

O 2E 30
O 2F 01

↓

Set Second or Minute :

O 2E F5
O 2F N N=00 or 08(See below table)

↓

Set base timer :

O 2E F6
O 2F M=00,01,02,…FF(Hex) ,Value=0 to 255

↓

WDT counting re-set timer :

O 2E F6
O 2F M ; M=00,01,02,…FF(See below table)

; IF to disable WDT:

O 2E 30
O 2F 00 ; Can be disable at any time

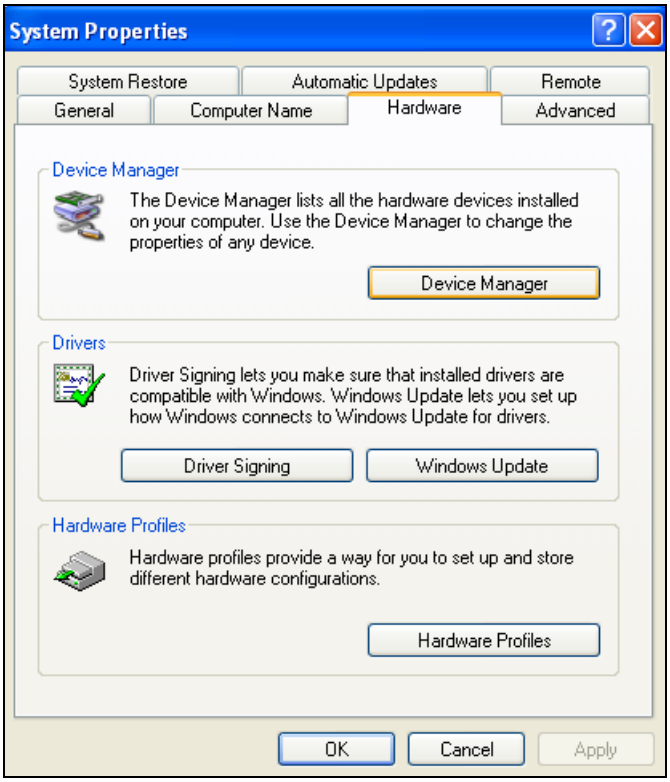
- Timeout Value Range
  - 1 to 255
  - Minute / Second
- Program Sample
  Watchdog timer setup as system reset with 5 second of timeout

2E, 87	
2E, 87	
2E, 07	
2F, 08	Logical Device 8
2E, 30	Activate
2F, 01	
2E, F5	
2F, N	Set Minute or Second N=08 (Min),00(Sec)
2E, F6	
2F, M	Set Value M = 00 ~ FF

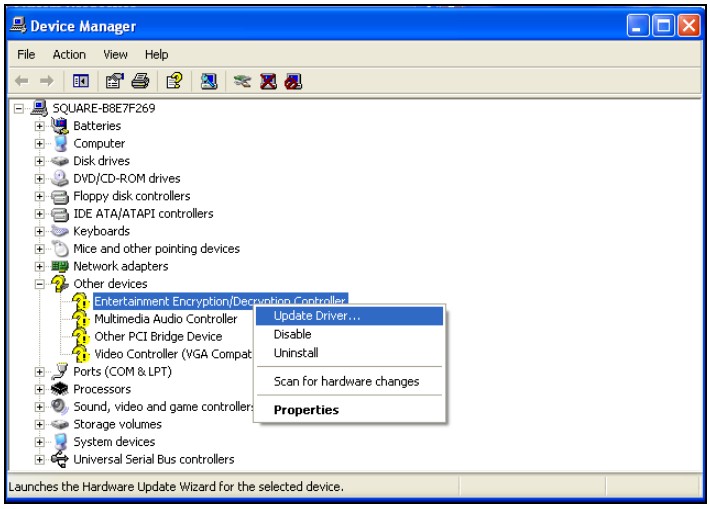
APPENDIX B
INSTALLATION OF DRIVERS

1. Installation of AES Driver

1-1. Click the "Device Manager" button.

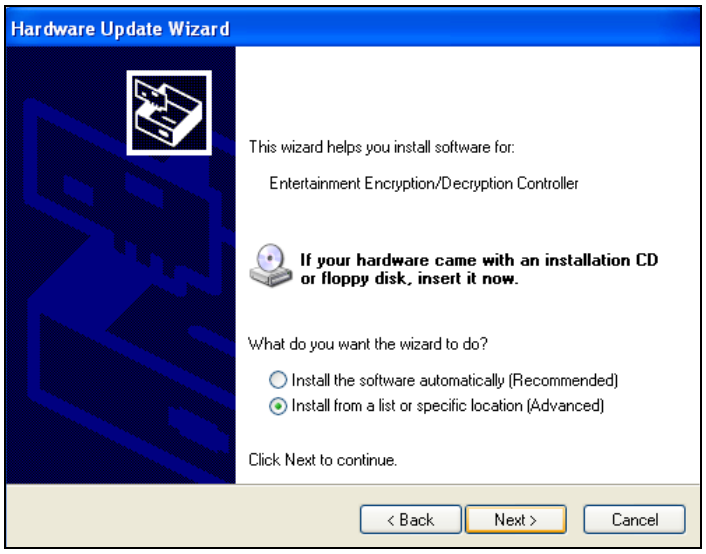


1-2. Click the "Update Driver" option.

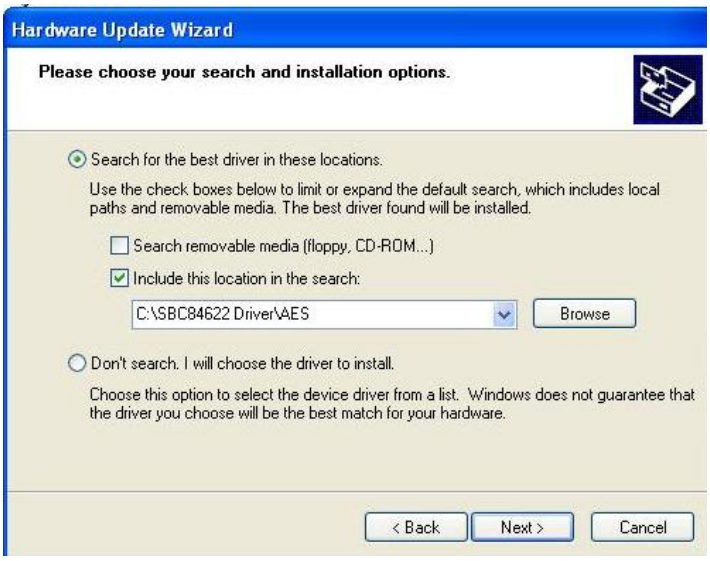


1-3. Click the "Next" button.

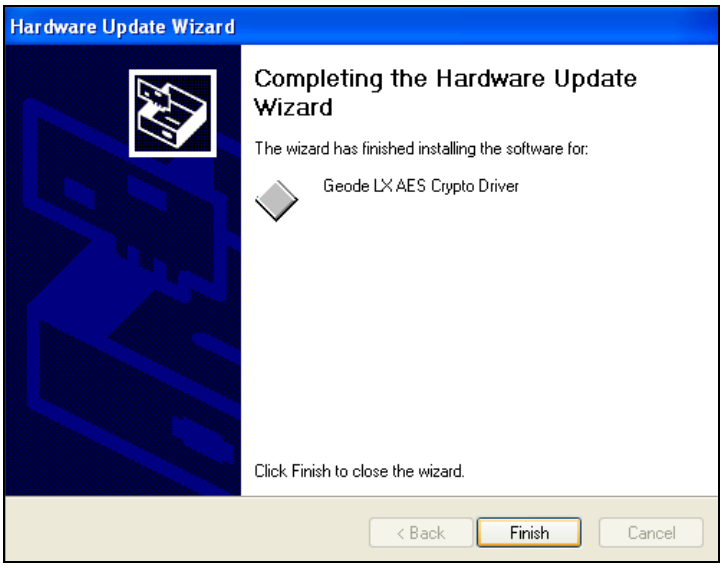
1-4. Click the "Next" button.



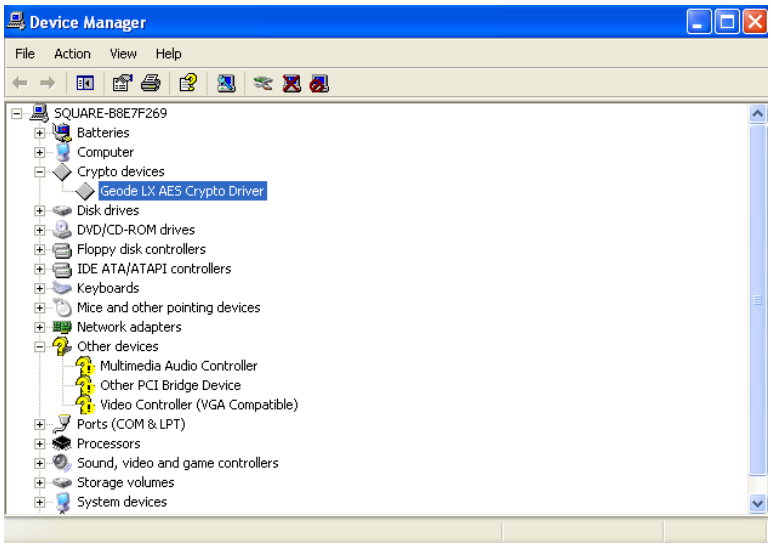
1-5. Click the "Browse" button to select AES Driver Folder, and then click the "Next" button.



1-6. Click the "Finish" button.

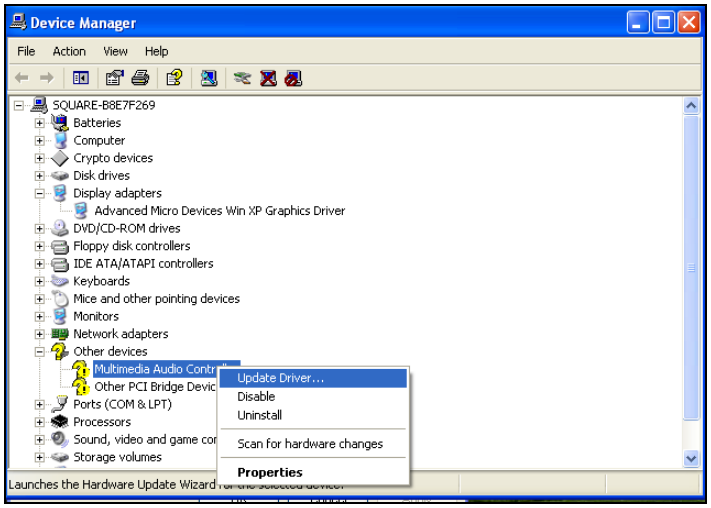


1-7. The Geode LX AES Crypto Driver installation is finished.



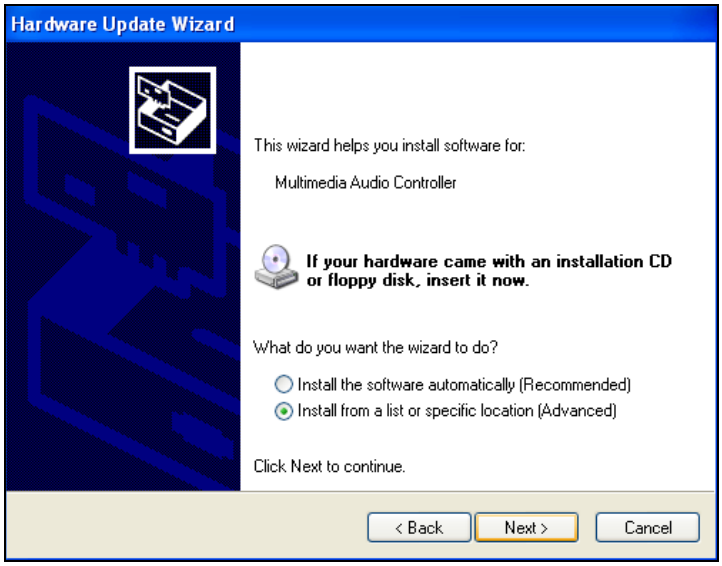
2. Installation of Audio Driver

2-1. Enter the "Device Manager" window, click right mouse button on the "Multimedia Audio Control" icon, and a pull-down list pops out. Please slect the "Update Driver" option.

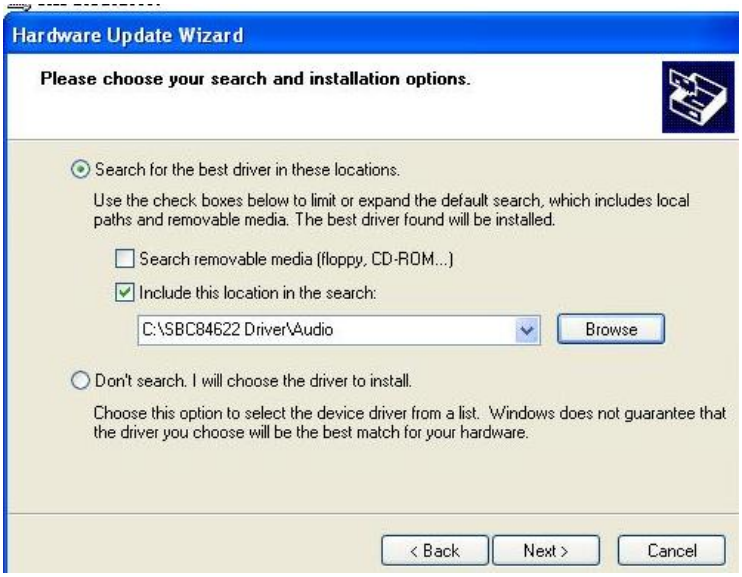


2-2. Click the "Next" button

2-3. Click the "Next" button.

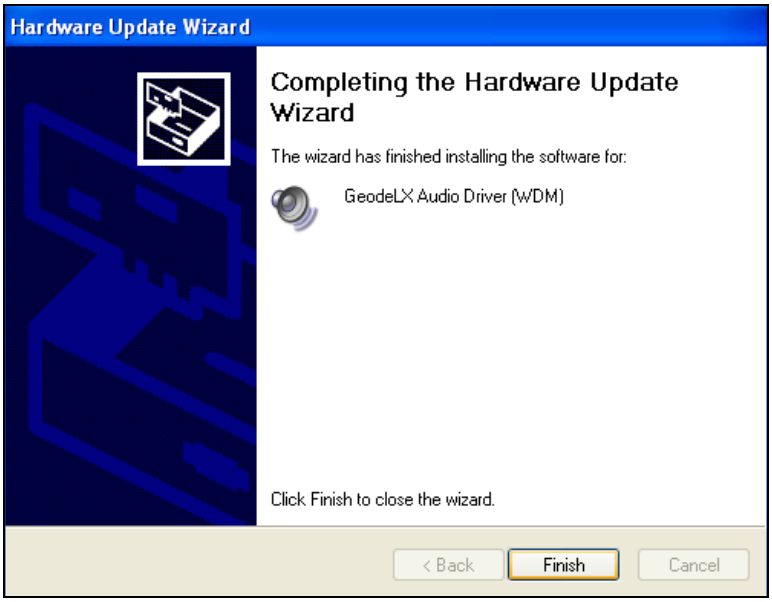


2-4. Click the "Browse" button to access the correct location of the Audio Driver folder, and then click the "Next" button.

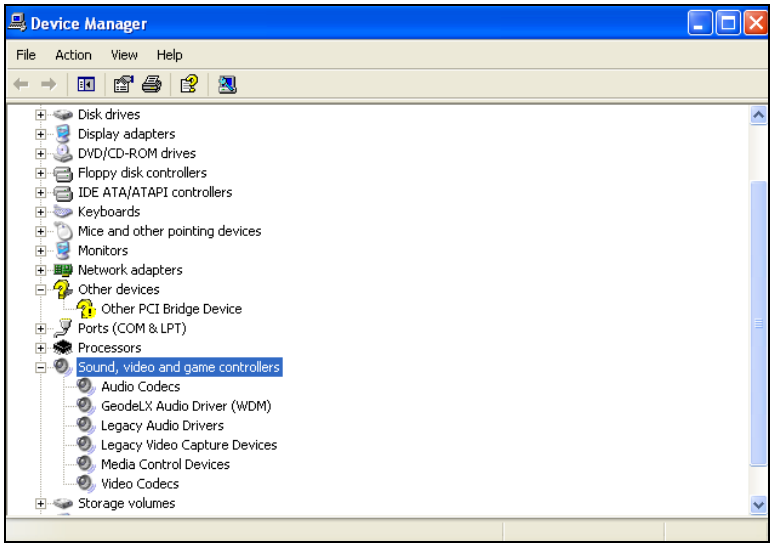


2-5. Click the "Continue Anyway" button.

2-6. Click the "Finish" button.

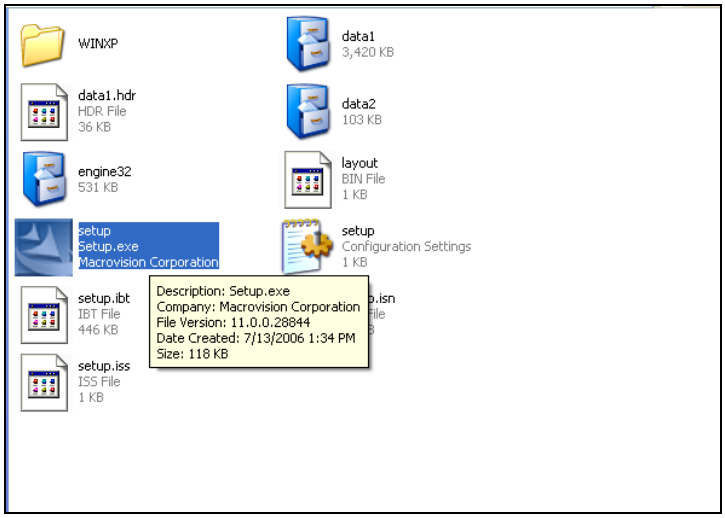


2-7. The Audio Driver installation is finished.

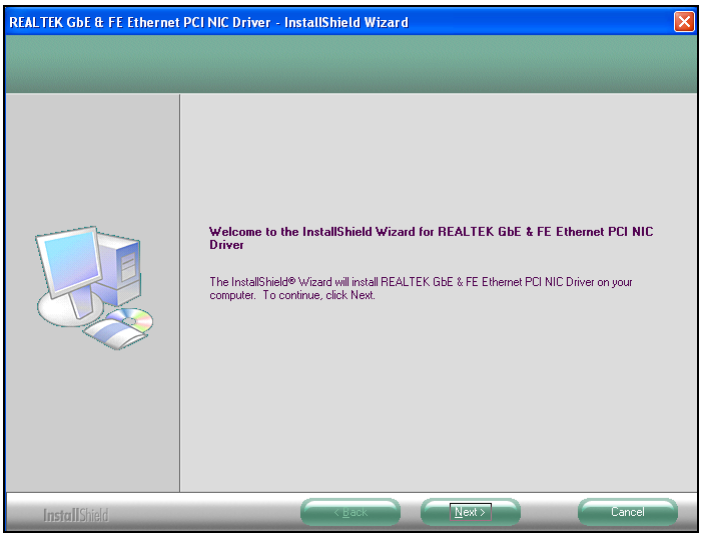


3. Installation of LAN Driver

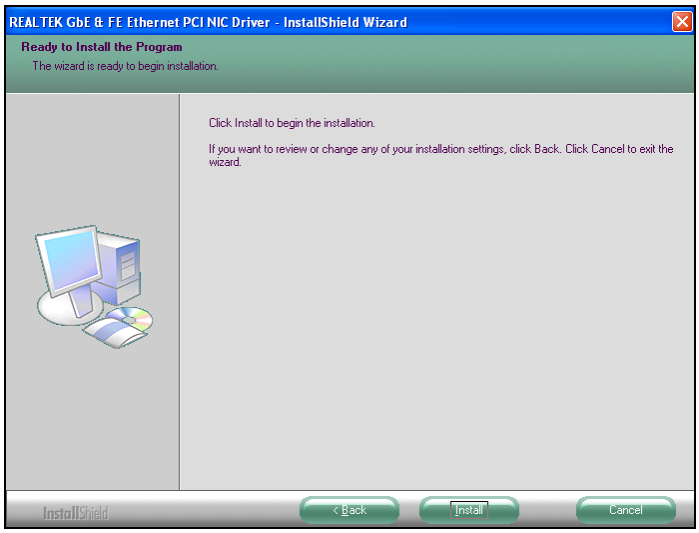
3-1. Click the "Setup" icon



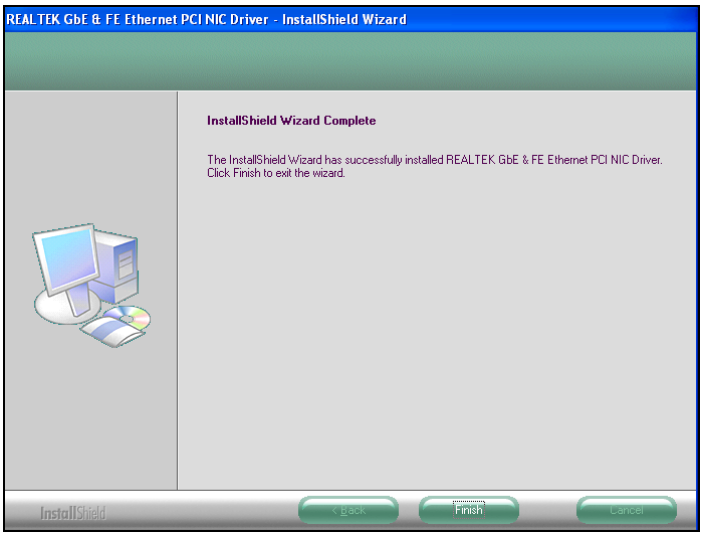
3-2. Click the "Next" button.



3-3. Click the "Install" button.

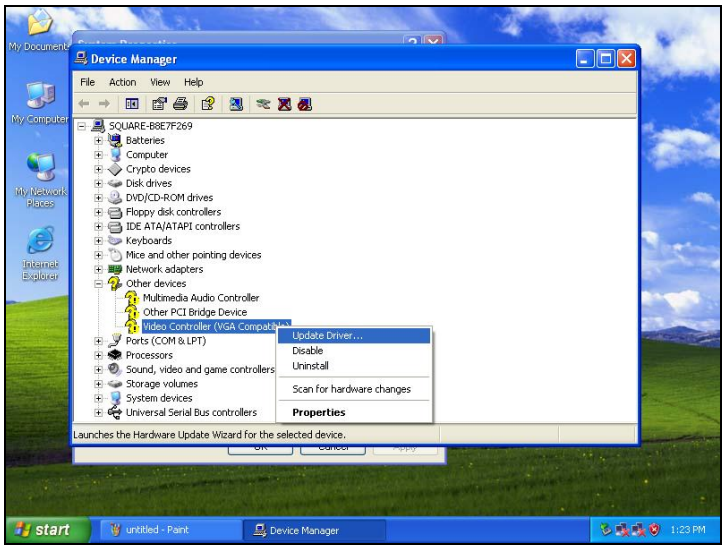


3-4. Click the "Finish" button.



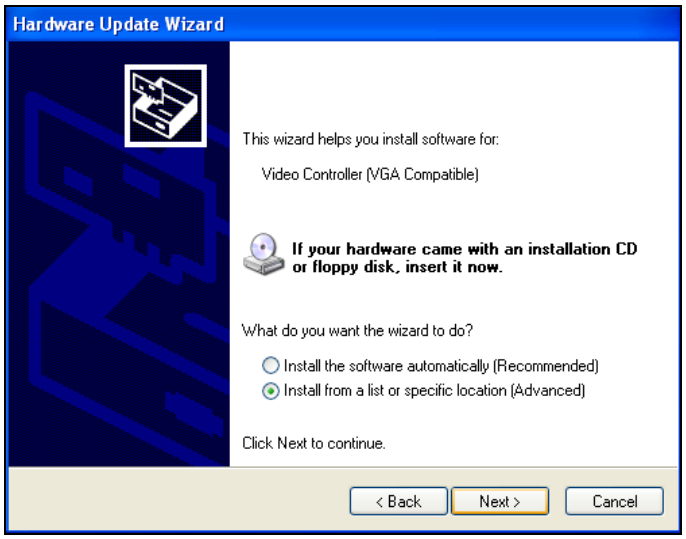
4. Installation of VGA Driver

4-1. Enter the "Device Manager" window, click right mouse button on the "Video Controller" ican, and a pull-down list pops out. Please click the "Update Driver" option.

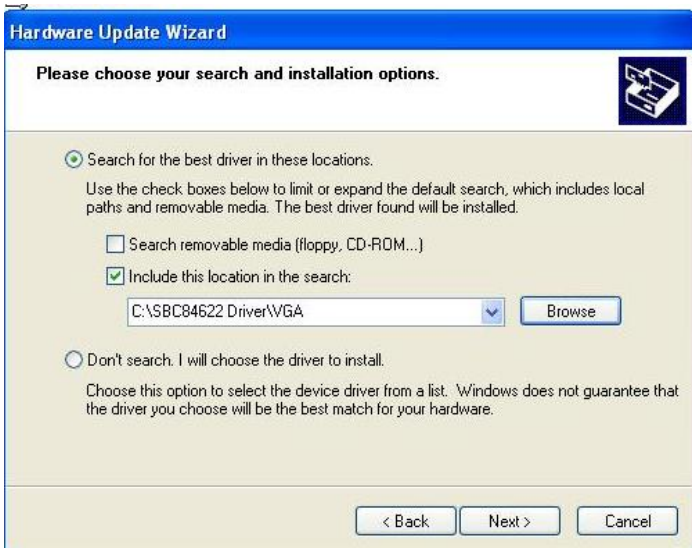


4-2. Click the "Next" button.

4-3. Click the "Next" button.

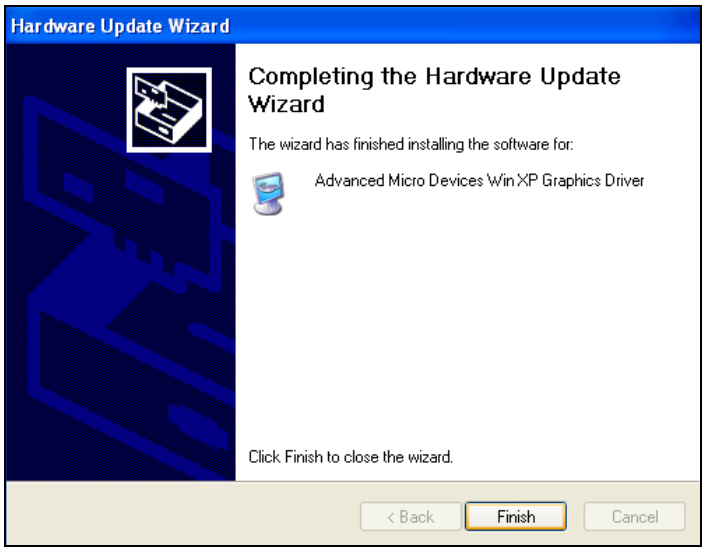


4-4. Click the "Browse" button to access the correct location of VGA driver.



4-5. Click the "Continue Anyway" button.

4-6. Click the "Finish" button.



*** Please reboot the syster after finishing all drivers' installation.**

MEMO

APPENDIX C
DIGITAL I/O

- GPI program sample:

O 2E 87	
O 2E 87	
O 2E 07	
O 2F 08	Select Device 8
O 2E 30	
O 2F F2	Activate GPIO5
O 2E E0	
O 2F FF	GPIO5 pins are programmed as input pins.
O 2E E1	Read only from pin
I 2F	Display input read value

- GPO program sample:

O 2E 87	
O 2E 87	
O 2E 07	
O 2F 08	Select Device 8
O 2E 30	
O 2F F2	Activate GPIO5
O 2E E0	
O 2F 00	GPIO5 pins are programmed as output pins.
O 2E E1	
O 2F FF	GPIO5 port output HI

MEMO