

# Gene-4312

All-in-One 3.5" Single Board  
NS Geode computer with LCD,  
Dual Ethernet, Audio & 2 COMs,  
(LVDS, TV-Output Type T & S  
models)

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2. Please prepare your manual, product, and any other helpful information for calling your dealer and then describe the problem.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it out after paying to your dealer for it.

## Packing list

---

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

- 1 GENE-4312 All-in-One Single Board Computer
- 1 Hard disk drive (IDE) interface cable (44 pin, pitch 2.0mm)
- 1 Floppy disk drive interface (34 pin, pitch 2.0mm)
- 1 6-pin mini-DIN dual outlet adapter for keyboard and PS/2
- 1 Parallel port (26-25 pin, pitch 2.0mm) mouse & serial port (10-9 pin, pitch 2.0mm) adapter kit
- 1 USB cable with bracket (2.00mm)
- 1 Audio 3.14-pin (2.00mm) and RCA jack cable 4-pin (2.54mm)
- 1 20cm 20-pin (2.0mm) for LVDS extension (Gene-4312 S & T)
- 1 bag of screws and miscellaneous parts
- 1 Quick Installation Guide
- 1 CD-ROM contains the followings:

**User Manual (this manual in PDF file)**

**Ethernet drivers and utilities**

**VGA drivers and utilities**

**Audio drivers and utilities**

**Lastest BIOS (as of the CD-ROM was made)**

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

## Notice

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Dear Customer,

Thank you for purchasing the GENE-4312 board. This user's manual is designed to help you to get the most out of the GENE-4312, please read it thoroughly before you install and use the board. The product that you have purchased comes with a two-year limited warranty, but AAEON will not be responsible for misuse of the product. Therefore, we strongly suggest you to read the manual first before using the product.

To get the latest version of the user manual, please visit our web site at:

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# Contents

Chapter 1:General Information .....	1
<b>Introduction .....</b>	<b>2</b>
<b>LVDS Introduction .....</b>	<b>3</b>
<b>Features .....</b>	<b>4</b>
<b>Specifications .....</b>	<b>5</b>
<b>Board Layout .....</b>	<b>8</b>
<b>Board Layout (Reverse Side) .....</b>	<b>9</b>
<b>Board dimensions .....</b>	<b>10</b>
<b>Board dimensions (Reverse Side) .....</b>	<b>11</b>
Chapter 2:Installation .....	13
<b>Jumpers .....</b>	<b>14</b>
<b>Connectors .....</b>	<b>15</b>
<b>Locating Jumpers &amp; Connectors .....</b>	<b>16</b>
<b>Locating Jumpers &amp; Connectors (Reverse side) .....</b>	<b>17</b>
<b>Setting jumpers .....</b>	<b>18</b>
<b>Installing SDRAM (SoDIMM-144pins).....</b>	<b>19</b>
<b>Composite Video Output Connector (JP1) .....</b>	<b>20</b>
<b>Clear CMOS (JP2) Pin 1-3 .....</b>	<b>20</b>
<b>IrDA Connector (JP3) .....</b>	<b>21</b>
<b>Onboard Buzzer / External Speaker Select JP2 (4-7) ...</b>	<b>21</b>
<b>Audio Connector (JP5) .....</b>	<b>22</b>
<b>COM2 RS-232/422/485 Select (JP12, JP4).....</b>	<b>22</b>
<b>LCD Driving Voltage Select (JP8 1-3-5) .....</b>	<b>23</b>
<b>LCD Backlight Voltage Select &amp; Output (JP8 2-4-6)</b> <b>(JP10) .....</b>	<b>23</b>
<b>Watchdog Timer Output Select (JP11) .....</b>	<b>24</b>
<b>LVDS Edge Trigger Select (JP13) (Type T &amp; S).....</b>	<b>24</b>
<b>LAN Port Enable/ Disable Select (J18) .....</b>	<b>25</b>
<b>IDE Hard Drive Connector (J2) .....</b>	<b>26</b>
<b>Serial Ports (J4, J5) .....</b>	<b>28</b>
<b>USB Connector (J7) .....</b>	<b>29</b>
<b>Keyboard and PS/2 Mouse Connector (J8) .....</b>	<b>29</b>

<b>Floppy Drive Connector (J9)</b> .....	<b>30</b>
<b>Parallel Port Connector (J10)</b> .....	<b>32</b>
<b>Display Connectors (J14, J16)</b> .....	<b>33</b>
<b>FAN Connector (J17)</b> .....	<b>33</b>
<b>LCD Connector (J14)</b> .....	<b>34</b>
<b>LVDS Interface Connector (J15) (Type T &amp; S)</b> .....	<b>35</b>
<b>Power LED &amp; HDD LED (J19)</b> .....	<b>35</b>
<b>100Base-T Ethernet Connector(LAN1,LAN2)</b> .....	<b>36</b>
<b>Power Connector (P1)</b> .....	<b>36</b>
<b>Chapter 3:Award BIOS Setup</b> .....	<b>37</b>
<b>Starting Setup</b> .....	<b>38</b>
<b>Setup Keys</b> .....	<b>39</b>
<b>Getting Help</b> .....	<b>40</b>
<b>Main Setup Menu</b> .....	<b>41</b>
<b>Standard CMOS Setup</b> .....	<b>43</b>
<b>BIOS Features Setup</b> .....	<b>48</b>
<b>CHIPSET Features Setup</b> .....	<b>52</b>
<b>Power Management Setup</b> .....	<b>55</b>
<b>PNP/PCI Configuration Setup</b> .....	<b>58</b>
<b>Load BIOS Defaults/Load Setup Defaults</b> .....	<b>60</b>
<b>Integrated Peripherals</b> .....	<b>61</b>
<b>Supervisor/User Password Setting</b> .....	<b>65</b>
<b>IDE HDD Auto Detection</b> .....	<b>67</b>
<b>Save &amp; Exit Setup</b> .....	<b>68</b>
<b>Exit without Saving</b> .....	<b>69</b>
<b>Chapter 4:Drivers Installation</b> .....	<b>71</b>
<b>Software Drivers</b> .....	<b>72</b>
<b>Necessary Prerequisites</b> .....	<b>73</b>
<b>Installing VGA &amp; Audio Drivers</b> .....	<b>74</b>
<b>Installing Ethernet Driver</b> .....	<b>77</b>
<b>Ethernet Software Configuration</b> .....	<b>78</b>
<b>Appendix A:Programming the Watchdog Timer</b> .....	<b>79</b>

## ***General Information***

This chapter gives background information on the mainboard.

Sections include:

- ❖ **Board specifications**
- ❖ **Layout and dimensions**

# Introduction

---

The GENE-4312 is an all-in-one NS GX1 processor based single board computer (SBC) with an AC97 2.0 compliant audio codec , a PCI Flat Panel controller, two 100Base-T Ethernet interfaces and a PC/104 for expansion. This compact (only 5.75" x 4") unit offers all the functions of a single board industrial computer, but still fits in the space of a HDD drive.

Onboard features include two serial ports (one RS-232, one RS-232/422/485), one multi-mode parallel (ECP/EPP/SPP) port, pin header for two USB (Universal Serial Bus) ports, a floppy drive controller, and a keyboard/PS/2 mouse interface. The built-in high speed PCI IDE controller supports Ultra DMA/33 mode. Up to two IDE devices can be connected, including large hard disks, CD-ROM drives, and tape backup drives, etc.

The GENE-4312 also features power management to minimize power consumption. It complies with the ACPI standard and supports three types of power saving features: Doze mode, Standby mode, and Suspend mode. In addition, the board's watchdog timer can automatically reset the system or generate an interrupt in case the system stops due to a program bug or SMI.

## Highly integrated multi-media SBC

The GENE-4312 is a highly integrated multi-media SBC that combines audio, video, and network functions on a HDD drive size single computer board. It provides integrated 3D audio and up to 1024 x 768 resolution @ 64K colors with UMA 4MB SDRAM display memory. Major onboard devices adopt PCI technology to achieve outstanding computing performance when used with NS GX1 level processors, making the GENE-4312 one of the world's smallest and most powerful all-in-one multimedia boards.

## LVDS Introduction

---

Low Voltage Differential Signaling (LVDS) is a low noise, low power, low amplitude method for high-speed (gigabits per second) data transmission over copper wire.

LVDS differs from normal input/output (I/O) in a few ways: Normal digital I/O works with 5 volts as a high (binary 1) and 0 volts as a low (binary 0). When you use a differential, you add a third option (-5 volts), which provides an extra level with which to encode and results in a higher maximum data transfer rate.

A higher data transfer rate means fewer wires are required, as in UW (Ultra Wide) and UW-2/3 SCSI harddrive, which use only 68 wires. These devices require a high transfer rate over short distances. Using standard I/O transfer, SCSI hard drives would require a lot more than 68 wires. Low voltage means that the standard 5 volts is replaced by either 3.3 volts or 1.5 volts. LVDS uses a dual wire system, running 180 degrees of each other. This enables noise to travel at the same level, which in turn can get filtered more easily and effectively.

With standard I/O signaling, data storage is contingent upon the actual voltage level. Voltage level can be affected by wire length (longer wires increase resistance, which lowers voltage). But with LVDS, data storage is distinguished only by positive and negative voltage values, not the voltage level. Therefore, data can travel over greater lengths of wire while maintaining a clear and consistent data stream.

# Features

---

- 3.5" HDD SubCompact Form Factor
- Supports NS Geode GX1 Low-power BGA CPUs
- Supports CRT and 18-bit TFT Panels
- LVDS interface
- two 10/100Base-T Fast Ethernet
- Integrated AC-97 2.0 SoundBlaster compatible Audio
- Supports Compact Flash Storage
- 2 COMs/1 Parallel/2 USB/1 IrDA Port
- 5V only power supply

# Specifications

---

## ● Standard SBC Functions

**CPU :** NS Geode GX1 (low-power) 300MHz (available in different speeds by request)

**CPU type:** Onboard BGA

**BIOS:** Award 256KB FLASH BIOS

**Chipset:** NS CS5530A

**I/O Chipset:** Winbond W83977F. Fully 16-bit I/O decoded

**Memory :** Onboard one 144-pin SODIMM socket supports up to 128 Mbytes SDRAM

**Enhanced IDE:** Supports two IDE devices. Supports Ultra DMA/33 mode with data transfer rate up to 33MB/sec.

**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)

**Parallel port:** Internal header for bi-directional parallel port x 1. Supports SPP, ECP, and EPP modes

**Serial port:** One external DB-9 connector supports RS-232 x 1, one internal header supports RS-232/422/485 x 1. Ports can be configured as COM1, COM2, or disabled individually (16C550 equivalent)

**IR interface:** Supports one IrDA Tx/Rx header

**KB/Mouse connector:** Mini-DIN connector supports Keyboard and PS/2 mouse

**USB connectors:** One 5 x 2 header onboard supports dual USB ports

**Battery:** Lithium battery for data retention

**Watchdog Timer:** Can generate a system reset or IRQ15. Supports Win98, Win3.1. Software selectable time-out interval (15 sec. ~ 3825sec., 15 sec./step)

**DMA:** 7 DMA channels (8237 equivalent)

**Interrupt:** 15 interrupt levels (8259 equivalent)

**Power management:** I/O peripheral devices support power saving and doze/standby/suspend modes. APM 1.2 compliant

**H/W status monitoring:** Winbond W83781D H/W status monitoring IC supports power supply voltages, fan speed, and temperatures monitoring

### ❁ Flat Panel/CRT Interface

**Chipset:** NS CS5530A

**Display memory:** Shared UMA up to 4MB

**Display type:** Supports non-interlaced CRT and up to 18-bit TFT LCD displays. Can display both CRT and flat panel simultaneously

**Resolution:** Up to 1024x768 @ 64K colors (CRT/LCD simultaneous display)

### ❁ RCA TV-Out Connector

**Chipset:** Chrontel 7003B-T

### ❁ LVDS Interface (Optional)

**Chipset:** Thine THC63LVDM63A

**Transmitting capability:** 18-bit panel signal over 10 meters cable

### ❁ Audio Interface

**Chipset:** AD1819B

**3D audio supports:** Microsoft DirectSound and DirectSound 3D audio technology in two-speaker mode (requires Microsoft Direct Sound 3D supported software titles)

**16-bit stereo digital audio:** Full-duplex supports enables simultaneous record and playback for Internet communications software

## ❁ Ethernet Interface

**Chipset:** Dual Realtek 8139C 10/100Base-T Fast Ethernet controller

**Ethernet interface:** Dual Onboard 10/100Base-T RJ-45 connector.

Optional Remote Boot ROM function

## ❁ SSD Interface

One socket supports Compact Flash Disk

## ❁ Expansion Interface

**PC/104 connector:** One 16-bit 104-pin connector onboard Connectors

**External connectors:** VGA (DB-15), COM 1 (DB-9), Ethernet (RJ-45), KB/  
Mouse (Mini-DIN)

**Power connectors:** 4-pin HDD type

## ❁ Mechanical and Environmental

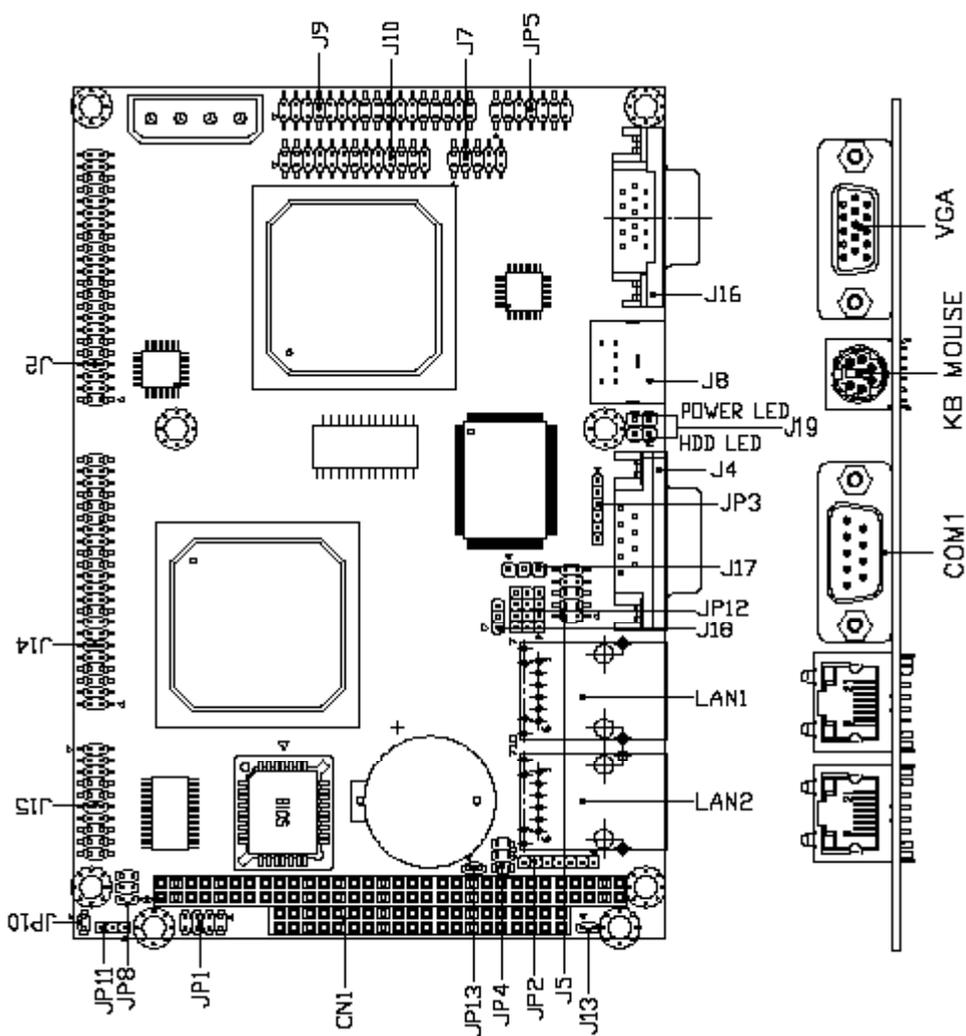
**Power supply voltage:** +5V (4.75V to 5.25V)

**Operating temperature:** 32 to 140 °F ( 0 to 60 °C)

**Board size:** 5.75" (L) x 4" (W) (146 mm x 101.6 mm)

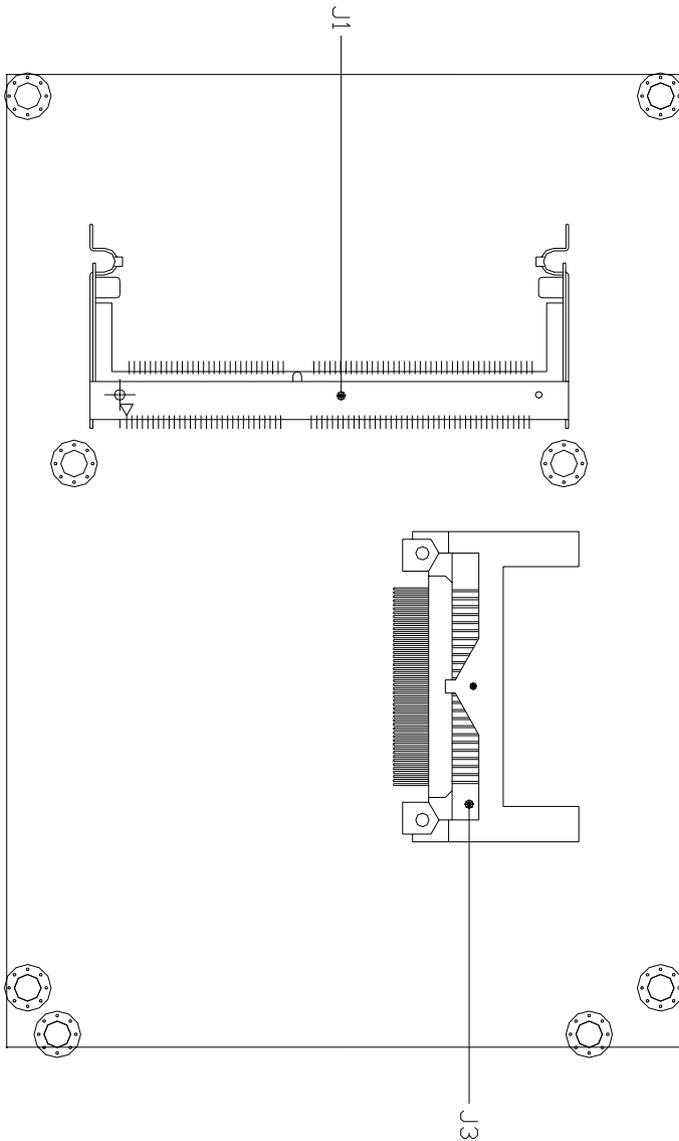
**Weight:** 0.88 lb. (0.4 Kg)

# Board Layout



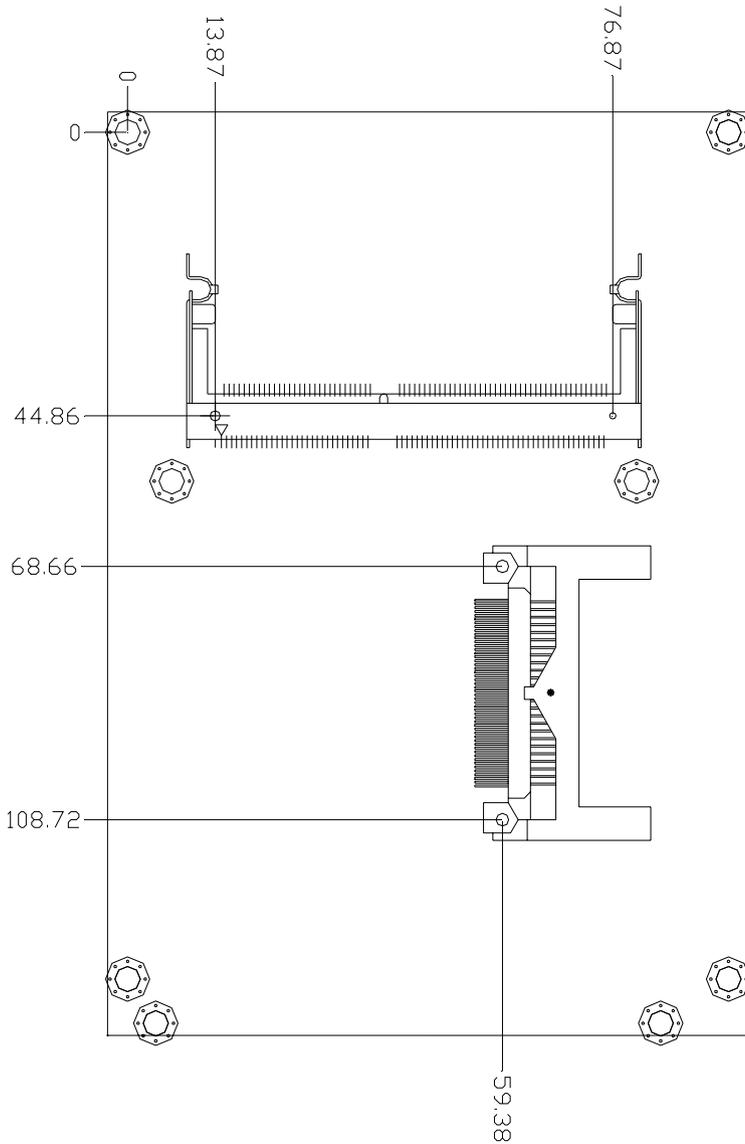
# Board Layout (Reverse Side)

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# Board Dimensions (Reverse Side)





## ***Installation***

This chapter describes how to set up the main board hardware, including instructions on setting jumpers and connecting peripherals, switches, and indicators. Be sure to read all the safety precautions before you begin the installation procedure.

## Jumpers

---

Connectors on the board link themselves to external devices , such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers allowing you to configure your system to suit your applications.

The following tables list the function of each jumper and connector on the board.

---

<b>Jumpers</b>	
<b>Label</b>	<b>Function</b>
JP2 (1~3)	Clear CMOS
JP2 (4~7)	Onboard buzzer and external speaker select
JP4	COM2 RS232/422/485 select
JP12	COM2 RS232/422/485 select
JP8 (1-3-5)	LCD Panel voltage select
JP8 (2-4-6)	LCD Backlight voltage select
JP11	Watchdog Timer output select
JP13	LVDS Edge Trigger select (Type S & T)
J18	LAN Port Enable/Disable

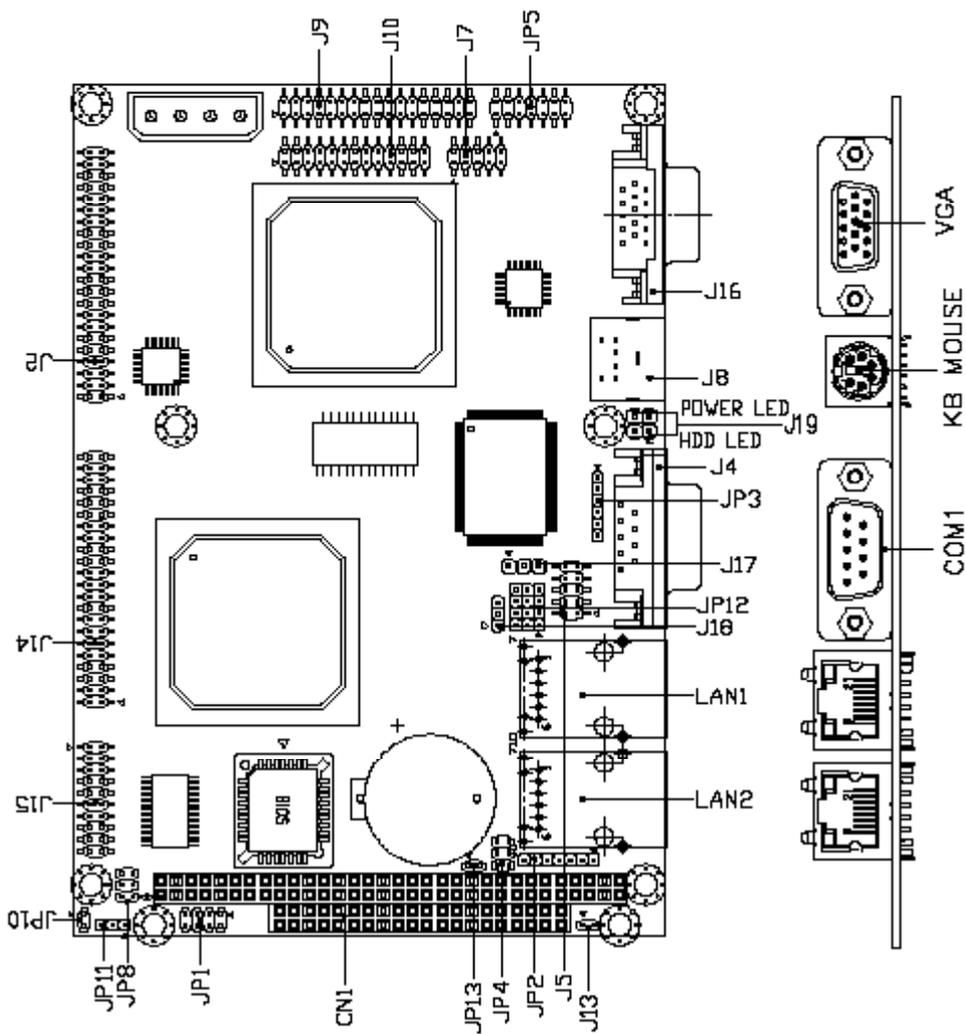
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# Connectors

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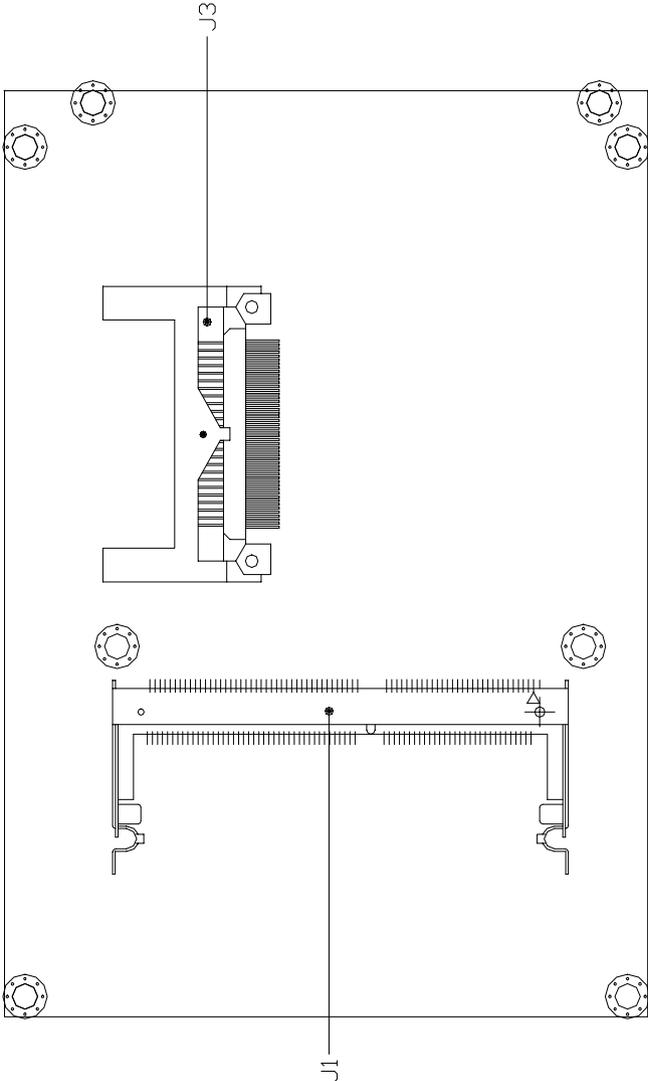
Connectors	
Label	Function
J1	SoDIMM 144 Pin socket
J2	IDE connector (2.0 mm)
J3	Compact Flash Disk socket
J4	COM1 D-SUB 9 Pin connector
J5	COM2 RS232/422/485 connector (2.0 mm)
J7	Dual USB connector (2.0 mm)
J8	PS/2 Mouse and Keyboard connector
J9	FDD connector (2.0 mm)
J10	LPT1 Parallel Port connector (2.0 mm)
J13	Reset Switch connector
J14	LCD connector (2.0 mm)
J15	LVDS interface connector (2.0 mm) (Type S & T)
J16	VGA D-SUB connector
J17	FAN connector (Reserved)
J19	Power LED/HDD LED
JP1	TV-out connector (2.0mm) (Type T)
JP3	IR connector
JP5	Audio connector (2.0 mm)
JP10	LCD Backlight Voltage connector (2.0 mm)
CN1	PC104 connector
LAN1	RJ45 connector with LED indicator
LAN2	RJ45 connector with LED indicator

## Locating Jumpers & Connectors



# Locating Jumpers & Connectors (Reverse side)

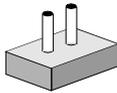
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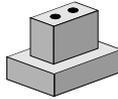
## Setting Jumpers

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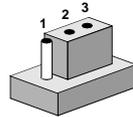
You can configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To close a jumper you have to connect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



**Open**



**Closed**



**Closed 2-3**

The jumper settings are schematically depicted in this manual as follows:



**Open**



**Closed**



**Closed 2-3**

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

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

## Installing SDRAM (SoDIMM-144pins)

---

### System Memory

The reverse side of the Gene-4312 contains a socket for 144-pin dual inline memory module (SoDIMM). The socket uses 3.3 V unbuffered synchronous SDRAM and is available in capacities of 16, 32, 64, or 128 MB. The socket can be filled in the SoDIMM of any size, giving your Gene-4312 single board computer between 16 and 128 MB of memory.

### Supplementary information about DIMM

Your Gene-4312 can accept regular PC-100/133 SDRAM SoDIMM Module(with or without parity).

Single-sided modules are typically 16 or 64 MB; double-sided modules are usually 32, 128MB.

## Composite Video Output Connector (JP1) (Type T Only)

---

The Gene-4312 has a RCA Jack and a S-terminal for transferring composite video signal to the TV. These two connectors are located on the daughter board. A cable connects the two boards and the 8-pin definition is provided below.

---

TV-Out 4*2 Pin Connector (2.0mm) (JP1)			
Pin	Signal	Pin	Signal
1	LUMF	2	Composite
3	GND	4	GND
5	CHROMF	6	NC
7	GND	8	NC

---

## Clear CMOS (JP2) Pin 1-3

---

You can use JP2 pin 1-3 to clear the CMOS data if necessary. To reset the CMOS data, set JP2 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed.

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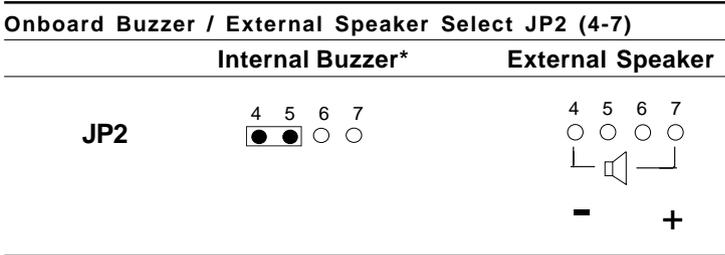
Clear CMOS (JP2) Pin 1-3		
	Protect*	Clear CMOS
JP2	1 	1 <input type="radio"/>
	2 	2 
	3 <input type="radio"/>	3 

---

\*default

# Onboard Buzzer / External Speaker Select JP2 (4-7)

---



\* default

## IrDA Connector (JP3)

---

The IrDA connector (JP3) can be configured to support wireless infrared module, with this module and application software, such as laplink or Win95/98 Direct Cable connection, user can transfer files to or from laptops, notebooks, PDA and printers. This connector supports HPSIR (115.2Kbps, 2 meters), ASK-IR (56Kbps) and Fast IR (4Mbps, 2 meters).

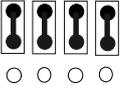
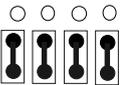
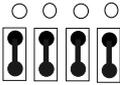
Install infrared module onto IrDA connector and enable infrared function from BIOS setup. And make sure to have correct orientation when you plug onto IrDA connector (JP3).

IrDA connector (JP3)	
Pin	Signal
1	Vcc
2	IrRxH
3	IrRx
4	GND
5	IrTx
6	CIRRX

## COM2 RS-232/422/485 Select (JP12, JP4)

The Gene-4312 COM2 serial port can be selected as RS-232, RS-242, or RS-485 by setting JP12 and JP4.

### COM2 Select (JP12, JP4)

	RS-232*	RS-422	RS-485
JP12	1 4 7 10  3 6 9 12	1 4 7 10  3 6 9 12	1 4 7 10  3 6 9 12
	1 3 5  2 4 6	1 3 5  2 4 6	1 3 5  2 4 6

\*default

## Audio Connector (JP5)

The Gene-4312 provides all major audio signals on a 14-pin flat-cable connector, JP5.

Attach the Mic In, Line In, and Audio Out to the corresponding pins as shown in the following table.

### Audio Connector (JP5)

Pin	Signal	Pin	Signal
1	MIC In	2	MIC_Vcc
3	GND	4	CD_GND
5	Line In Left	6	CD_Left
7	Line In Right	8	CD_GND
9	GND	10	CD_Right
11	Audio Out Left	12	Audio Out Right
13	GND	14	GND

## LCD Driving Voltage Select (JP8 1-3-5)

You can select the LCD connector J14 (pin 5 and pin 6) driving voltage by setting JP8 1-3-5. The configurations are as follows:

### LCD Driving Voltage Select (JP8 1-3-5)

	5V	3.3V *
<b>JP8</b>	1  ○ 2 3  ○ 4 5 ○ ○ 6	1 ○ ○ 2 3  ○ 4 5  ○ 6

\*default

## LCD Backlight Voltage Select & Output (JP8 2-4-6) (JP10)

You can set the JP10 for LCD backlight voltage to 5V or 12V output, by configuring JP8 2-4-6. The configurations are as follows:

### LCD Backlight Voltage Select (JP8 2-4-6)

	5V*	12V
<b>JP8</b>	1   2 3   4 5 ○ ○ 6	1  ○ 2 3   4 5 ○  6

\*default

### LCD Backlight Voltage Output (JP10)

Pin	Signal
1	Backlight Vcc
2	GND

## Watchdog Timer Output Select (JP11)

---

The Gene-4312 is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for whatever reason. This feature ensures system reliability in industrial standalone, or unmanned environment.

---

### Watchdog Timer Output Select (JP11)

---

	IRQ15	Reset *
JP11		

---

\*default

## LVDS Edge Trigger Select (JP13) (Type T & S)

---

The LVDS edge trigger select is only used for Gene-4312 type T & S model. The trigger acts like a power switch to either activate the LVDS system or shut it down.

---

### LVDS Edge Trigger Select (JP13)

---

	Falling Edge *	Rising Edge
JP13		

---

\*default

# LAN Port Enable/ Disable Select (J18)

---

The Gene-4312 is equipped with dual Ethernet function. This jumper setting could disable one of the ethernet function

---

## LAN Port Enable/Disable Select (J18)

**LAN1 Disabled    LAN2 Disabled    Both LAN Enabled**

---

**J18**



## IDE Hard Drive Connector (J2)

---

You can attach one or two Enhanced Integrated Device Electronics hard disk drives to the Gene-4312 internal controller. The Gene-4312 IDE controller uses the advanced PCI local-bus interface to support faster data transfer.

### Connecting the hard drive

Connecting drives is done in a daisy-chain fashion and requires one of two cables, depending on the drive size.

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

1. Connect one end of the cable to J2. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).
2. Plug the other sude of the cable to the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drives. (see your hard drive's documentation for the location of the connector).

Connect a second drive as described above.

Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the master and the other as the slave by using jumpers on the drives. If you install just one drive, set it as the master.

## IDE Hard Drive Connector (J2)

IDE Hard Drive Connector (J2)			
Pin	Signal	Pin	Signal
1	IDE 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	SIGNAL GND	20	NC
21	DREQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	ALE
29	DACK#	30	GND
31	IRQ14	32	IOCS16
33	ADDR 1	34	NC
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0	38	HARD DISK SELECT 1
39	IDE ACTIVE	40	MGND
41	VCC	42	MVCC
43	GND	44	NC

# Serial Ports (J4, J5)

---

The Gene-4312 offers two serial ports, RS-232 and RS-232/422/485 allowing you to connect them to serial devices (mouse, printers, etc.).

## COM 2 RS-232/422/485 serial ports (J5)

<b>COM1, COM2, RS-232/422/485 Serial Port</b>				
	<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
<b>COM1</b>	1	DCDB	2	RXDB
	3	TXDB	4	DTRB
	5	GND	6	DSRB
	7	RTSB	8	CTSB
	9	RIB	10	NC
<b>COM2</b>	1	DCDB (485DTXD-)	2	RXDB (422RXD+)
	3	TXDB (485TXD+)	4	DTRB (422RXD-)
	5	GND	6	DSRB
	7	RTSB	8	CTSB
	9	RIB	10	NC

## USB Connector (J7)

---

The Gene-4312 provides two 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. 1.0, and can be disabled in the system BIOS setup.

---

**USB Connector (J7)**

---

Pin	Function	Pin	Function
1	USB Vcc	2	GND
3	UD0-	4	USB GND
5	UD0+	6	UD1+
7	USB GND	8	UD1-
9	GND	10	USB Vcc

---

## Keyboard and PS/2 Mouse Connector (J8)

---

The Gene-4312 provides a keyboard connector which supports both a keyboard and a PS/2 style mouse. In most cases, especially in embedded applications, a keyboard is not used. The standard PC/AT BIOS will report an error or fail during power-on-self-test (POST) after a reset if the keyboard is not present. The mainboard BIOS Advanced setup menu allows you to select "Present" or "Absent" under the "System Keyboard" section. This allows no-keyboard operating in embedded system applications without the system halting under POST (power-on-self-test).

---

**Keyboard and Mouse Connector (J8)**

---

Pin	Signal
1	KB DATA
2	MS DATA
3	GND
4	Vcc
5	KB CLOCK
6	MS CLOCK

---

## Floppy Drive Connector (J9)

---

You can attach up to two floppy drives to the mainboard controller. You can use any combination of 5.25" (360 KB and 1.2 MB) and/or 3.25" (720 KB, 1.44 MB, and 2.88 MB) drives.

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, and 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 3.25" 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 J9. And make sure 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, and 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 3.25" 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.

If you desire, connect the B: drive to the connectors in the middle of the cable as described above.

## Floppy Drive Connector (J9)

<b>Floppy Drive Connector (J9)</b>			
<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
1	GND	2	DENSITY SELECT
3	GND	4	NC
5	GND	6	DRIVE TYPE
7	GND	8	INDEX
9	GND	10	MOTOR 0
11	GND	12	DRIVE SELECT 1
13	GND	14	DRIVE SELECT 2
15	GND	16	MOTOR 1
17	GND	18	DIRECTION
19	GND	20	STEP
21	GND	22	WRITE DATA
23	GND	24	WRITE GATE
25	GND	26	TRACK 0
27	GND	28	WRITE PROTECT
29	GND	30	READ DATA
31	GND	32	HEAD SELECT
33	GND	34	DISK CHANGE

## Parallel Port Connector (J10)

---

Normally, the parallel port is used to connect the board to a printer. The Gene-4312 includes an onboard parallel port, accessed through PC1, a 26-pin flat-cable connector. You need an adapter cable if you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other.

### Parallel port IRQ

The Gene-4312 supports one parallel port designated as LPT1 and can be disabled or changed to LPT2 or LPT3 in the system BIOS setup.

### Parallel Port Connector Table (J10)

<b>Parallel Port Connector (J10)</b>			
<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
1	STROBE	2	AUTOFD
3	DO	4	ERR
5	D1	6	INIT
7	D2	8	SLCTINI
9	D3	10	GND
11	D4	12	GND
13	D5	14	GND
15	D6	16	GND
17	D7	18	GND
19	ACK	20	GND
21	BUST	22	GND
23	PE	24	GND
25	SLCT	26	NC

## Display Connectors (J14, J16)

---

The Gene-4312 PCI SVGA interface can drive conventional CRT displays and is capable of driving a wide range of flat panel displays, including electroluminescent (EL), gas plasma, passive LCD, and active LCD displays. The board has two connectors to support these displays, one for standard CRT VGA monitors and the other for flat panel displays.

### VGA D-SUB Connector (J16)

A simple one-to-one adapter can be used to match J16 to a standard 15-pin D-SUB connector commonly used for VGA.

Pin	Signal	Pin	Signal
1	Red video	9	DENSITY SELECT (no pin)
2	Green video	10	Sync return (GND)
3	Blue video	11	Monitor ID (not used)
4	Not used	12	Monitor ID
5	GND	13	Horizontal Sync
6	Red returned(GND)	14	Vertical Sync
7	Green returned(GND)	15	Not used
8	Blue returned (GND)		

## FAN Connector (J17)

---

### FAN Connector (J17)

Pin	Signal
1	GND
2	FAN VCC
3	FAN Sensor

## LCD Connector (J14)

---

J14 is a 44-pin, dual-in-line header used for flat panel displays.

When the power of mainboard is applied, the control signal is low until the relevant flat panel signals are present.

Configuration of the VGA interface is done completely via the software utility. You don't need to set any jumpers.

---

### LCD Connector (J14)

---

Pin	Signal	Pin	Signal
1	+12 V <sub>DC</sub>	2	+12 V <sub>DC</sub>
3	GND	4	GND
5	LCDVCC	6	LCDVCC
7	ENAVEE	8	GND
9	GND	10	GND
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	GND	18	GND
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	GND	26	GND
27	P18	28	P19
29	P20	30	P21
31	P22	32	P23
33	GND	34	GND
35	SHF CLK	36	FLM (V SYS)
37	M	38	LP (H SYS)
39	GND	40	ENABKL
41	GND	42	NC
43	LCDVCC	44	LCDVCC

---

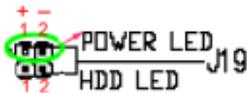
## LVDS Interface Connector (J15) (Type T & S)

Gene-4312 supports one 20-pin header for LVDS functions connection. For further details, please check the following pin definition.

LVDS Interface Connector (J15)			
Pin	Signal	Pin	Signal
1	TX1+	2	TX1-
3	GND	4	GND
5	TXCLK+	6	TXCLK-
7	GND	8	PPVCC
9	PPVCC	10	PPVCC
11	TX2+	12	TX2-
13	GND	14	GND
15	TX0+	16	TX0-
17	GND	18	GND
19	GND	20	GND

## Power LED and HDD LED (J19)

You can use an LED to indicate when the CPU card is on or the HDD is active. Pin1 supplies the LED power, and Pin2 is the ground.



Power LED	
Pin	Function
1	LED power (Vcc)
2	GND

HDD LED	
Pin	Function
1	HD-LED+
2	HD-LED-

## 100Base-T Ethernet Connector(LAN1,LAN2)

---

This 100Base-T Ethernet connector is a standard RJ-45 connector.

The onboard Realtek RTL8139C fast Ethernet controller supports 10Mb/s and 100 Mb/s N-way auto-negotiation operation. Ethernet is the most popular type of local area network, which sends its communications through radio frequency signals carried by a coaxial cable.

Ethernet uses a bus or star topology and supports data transfer rates of 10 Mbps. A newer version of Ethernet, called *100Base-T* (or *Fast Ethernet*), supports data transfer rates of 100 Mbps. And the latest version, *Gigabit Ethernet* supports data rates of 1 gigabit (1,000 megabits) per second.

---

### 100Base-Tx Ethernet Connector

Pin	Signal	Pin	Signal
1	Tx+	2	Tx-
3	Rx+	4	NC
5	NC	6	Rx-
7	NC	8	NC

## Power Connector (P1)

---

In single board computer (non-passive backplane) applications, you will need to connect the power to the Gene-4312 board using P1. This connector is fully compatible with the standard PC power supply connector. Please check the following table for its pin assignments:

---

### Power Connector (P1)

Pin	Signal
1	+5V
2	GND
3	GND
4	+12 Vcc

---

## ***Award BIOS Setup***

This chapter describes how to configure the BIOS for the Gene-4312.

## Starting Setup

---

The Award BIOS is immediately activated when you first turn on the computer. The BIOS reads system configuration information in CMOS RAM and begins the process of checking out the system and configuring it through the power-on self test (POST).

When these preliminaries are finished, the BIOS seeks an operating system on one of the data storage devices (hard drive, floppy drive, etc.). The BIOS launches the operating system and hands control of system operations to it.

During POST, you can start the Setup program in one of two ways:

1. By pressing Del immediately after switching the system on, or
2. By pressing Del or pressing Ctrl-Alt-Esc when the following message appears briefly at the bottom of the screen during POST:

### **TO ENTER SETUP BEFORE BOOT PRESS DEL KEY**

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the RESET button on the system case. You may also restart by simultaneously pressing Ctr-Alt-Del. If you do not press the keys at the correct time and the system does not boot, an error message appears and you are again asked to

### **PRESS F1 TO CONTINUE, DEL TO ENTER SETUP**

## Setup Keys

---

These keys help you navigate in Setup:

<b>Up arrow</b>	Move to previous item
<b>Down arrow</b>	Move to next item
<b>Left arrow</b>	Move to the item in the left hand
<b>Right arrow</b>	Move to the item in the right hand
<b>Esc</b>	Main Menu: Quit and not save changes into CMOS RAM Other pages: Exit current page and return to Main Menu
<b>PgDn/+</b>	Increase the numeric value or make changes
<b>PgDn/-</b>	Decrease the numeric value or make changes
<b>F1</b>	General help, only for Status Page Setup Menu and Option Page Setup Menu
<b>F2</b>	Change color from total 16 colors. F2 to select color forward, Shift-F2 to select color backward
<b>F3</b>	Calendar, only for Status Page Setup Menu
<b>F4</b>	Reserved
<b>F5</b>	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
<b>F6</b>	Load the default CMOS RAM value from BIOS default table, only for Option Page Setup Menu
<b>F7</b>	Load the default
<b>F8</b>	Reserved
<b>F9</b>	Reserved
<b>F10</b>	Save all the CMOS changes, only for Main Menu

## Getting Help

---

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 Esc or the F1 key again.

### In Case of Problems

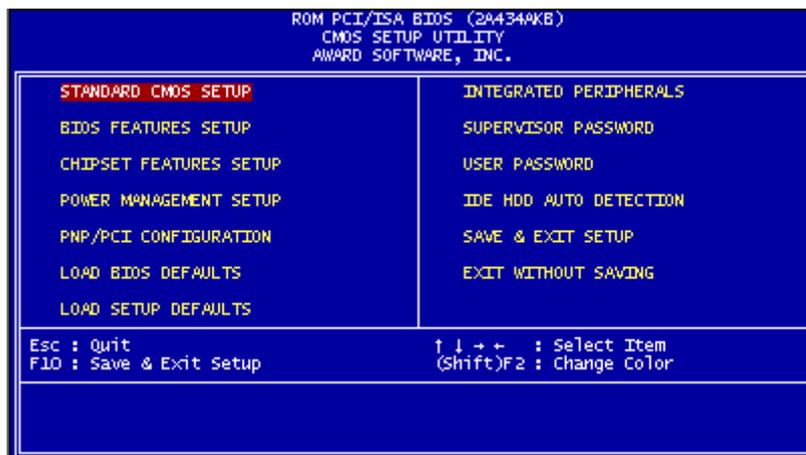
If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the **Award-BIOS** supports an override to the CMOS settings that resets your system to its default configuration.

You can invoke this override by immediately pressing Insert; when you restart your computer. You can restart by either using the ON/OFF switch, the RESET button or by pressing Ctrl-Alt-Delete.

*The best advice is to alter only settings that you thoroughly understand. In particular, do not change settings in the Chipset screen without a good reason. The Chipset defaults have been carefully chosen by Award Software or your system manufacturer for the best performance and reliability. Even a seemingly small change to the Chipset setup may causing the system to become unstable.*

# Main Setup Menu

---



---

## Standard CMOS Setup

Options in the original PC AT-compatible BIOS.

## BIOS Features Setup

Award Software enhanced BIOS options.

## Chipset Features Setup

Options specific to your system chipset.

## Power Management Setup

Advanced Power Management (APM) options.

## PnP/PCI Configuration

Plug and Play standard and PCI Local Bus configuration options.

## Load BIOS Defaults

BIOS defaults are factory settings for the most stable, minimal-performance system operations.

### **Load Setup Defaults**

Setup defaults are factory settings for optimal-performance system operations.

### **Integrated Peripherals**

I/O subsystems that depend on the integrated peripherals controller in your system.

### **Supervisor or User Password Setting**

Change, set, or disable the password of supervisor user. But only the supervisor password permits access to Setup. The user password generally allows only power-on access.

### **IDE HDD Auto Detection**

Automatically detect and configure IDE hard disk parameters.

### **Save & Exit Setup**

Save CMOS value changes to CMOS and exit Setup.

### **Exit Without Saving**

Abandon all changes and exit Setup.





This standard setup menu allows users to configure system components such as the date, time, hard disk drive, floppy drive, display, and memory. Online help for each field can be accessed by pressing F1.

### **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 increment 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. Press the left or right arrow key to move to the desired field. Press the PgUp/- or PgDn/+ key to increment the setting, or type the desired value into the field.

### **HARD DISKS**

The BIOS supports up to four IDE drives. This section does not show information about other IDE devices, such as a CD-ROM drive, or about 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 type **AUTO** for a hard drive, the BIOS detects its specifications during POST, every time the system boots.

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

1. Match the specifications of your installed IDE hard drive(s) with the preprogrammed values for drive types 1 through 45.
2. Select USER and enter values into each drive parameter field.
3. Use the IDE HDD AUTO DETECTION function in Setup.

Here is a brief explanation of drive specifications:

**Type:** The BIOS contains a table of pre-defined drive types. Each defined drive type has a specified number of cylinders, number of heads, write precompensation factor, landing zone, and number of sectors. Drives whose specifications do not accommodate any pre-defined type are classified as type USER.

**Size:** Disk drive capacity (approximate). Note that this size is usually slightly greater than the size of a formatted disk given by a disk-checking program.

**Cyls:** Number of cylinders

**Head:** Number of heads

**Precomp:** Write precompensation cylinder

**Landz:** Landing zone

**Sector:** Number of sectors

**Mode:** Auto, Normal, Large, or LBA

- **Auto:** The BIOS automatically determines the optimal mode.
- **CHS:** This allows the user to enter their own hardware values
- **Large:** For drives that do not support LBA and have more than 1024 cylinders.
- **LBA (Logical Block Addressing):** During drive access, the

IDE controller transforms the data address described by sector, head, and cylinder number into a physical block address, significantly improving data transfer rates. For drives with greater than 1024 cylinders.

## **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 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 megabyte capacity

## **Video**

Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. The BIOS supports a secondary video subsystem, but you do not select it in Setup.

EGA/VGA Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA, or PGA monitor adapters.

CGA 40 Color Graphics Adapter, power up in 40 column mode

CGA 80 Color Graphics Adapter, power up in 80 column mode

MONO Monochrome adapter, includes high resolution monochrome adapters

**Halt On**

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

**No errors:** POST does not stop for any errors.

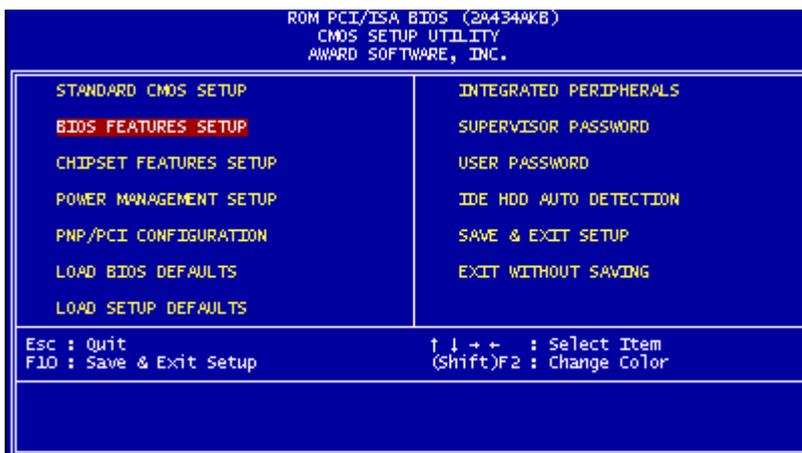
**All errors:** the BIOS detects any non-fatal error, POST stops and prompts you to take corrective action.

**All, But Keyboard:** POST does not stop for a keyboard error, but stops for all other errors

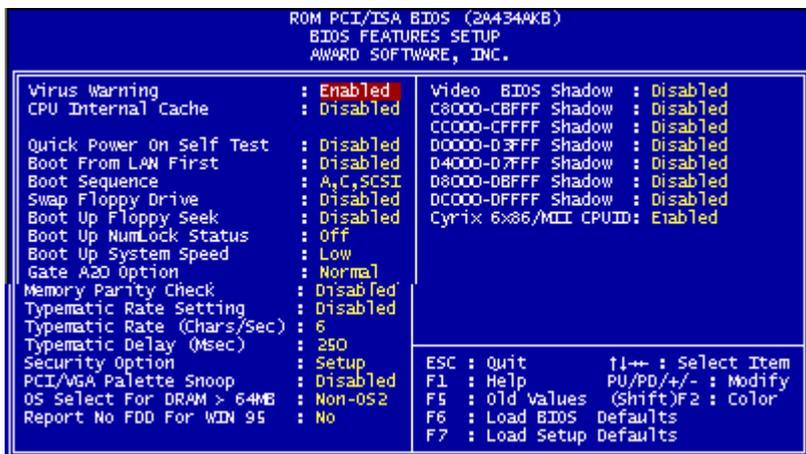
**All, But Diskette:** POST does not stop for diskette drive errors, but stops for all other errors.

**All, But Disk/Key:** POST does not stop for a keyboard or disk error, but stops for all other errors.

## BIOS Features Setup



By choosing the BIOS FEATURES SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed.



The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

### **Virus Warning**

When enabled, 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.*

### **CPU Internal Cache**

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU.

The External Cache field may not appear if your system does not have external cache memory.

### **Quick Power On Self Test**

Select Enabled to reduce the amount of time required to run the power-on-self-test (POST). A quick POST skips certain steps. We recommend that you normally disable quick POST. Better to find a problem during POST than lose data during your work.

### **Boot from LAN First**

When enabled, the BIOS attempts to boot from a LAN boot image before it attempts to boot from a local storage device.

**The choices: Disabled/Enabled**

### **Boot Sequence**

The original IBM PCs loaded the DOS operating system from drive A (floppy disk), so IBM PC-compatible systems are designed to search for an operating system first on drive A, and then on drive C (hard disk). However, the BIOS now offers many boot sequence options.

### **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 physical drive A to logical drive B.

### **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 that you set this field to Disabled to save time.

### **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.

### **Boot Up System Speed**

Select High to boot at the default CPU speed; select Low to boot at the speed of the AT bus. Some add-in peripherals or old software (such as old games) may require a slow CPU speed. The default setting is High.

### **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.

### **Memory Parity Check**

Select Enabled if the DRAM chips in your system support parity.

### **Typematic Rate Setting**

Key strokes 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 ( the rate at which character repeats when you hold down a key) of 6, 8, 10, 12, 15, 20, 24, 30.

### **Typematic Delay**

When the typematic rate setting is enabled, you can select a typematic delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 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.

### **PCI/VGA Palette Snoop**

Leave this field at Disabled.

### **OS Select For DRAM>64M**

Select the operating system that is running with greater than 64MB or RAM on the system.

**The choices: Non-OS2/OS2**

## **Report No FDD For WIN 95**

Report no FDD for Win 95 or not.

**The choices: Yes/ no**

### **Shadow**

Software that resides in a read-only memory (ROM) chip on a device is called firmware. The AwardBIOS permits shadowing of firmware such as the system BIOS, video BIOS, and similar operating instructions that come with some expansion peripherals, such as, for example, a SCSI adaptor.

Shadowing copies firmware from ROM into system RAM, where the CPU can read it through the 16-bit or 32-bit DRAM bus. Firmware not shadowed must be read by the system through the 8-bit X-bus. Shadowing improves the performance of the system BIOS and similar ROM firmware for expansion peripherals, but it also reduces the amount of high memory (640 KB to 1 MB) available for loading device drivers, etc.

Enable shadowing into each section of memory separately. Many system designers hardwire shadowing of the system BIOS and eliminate a System BIOS Shadow option.

Video BIOS shadows into memory area C8000-CBFFF. The remaining areas shown on the BIOS Features Setup screen may be occupied by other expansion card firmware. If an expansion peripheral in your system contains ROM-based firmware, you need to know the address range the ROM occupies to shadow it into the correct area of RAM.



The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

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

Because of the complexity and technical nature of some of the options, not all of the options are described here.

#### **SDRAM 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.

#### **8/16 Bit I/O Recovery Time**

The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus.

These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

#### **USB Controller**

The Gene-4312 supports 2 sets of USB for connection. To Enable the onboard USB controller please set to Enable, otherwise set to Disable as default.



**Power Management**

This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes.

This table describes each power management mode: Max Saving Maximum power savings. Only Available for SL CPUs.

User Define Set each mode individually.

Min Saving Minimum power savings.

**Standby mode**

After the selected period of system inactivity, the CPU clock stops, the board drive enters an idle state, and the L2 cache enters a power-save mode. All other devices still operate at full speed.

**HDD Power Down**

After the selected period of drive inactivity, any system IDE devices compatible with the ATA-2 specification or later power manage themselves, putting themselves into an idle state after the specified timeout and then waking themselves up when accessed.

**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.

**Throttle Duty Cycle**

When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

### **IRQ1~IRQ15**

IRQ1 (keyboard)

IRQ3 (COM2)

IRQ4 (COM1)

IRQ5 (LPT2)

IRQ6 (Floppy Disk)

IRQ7 (LPT1)

IRQ9 (IRQ2 Redir)

IRQ10 (Reserved)

IRQ11 (Reserved)

IRQ12 (PS/2 mouse)

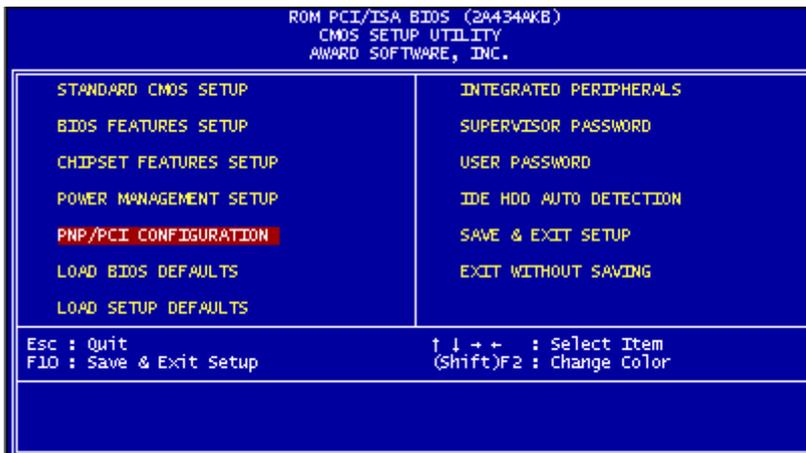
IRQ13 (Coprocessor)

IRQ14 (Hard Disk)

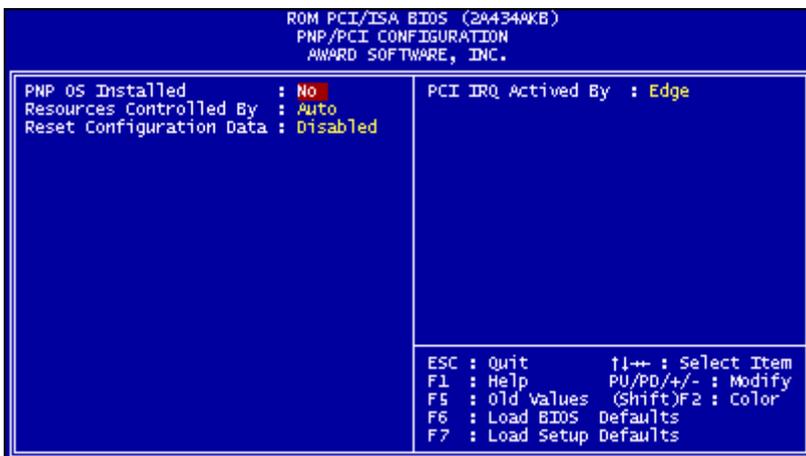
IRQ15 (Reserved)

As above the default settings are Disable.

## PNP/PCI Configuration Setup



By choosing the PNP/PCI CONFIGURATION SETUP 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 (e.g., Windows 95).

**Resources Controlled By**

The Plug and Play AwardBIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.

**Reset Configuration Data**

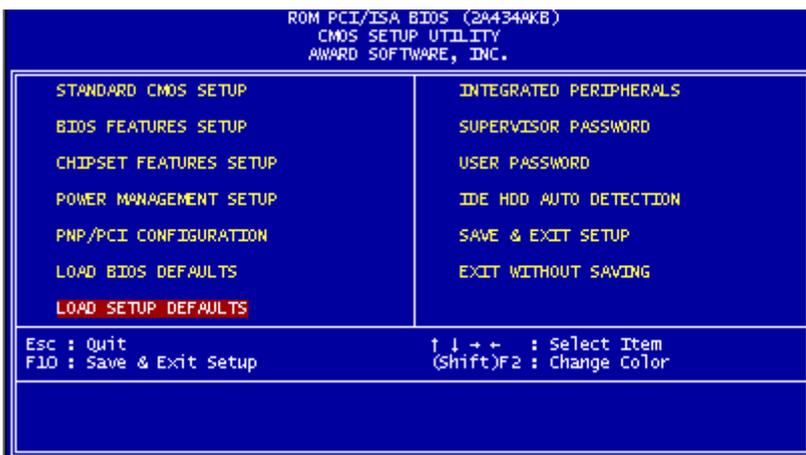
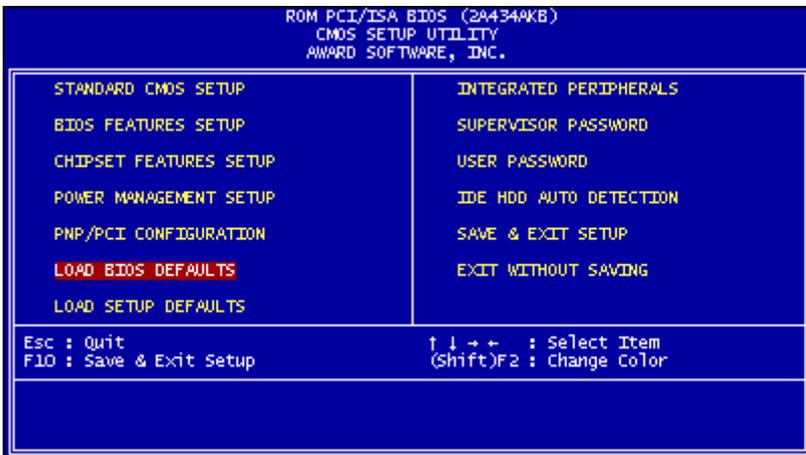
Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

**PCI IRQ Activated By**

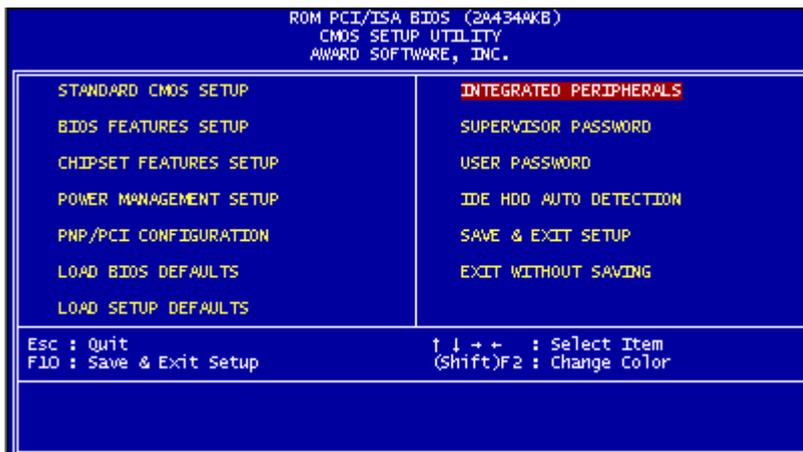
Leave the IRQ trigger set at Level unless the PCI device assigned to the interrupt specifies Edge-triggered interrupts.

## Load BIOS Defaults/Load Setup Defaults

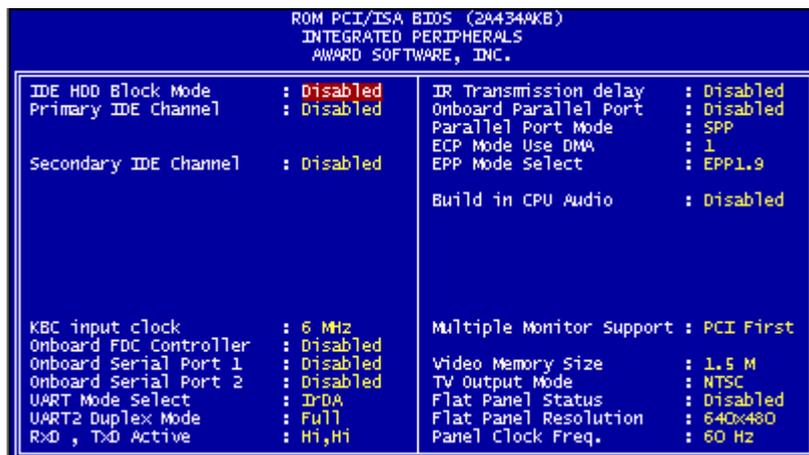
LOAD BIOS DEFAULTS loads the default system values directly from ROM. The BIOS DEFAULTS provides the most stable settings, though they do not provide optimal performance. LOAD SETUP DEFAULTS, on the other hand, provides for maximum system performance. If the stored record created by the setup utility becomes corrupted (and therefore unusable), BIOS defaults will load automatically when you turn the Gene-4312 on.



# Integrated Peripherals



By choosing the INTEGRATED PERIPHERALS option from the initial SETUP SCREEN menu, the screen below is displayed.



**IDE HDD Block Mode**

Select Enabled only if your hard drives support block mode.

**(Primary/Secondary) IDE Channel 1**

**The choices: Enabled/Disabled**

**KBC input clock**

The Gene-4312 offer four kind of frequency for user option, as default 6MHz, 8 MHz, 12 MHz, and 16 MHz.

**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.

**Onboard Serial Ports (1, 2)**

Select a logical COM port address for the first and second serial ports.

**UART2 Duplex Mode**

In an infrared port mode, this field appears. Full-duplex mode permits simultaneous two-direction transmission. Half-duplex mode permits transmission in one direction only at a time. Select the value required by the IR device connected to the IR port.

**IR Transmission delay:**

Enable or Disable IR transmission delay.

**Onboard parallel port**

You can enable or Disable the parallel port address / IRQ as 278/IRQ5, 378/IRQ7, 3BC/IRQ7, for user option.

### **Parallel Port Mode**

Select an operating mode for the onboard parallel (printer) port. Select Normal, Compatible, or SPP unless you are certain your hardware and software both support one of the other available modes.

### **ECP Mode Use DMA**

Setup ECP DMA, it is available, when parallel port mode be selected as ECP.

### **EPP Mode Select: EPP1.9**

Setup EPP operation version when parallel port mode select EPP or EPP+ECP.

### **Build in CPU Audio**

Onboard offer Audio function which be selected by this item, when you set it to Enable, some extra items will appear below:

### **Multiple Monitor support:**

Support dual display functions (PCI first, M/B first, No onboard).

### **Video Memory size**

SODIMM is primarily used to support RAM. Video memory in GENE-4312 also uses SoDIMM, allocating 1.5MB to 4MB of storage area.

### **TV Output Mode**

The Gene-4312 onboard support TV output function for option. (NTSC, PAL).

**Flat Panel Status**

Choose **Enabled** if you want to use flat panel.

**Flat Panel Resolution**

Onboard support TFT LCD as below.

**640x480**

**800x600**

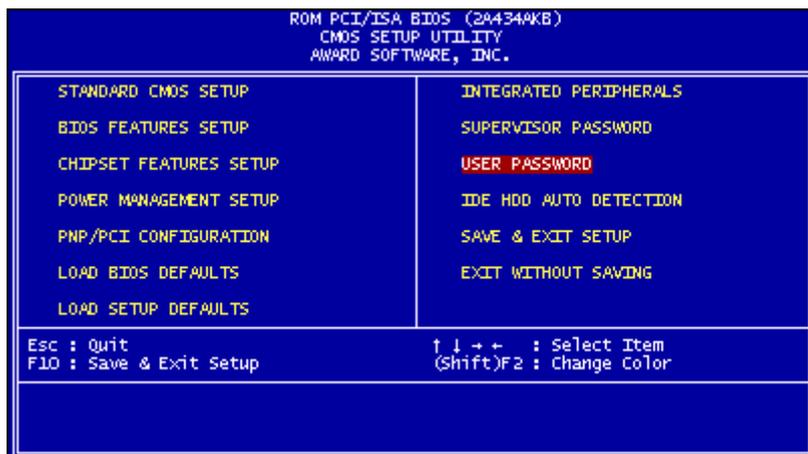
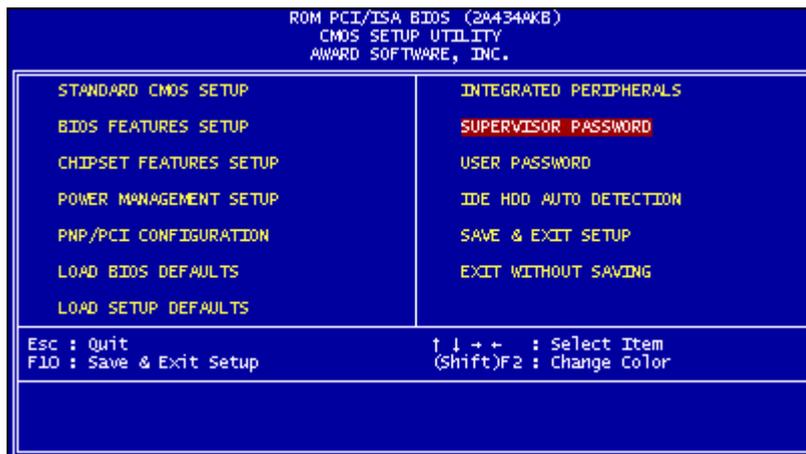
**1024x768**

**Panel Clock Freq.**

There are 4 kind of LCD frequency for option as 60Hz , 72 Hz, 80 Hz, and 85 Hz.

## Supervisor/User Password Setting

You can set either SUPERVISOR or USER PASSWORD, or both of them. The difference between the two is that the supervisor password allows unrestricted access to enter and change the options of the setup menus, while the user password only allows entry to the program, but not modify options.



When you select this function, a message appears at the center of the screen:

### ENTER PASSWORD:

Type the password, up to eight characters, and press Enter. Typing a password clears any previously entered password from CMOS memory.

Now the message changes:

### CONFIRM PASSWORD:

Again, type the password and press Enter.

To abort the process at any time, press Esc.

In the Security Option item in the BIOS Features Setup screen, select System or Setup:

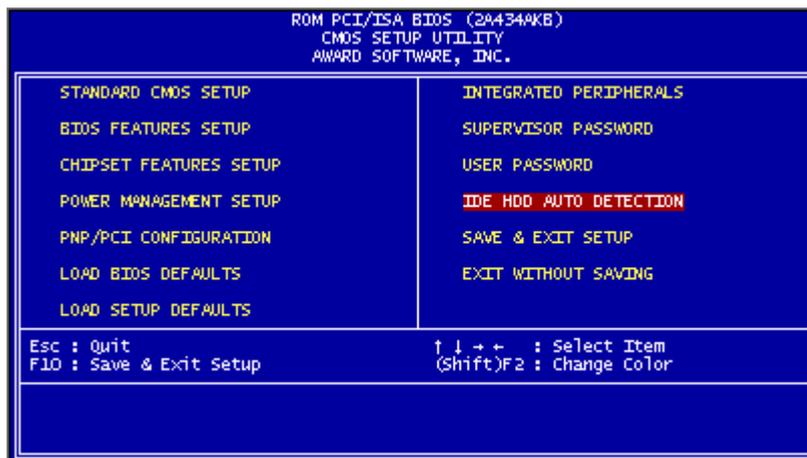
**System** Enter a password each time the system boots and when ever you enter Setup.

**Setup** Enter a password when ever you enter Setup.

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

## IDE HDD Auto Detection

The IDE HDD AUTO DETECTION utility can automatically detect the IDE hard disk installed in your system. You can use it to self-detect and/or correct the hard disk type configuration. You need to repeat the setup for each of the IDE combinations:



## Save & Exit Setup

If you select this option and press <ENTER>, the values entered in the setup utility 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

---

If you select this option and press <ENTER>, the values entered in the setup utility 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.





CHAPTER  
**4**

## ***Drivers Installation***

This Gene-4312 is equipped with an audio interface that records and playback CD-quality audio. This chapter provides instructions for installing the software drivers on the included CDROM.

## Software Drivers

---

This chapter describes the operation and installation of the display drivers supplied on the *Supporting CD-ROM* that are shipped with your product. The onboard VGA adapter is based on the CS5330A VGA Flat Panel/CRT controller. This controller offers a large set of extended functions and higher resolutions. If you intend to use your VGA adapter in standard VGA modes only, you do not need to install any of these drivers. Since your VGA adapter is fully compatible, it does not require any special drivers to operate in standard modes.

The purpose of the enclosed software drivers is to take advantage of the extended features of the CS5330A VGA Flat Panel/CRT controller.

## Hardware Configuration

Some of the high-resolution drivers provided in this package will work only in certain system configurations. If a driver does not display correctly, try the following:

1. Change the display controller to CRT-only mode, rather than flat panel or simultaneous display mode. Some high-resolution drivers will display correctly only in CRT mode.
2. If a high-resolution mode is not supported on your system, try using a lower-resolution mode. For example, 1024 x 768 mode will not work on some systems, but 800 x 600 mode is supported on most.

## Necessary to Know

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The instructions in this manual assume that you understand elementary concepts of MS-DOS and the IBM Personal Computer. Before you attempt to install any driver from the *Supporting CD-ROM*, you should:

- Know how to copy files from a CD-ROM to a directory on the hard disk
- Understand the MS-DOS directory structure

If you are uncertain about any of these concepts, please refer to the DOS or OS/2 user reference guides for more information *before* you proceed with the installation.

### Before you begin

The Supporting CD-ROM contains different drivers for corresponding Windows OS, please choose the specific driver for your Windows OS.

# Installing VGA and Audio Drivers

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## Win 9X VGA and Audio

Gene-4312 has a built in CX 5530 chipset that offers VGA and Audio interface. The installation for VGA and Audio are automatic. Simply, install the provided CD into the CD-ROM drive and select, **my computer**. Click on the CD-ROM drive in the opened window. Find the VGA and Audio file named **Cyrix Media GX Certified Win9x Driver 4.0**, and double click on the file. The file will open up and offer a **set up wizard**. Follow the instructions and click on the corresponding buttons and the VGA and Audio features will self install. Shutdown afterwards to ensure proper installation.

## Win NT 4.0 VGA

1. Install Windows<sup>®</sup> NT 4.0 as you normally do for a **VGA** display. Click the **Start** button, go to **Settings** and click on **Control Panel** icon. Then choose the **Display** and double click on the icon. In the **Display Properties** window, click the **Setting** button, then click the **Display Type** button into the **Display Type** windows, then click on **Change** button from the **Adapter Type** icon. And click on **Have Disk** button in the change display window.
2. Place the *Supporting CD-ROM* into your CD-ROM dirve. In the *Select Device* window, click on **Have Disk**, select "**Browse**" and find the NT 4.0 driver from:

```
cd-rom : \CD ROM\model name\dirver\vga driver\win98  
nt\windows.nt\nt40\Oemsetup.inf
```

"**cd-rom**" : the drive letter of your CD-ROM drive

"**model name**" : the model number of your product

and then click OK. The name of the *CCryix Xpress GRAPHICS(TM)* driver will appear highlighted in the Modules list box. Select Gx5530 and Click **OK**. Click **OK** to start the driver installation.

3. Once the installation is complete, the *Change Display Type* window will reappear. Click on close to close the window. Then the *Display Properties* window will reappear. Click on **Apply**. Restart the system for the new settings to take effect.
4. There are five files ( gx.dll, gx.sys, gx.inf, gx.vid, license.pdf) in the Windows NT 4.0 system.

## Win NT 4.0 Audio

**\*Must Disable the MPU-401 function first, In your BIOS\***

1. Install Windows<sup>®</sup> NT 4.0 as you normally do for an **Audio driver** display. Click the **Start** button, go to **Settings** and click on **Control Panel** icon. Then choose the **multimedia** and double click on the icon. In the **Multimedia** window, click the **device** button, then click the **add** button in the **device** window. Select the **unlisted or updated driver**, and then click on the **OK** button. The next window will ask for a specific drive location and file name. The audio driver will be found in the CD-ROM player under the Audio section. After you have found the location of your audio drive, please click OK.

2. Place the *Supporting CD-ROM* into your CD-ROM drive. In the *Select Device* window, click on **Have Disk**, select "**Browse**" and find the NT 4.0 driver from:

cd-rom : \CD ROM\model name\dirver\audio  
driver\win98 nt\windows.nt\nt40\Oemsetup.inf

"**cd-rom**" : the drive letter of your CD-ROM drive

"**model name**" : the model number of your product

Once you have found the audio driver, click **OK**. Next an add unlisted or updated driver window will appear, there will be a message reading National Xpress Audio (TM) Driver, click **OK**.

An I/O window will appear next asking for the address number, type in **220** and click on the continue **button**. The very next window is the Xpress Audio Configuration window. In the bottom of the page there is a MPU 401 I/O Address, select the **disable** function and click **OK**.

The audio driver has been installed, and please restart your system.

## Installing Ethernet Driver

---

Place the Driver CDROM into your CDROM drive and pull up the CDROM file on you screen.

1. Click on **Start** button.
2. Click on **Settings** button.
3. Click on **Control Panel** button.
4. Click on **System** button.
5. Click on **Devise Manager** button.
6. Click on **PCI Ethernet Controller**.
7. Click on **OK**.
8. Click on **Refresh**.
9. Click on **Next**.
10. Select the Optional: **Search for best Lan driver...**
11. Click **Next**.
12. Select CDROM file.
13. Select **Driver/LAN/8139C/Win9X or Windows.NT** (choose the specific file depending on your OS)
14. Click on **OK**
15. Click on **Next**.
16. **Rtl 8139.inf** will appear.
17. Click on **Next**.
18. Click on **Finish**.

Shut down the computer to restart Window, and then the chipset driver has been installed.

## Ethernet Software Configuration

---

The onboard Ethernet interface supports all major network operating systems. I/O addresses and interrupts are easily configured via the Award BIOS Setup. To configure the medium type, to view the current configuration, or to run diagnostics, please refer to the following instruction:

1. Power the mainboard on. Ensure that the RSET8139.EXE file is located in the working drive.
2. At the prompt, type RSET8139.EXE and press <ENTER>. The Ethernet configuration program will then be displayed.
3. This simple screen shows all the available options for the Ethernet interface. Just highlight the option you wish to change by using the Up and DOWN keys. To change a selected item, press <ENTER>, and a screen will appear with the available options. Highlight your option and press <ENTER>. Each highlighted option has a helpful message guide displayed at the bottom of the screen for additional information.
4. After you have made your selections and the configuration is what you want, press <ESC>. A prompt will appear asking if you want to save the configuration. Press "Y" if you want to save.

The Ethernet Setup Menu also offers three very useful diagnostic functions. These are:

1. Run EEPROM test
2. Run Diagnostics on Board
3. Run Diagnostics on Network

Each option has its own display screen which shows the format and result of any diagnostic tests undertaken.

## ***Watchdog Timer***

The mainboard is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for whatever reason. This feature ensures system reliability in industrial stand-alone and unmanned environments.

# Watchdog Timer

---

Gene-4312 contains a watchdog timer reset pin. (GP16)

All reference material can be found on the following pages.

```
=====**
** Title : WatchDog Timer Setup Utility (for W83977 GP16) **
** Company : AAEON Technology Inc. **
** Compiler : Borland C ++ Version 3.0 **
**=====*/
```

```
#include <dos.h>
#include <io.h>
#include <bios.h>
#include <stdio.h>
#include <stdlib.h>
#include <conio.h>
```

```
/* Set I/O Address : 370/371 or 3F0/3F1 */
#define IO_INDEX_PORT 0x370
#define IO_DATA_PORT 0x371
```

```
/* Set Watchdog reset pin : 12/13/16 */
#define watch_dog_output_GP 16
```

```
#define UNLOCK_DATA 0x87
#define LOCK_DATA 0xAA
#define DEVICE_REGISTER 0x07
```

```
void EnterConfigMode()
```

```
{
    outportb(IO_INDEX_PORT, UNLOCK_DATA);
    outportb(IO_INDEX_PORT, UNLOCK_DATA);
}
```

```
void ExitConfigMode()
```

```
{
    outportb(IO_INDEX_PORT, LOCK_DATA);
}
```

```

void SelectDevice(unsigned char device)
{
    outportb(IO_INDEX_PORT, DEVICE_REGISTER);
    outportb(IO_DATA_PORT, device);
}

```

```

unsigned char ReadAData(short int reg)
{
    outportb(IO_INDEX_PORT, reg);
    return (inportb(IO_DATA_PORT));
}

```

```

void WriteAData(unsigned char reg, unsigned char data)
{
    outportb(IO_INDEX_PORT, reg);
    outportb(IO_DATA_PORT, data);
}

```

```

void SetWatchDogTime(unsigned char time_val)
{
    EnterConfigMode();
    SelectDevice(8);
    //Set Register F2
    //Set Watch-Dog Timer 1~ 256
    WriteAData(0xF2, time_val);
    // set counter counts in second (or minute)
    // Register F4 Bit 6 = 0/1 (minutes/seconds)
    // For w83977EF only
    WriteAData(0xF4, 0x40);
    ExitConfigMode();
}

```

```

void init_w83977tf_aw_watchdog()
{
    short int value;

    //Enter W83977 Configure Mode
    EnterConfigMode();

    //Select Device 7
    SelectDevice(7);
    //Set Device Active
    WriteAData(0x30, 0x01);

    //caution:skip this step will be a mistake!!
    if (watch_dog_output_GP==12)
    {
        //Set Register E2 to define GP12
        WriteAData(0xE2, 0x0A);
    }
    else if(watch_dog_output_GP==13)
    {
        //Set Register E3 to define GP13
        WriteAData(0xE3, 0x0A);
    }
    else if(watch_dog_output_GP==16)
    {
        //Set Register E6 to define GP16
        WriteAData(0xE6, 0x0A);
    }

    //Select Device 8
    SelectDevice(8);
    //Set Register F3
    //keyboard and mouse interrupt reset Enable
    //When Watch-Dog Time-out occurs,Enable POWER LED
    output
    WriteAData(0xF3, 0x0E);
}

```

```

//caution:skip this step will be a mistake!!
if (watch_dog_output_GP==12)
{
//Set Register 2A (PIN 57) Bit 7 = 0/1 (KBLOCK/GP12)
//set to GP12 for WD Rst
WriteAData(0x2A,ReadAData(0x2A)|0x80);
}
else if(watch_dog_output_GP==13)
{
//Set Register 2B (PIN 58) Bit 0 = 0/1 (KBLOCK/GP13)
//set to GP13 for WD Rst
WriteAData(0x2B,ReadAData(0x2B)|0x01);
}
else if(watch_dog_output_GP==16)
{
//Set Register 2C (PIN 119) Bit 5-4 = 01 (GP16)
//set to GP16 for WD Rst
WriteAData(0x2C,ReadAData(0x2C)|0x10);
}

//Exit W83977 Configure mode
ExitConfigMode();
}

void main(int argc, char* argv[])
{
    int time_value=0;
    char *ptr;
    printf("winBond 83977 WatchDog Timer Setup Utility
Version 1.0\n");
    printf("Copyright (c) 2000 AAEON Technology Inc.\n");
    printf("This version only for W83977 that using GP%d to
Reset System.\n",watch_dog_output_GP);
}

```

```

if (argc == 1)
{
    printf("\n Syntax: WATCHDOG [time] \n");
    printf(" time range : 1 ~ 256 \n\n");
    return ;
}
if (argc > 1)
{
    ptr = argv[1];
    time_value = atoi(ptr);
}
if (time_value > 0 && time_value < 256)
{
    SetWatchDogTime((unsigned char) time_value);
    init_w83977tf_aw_watchdog();
    printf("Watch Dog Timer set up : %d \n",time_value);
}
}

```