Gene-4310

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

FCC STATEMENT

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE. (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINTST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND , IF NOT INSTATLLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

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Prepared in Taiwan OCT. 2000

A Message to the Customer

AAEON Customer Services

Each and every AAEON product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new AAEON equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name AAEON has come to be known.

Your satisfaction is our primary concern. Here is a guide to AAEON's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your AAEON products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from AAEON engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

Product Warranty

AAEON warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by AAEON, or which have been subject to misuse, abuse, accident or improper installation. AAEON assumes no liability under the terms of this warranty as a consequence of such events.

Because of AAEON's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an AAEON product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU type and speed, AAEON products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
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 prepaid to your dealer.

Packing list

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

- 1 GENE-4310 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, ptich 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-4310 S & T)
- 1 bag of screws and miscellaneous parts
- 1 Quick Installation Guide
- 1 CD-ROM contains the followings:

  — User's 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

Dear Customer,

Thank you for purchasing the GENE-4310 board. This user's manual is designed to help you to get the most out of the GENE-4310, 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 urge you to first read the manual before using the product.

To receive the lastest version of the user manual, please visit our Web site at:

http://www.aaeon.com

Contents

CHAPTER 1

General Information

This chapter gives background information on the mainboard.

Sections include:

- Board specifications
- Layout and dimensions

Introduction

The GENE-4310 is an all-in-one NS GXLV processor based single board computer (SBC) with a 16-bit PCI audio controller, a PCI Flat Panel controller, a 100Base-T Ethernet interface and a PC/104 fo 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 FDD 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-4310 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-4310 is a highly integrated multi-media SBC that combines audio, video, and network functions on a FDD drive size single computer board. It provides , 16-bit full-duplex, 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 GXLV level processors, making the GENE-4310 one of the world's smallest and most powerful all-in-one multimedia boards.

LVDS Introduction

Low Voltage Differential Signaling 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 tranferrate.

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/0 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" FDD SubCompact Form Factor
- Supports NS Geode GXLV Low-power BGA CPUs
- Supports CRT and 18-bit TFT Panels
- LVDS interface
- 10/100Base-T Fast Ethernet
- Integrated AC-97 2.0 SoundBlaster compatible Audio
- Supports Compact Flash Storages
- 2 COMs/1 Parallel/2 USB/1 IrDA Port
- 5V only operation

Specifications

Standard SBC Functions

CPU : NS Geode GXLV (low-power) 233MHz (available in different speeds by request)

CPU type: Onboard BGA

BIOS: Award 256KB FLASH BIOS

Chipset: NS CS5530

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 CS5530

• **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 7003

LVDS Interface (Optional)

Chipset: Thine THC63LVDM63A

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

Audio Interface

Chipset: NS CS5530

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: Intel 82559ER 10/100Base-T Fast Ethernet controller

Ethernet interface: 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

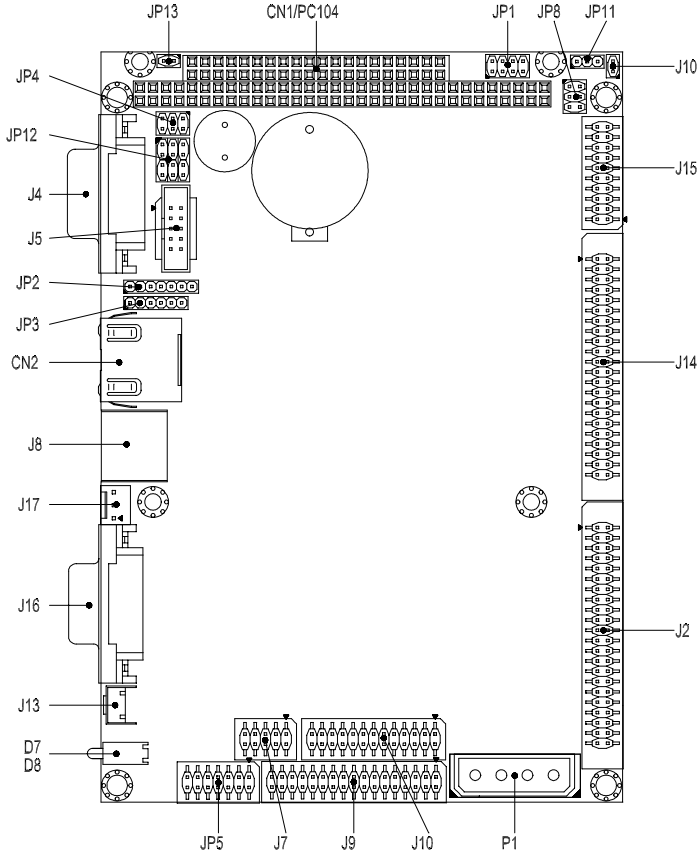
Power supply voltage: +5V (4.75V to 5.25V)

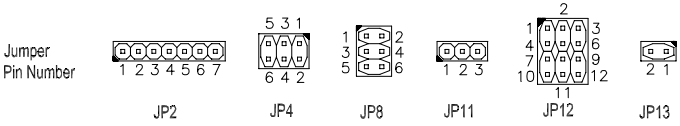
Operating temperature: 32 to 140 °F (0 to 60 °C)

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

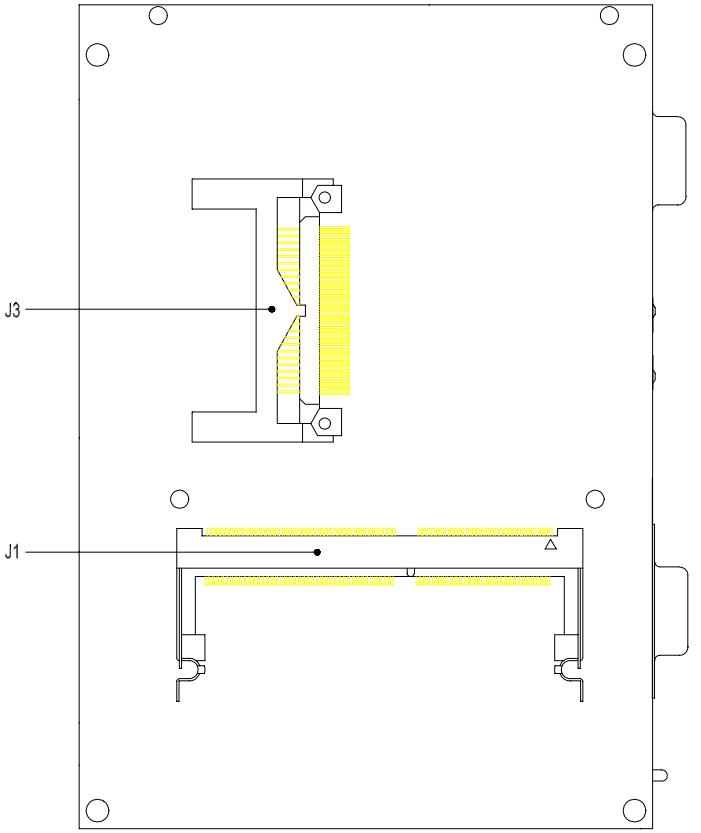
Weight: 0.88 lb. (0.4 Kg)

Board layout

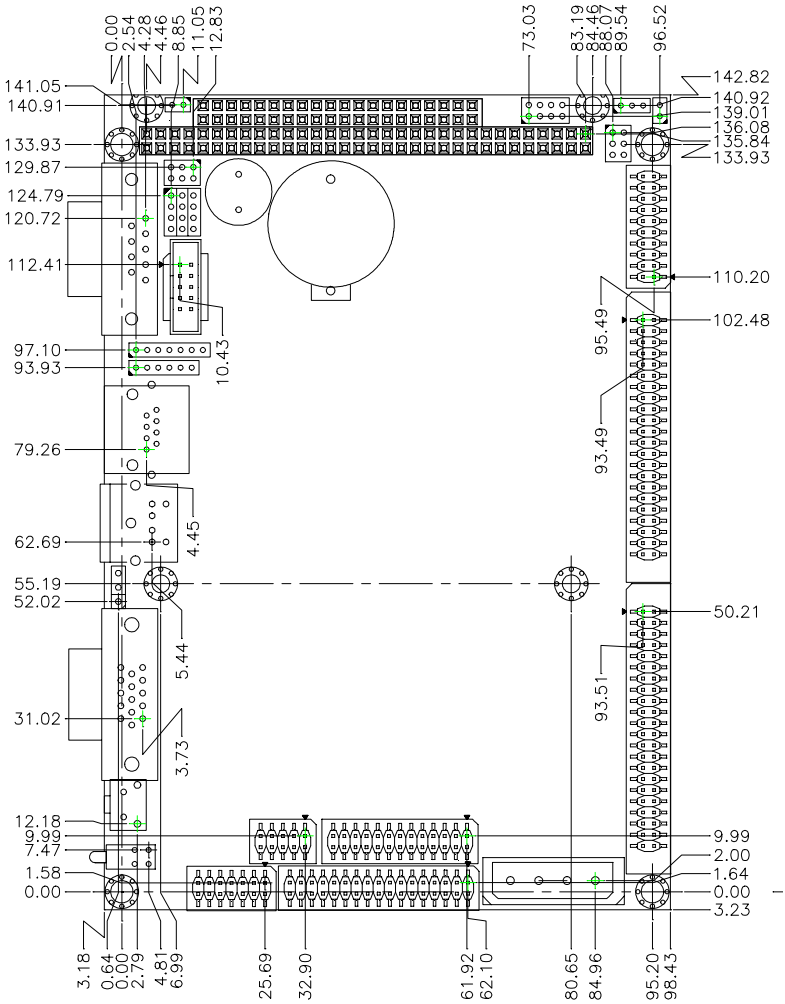




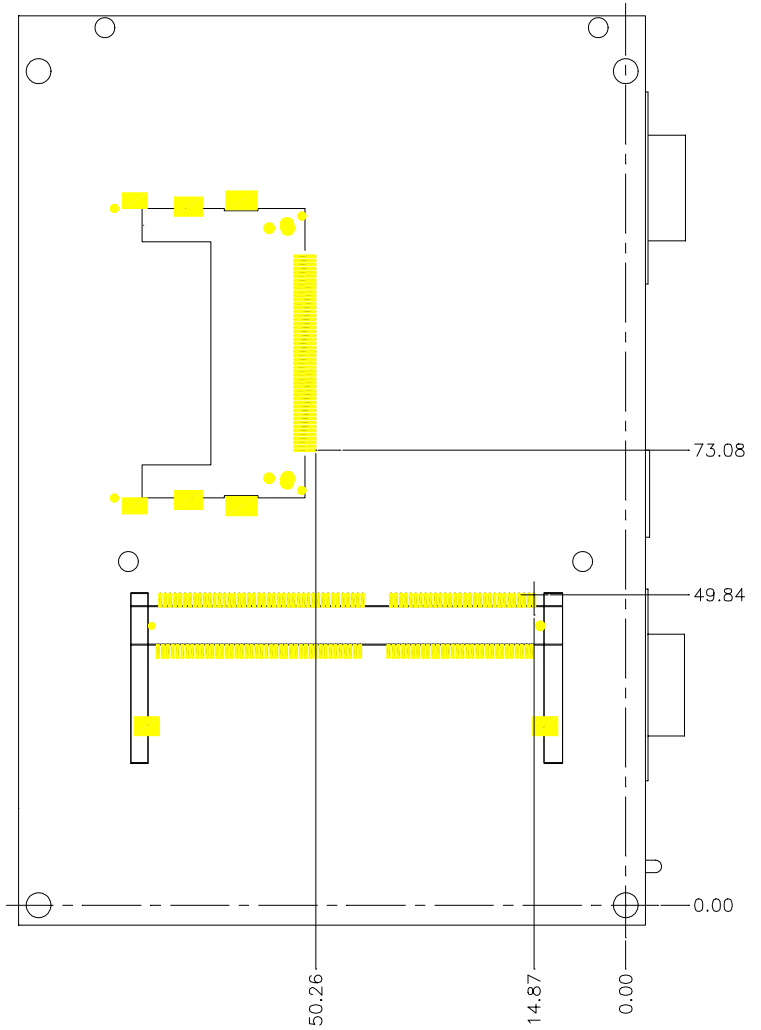
Board layout (Reverse Side)



Board dimensions



Board dimensions (Reverse Side)



CHAPTER 2

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 and connectors

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

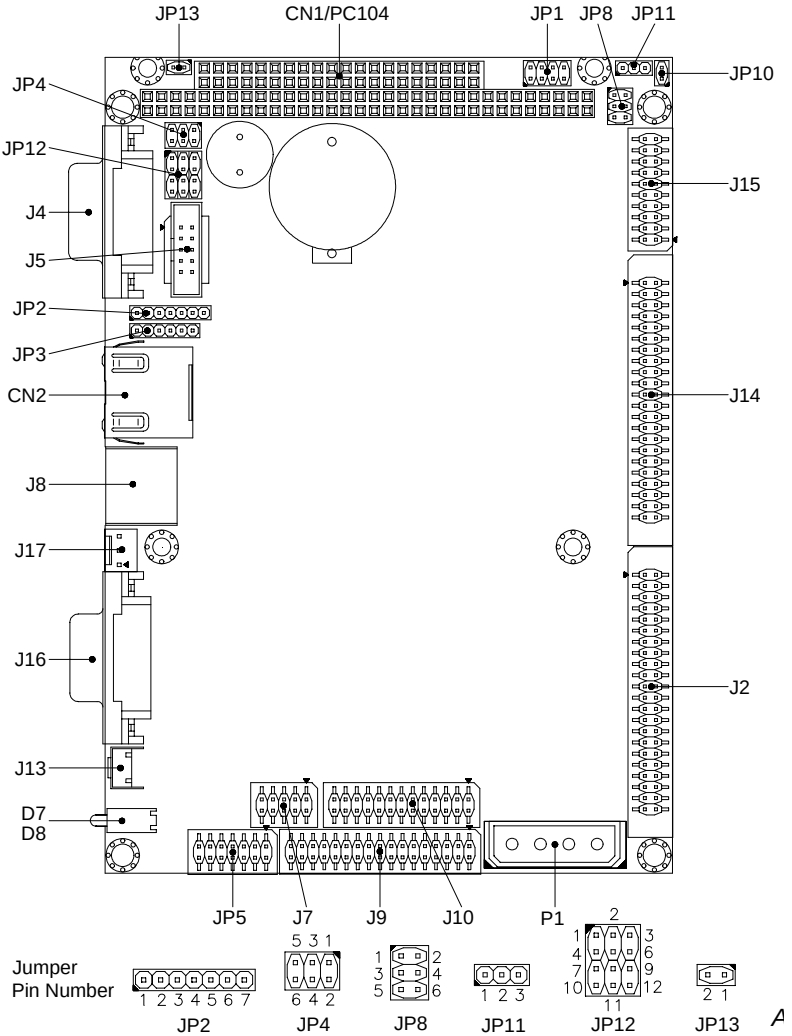
The following tables list the function of each of the board's jumpers and connectors.

Jumpers

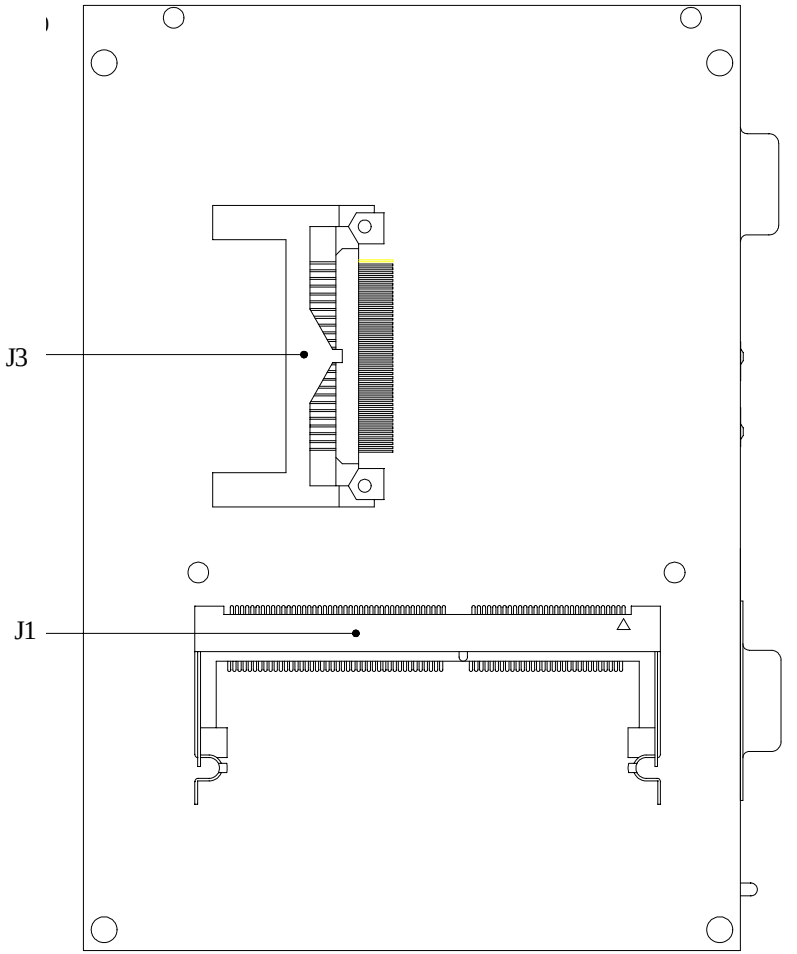
Label	Function
JP2 (1~3)	Clear CMOS
JP2 (4~7)	Onboard buzzer and external speaker select
JP4	COM2 RS232/422/485 select
JP12	COM2 RS232/422/485 select
JP8 (1-3-5)	LCD Panel voltage select
JP8 (2-4-6)	LCD Backlight voltage select
JP11	Watchdog Timer output select
JP13	LVDS Edge Trigger select (Type T&S)

Connectors	
Label	**Function**
J1	SO-DIMM 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 T&S)
J16	VGA D-SUB connector
J17	FAN connector (Reserved)
JP1	TV-out connector (2.0mm) (Type T only)
JP3	IR connector
JP5	Audio connector (2.0 mm)
JP10	LCD Backlight Voltage connector (2.0 mm)
CN1	PC104 connector
CN2	RJ45 connector with LED indicator
P1	Power connector

Locating jumpers & connectors

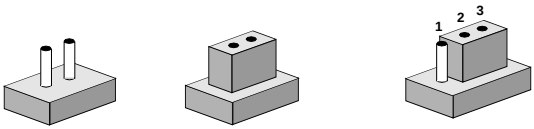


Locating jumpers & connectors (Reverse Side)



Setting jumpers

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



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)

System Memory

The reverse side of the Gene-4310 contains a socket for 144-pin dual inline memory module (SODIMM). The socket can be filled in the SODIMM of any size, giving your GENE-4310 single board computer between 16 and 128 MB of memory.

Installing the SODIMM card

Initial allignment of the card with the supporting bracket must be carried out before proceeding any further. The card and the bracket must be lined up in the specially grooved area before installation. The SODIMM card is inserted at a 45 degree angle. Push firmly until the card has been fully inserted, a couple of millimeters. Then push the card downwards until there is a clicking noise. The SODIMM card is now held in place by the supporting brackets.

To remove the SODIMM card simply push outwards on the two silver bracket supports and the card will pop out automatically.

Composite video output connector (JP1) (Type T only)

The Gene-4310 T has a RCA Jack and a S-Video 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) 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.

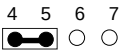
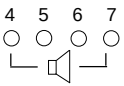
Clear CMOS (JP2) 1~3

	Protect*	Clear CMOS
JP2		

*default

Onboard buzzer / external speaker select (JP2) 4~7

Onboard buzzer / external speaker select JP2 (4~7)

	Internal buzzer*	External speaker
JP2		

* 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 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. Make sure to have correct orientation when you plug onto IrDA connector (JP3).

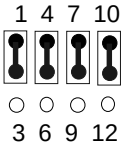
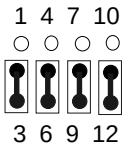
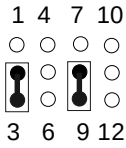
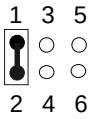
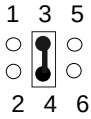
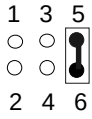
IrDA connector (JP3)

Pin	Signal
1	Vcc
2	IrRxH
3	IrRx
4	GND
5	IrTx
6	CIRRX

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

The Gene-4310 COM2 serial port can be selected as RS-232, RS-422, or RS-485 by setting JP12 and JP4.

COM2 Select (JP12, JP4)

	RS-232*	RS-422	RS-485
JP12			
J4			

*default

Audio connector (JP5)

The Gene-4310 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.

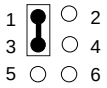
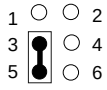
Audio connector (JP5)

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

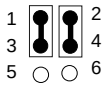
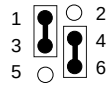
	5V	3.3V *
JP8		

*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
JP8		

*default

LCD backlight voltage output (JP10)

Pin	Signal
1	Backlight Vcc
2	GND

Note : DC 12V input is required to have 12V backlight output.

Watchdog timer output select (JP11)

The Gene-4310 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, environments.

Watchdog timer output select (JP11)

	IRQ15	Reset *
JP11		

*default

LVDS edge trigger select (JP13) (4310Type T & S)

The LVDS edge trigger select is only used for Gene-4310 type T & S models. 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

IDE hard drive connector (J2)

You can attach one or two Enhanced Integrated Device Electronics hard disk drives to the mainboard's internal controller. The mainboard's IDE controller uses a PCI local-bus interface. This advanced interface supports faster data transfer and allows the IDE hard drive to exceed 528 MB.

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 end 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 one as the slave by using jumpers on the drives. If you install just one drive, set it as the master.

IDE Hard Drive Connector

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-4310 offers two serial ports, one RS-232 and one RS-232/422/485. These ports allow you to connect them to serial devices (mouse, printers, etc.).

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

COM1, COM2, RS-232/422/485 serial port

	PIN	SIGNAL	PIN	SIGNAL
COM1	1	DCDB	2	RXDB
	3	TXDB	4	DTRB
	5	GND	6	DSRB
	7	RTSB	8	CTSB
	9	RIB	10	NC
COM2	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-4310 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

Floppy drive connector (J9)

You can attach up to two floppy drives to the mainboard controller. You can use any combination of 5¼" (360 KB and 1.2 MB) and/or 3½" (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. 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 3½" drives) and a printed-circuit board connector (usually used for 5¼" 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. Make sure that the red or blue wire corresponds to pin 1 on the connector.
2. Attach the appropriate connector on the other end of the cable to the floppy drive(s). You can use only one connector in the set. The set on the end (after the twist in the cable) connects to the A: drive. The set in the middle connects to the B: drive.
3. If you are connecting a 5¼" 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 3½" 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)

Floppy drive connector (J9)

Pin	Signal	Pin	Signal
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-4310 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-4310 supports one parallel port. The port is designated as LPT1 and can be disabled or changed to LPT2 or LPT3 in the system BIOS setup.

Parallel port connector table (J10)

Parallel port connector (J10)

Pin	Signal	Pin	Signal
1	$\overline{\text{STROBE}}$	2	$\overline{\text{AUTOFD}}$
3	DO	4	ERR
5	D1	6	$\overline{\text{\INIT}}$
7	D2	8	$\overline{\text{SLCTINI}}$
9	D3	10	GND
11	D4	12	GND
13	D5	14	GND
15	D6	16	GND
17	D7	18	GND
19	$\overline{\text{ACK}}$	20	GND
21	BUST	22	GND
23	PE	24	GND
25	SLCT	26	NC

Display connectors (J14, J16)

The mainboard's 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 one for flat panel displays.

VGA display 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)		

LCD connector (J14)

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

When the mainboard's power is applied, the control signal is low until just after the relevant flat panel signals are present.

Configuration of the VGA interface is done completely via the software utility. You do not have to set any jumpers.

LCD connector (J14)

Pin	Signal	Pin	Signal
1	+12 V_{DC}	2	+12 V_{DC}
3	GND	4	GND
5	+5 V_{DC}	6	+5 V_{DC}
7	ENAVEE	8	GND
9	P0	10	P1
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	P8	18	P9
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
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	NC	42	NC
43	NC	44	NC

LVDS Connector (J15) (Type S & T)

Gene-4310 T supports one 20-Pin header for LVDS functions connector. For further details see pin definition below.

LVDS Connector (J15)

Pin	Signal	Pin	Signal
1	TX 1 +	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	TXO+	16	TXO-
17	GND	18	GND
19	GND	20	GND

100Base-T Ethernet connector (CN2)

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

The onboard Intel 82559ER 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.

100Base-Tx Ethernet connector (CN2)

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-4310 board using P1. This connector is fully compatible with the standard PC power supply connector. See the following table for its pin assignments:

Power connector (P1)

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

Keyboard and PS/2 mouse connector (CN11)

The Gene-4310 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 main-board BIOS Advanced setup menu allows you to select "Present" or "Absent" under the "System Keyboard" section. This allows no-keyboard operation in embedded system applications without the system halting under POST (power-on-self-test).

Keyboard and mouse connector (CN11)

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

CHAPTER 3

Award BIOS Setup

This chapter describes how to configure the BIOS for the Gene-4310.

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 helps you navigate in Setup:

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

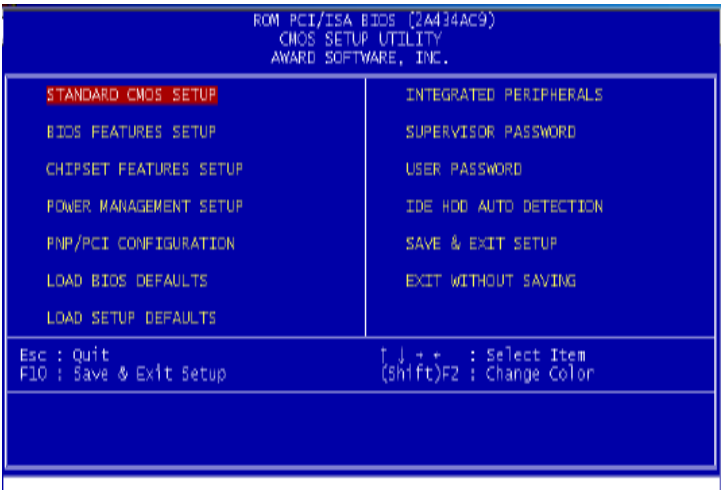
In Case of Problems

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.

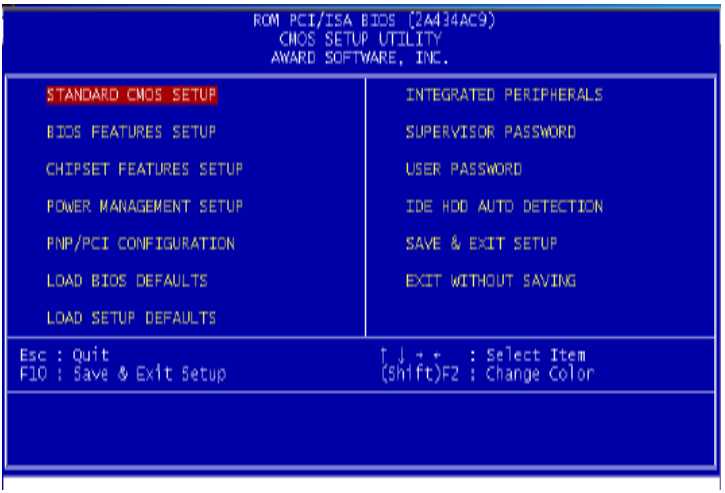
Main setup Menu



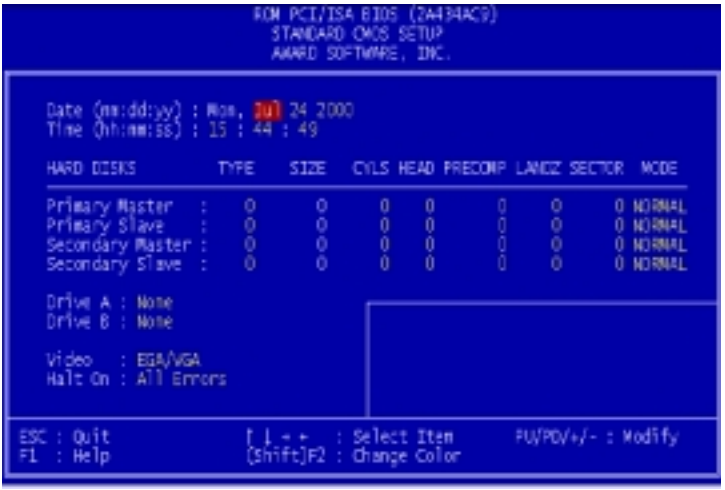
Standard CMOS	Options in the original PC AT-compatible BIOS.
BIOS Features	Award Software enhanced BIOS options.
Chipset Features	Options specific to your system chipset.
Power Management	Advanced Power Management (APM) options.
PnP/PCI Configuration	Plug and Play standard and PCI Local Bus configuration options.
Integrated Peripherals	I/O subsystems that depend on the integrated peripherals controller in your system.
Supervisor/User Password Setting	Change, set, or disable a password. In BIOS versions that allow separate user and supervisor passwords, 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.

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.
Save & Exit Setup	Save settings in nonvolatile CMOS RAM and exit Setup.
Exit Without Save	Abandon all changes and exit Setup.

Standard CMOS setup



When you choose the STANDARD CMOS SETUP option from the INITIAL SETUP SCREEN menu**,** the screen below is displayed.



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 DECTECTION 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.
- **Normal**: Maximum number of cylinders, heads, and sectors supported are 1024, 16, and 63.
- **Large**: For drives that do not support LBA and have more than 1024 cylinders.

- **LBA** (Logical Block Addressing): During drive accesses, 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 mega byte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 mega byte capacity

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 If**: 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.

•Other Memory

Between 640 KB and 1 MB; often called High memory. DOS may load terminate-and-stay-resident (TSR) programs, such as device drivers, in this area, to free as much conventional memory as possible for applications. Lines in your CONFIG.SYS file that start with LOADHIGH load programs into high memory.

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 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.

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.

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.

Shadow

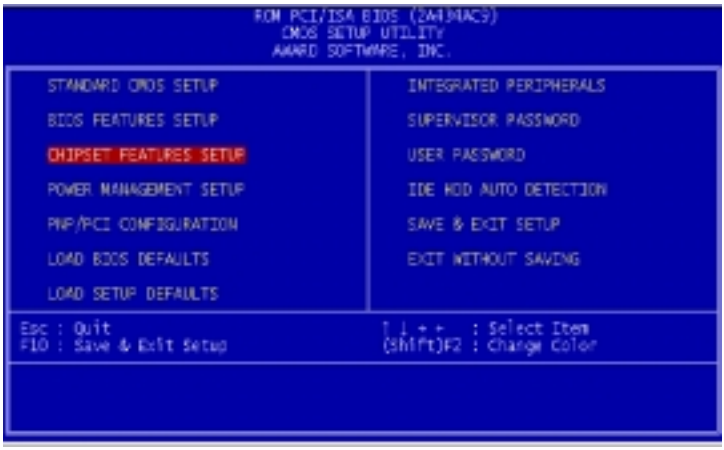
Software that resides in a read-only memory (ROM) chip on a device is called firmware. The AwardBIOS permits shadowing of firmware such as the system BIOS, video BIOS, and similar operating instructions that come with some expansion peripherals, such as, for example, a SCSI adaptor.

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.

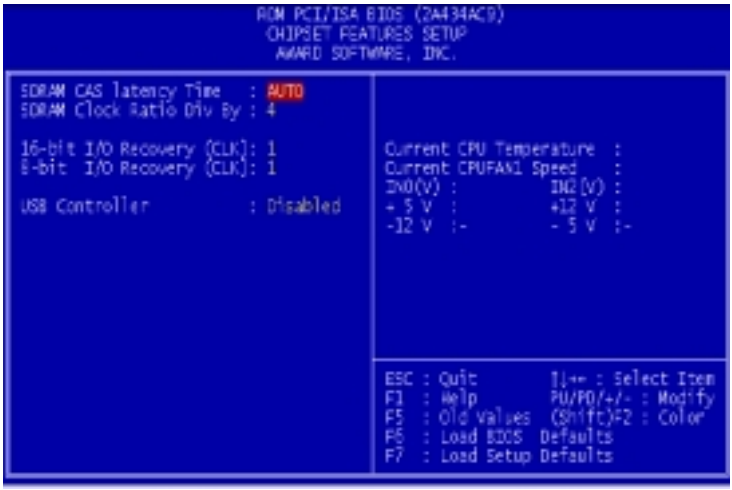
Enable shadowing into each section of memory separately. Many system designers hardwire shadowing of the system BIOS and eliminate a System BIOS Shadow option.

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.

CHIPSET features setup



By choosing the CHIPSET 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.

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 SDRAM is installed, you can control the number of CLKs between when the SDRAMs sample a read command and when the contoller samples read data from the SDRAMs. 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-4310 supports 2 sets of USB for connection. To Enable the onboard USB controller please set to Enable, otherwise set to Disable as default.

USB legacy support

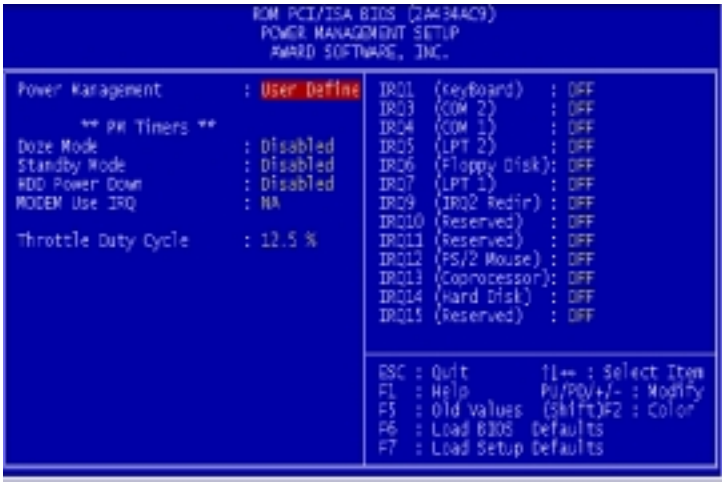
When you set the USB controller to be Enable, then the item will be appear. It is in order to support applications and drivers in non-USB-aware environments (e.g., DOS), the Host controller needs to provide some amount of hardware support for the emulation of PS/2 KB or PS/2 Mouse by their USB equivalents.

Hardware monitoring support

The Gene-4310 support onboard monitoring as CPU temperature, Fan speed, and Voltages for user reference.

Power management setup

By choosing the POWER MANAGEMENT option from the INITIAL SETUP SCREEN menu, the screen below is displayed.



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. Inactivity period is 1 minute in each mode.
User Define	Set each mode individually. Select time-out periods in the section for each mode, below.
Min Saving	Minimum power savings. Inactivity period is 1 hour in each mode (except the hard drive).

Doze Mode
After the selected period of system inactivity, the CPU clock throttles to a small percentage of its duty cycle — between 10 percent and 25 percent for most chipsets. All other devices still operate at full speed.

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.

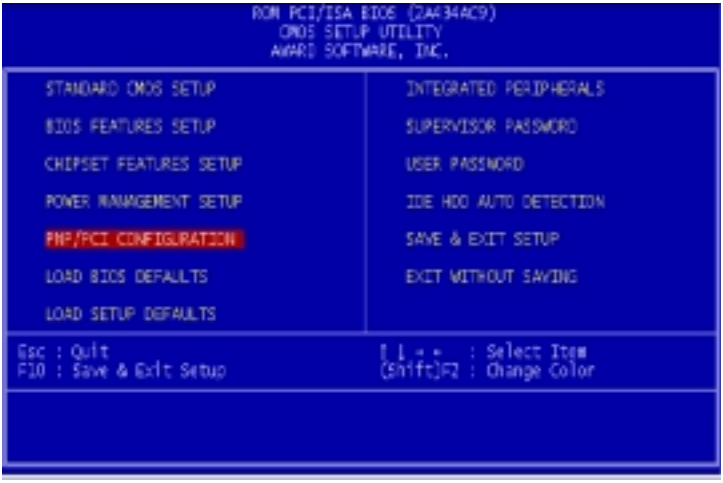
MODEM Use IRQ
Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

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.

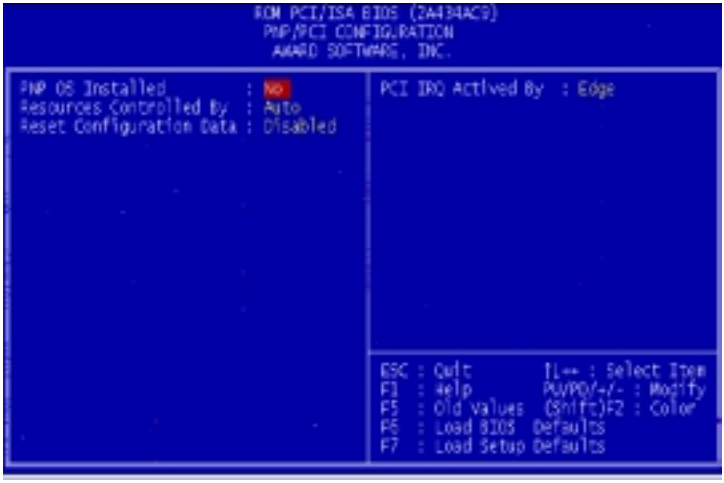
IRQ1~IRQ15
IRQ1 (keyboard)
IRQ3 (COM2)
IRQ4 (COM1)
IRQ5 (LPT2)
IRQ6 (Floppy Disk)
IRQ7 (LPT1)
IRQ9 (IRQ2 Redir)
IRQ10 (Reserved)
IRQ11 (Reserved)
IRQ12 (PS/2 mouse)
IRQ13 (Coprocessor)
IRQ14 (Hard Disk)
IRQ15 (Reserved)

As abye the default setting 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).

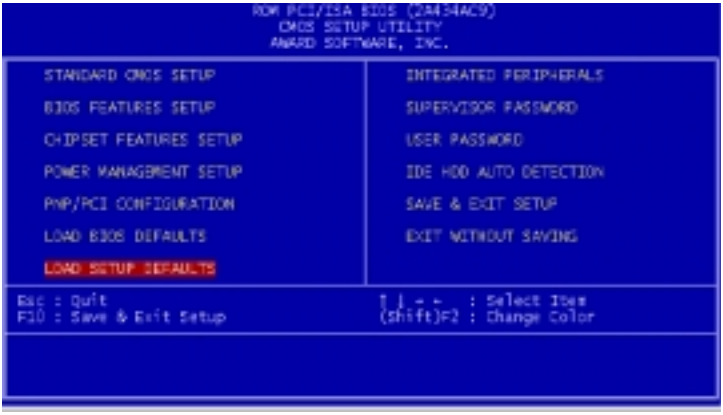
Resources Controlled By
The Plug and Play AwardBIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.

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-4310 on.



Integrated peripherals setup

By choosing the INTEGRATD 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.

IDE PIO Modes (Primary Master/Slave)
The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of up to four IDE devices that the internal PCI IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

IDE Primary Master/Slave UDMA
UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 33 MB/s. When you select Auto in the four IDE UDMA fields (for each of up to four IDE devices that the internal PCI IDE interface supports), the system automatically determines the optimal data transfer rate for each IDE device.

KBC input clock
The Gene-4310 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.

Onboard IR controller

Enable or Disable the onboard IR controller, as default is Disable. When you set it to Enable. There are several item will be appear as below.

IR Address select: Set IR address as (2F8H, 3E8H, 2E8H, 3E0H, 2E0H, 3F8H)

IR Mode: Setup IR mode as (IrDA, ASKIR, FIR, CIR)

When you set it to FIR mode. You also have to setting the FIR DMA.

IR Transmittion delay: enable or Disable IR transmittion delay.

IR IRQ select: Setup IR IRQ

Onboard parallel port

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

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:

Audio I/O Base Address: Setup audio I/O base address. (220H, 240H, 260H, 280H)

Audio IRQ select: Disable or Setup audio IRQ (IRQ5, IRQ7, IRQ10, & disable)

Audio Low DMA select: disable or Setup low DMA (DMA1, DMA1, DMA3, & disable)

Audio High DMA select: Disable or Setup audio high DMA. (DMA5, DMA6, & DMA7)

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-4310 also uses SODIMM, allocating 1.5MB to 4MB of storage area.

TV output Mode

The Gene-4310 onboard support TV output function for option. (NTSC, PAL).

Panel Clock Frequency

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

Flat Panel Resolution

Onboard support TFT LCD as below.

640x480

800x600

1024x768

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:

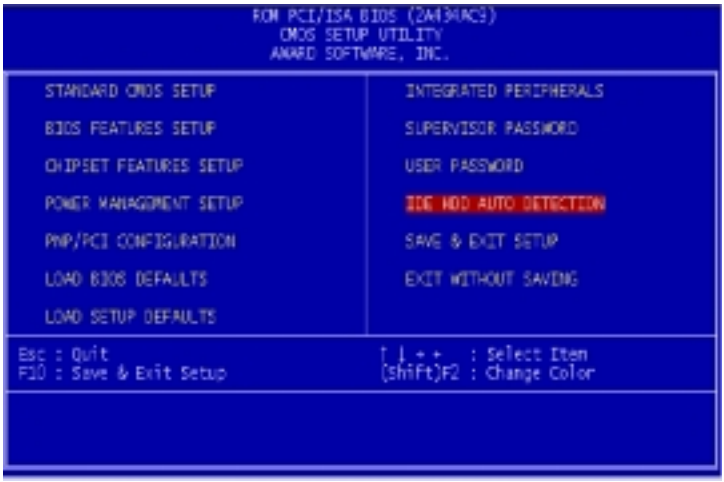
System Enter a password each time the system boots and when ever you enter Setup.

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.*

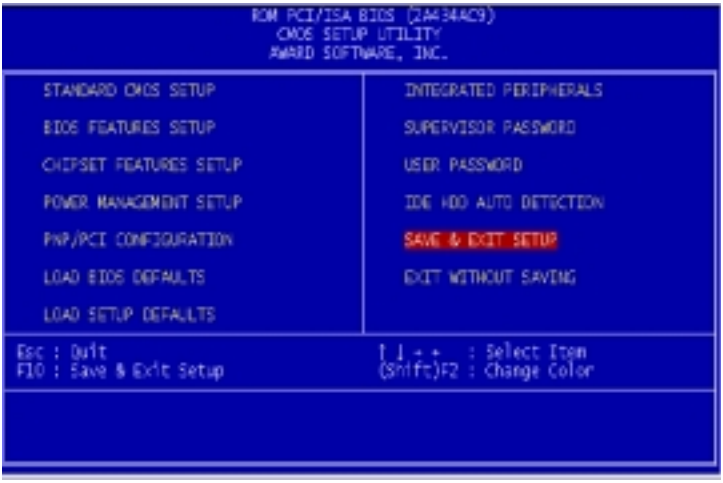
IDE HDD auto detection

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:



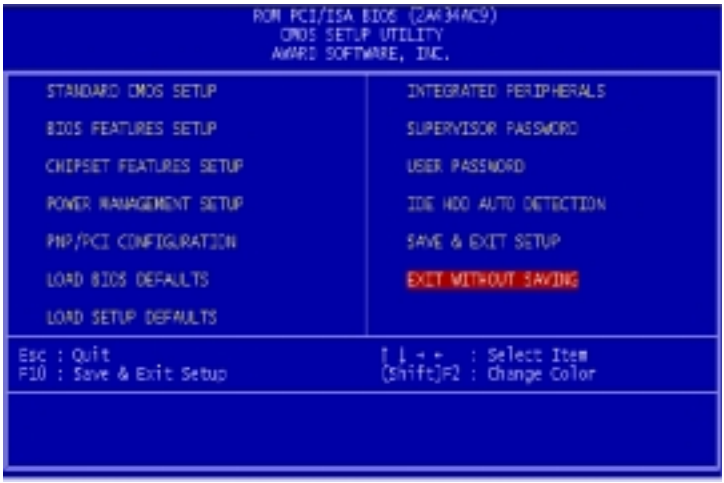
Save & exit setup

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-4310 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 Cx5530 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 CHIPS 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 prerequisites

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

Make sure you know the version of the application for which you are installing drivers. The *Supporting CD-ROM* contain drivers for several versions of certain applications. For your driver to operate properly, you must install the driver for your version of the application program.

Windows 95/98

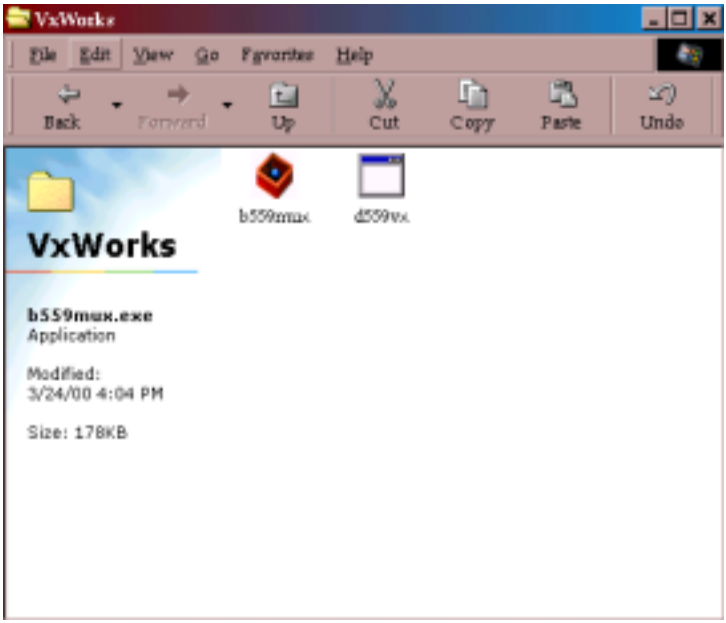
Installing VGA and Audio Driver

Gene-4310 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.

Installing Lan Driver

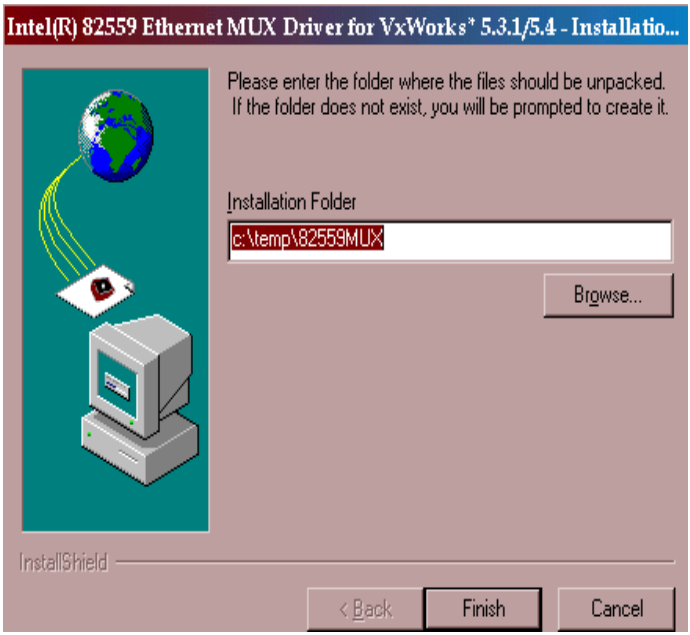
First you must unzip the Lan Intel 82559ER file on the CD-ROM. If the file is already unzipped, proceed with the installtion. There are two main files needed for installation **b559mux and d559vx.** Choose and click on **my computer**, from there select your CD-ROM drive. Find the two file names from above and select **enter.** The following three pages show installation directions. Follow the same steps for both files and your LAN driver will have been installed. Shut down afterwards to ensure proper installation.

Ethernet Installation



After installing the provided CD in the CD-ROM player this widow will appear. Double click on the ***b559mus*** icon to proceed with the installation. The file name for ethernet installation is 82559ER, in the 82559erdrivers16.zip.

Ethernet Installation



This window is asking for a folder location on your computer to save this new ***Ethernet download***. In this situation the preselected folder is the C:folder. If you choose to change the folder location simple double click the ***Browse*** icon and make your selection. To proceed with the installation, simply double click on the ***Finish*** icon.

Ethernet Installation

This is the final step in the Ethernet installation. Simply double click on the ***YES*** icon to finalize the installation.

Windows® NT 4.0 VGA Driver

Driver installation

1. Install Windows® NT 4.0 as you normally would for a **VGA** display. Click the **Start** buttom, 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** buttom, then click the **Display Type** buttom into the **Display Type** windows, then click on **Change** buttom from the **Adapter Type** icon. And click on **Have Disk** buttom 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.

Windows® NT 4.0 Audio Driver

Driver installation

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

1. Install Windows® NT 4.0 as you normally would for a **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**, 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, click OK.

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\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 please restart your system.

Windows® NT 4.0 Lan Driver

Driver installation

1. Install Windows® NT 4.0 as you normally would for a **Lan driver** display. Click the **Start** buttom, go to **Settings** and click on **Control Panel** icon. Then choose the **Network** and double click on the icon. In the **Network** window, click the **Yes, want to install** button. Then a wired to network window will appearclick the **Next** button. A select from list window will then appear click on the **choose from disk** option. Once you have found your CD-ROM address click **OK.**

2. Place the *Supporting CD-ROM* into your CD-ROM dirve.

   cd-rom : \CD ROM\model name\dirver\lan 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.

   In the next widow INTEL (R) GD82559ER Evaluation Adapter will appear, click **OK.**

   The next window will be asking for Network Protocal information select the desired options and click, **next.**

3. Once the installation is complete, check under the Network windows in the control panel option to verify your LAN driver has been installed.

APPENDIX A

Programming the 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.

Programming the watchdog timer

Watchdog timer

The watchdog timer uses a 8-bit counter. The time range is from 15 seconds to 3825 seconds with a resolution of 15 seconds. When timer times out, a system reset will happen.

Configuration register

The watchdog timer of Gene-4310 is located on the chipset – Winbond W83977. If you want to use it, you have to know how to read/write the configuration register of W83977. The basic procedure is as follows.

1. Enter configuration mode.
2. Select Logical Device.
3. Select register number.
4. Write/read data to/from register.
5. Exit configuration mode.

To Enter/Exit the configuration mode is to write a specific value to configuration port — ***370h***.

Enter configuration mode: write value ***87h*** to configuration port twice.

Exit configuration mode: write value ***aah*** to configuration port.

How to set the watchdog timer

1. Set register 30h of logical device 7 to 1 to activate the timer.

2. Write the desired counter value to register F2h of logical deivice 8.

Logical Device 7 : Register number 30h (CR30)

00h : Logical device is inactive

01h : Activates the logical device

Logicel Device 8 : Register number F2h (CRF2)

00h : Time-out Disable

01h : Time-out occurs after 15 seconds

02h : Time-out occurs after 30 seconds

03h : Time-out occurs after 45 seconds

04h : Time-out occurs after 60 seconds

.....

FFh : Time-out occurs after 3825 seconds

Example

Following is an example of programming 15 sec period for watch-dog timer in assembly language. When timer times out, it will generate signal of system reset.

```
CONFIG_PORT     dw      370h
DATA_PORT       dw      371h


SetWatchDog_Time PROC
    push  bx
    push  cx
    push  dx
    mov         bl,7            ;; Select logical device number 7
    mov         ax,0130h        ;; write 01h to register 30h to
                                   activate
                                ;; timer
    call        W977Write       ;; mov bl,8
                                ;; Select logical device number 8
    mov         ax,01f2h        ;; write time-out value (01h) to
                                   register
                                ;; F2h
    call        W977Write       ;; set time-out value to 32 sec
    pop         dx
    pop         cx
    pop         bx
    mov           ah,4ch
    int           21h
    ret
SetWatchDog_Time ENDP
```

```
;; Enter to I/O Chip Program Configuration Register Mode Enterv
   Config proc
      push      ax
      push      dx
      mov       al,87h    ;; Specific value to enter Config
                          ;; Mode
      mov       dx,cs:CONFIG_PORT
      out       dx,al     ;; Write to Config Port twice!
      out       dx,al
      jmp       $+2       ;; Delay
      jmp       $+2       ;;
      pop       dx
      pop       ax
      ret
```

EnterConfig endp

```
;; Exit to I/O Chip Program Configuration Register Mode
ExitConfig proc
      push  ax
      push  dx
      mov       al,0aah   ;; Specific value to exit Config
                          ;; Mode
      mov       dx,cs:CONFIG_PORT
      out       dx,al
      pop       dx
      pop       ax
      ret
```

ExitConfig endp

```
;; Select The I/O Chip Program Configuration Register Logical
Device
;; Input : bl = logical device number
SelectDevice proc
    push  ax
    push  dx
    mov         al,07h     ;; Select control register 7
    mov         dx,cs:CONFIG_PORT
    out         dx,al      ;; Write to Config Port
    jmp         $+2
    mov         al,bl      ;; Write logical device number
    mov         dx,cs:DATA_PORT          ;; to Data Port
    out         dx,al
    pop         dx
    pop         ax
    ret
```

SelectDevice endp

```
;; Setting I/O Chip Program Configuration Register Value
;; Input : al = register number
;; ah = setting value
```

```
W977Write PROC
    push    dx
    call    EnterConfig     ;; Enter Config Mode
    call    SelectDevice    ;; Select logical device
    mov     dx,cs:CONFIG_PORT
    out     dx,al           ;; Select register number
    mov     al,ah
    mov     dx,cs:DATA_PORT
    out     dx,al
    call    ExitConfig      ;; Exit Config Mode
    pop     dx
    ret
W977Write ENDP
    end
```