NEXCOM International Co., Ltd.

Industrial Computing Solutions

Embedded Computing (3.5” CPU Board)

EBC 342

User Manual

NEXCOM International Co., Ltd.
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PREFACE

Copyright

Disclaimer

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Acknowledgements

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Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2002/95/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force in to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2006 will be RoHS compliant. They will use the usual NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."
- Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needlenose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Precautions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect the equipment from an AC power outlet prior to installing a component inside the chassis.
4. To prevent electrostatic build-up, leave the board in its anti-static bag until you are ready to install it.
5. Keep the board away from humidity.
6. Put the board on a stable surface. Dropping it or letting it fall may cause damage.
7. Do not leave the board in either an unconditioned environment or in a above 60°C storage temperature as this may damage the board.
8. Wear an antistatic wrist strap.
9. Do all preparation work on a static-free surface.
10. Hold the board only by its edges. Be careful not to touch any of the components, contacts or connections.
11. All cautions and warnings on the board should be noted.
12. Use the correct mounting screws and do not over tighten the screws.
13. Keep the original packaging and the anti-static bag; in case the board has to be returned for repair or replacement.

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   - Product name and serial number
   - Detailed information of the peripheral devices
   - Detailed information of the installed software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wordings of the error messages

Conventions Used in this Manual

Warning: Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.

Caution: Information to avoid damaging components or losing data.

Note: Provides additional information to complete a task easily.

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Fax: +81-3-5419-7832
http://www.nexcom-jp.com

Package Contents

Before continuing, verify that the EBC 342 package that you received is complete. Your package should have all the items listed in the following table.

Item	P/N	Description	Qty
1	60233USB59X00	USB CABLE	1
2	60233POW22X00	POWER CABLE	1
3	60233ATA17X00	SATA CABLE	1
4	6023309101X00	COM PORT CABLE	2
5	60233PS203X00	PS/2 CABLE	1

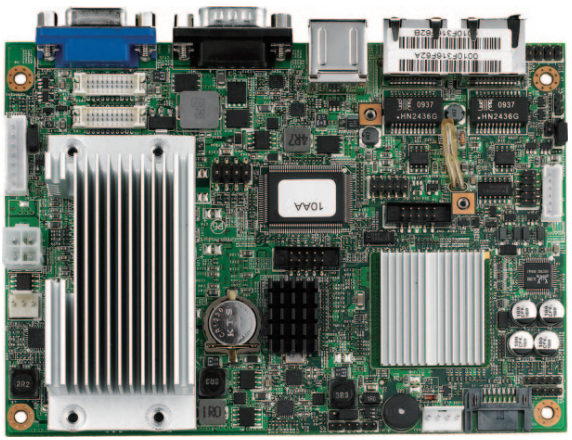
Ordering Information

The following provides ordering information for EBC 342.

- **EBC 342 (P/N: 10E00034200X0) RoHS Compliant**
  Low power Embedded Board with Intel® Atom™ N270 processor and based on Intel® 945GSE 3D graphics engine GMA950 with VGA, 24-bit LVDS, 6 x USB2.0, 3 x COMs, 1 x Mini PCIe, 2 x Gigabit LAN, 1 x parallel port.

Chapter 1: Product Introduction

Overview



Key Features

- Onboard Intel® Atom™ N270 1.6GHz CPU
- Intel® 945GSE/ICH7-M chipset
- One 200-pin SODIMM socket supports up to 2GB DDR2 400/533MHz SDRAM
- 24-bit LVDs Dual View, 2-CH LVDS
- 5.1-CH Audio
- 1 CF, 1 Mini PCIe card
- 1 SATA, 3 COM, 6 USB, 16-bit GPIO

Hardware Specifications

CPU

- Intel® Atom™ N270 1.6GHz processor with 533MHz FSB

Chipset

- Intel® 82945GSE Graphic Memory Controller Hub (GMCH)
- Intel® 82801 GBM ICH7 Mobile (ICH7-M)

Main Memory

- 1 x 200-pin DDR2 SODIMM socket
- Supports up to 2GB non-ECC 400/533 DDR2 memory

BIOS

- Award System BIOS
- Plug & Play support
- Advanced Power Management
- Advanced Configuration & Power Interface
- 8Mbits SPI ROM

Onboard LAN

- 2 x Realtek RTL8111C-GR PCI Express Gigabit Ethernet
- Supports Boot From LAN (PXE)
- 2 x RJ45 with LED

Display

- Intel® 945GSE integrated 3D graphics engine, based on Intel GMA950 architecture, delivers sophisticated graphics for large display application, dual independent display support, graphics core speed up to 166MHz, provides a wealth of options for high-resolution displays
- Analog VGA Interface
  - 1 x DB15 VGA port
  - Resolution up to 1600x1200 at 85Hz, 2048x1536 at 75Hz
- LVDS Interface
  - SDVO w/ CH7308B single/dual LVDS transmitter to single (24-bit) or dual pixel (48-bit) LVDS panel, resolution up to 1600x1200
  - 2 x DF13 20-pin LVDS connector for internal connection
- CCFL Interface
  - 1 x CCFL for LCD Panel Backlight Inverter

Onboard Audio

- Realtek ALC888 HD CODEC
- 1 x Mic-in and 1 x Line-out pin header

Expansion

- 1 x Mini PCIe

I/O Interface

- Serial ports: 3 ports - One DB9 port and Two 2x5 2.0mm box header serial
- Parallel port: One 26-pin box header
- USB 2.0 ports: 6 ports - 2 edge ports, 2 ports by 2.0mm JST connector and 2 ports by 2.0mm pin header
- 8 GPIO lines via header (GPI 0~3 and GPO 0~3) TTL Level (0/5 V)
- Onboard Power LED and HDD Active LED pin header
- 1 x 3-pin fan connector (for CPU)
- 1 x DB15 VGA connector
- 1 x Keyboard/Mouse pin header
- Onboard Buzzer, SMBus2.0, Reset SW

Watchdog Timer

- Watchdog timeout is programmable by software from 1 sec to 255 sec and from 1 min to 255 minutes (Tolerance 15% under 25°C room temperature)

Storage

- 1 x SATA port
- 1 x CF socket

System Monitor

- Monitors 4 voltages and 2 temperatures
- 4 voltages (Vcore, +12V, +3.3V, +1.5V)
- 2 temperatures (CPU and system)

Onboard RTC

- On-chip RTC with battery backup
- 1 x External Li-Ion battery

Power Input

- Supports AT and ATX modes

Power Requirements

- Power requirement: +12V DC input
- One 4-pin power connector

Dimensions

- 3.5" form factor
- 146mm (L) x 105mm (W) (5.7"x 4.1")

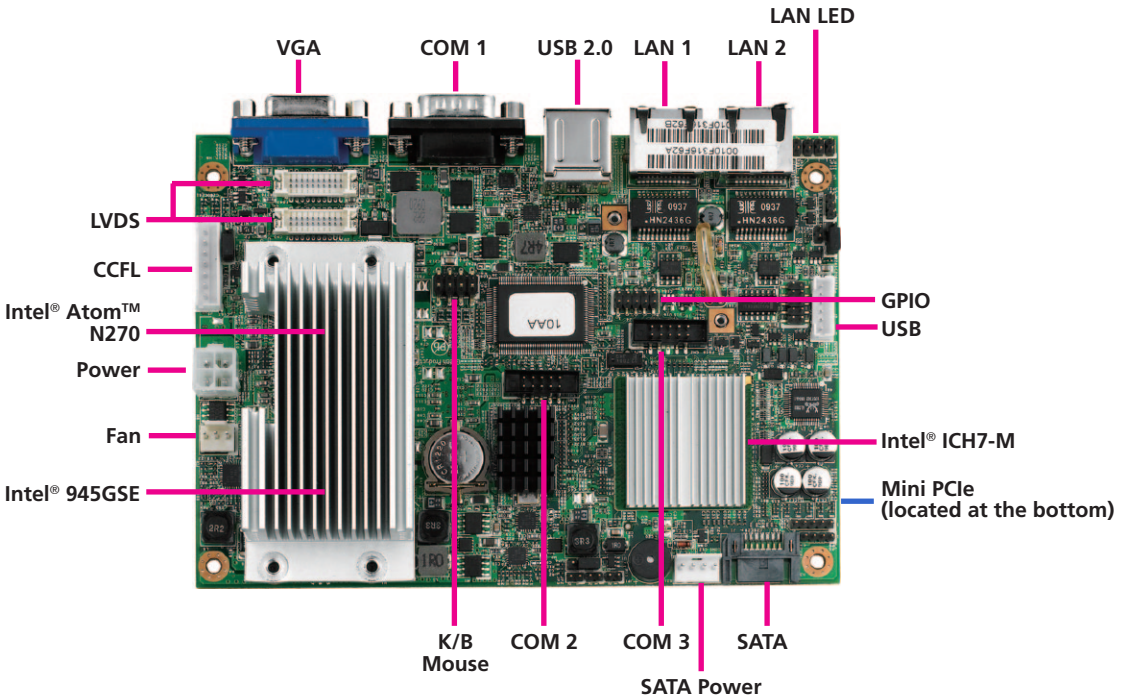
Environment

- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 85°C
- Operating Relative Humidity: 10% - 90%, non condensing

Certifications

- CE approval
- FCC Class A

Getting to Know EBC 342



Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the motherboard. Note that the following procedures are generic for EBC 342.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers Screwdrivers
  - A grounding strap
  - An anti-static pad
- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.
- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environment tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on the computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:

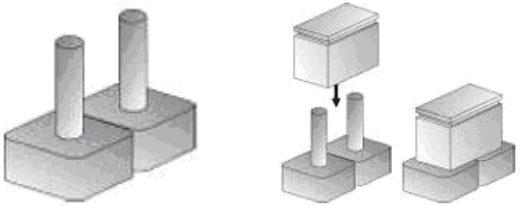
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

Jumper Settings

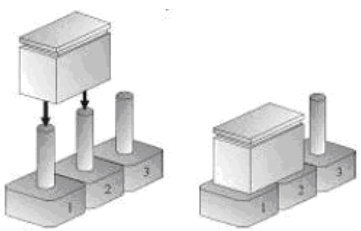
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is **short**. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is **open**.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)

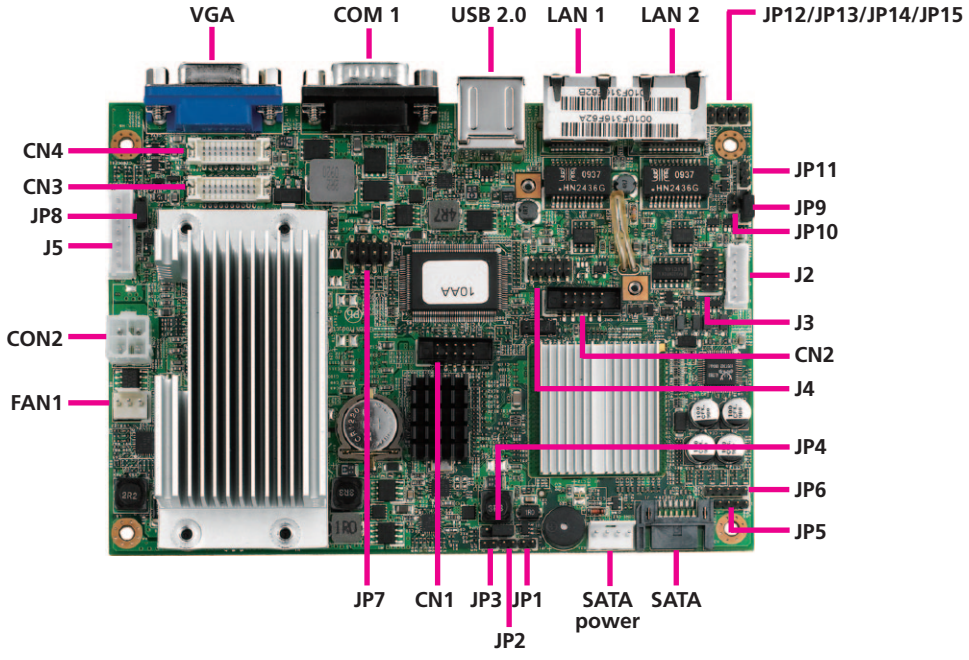


Three-Pin Jumpers: Pins 1 and 2 Are Short



Locations of the Jumpers and Connectors

The figure below shows the locations of the jumpers and connectors.



Jumpers

Panel Power Select

Connector type: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP8

Pin	Definition
1	VCC3
2	Panel power
3	VCC5

1-2 On: default

RTC Clear

Connector type: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP4

Pin	Settings
1-2 On	Normal
2-3 On	CMOS Clear

1-2 On: default

Pin	Definition
1	Battery 3.3V
2	RTCRST#
3	GND

Power Type Select

Connector type: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP9

Pin	Definition
1-2 On	AT Mode
2-3 On	ATX Mode

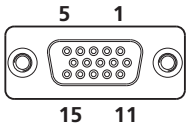
2-3 On: default

Connector Pin Definitions

External I/O Interface

VGA Port

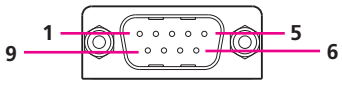
Connector type: DB-15 port, 15-pin D-Sub
Connector location: VGA1



Pin	Definition	Pin	Definition
1	RED_VGA	9	VGA_VCC
2	GREEN_VGA	10	GND
3	BLUE_VGA	11	NC
4	NC	12	VGA_DDC_DATA
5	GND	13	G_HSYNC
6	GND	14	G_VSYNC
7	GND	15	VGA_DDC_CLK
8	GND		

RS232 COM1 Port

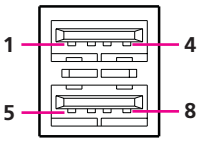
Connector type: DB-9
Connector location: COM1



Pin	Definition	Pin	Definition
1	DCD	6	DSR
2	RxD	7	RTS
3	TxD	8	CTS
4	DTR	9	RI
5	GND		

USB Ports

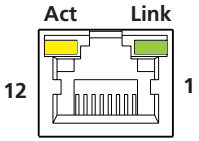
Connector type: Dual USB port, Type A
Connector location: CN5



Pin	Definition	Pin	Definition
1	VCC5	5	VCC5
2	USB0-	6	USB1-
3	USB0+	7	USB1+
4	GND	8	GND

LAN Port

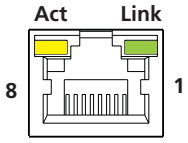
Connector type: RJ45 port with LEDs
Connector location: LAN1



Pin	Definition	Pin	Definition
1	LAN2_TXD0P	2	LAN2_TXD0N
3	LAN2_TXD1P	4	LAN2_TXD2P
5	LAN2_TXD2N	6	LAN2_TXD1N
7	LAN2_TXD3P	8	LAN2_TXD3N
9	LAN2_LINKLED#	10	VCC3
11	LAN2_ACTLED#	12	VCC3
MH1	GND_CHASSIS	MH2	GND_CHASSIS

LAN Port

Connector type: RJ45 port with LEDs
Connector location: LAN2



Pin	Definition	Pin	Definition
1	LAN1_TXD0P	2	LAN1_TXD0N
3	LAN1_TXD1P	4	LAN1_TXD2P
5	LAN1_TXD2N	6	LAN1_TXD1N
7	LAN1_TXD3P	8	LAN1_TXD3N
9	LAN1_LINKLED#	10	VCC3
11	LAN1_ACTLED#	12	VCC3
MH1	GND_CHASSIS	MH2	GND_CHASSIS

SATA Port

Connector type: Standard Serial ATAII 7P (1.27mm)
Connector location: J1

Pin	Definition
1	GND
2	TXP0
3	TXN0
4	GND
5	RXN0
6	RXP0
7	GND

SATA Power Connector

Connector type: 1x4 4-pin Wafer, 2.54 mm pitch
Connector location: CON1

Pin	Definition
1	VCC12
2	GND
3	GND
4	VCC5

Internal Connectors

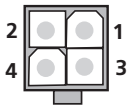
System Fan Connector

Connector type: 1x3 3-pin Wafer, 2.54 mm pitch
Connector location: FAN1

Pin	Definition
1	GND
2	+12V
3	SENSE

DC Power Input Connector (ATX AUX Power)

Connector type: 2x2
Connector location: CON2



Pin	Definition
1	GND
2	GND
3	12V DC-IN
4	12V DC-IN

Power Button Connector

Connector type: 1x2 2-pin header, 2.0 mm pitch
Connector location: JP10

Pin	Definition
1	PS_ON#
2	GND

Reset Button Connector

Connector type: 1x2 2-pin header, 2.0 mm pitch
Connector location: JP1

Pin	Definition
1	RESET#
2	GND

Power LED Connector

Connector type: 1x2 2-pin header, 2.0 mm pitch
Connector location: JP3

Pin	Definition
1	VCC5
2	GND

HDD Active LED Connector

Connector type: 1x2 2-pin header, 2.0 mm pitch
Connector location: JP2

Pin	Definition
1	VCC5
2	HD_LED#

LAN 1 Link LED Connector

Connector type: 1x2 2-pin header, 2.0 mm pitch
Connector location: JP15

Pin	Definition
1	VCC3
2	LAN1_LINKLED#

LAN 2 Link LED Connector

Connector type: 1x2 2-pin header, 2.0 mm pitch
Connector location: JP13

Pin	Definition
1	VCC3
2	LAN2_LINKLED#

LAN 1 Active LED Connector

Connector type: 1x2 2-pin header, 2.0 mm pitch
Connector location: JP14

Pin	Definition
1	VCC3
2	LAN1_ACTLED#

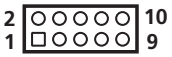
LAN 2 Active LED Connector

Connector type: 1x2 2-pin header, 2.0 mm pitch
Connector location: JP12

Pin	Definition
1	VCC3
2	LAN2_ACTLED#

GPIO Connector

Connector type: 2x5 10-pin header, 2.0 mm pitch
Connector location: J4



Pin	Definition	Pin	Definition
1	VCC5	2	GND
3	SIO_GPI54-(GPO)	4	SIO_GPO50-(GPI)
5	SIO_GPI55-(GPO)	6	SIO_GPO51-(GPI)
7	SIO_GPI56-(GPO)	8	SIO_GPO52-(GPI)
9	SIO_GPI57-(GPO)	10	SIO_GPO53-(GPI)

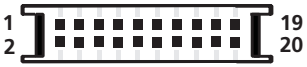
CCFL Connector

Connector type: JST 7-pin, 2.54 mm pitch
Connector location: J5

Pin	Definition
1	+5V
2	+12V
3	+12V
4	N.C.
5	GND
6	GND
7	Backlight Enable

LVDS Connector

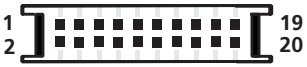
Connector type: 2x10 20-pin, 2.0 mm pitch, HIROSE: DF13-20DP-1.25V
Connector location: CN3



Pin	Definition	Pin	Definition
1		11	LVDSA_CLK1P
2		12	LVDSA_TX1N
3	VDD	13	LVDSA_CLK1N
4	LVDSA_TX0P	14	LVDSA_GND
5	LVDSA_TX3P	15	LVDSA_GND
6	LVDSA_TX0N	16	VCC12
7	LVDSA_TX3N	17	LVDSA_TX2P
8	VDD	18	VCC12
9	LVDSA_GND	19	LVDSA_TX2N
10	LVDSA_TX1P	20	LVDSA_GND

LVDS Connector

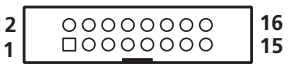
Connector type: 2x10 20-pin, 2.0 mm pitch, HIROSE: DF13-20DP-1.25V
Connector location: CN4



Pin	Definition	Pin	Definition
1		11	LVDSB_CLK2P
2		12	LVDSB_TX5N
3	VDD	13	LVDSB_CLK2N
4	LVDSB_TX4P	14	LVDSB_GND
5	LVDSB_TX7P	15	LVDSB_GND
6	LVDSB_TX4N	16	VCC12
7	LVDSB_TX7N	17	LVDSB_TX6P
8	VDD	18	VCC12
9	LVDSB_GND	19	LVDSB_TX6N
10	LVDSB_TX5P	20	LVDSB_GND

VGA Connector (co-layout with the edge connector)

Connector type: 2x8 16-pin box header, 2.0 mm pitch
Connector location: CN8



Pin	Definition	Pin	Definition
1	RED_VGA	9	VGA_VCC
2	GREEN_VGA	10	GND
3	BLUE_VGA	11	NC
4	NC	12	VGA_DDC_DATA
5	GND	13	G_HSYNC
6	GND	14	G_VSYNC
7	GND	15	VGA_DDC_CLK
8	GND		

USB Connector

Connector type: 1x6 6-pin boxed header, JST-2.0mm-M-180
Connector location: J2

Pin	Definition
1	VCC5
2	USB2-
3	USB2+
4	USB3-
5	USB3+
6	GND

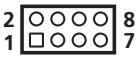
SMBus Connector

Connector type: 1x3 3-pin header, 2.0 mm pitch
Connector location: JP11

Pin	Definition
1	SMB_DATA
2	SMB_CLK
3	GND

PS/2 Keyboard/Mouse Connector

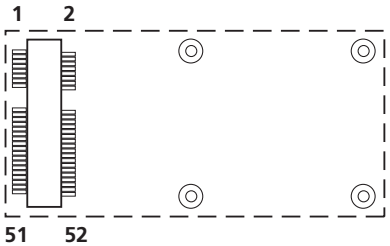
Connector type: 2x4 8-pin header, 2.54 mm
Connector location: JP7



Pin	Definition	Pin	Definition
1	VCC5	2	VCC5
3	KB_DATA	4	LM_DATA
5	KB_CLK	6	LM_CLK
7	GND	8	GND

Mini PCIe Slots

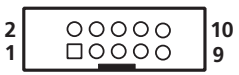
Connector location: CN7



Pin	Definition	Pin	Definition
1	WAKE0#	2	+V3.3_MINI
3	NC	4	GND
5	NC	6	+V1.5S_MINI
7	NC	8	NC
9	GND	10	NC
11	GPP_CLK0_N	12	NC
13	GPP_CLK0_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD1_DIS#
21	GND	22	PCIE_RST#
23	PCIE_RX2N	24	+V3.3A_MINI
25	PCIE_RX2P	26	GND
27	GND	28	+V1.5S_MINI
29	GND	30	SMB_CLK
31	PCIE_TX2N	32	SMB_DAT
33	PCIE_TX2P	34	GND
35	GND	36	USB_6N
37	GND	38	USB_6P
39	+V3.3A_MINI	40	GND
41	+V3.3A_MINI	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+V1.5S_MINI
49	NC	50	GND
51	NC	52	+V3.3A_MINI

RS232 Serial Port Connector

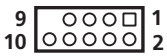
Connector type: 2x5 10-pin boxed header, 2.0 mm
Connector location: CN1 and CN2



Pin	Definition	Pin	Definition
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N.C.

USB DOM Connector

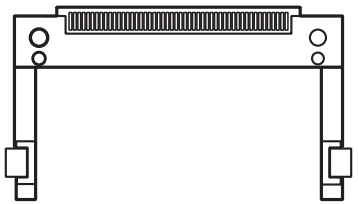
Connector type: 2x5 10-pin header, 2.0 mm pitch
Connector location: J3



Pin	Definition	Pin	Definition
1	VCC5	2	VCC5
3	USB4-	4	USB5-
5	USB4+	6	USB5+
7	GND	8	GND
9	GND	10	GND

CompactFlash Socket

Connector type: CompactFlash Type 2
Connector location: CN6



Pin	Description	Pin	Description
1	GND	2	SDD3A
3	SDD4A	4	SDD5A
5	SDD6A	6	SDD7A
7	SDCS#1	8	GND
9	GND	10	GND
11	GND	12	GND
13	VCC	14	GND
15	GND	16	GND
17	GND	18	SDA2A
19	SDA1A	20	SDA0A
21	SDD0A	22	SDD1A
23	SDD2A	24	NC
25	CF_CD2#	26	CF_CD1#
27	SDD11A	28	SDD12A

Pin	Description	Pin	Description
29	SDD13A	30	SDD14A
31	SDD15A	32	SDCS#3
33	NC	34	SDIOR#
35	SDIOW#	36	VCC
37	HDIRQ14	38	VCC
39	CF_SEL#	40	NC
41	IDERST#	42	SIORDY
43	SDREQ	44	SDDACK#
45	IDEACTP#	46	DIAG#
47	SDD8A	48	SDD9A
49	SDD10A	50	GND

Line-out Connector

Connector type: 1x5 5-pin header, 2.0 mm pitch
Connector location: JP6

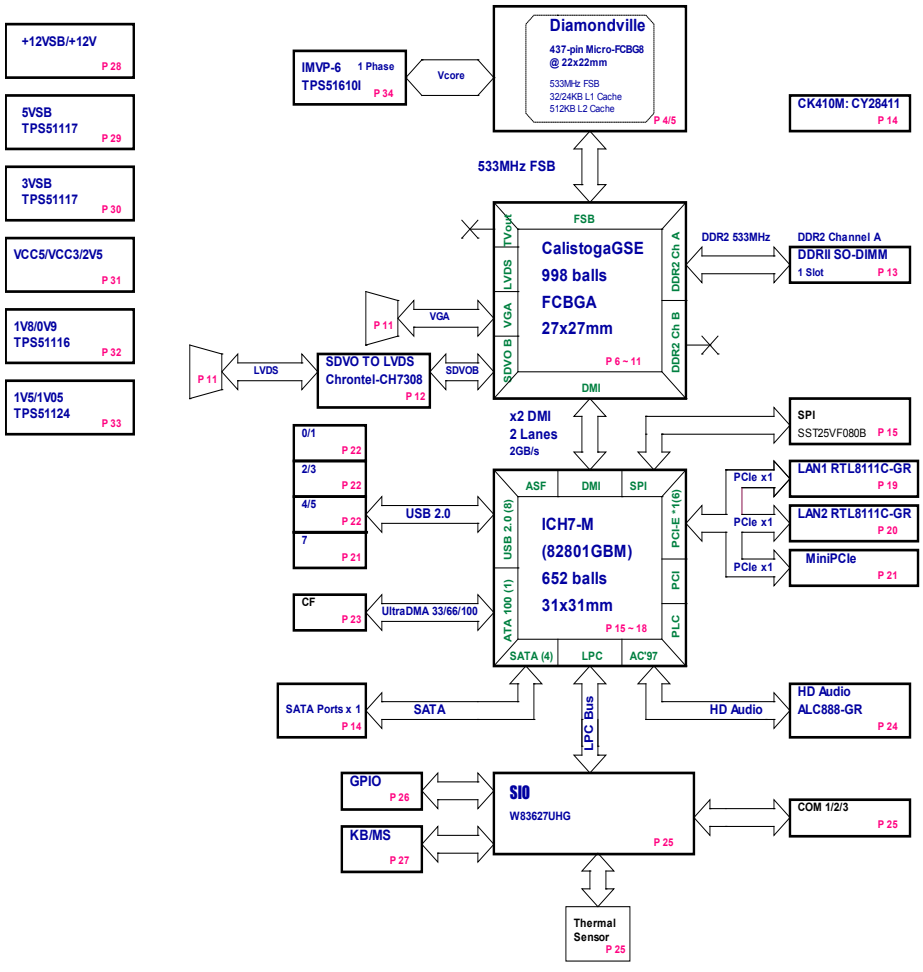
Pin	Definition
1	LOUT_L+
2	LOUT_L-
3	GND
4	LOUT_R+
5	LOUT_R-

Mic-in Connector

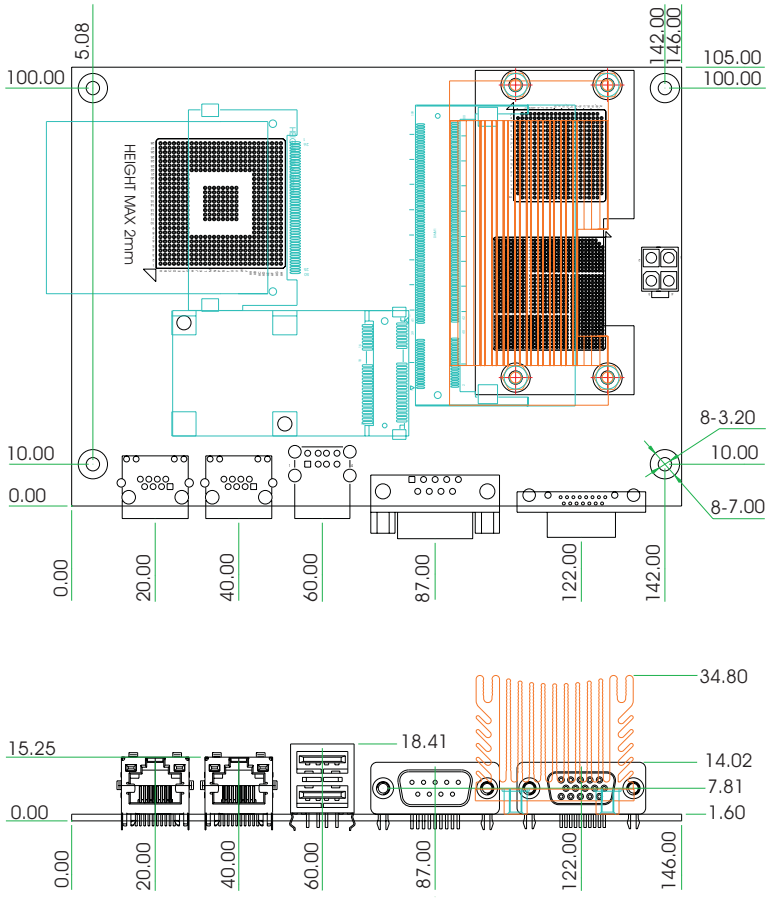
Connector type: 1x4 4-pin header, 2.0 mm pitch
Connector location: JP5

Pin	Definition
1	MIC_L
2	GND
3	GND
4	MIC_R

Block Diagram



Board Dimensions



Chapter 3: BIOS Setup

This chapter describes how to use the BIOS setup program for EBC 342. The BIOS screens in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM Web site at www.nexcom.com.tw.

About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program intimately affect how the computer performs. It is important, therefore, first to try to understand all the Setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

This program should be executed under the following conditions:

- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the Setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

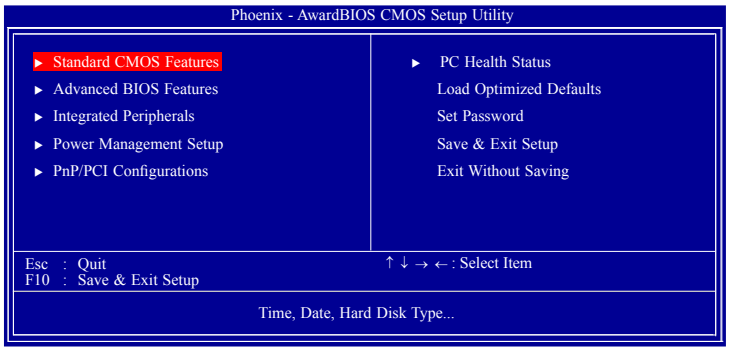
- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <Del> allows you to enter Setup. Another way to enter Setup is to power on the computer and wait for the following message during the POST:

TO ENTER SETUP BEFORE BOOT
PRESS <CTRL-ALT-ESC>
Press the <Del> key to enter Setup:

BIOS Main Menu

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



The following table lists the available options on the main menu.

Menu	Description
Standard CMOS Features	Use this menu for basic system configuration.
Advanced BIOS Features	Use this menu to set the advanced features available on the system.
Integrated Peripherals	Use this menu to specify your settings for integrated peripherals.
Power Management Setup	Use this menu to specify your settings for power management.
PnP/PCI Configurations	Appears if your system supports Plug and Play and PCI Configuration.
PC Health Status	Displays CPU, System Temperature, Fan Speed, and System Voltages Value.
Load Optimized Defaults	Use this menu to load the BIOS default values, that is, factory settings for optimum system performance. While Award has designed the custom BIOS to maximize performance, the factory has the option to change these defaults to meet their needs.
Set Password	Enables you to change, set, or disable the supervisor or user password.
Save & Exit Setup	Saves CMOS value changes to CMOS and exits setup
Exit Without Saving	Ignores all CMOS value changes and exits setup.

Getting Help

The BIOS Setup program provides descriptions of the options available on the menu.

- If you are on the main menu, a description of the highlighted option can be found at the bottom of the screen.
- If you are on the Status Page or Option Page setup menu, a description of the highlighted option can be found on the right side of the screen under the heading Item Help.

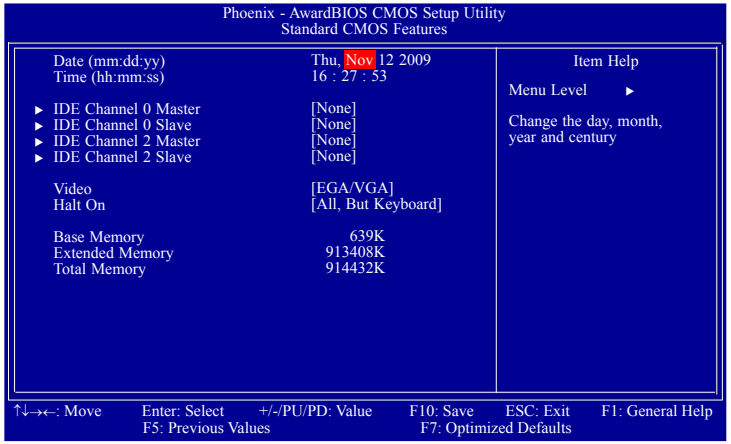
Using the Control Keys

The table below lists the keys that help you navigate the setup program.

Use This Key	To Do This
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item to the left
Right arrow	Move to the item to the right
Esc key	Main Menu: Quit without saving changes to CMOS Status Option Page Setup Menus: Exit current page and return to Main Menu.
Enter Key	Select or Accept an Item
PgUp/plus key	Increase the numeric value or make changes
PgDn/minus key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2/Shift + F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F5 key	Restore the previous CMOS value from CMOS (only for Option Page Setup Menu)
F6 key	Load the default CMOS value from BIOS default table (only for Option Page Setup Menu)
F7 key	Load the Setup default value (only for Option Page Setup Menu)
F9 Key	Menu in BIOS
F10 key	Save all the CMOS changes (only for Main Menu)

BIOS Setup Utility

Standard CMOS Features



Date

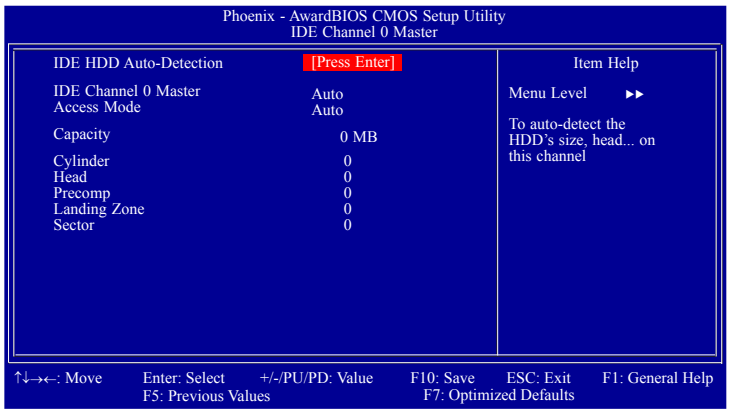
The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

IDE Channel 0 Master and IDE Channel 2 Slave

To configure the IDE drives, move the cursor to a field then press <Enter>. The following screen will appear.



IDE HDD Auto-Detection

Detects the parameters of the drive. The parameters will automatically be shown on the screen.

IDE Channel 0 Master / IDE Channel 0 Slave

If you select "Auto", the BIOS will auto-detect the HDD & CD-ROM drive at the POST stage and show the IDE for the HDD & CD-ROM drive. If a hard disk has not been installed, select "None".

Access Mode

For hard drives larger than 528MB, you would typically select the LBA type. Certain operating systems require that you select CHS or Large. Please check your operating system's manual or Help desk on which one to select.

Capacity

Displays the approximate capacity of the disk drive. Usually the size is slightly greater than the size of a formatted disk given by a disk checking program.

Cylinder

This field displays the number of cylinders.

Head

This field displays the number of read/write heads.

Precomp

This field displays the number of cylinders at which to change the write timing.

Landing Zone

This field displays the number of cylinders specified as the landing zone for the read/write heads.

Sector

This field displays the number sectors per track.

Video

This field selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type. The default setting is EGA/VGA.

EGA/VGA
Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA and 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

This field determines whether the system will stop if an error is detected during power up. The default setting is All Errors.

No Errors
The system boot will not stop for any errors detected.

All Errors
The system boot will stop whenever the BIOS detects a non-fatal error.

All, But Keyboard
The system boot will not stop for a keyboard error; it will stop for all other errors.

Base Memory

Displays the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard or 640K for systems with 640K or more memory installed on the motherboard.

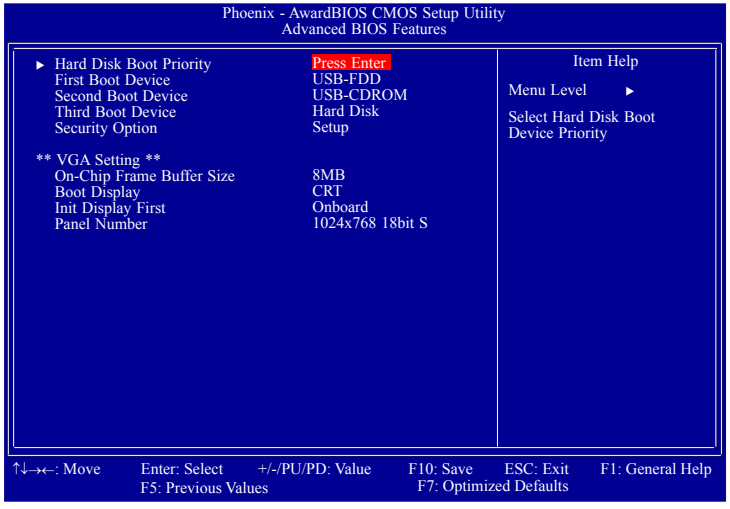
Extended Memory

Displays the amount of extended memory detected during boot-up.

Total Memory

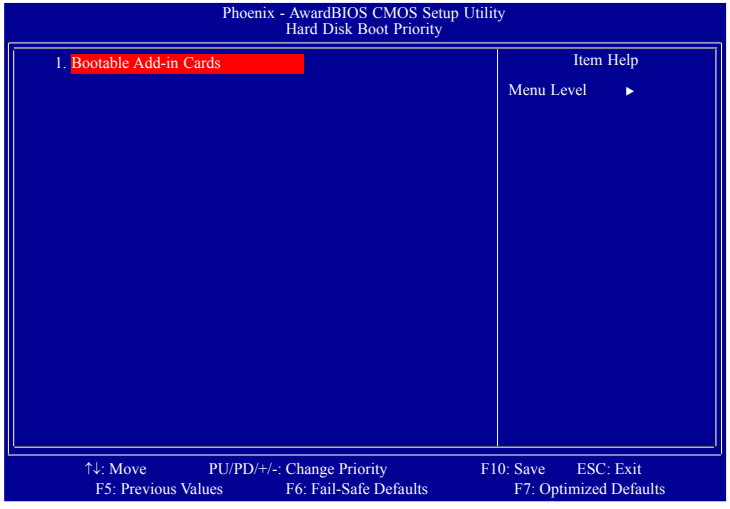
Displays the total memory available in the system.

Advanced BIOS Features



Hard Disk Boot Priority

This field is used to select the boot sequence of the hard drives. Move the cursor to this field then press <Enter>. Use the Up or Down arrow keys to select a device then press <+> to move it up or <-> to move it down the list.



First Boot Device, Second Boot Device and Third Boot Device

Select the drive to boot first, second and third in the "First Boot Device" "Second Boot Device" and "Third Boot Device" fields respectively. The BIOS will boot the operating system according to the sequence of the drive selected.

The options are:

Hard Disk
CDROM
USB-FDD
USB-ZIP
USB-CDROM
LAN
Disabled

Security Option

This field determines when the system will prompt for the password - everytime the system boots or only when you enter the BIOS setup. Set the password in the Set Supervisor/User Password submenu.

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

Setup
The system will boot, but access to Setup will be denied unless the correct password is entered at the prompt.

On-Chip Frame Buffer Size

This field is used to select the onboard VGA's frame buffer size that is shared from the system memory.

The options are:

1MB
8MB

Boot Display

This field is used to select the type of display to use when the system boots.

CRT1
LFP
CRT1 + LFP
CRT2
CRT1 + CRT2
DVI
CRT1+DVI

Init Display First

Onboard
When the system boots, it will first initialize the onboard VGA.

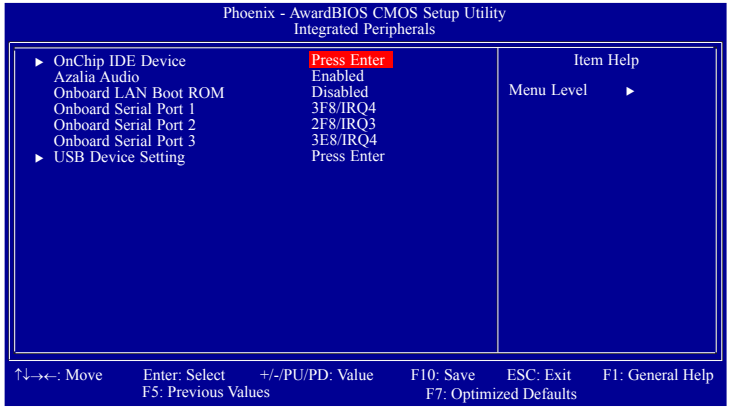
PCI Slot
When the system boots, it will first initialize PCI.

Panel Number

This field is used to select the type of panel that you are using. The options are:

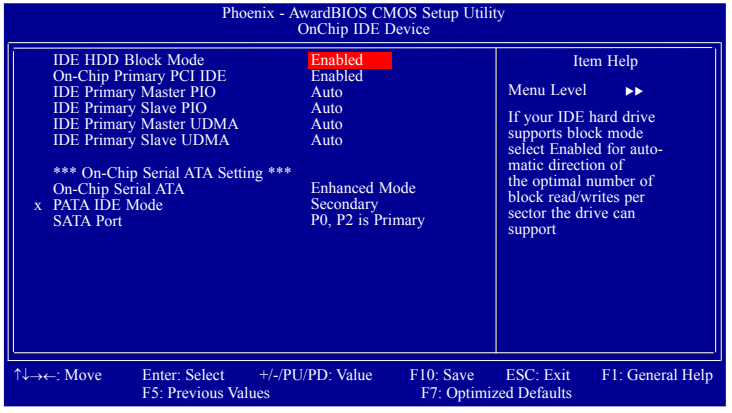
640x480 18bit S
800x600 18bit S
1024x768 18bit S
1280x1024 18bit D
1400x1050 18bit D
1280x800 24bit D

Integrated Peripherals



OnChip IDE Device

Move the cursor to this field and press <Enter>. The following screen will appear.



IDE HDD Block Mode

Enabled
The IDE HDD uses the block mode. The system BIOS will check the hard disk drive for the maximum block size the system can transfer. The block size will depend on the type of hard disk drive.

Disabled
The IDE HDD uses the standard mode.

On-Chip Primary PCI IDE

Enables or disables the primary IDE. The default is Enabled. Select Disabled if you want to add a different hard drive controller.

IDE Primary Master PIO and IDE Primary Slave PIO

PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by themselves. Your system supports five modes, 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode after checking your drive.

Auto
The BIOS will automatically set the system according to your hard disk drive's timing.

Mode 0-4
You can select a mode that matches your hard disk drive's timing. Caution: Do not use the wrong setting or you will have drive errors.

IDE Primary Master UDMA and IDE Primary Slave UDMA

These fields allow you to set the Ultra DMA in use. When Auto is selected, the BIOS will select the best available option after checking your hard drive or CD-ROM.

Auto
The BIOS will automatically detect the settings for you.

Disabled
The BIOS will not detect these categories.

On-Chip Serial ATA

Disabled
Disables the onboard SATA.

Combined Mode
PATA and SATA are combined. Maximum of 2 IDE drives in each channel.

Enhanced Mode
Enables both SATA and PATA. Supports maximum of 5 IDE drives.

SATA Only
This option automatically sets the SATA drives to Primary Master mode. Since the SATA drives are in Master mode, you cannot set the IDE drive to Master mode.

PATA IDE Mode

This field is used to select the function mode of the IDE 1 connector and its relation to the SATA ports.

Primary
IDE 1 serves as Primary Master and Primary Slave channel. SATA 2 and SATA 4 serve as Secondary Master and Secondary Slave channel. SATA 1 and SATA 3 are disabled.

Secondary
IDE 1 serves as Secondary Master and Secondary Slave channel. SATA 1 and SATA 3 serve as Primary Master and Primary Slave channel. SATA 2 and SATA 4 are disabled.

SATA Port

If the "PATA IDE Mode" field is set to Primary, this field will show "P1, P3 is Secondary"; meaning SATA 2 and SATA 4 are Secondary.

If the "PATA IDE Mode" field is set to Secondary, this field will show "P0, P2 is Primary"; meaning SATA 1 and SATA 3 are Primary.

Azalia Audio

Enables or disables the Azalia audio controller.

Onboard LAN Boot ROM

Enable this field if you wish to use the boot ROM (instead of a disk drive) to boot-up the system and access the local area network directly.

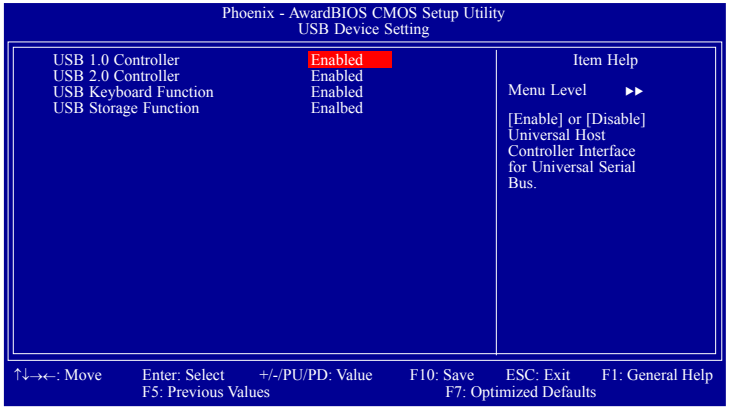
If you wish to change the boot ROM's settings, type the <Shift> and <F10> keys simultaneously when prompted during boot-up. Take note: you will be able to access the boot ROM's program (by typing <Shift> + <F10>) only when this field is enabled.

Onboard Serial Port 1 to Onboard Serial Port 3

3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, 2E0/IRQ4
Allows you to manually select an I/O address for the serial port.

Disabled
Disables the serial port.

USB Device Setting



USB 1.0 Controller

This field is used to enable or disable the Universal Host Controller Interface (USB 1.0).

USB 2.0 Controller

This field is used to enable or disable the Enhanced Host Controller Interface (USB 2.0).

USB Keyboard Function

Due to the limited space of the BIOS ROM, the support for legacy USB keyboard (in DOS mode) is by default set to Disabled. With more BIOS ROM space available, it will be able to support more advanced features as well as provide compatibility to a wide variety of peripheral devices.

If a PS/2 keyboard is not available and you need to use a USB keyboard to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

USB Storage Function

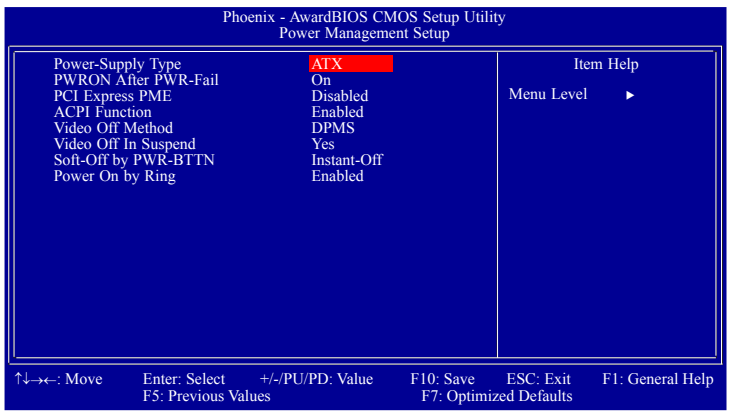
This field is used to enable or disable the support for legacy USB mass storage.

Power Management Setup

Power Management Setup lets you control the system power. The system has various power-saving modes — including powering down the hard disk, turning off the video, suspending to RAM, and software power down — that allows the system to automatically resume by certain events.

The power-saving modes can be controlled by timeouts. If the system is inactive for a time, the timeouts begin counting. If inactivity continues and reaches the defined timeout period, the system enters a power saving mode. If any item in the list of Reload Global Timer Events is enabled, then any activity on that item will reset the timeout counters to zero.

If the system is suspended or has been powered down by software, it can be resumed by a wake up call that is generated by incoming traffic to a modem, a LAN card, a PCI card, or a fixed alarm on the system real-time clock.



Power Supply Type

This field is used to select the type of power supply used.

PWRON After PWR-Fail

Off
When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.

On
When power returns after an AC power failure, the system will automatically power-on.

Former-Sts
When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

PCI Express PME

This field is used to configure the PCI Express PME.

ACPI Function

By default, the ACPI function is enabled. This function should be enabled only in operating systems that support ACPI.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC + Blank
This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.

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

DPMS Support
Initializes display power management signaling. Use this option if your video board supports it.

Video Off In Suspend

This field is used to activate the video off feature when the system enters the Suspend mode. The options are Yes and No.

Soft-Off by PWR-BTTN

This field allows you to select the method of powering off your system.

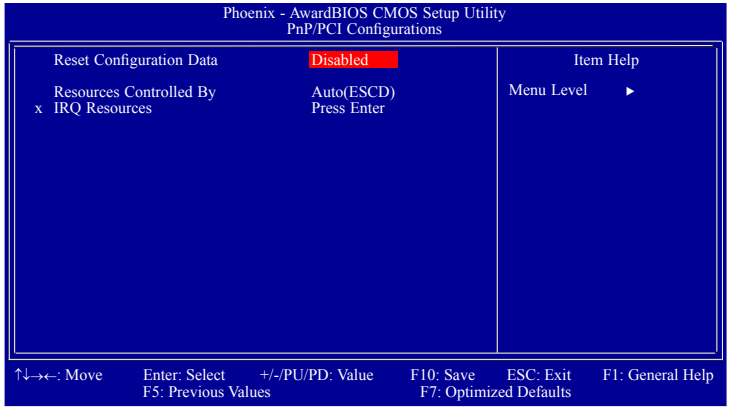
Delay 4 Sec.
Regardless of whether the Power Management function is enabled or disabled, if the power button is pushed and released in less than 4 sec, the system enters the Suspend mode. The purpose of this function is to prevent the system from powering off in case you accidentally "hit" or pushed the power button. Push and release again in less than 4 sec to restore. Pushing the power button for more than 4 seconds will power off the system.

Instant-Off
Pressing and then releasing the power button at once will immediately power off your system.

Power On By Ring

Set this field to Enabled to use the modem ring-on function. This will allow your system to power-on to respond to calls coming from an external modem.

PnP/PCI Configurations



Reset Configuration Data

Enabled
The BIOS will automatically reset the Extended System Configuration Data (ESCD) once. It will then recreate a new set of configuration data.

Disabled
The BIOS will not reset the configuration data.

Resources Controlled By

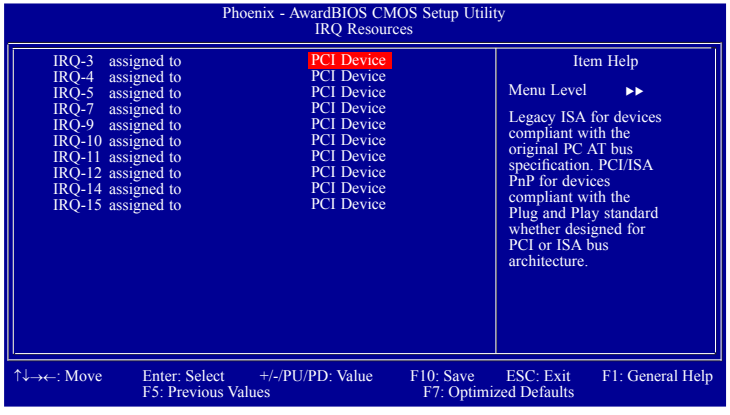
The Award Plug and Play BIOS has the capability to automatically configure all of the boot and Plug and Play compatible devices.

Auto(ESCD)
The system will automatically detect the settings for you.

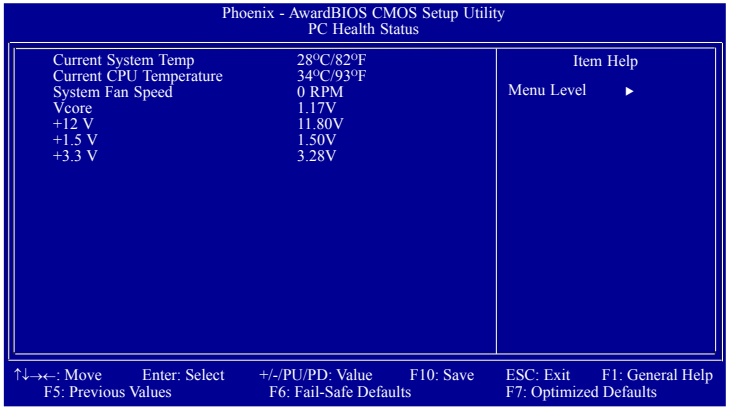
Manual
Choose the specific IRQ resources in the "IRQ Resources" field.

IRQ Resources

Set each system interrupt to either PCI Device or Reserved.



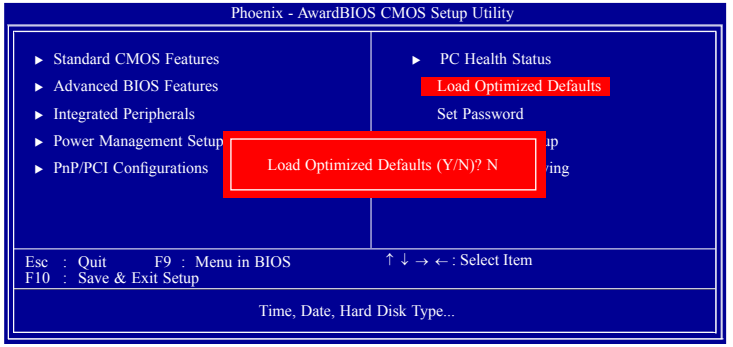
PC Health Status



Current System Temp to +3.3V

These fields will show the temperature, fan speed and output voltages of the monitored devices or components.

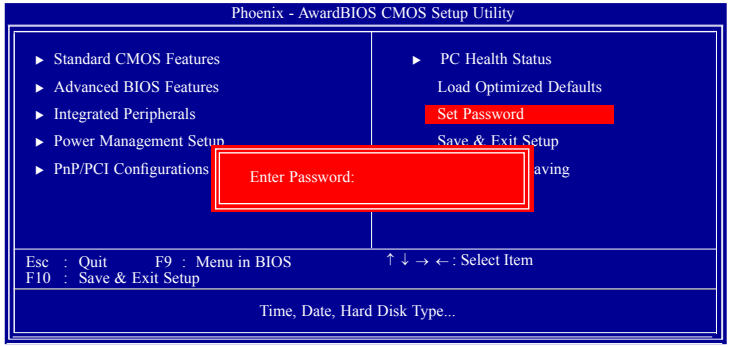
Load Optimized Defaults



This option opens a dialog box that lets you install optimized defaults for all appropriate items in the whole setup utility. Press the <Y> key and then <Enter> to install the defaults. Press the <N> key and then <Enter> if you do not want to install the defaults. The optimized defaults place demands on the system that may be greater than the performance level of the components, such as the CPU and the memory.

Fatal errors or instability may occur if you install the optimized defaults when your hardware does not support them. If you only want to install setup defaults for a specific option, select and display that option, and then press the <F7> key.

Set Password

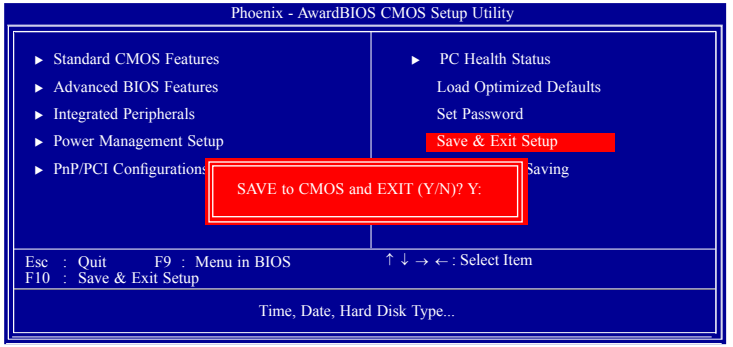


The User Password utility sets the password. The main board is shipped with the password disabled. If you want to change the password, you must first enter the current password, then at the prompt enter your new password. The password is case sensitive. You can use up to eight alpha-numeric characters. Press <Enter> after entering the password. At the next prompt, confirm the new password by retyping it and pressing <Enter> again.

To disable the password function, highlight "Set Password" then press <Enter>, instead of typing in a new password. A message appears confirming that the password has been disabled. If you have set supervisor and user Password, only the supervisor password allows you to enter the BIOS setup program.

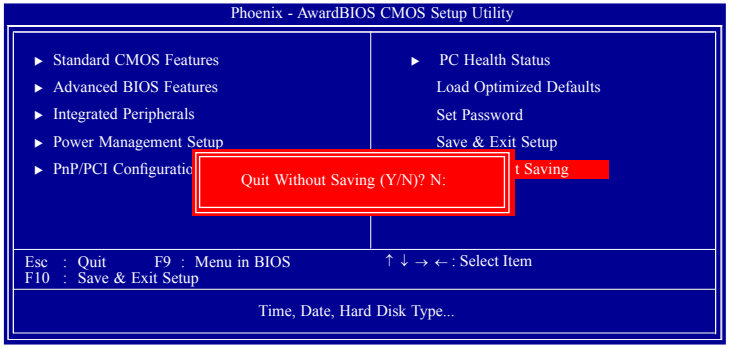
Note: If you forgot your password, the only way to solve this problem is to discharge the CMOS memory by turning power off and placing a shunt (jumper cap) on the RTC Clear jumper to short pin 2 and pin 3 for five seconds, then putting the shunt back to pin 1 and pin 2.

Save & Exit Setup



Selecting this option and pressing <Enter> will save the new setting information in the CMOS memory and continue with the bootup process.

Exit Without Saving

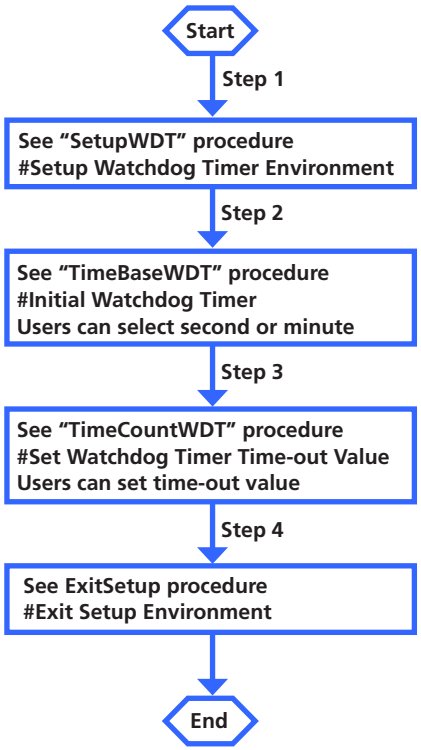


Selecting this option and pressing <Enter> will exit the Setup utility without recording any new values or changing old ones.

Appendix A: Watchdog Timer

WDT Programming Guide

EBC 342 Watchdog Function Configuration Sequence Description:



Watch Dog Sample Code

```
;================================================
SetupWDT        PROC
        mov     dx, 2eh
        mov     al, 087h
        out     dx, al
        nop
        nop
        out     dx, al

        mov     al, 07h
        out     2eh, al
        mov     al, 08h   ;Select logical device for Watch Dog.
        out     2fh, al
        ret
SetupWDT        ENDP

;================================================
TimeBaseWDT             PROC
        mov     al, 0F5h
        out     2eh, al
        mov     al, 02h   ;Set WDT reset upon KBRST#
        or      al, 00h   ;Here!! set 00h for second, set 08h for minute
        out     2fh, al
```

```
        ret
TimeBaseWDT     ENDP

;-----------------------------------------------
TimeCountWDT    PROC
        mov     al, 0F6h ;WDT Time-out register.
        out     2eh, al
        mov     al, 03h   ;Here!! Set count 3.
        out     2fh, al
        ret
TimeCountWDT    ENDP

;-----------------------------------------------
ExitSetup       PROC
        mov     dx, 2eh
        mov     al, 0AAh
        out     dx, al
ExitSetup       ENDP
;-----------------------------------------------
```

Appendix B: GPI/O Programming Guide

This appendix provides definitions for the GPI/O pins on EBC 342. GPI/O (General Purpose Input/Output) pins are provided for custom system design. The pin programmed as input mode (GPI) or output mode (GPO) depends on the configuration.

GPIO

Pin	Description	Pin	Pin 9
1	+5V	2	GND
3	GPO54	4	GPI50
5	GPO55	6	GPI51
7	GPO56	8	GPI52
9	GPO57	10	GPI53

I/O Base Address: 800h

Bit0 : GPI 50
Bit1 : GPI 51
Bit2 : GPI 52
Bit3 : GPI 53
Bit4 : GPO 54
Bit5 : GPO 55
Bit6 : GPO 56
Bit7 : GPO 57

1. Select GPIO group5 by setting I/O port 800h to 5h.
2. Read/Write GPIO data by I/O port 802h.

Appendix C: Power Consumption

Power Consumption

Voltage	+12V	5VDUAL	3VSB	VCC5	VCC3	V1_5	V1_8	V0_9	VCORE	VCC2_5	VCC_1.05V
Net Name	VCC12	5VDUAL	3VSB	VCC5	VCC3	1V5	1V8	0V9	+VCC_CORE	2V5	1V05
+ Tolerance	+5%	+5%	+5%	+5%	+5%	+5%	+5%	+5%	+5%	+5%	+5%
- Tolerance	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%
CPU (Atom)						0.13A			4A		2.5A
NB (945GSE)					0.16A	2.03A	1.72A			0.14A	3.72A
SB (ICH7-M)		0.01A	0.1A	0.06A	0.34A	1.52A					1A
Memory							1.36A	1A			
Clock Gen					0.56A						
RTL8111C-GRx2			0.8A								
SIO		0.1A		0.5A	0.025A						
VCC12 OUTPUT	2A										
SPI Flash					0.03A						
RS232 4x				0.15A							
LVDS LCD				1.5A/0A	0A/1.5A						
USB				4A							
Mini PCIe					0.5A	0.3A					
CF Card				0.5A							
ALC888				0.1A	0.1A						
Peripheral		0.5A		0.5A	1A						
SATA Power	1A			1A							
Total Current	**3A**	**0.61A**	**0.9A**	**8.31A**	**4.215A**	**3.98A**	**3.08A**	**1A**	**4A**	**0.14A**	**7.22A**
Watt	**36**	**3.05**	**2.97**	**41.55**	**13.91**	**5.97**	**5.544**	**0.9**	**7.22**	**0.35**	**7.581**

Power Consumption Measurement

Low AC Line 110~115V (System Only)	12V	Total(W)
S1 (Power On Suspend)	0.75A	9.00W
Light-Loading Mode (A/W)	1.02A	12.24W
Full-Loading Mode (A/W)	1.22A	14.64W