NEXCOM International Co., Ltd.

Industrial Computing Solutions
Fan-less Computer
NISE 2000, NISE 2010, NISE 2020
User Manual

www.nexcom.com

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PREFACE

Copyright

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Acknowledgements

NISE 2000 Series is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

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 this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.

7. Do not leave this equipment in either an unconditioned environment or in a above 40°C storage temperature as this may damage the equipment.

8. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.

9. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

10. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

11. All cautions and warnings on the equipment should be noted.

12. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

13. Never pour any liquid into an opening. This may cause fire or electrical shock.

14. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

15. If one of the following situations arises, get the equipment checked by service personnel:

    a. The power cord or plug is damaged.

    b. Liquid has penetrated into the equipment.

    c. The equipment has been exposed to moisture.

    d. The equipment does not work well, or you cannot get it to work according to the user's manual.

    e. The equipment has been dropped and damaged.

    f. The equipment has obvious signs of breakage.

16. Do not place heavy objects on the equipment.

17. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

18. CAUTION: 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.

19. The computer is provided with CD drives that comply with the appropriate safety standards including IEC 60825.

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEX-COM'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

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.

2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

3. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash storage card.

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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http://www.nexcom-jp.com

PACKAGE CONTENTS

Before continuing, verify that the NISE 2000 Series package that you received is complete. Your package should have all the items listed in the following table.

Item	Name	Qty
1	NISB2001 Driver CD	1
2	NISB2001 Quick Reference Guide	1
3	Flat head screws for HDD installation	4
4	DC Power Cable	1
5	Phoenix Contact Termininal block for COM port	2

ORDERING INFORMATION

The following provides ordering information for NISE 2000 Series.

- **Barebone**
  NISE 2000 (P/N:10J00200000X0)
  - Intel® Atom™ N270 Fan-less barebone system

- **Barebone**
  NISE 2010 (P/N:10J00201000X0)
  - Intel® Atom™ N270 Fan-less barebone system, with one PCI expansion slot

- **Barebone**
  NISE 2020 (P/N:10J00202000X0)
  - Intel® Atom™ N270 Fan-less barebone system, with two PCI expansion slots

Options

Part Number	Item
7400065006X00	19V, 65W AC/DC Power Adapter for NISE2000 series
7410120002X00	19V, 120W AC/DC Power Adapter for NISE3100/NISE3110/NISE2000 series
60233POW38X00	US type Power cord w/3-pin MICKY MOUSE HEAD
60233POW39X00	Schuko type Power cord w/3-pin MICKY MOUSE HEAD
60233POW40X00	UK type Power cord w/3-pin MICKY MOUSE HEAD

CHAPTER 1: PRODUCT INTRODUCTION

Overview

NISE 2000

Front

Rear

Key Features

- Onboard Intel® Atom™ N270 processor, 1.6GHz
- Intel® 945GSE chipset
- Dual 1000/100/10 Mbps LAN
- 4 x USB 2.0
- 1 x VGA
- 2 x RS232 and 2 x RS232/422/485

- Onboard DC to DC power design to support 16V to 30V DC power input
- Supports ATX power mode and PXE/WOL
- One Mini-PCIe socket
- One external CF socket

NISE 2010

Front

Rear

Key Features

- Onboard Intel® Atom™ N270 processor, 1.6GHz
- Intel® 945GSE chipset
- Dual 1000/100/10 Mbps LAN
- 4 x USB 2.0
- 1 x VGA
- 1 x Parallel
- 2 x RS232 and 2 x RS232/422/485

- Onboard DC to DC power design to support 16V to 30V DC power input
- Supports ATX power mode and PXE/WOL
- One Mini-PCIe socket
- One external CF socket
- One PCI expansion slot

NISE 2020

Front

Rear

Key Features

- Onboard Intel® Atom™ N270 processor, 1.6GHz
- Intel® 945GSE chipset
- Dual 1000/100/10 Mbps LAN
- 4 x USB 2.0
- 1 x VGA
- 1 x Parallel
- 2 x RS232 and 2 x RS232/422/485

- Onboard DC to DC power design to support 16V to 30V DC power input
- Supports ATX power mode and PXE/WOL
- One Mini-PCIe socket
- One external CF socket
- Two PCI expansion slots

Hardware Specifications

Main Board

- NISB2001 (NISE 2000 / NISE 2010 / NISE 2020)
- Onboard Intel® Atom™ N270 processor, 1.6GHz speed, 533MHz FSB

Chipset

- Northbridge: Intel® 945GSE
- Southbridge: Intel® ICH7M

Main Memory

- One DDR2 SODIMM socket, single channel, supports up to 2GB DDR2 400/533 SDRAM, unbuffered, non-ECC

Expansion

- NISE 2000
  - One Mini-PCIe socket
- NISE 2010
  - One 32-bit/33MHz PCI slot
    Max. 10W power consumption
    PCI Length: Max. 176 mm
  - One Mini-PCIe socket
- NISE 2020
  - Two 32-bit/33MHz PCI slots
    Max. 10W power consumption
    PCI Length: Max. 176 mm
  - One Mini-PCIe socket

I/O Interface - Front

- ATX Power on/off switch
- HDD Access / Power status LEDs
- 2 x USB 2.0 ports
- 1 x DB25 Parallel port (NISE 2010 / NISE 2020)
- 4 x Serial ports (COM3 and COM4 screw terminal supports RS232/422/485)
  Remarks:
  a. Version-C (shown on the PCB): COM3 and COM4 support RS232 only
  b. Version-D (shown on the PCB): COM3 and COM4 support RS232/422/485

I/O Interface - Rear

- 16V ~ 30V DC input
- 1 x PS/2 Keyboard/Mouse port
- 1 x DB15 VGA port
- 2 x Gbe LAN ports
- 1 x Speaker-out
- 2 x USB 2.0 ports
- One antenna hole for an optional Mini-PCIe WiFi module

Storage

- 1 x 2.5" SATA HDD drive bay
- 1 x external CF card socket
- Supports one optional USB DOM (2.54 mm, Horizontal type)

Power Requirements

- ATX Power mode
- Onboard DC to DC power supports 16V to 30VDC
- Optional AC/DC 65W or 120W power adapter

Dimensions

- NISE 2000
  195 mm (W) x 200 mm (D) x 65 mm (H)
- NISE 2010
  195 mm (W) x 200 mm (D) x 81 mm (H)
- NISE 2020
  195 mm (W) x 200 mm (D) x 101 mm (H)

Construction

- Aluminum chassis with fan-less design

Environment

- Operating temperature:
  Ambient with airflow: -5°C to 55°C
  (According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)
- Storage temperature: -20°C to 80°C
- Relative humidity: 10% to 93% (Non-Condensing)

Certifications

- CE approval
- FCC

Getting to Know NISE 2000 Series

Front Panel

COM3 & COM4 Power LED

Power on/off switch

Parallel

COM1 & COM2

USB
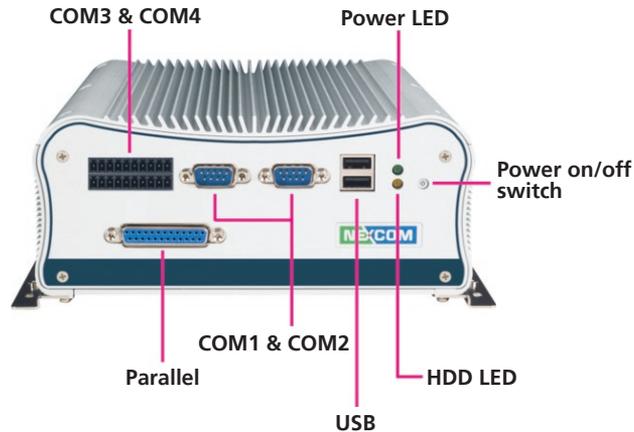
HDD LED

Power On/Off Switch

Press to power-on or power-off the system.

Power LED

Indicates the power status of the system.

HDD LED

Indicates the status of the hard drive.

USB

Used to connect USB 2.0/1.1 devices.

COM1 & COM2

Used to connect RS232 compatible serial devices.

COM3 & COM4

The COM3 & COM4 screw terminal port is used to connect RS232/422/485 compatible serial devices.

Parallel (NISE 2010)

Used to connect a parallel device.

Rear Panel
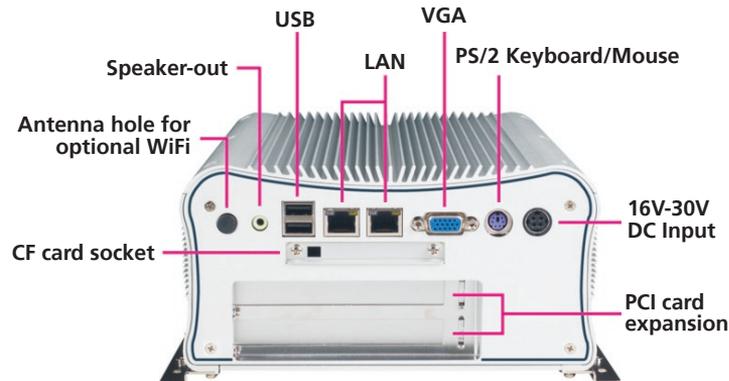
16V-30V DC Input

Used to plug a DC power cord.

PS/2 Keyboard/Mouse

Used to connect a PS/2 keyboard or PS/2 mouse device.

VGA

Used to connect an analog VGA monitor.

LAN

Used to connect the system to a local area network.

USB

Used to connect USB 2.0/1.1 devices.

Speaker-out

Used to connect a headphone or a speaker.

Antenna Hole for Optional WiFi

Used to connect an optional Mini-PCIe WiFi module.

CF Card Socket

Used to connect a CompactFlash card.

PCI Card Expansion

Used to connect 32-bit/33MHz PCI card.
- NISE 2010: 1 PCI slot
- NISE 2020: 2 PCI slots

Mechanical Dimensions

NISE 2000
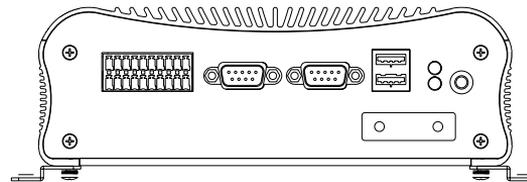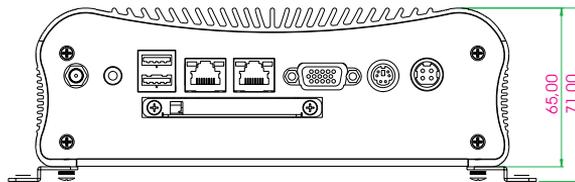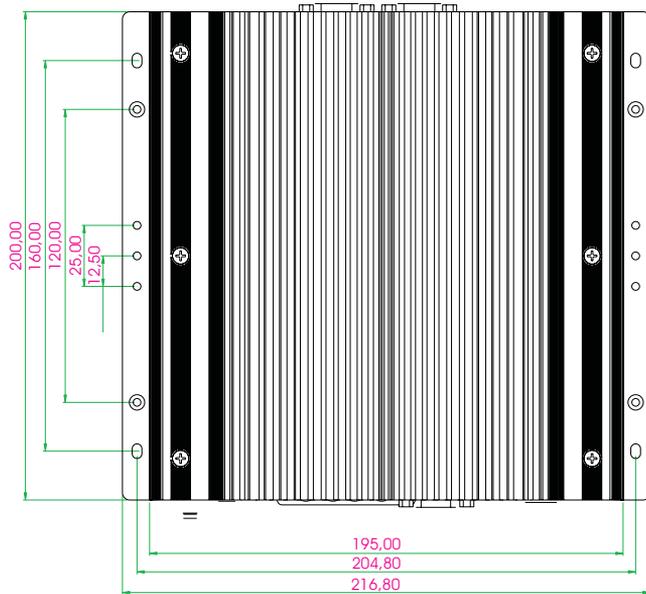
NISE 2010
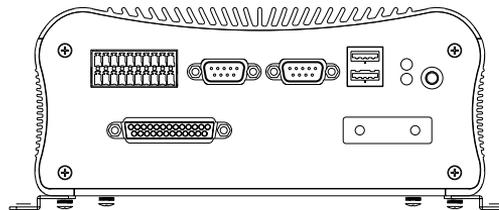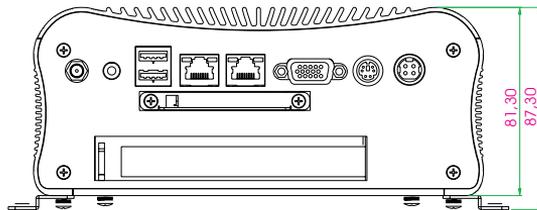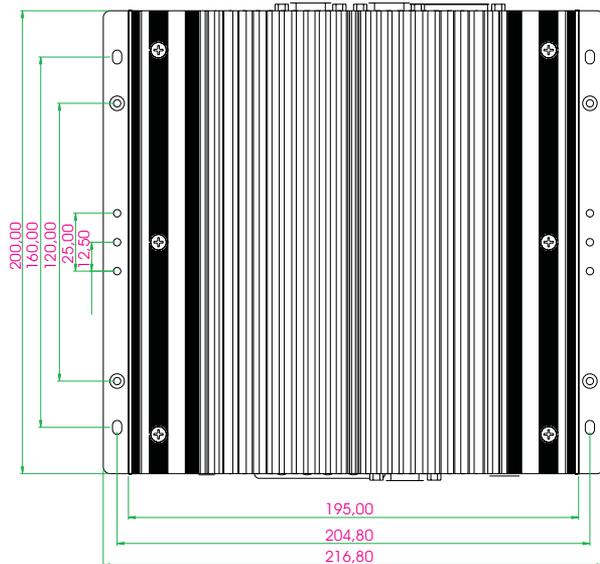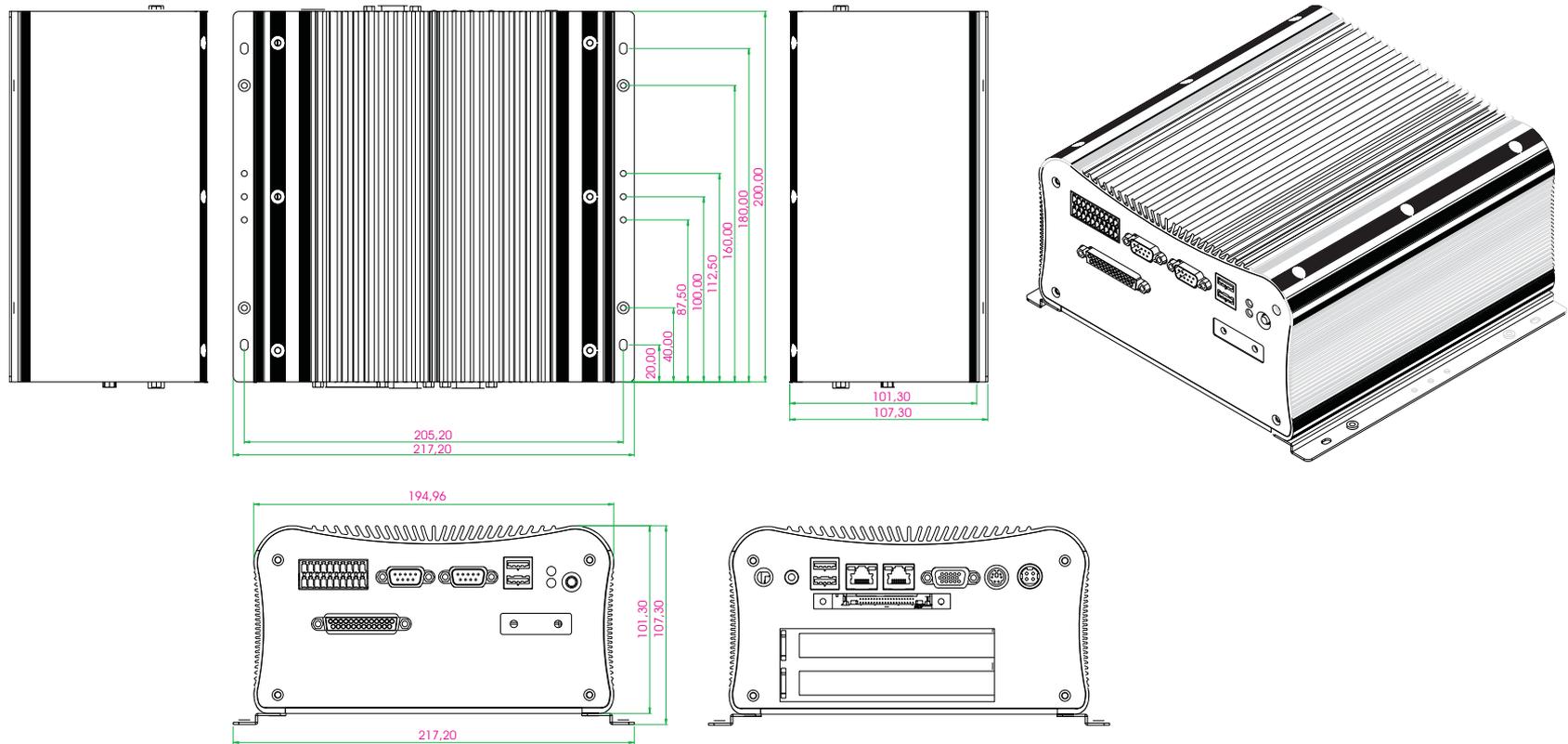
NISE 2020

Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers on the motherboard. Note that the following procedures are generic for all NISE 2000 series.

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)
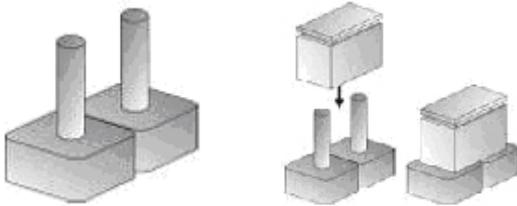
Three-Pin Jumpers: Pins 1 and 2 Are Short
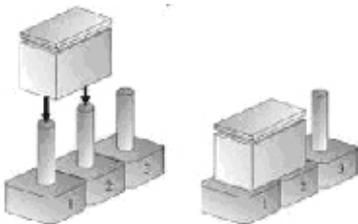
Locations of the Jumpers and Connectors

NISB2001

The figure on the right is the NISB2001 main board which is the main board used in the NISE 2000 Series system. It shows the locations of the jumpers and connectors.

HDD Power (CN3)

COM3/COM4 (J7)

SATA (J5)

SATA (J6)

SODIMM (DIM1)

16V-30V DC Input (CN10)

PS/2 KB/Mouse (KM1)

COM2

VGA (VGA1)

LVDS (CN4)

CMOS Clear (JP3)

Panel Power (JP5)

LAN 1 (CN9)

COM1

LAN 2 (CN8)

MIO (CN2)

COM1-COM4 (JP1)

USB (CN13)

Mini-PCIe (CN5)

USB (CN7)

Parallel (CN1)

HDD/Power LEDs

COM4 Power (JP2)

USB DOM (J3)

Speaker-out (CN11)

Power Switch (SW1)

Digital I/O (J1)

System Fan (FAN1)

CCFL (J2)

PCI (CN16)

PCI (CN15)

PCI (CN14)
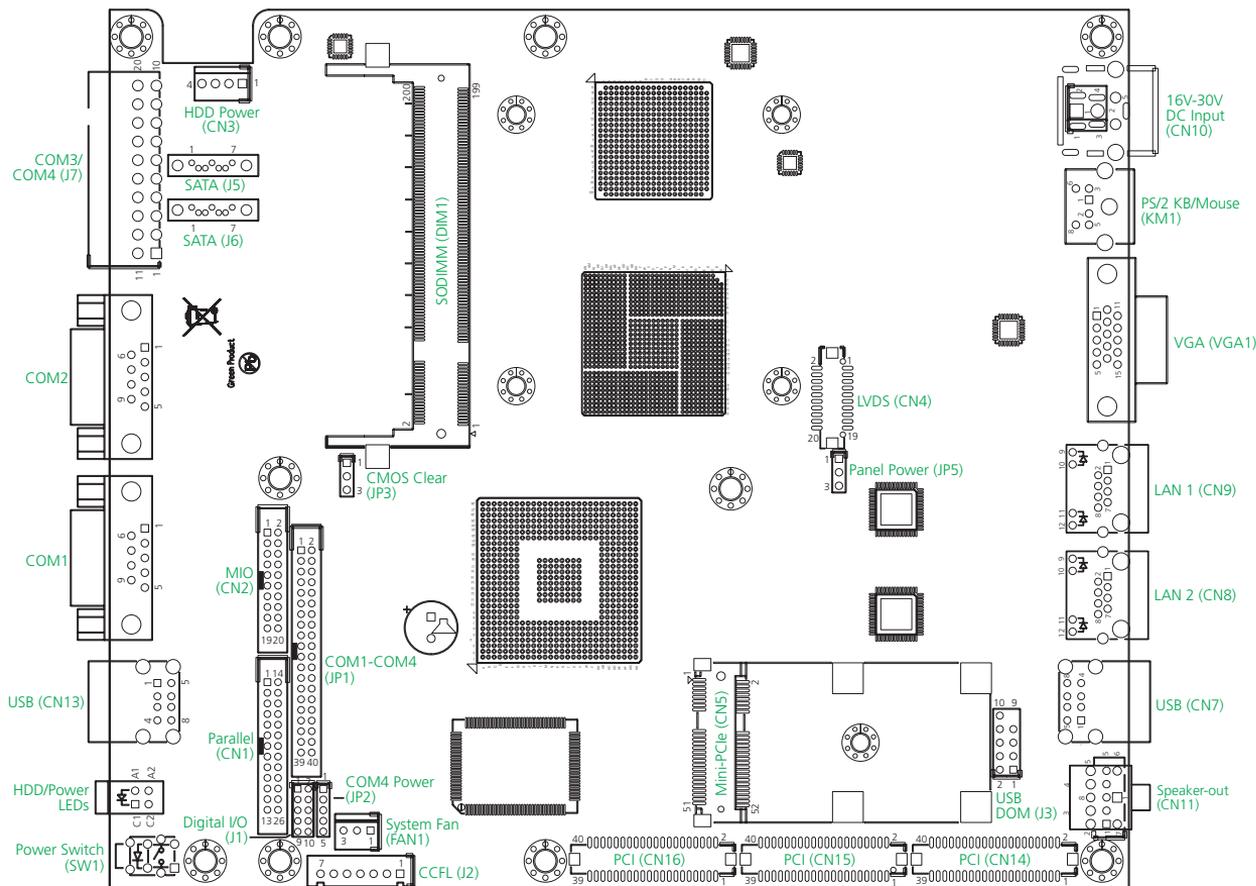
The figure on the right is the bottom view of the NISB2001 main board. The CompactFlash socket is located on this side of the main board.

CF card socket (CN12)
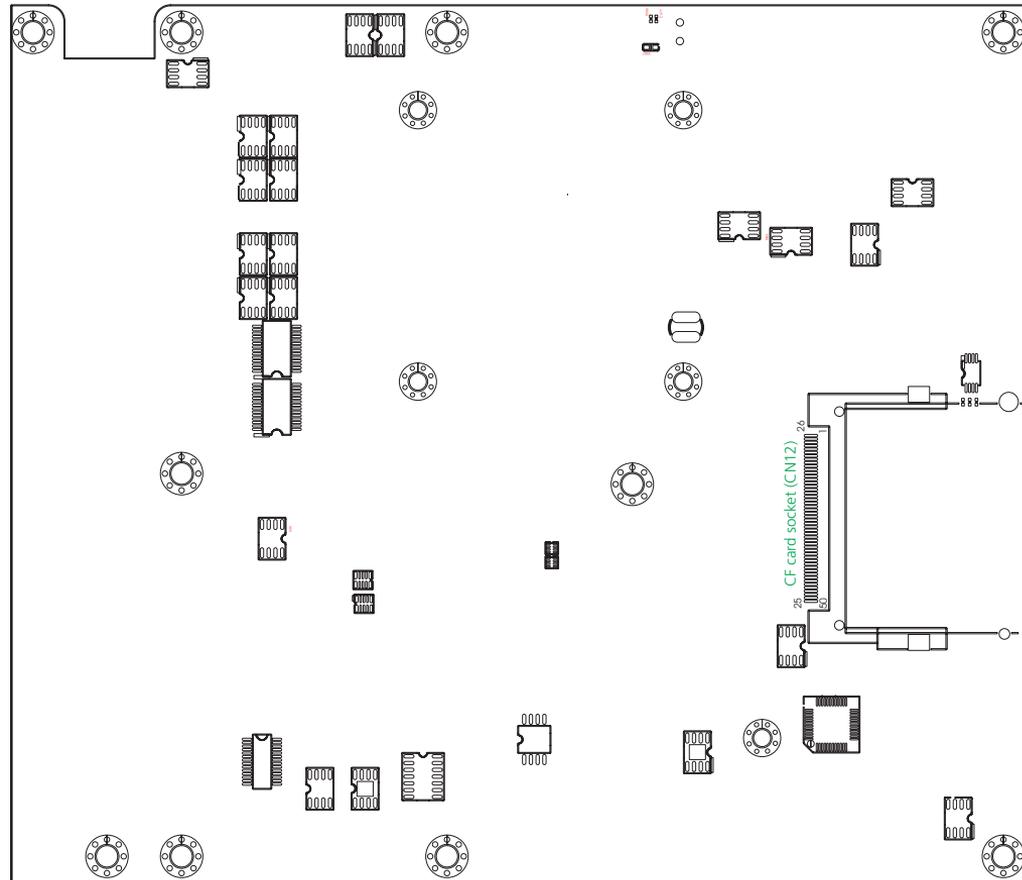
Connector Pin Definitions

External I/O Interface

HDD Access and Power Status LEDs

Connector location: LED2

PWR

🟢

🟡

HDD

Status	LED Color
PWR	Green
HDD	Yellow

USB Ports

Connector size: Dual USB port
Connector location: CN7 (at rear panel) and CN13 (at front panel)
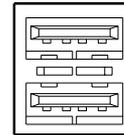
Pin	Definition	Pin	Definition
1	VCC	5	VCC
2	USB_1N	6	USB_2N
3	USB_1P	7	USB_2P
4	GND	8	GND

Serial Ports

Connector size: DB-9 port
Connector location: COM1 and COM2

16V-30V DC Input

Connector size: 4-pin power jack
Connector location: CN10
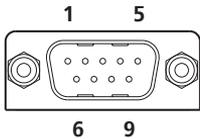
Pin	Definition (COM1)	Pin	Definition (COM2)
1	DCD1	1	DCD2
2	RXD1	2	RXD2
3	TXD1	3	TXD2
4	DTR#1	4	DTR#2
5	GND	5	GND
6	DSR#1	6	DSR#2
7	RTS#1	7	RTS#2
8	CTS#1	8	CTS#2
9	RI#1	9	RI#2
10	NC	10	NC

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

Keyboard/Mouse Port

Connector size: PS/2, Mini-DIN-6
Connector location: KM1
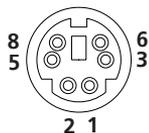
Pin	Definition	Pin	Definition
1	KB_DATA	2	LM_DATA
3	GND	5	GND
6	KB_CLK	8	LM_CLK

VGA Port

Connector size: DB-15 port, 15-pin D-Sub
Connector location: VGA1
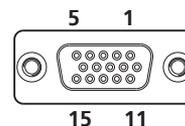
Pin	Definition	Pin	Definition
1	RED_VGA	9	VGA_VCC
2	GREEN_VGA	10	GND
3	BLUE_VGA	11	NC
4	NC	12	VGA_DDC_DATA
5	GND	13	G_HSYNC
6	GND	14	G_VSYNC
7	GND	15	VGA_DDC_CLK
8	GND		

LAN Ports

Connector size: RJ45 port with LEDs
Connector location: CN9 (LAN 1) and CN8 (LAN 2)

Act   Link
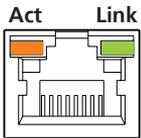
Act	Status
Orange Blinking	Data Activity
Off	No Acitivity

Link	Status
Green Always Lighted	Linked
Off	No Link

Pin	Definition	Pin	Definition
1	LAN_TXD0P	7	LAN_TXD3P
2	LAN_TXD0N	8	LAN_TXD3N
3	LAN_TXD1P	9	LAN_LINK#
4	LAN_TXD2P	10	3VSB PWR
5	LAN_TXD2N	11	LAN_ACT#
6	LAN_TXD1N	12	3VSB PWR

Speaker-out Jack

Connector size: 5-pin jack
Connector location: CN11

Pin	Definition
1	GND
2	SPK_Out_R
3	NC
4	NC
5	SPK_Out_L

Internal Connectors

DC Power Output for HDD (12V=1A, 5V=2A)

Connector size: 4-pin Wafer, 2.54 mm pitch
Connector location: CN3
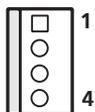
Pin	Definition
1	+12V
2	GND
3	GND
4	VCC5

SATAII Ports

Connector size: Standard Serial ATAII
Connector location: J5 and J6
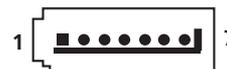
J5

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

J6

Pin	Definition
1	GND
2	TXP1
3	TXN1
4	GND
5	RXN1
6	RXP1
7	GND

MIO Connector

Connector size: 20-pin box header, 2.0 mm pitch (shares signal with I/O at the front panel)

Connector location: CN2
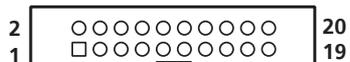
Pin	Definition	Pin	Definition
1	RESET#_SW	2	GND
3	PWRBT_SW	4	GND
5	PWR_LED	6	PWR_LED_N
7	HD_LED	8	HD_LED_N
9	5VSB	10	5VSB
11	IO_USB_2N	12	IO_USB_3N
13	IO_USB_2P	14	IO_USB_3P
15	GND	16	GND
17	VCC5	18	USB_OC23#
19	LED_WLAN_P	20	LED_WLAN_N

Parallel Connector

Connector size: 26-pin box header, 2.0 mm pitch

Connector location: CN1
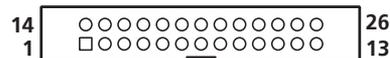
Pin	Definition	Pin	Definition
1	STB#	14	AFD-
2	PD0	15	ERR-
3	PD1	16	INIT-
4	PD2	17	SLIN-
5	PD3	18	GND
6	PD4	19	GND
7	PD5	20	GND
8	PD6	21	GND
9	PD7	22	GND
10	ACK-	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	NC

COM1-COM4 Connector

Connector size: 40-pin box header, 2.0 mm pitch
Connector location: JP1

Pin	Definition	Pin	Definition
31	SP_DCD4	32	SP_DSR4
33	SP_RXD4	34	SP_RTS4
35	SP_TXD4	36	SP_CTS4
37	SP_DTR4	38	SP_RI4
39	GND	40	NC

Pin	Definition	Pin	Definition
1	SP_DCD1	2	SP_DSR1
3	SP_RXD1	4	SP_RTS1
5	SP_TXD1	6	SP_CTS1
7	SP_DTR1	8	SP_RI1
9	GND	10	NC
11	SP_DCD2	12	SP_DSR2
13	SP_RXD2	14	SP_RTS2
15	SP_TXD2	16	SP_CTS2
17	SP_DTR2	18	SP_RI2
19	GND	20	NC
21	SP_DCD3	22	SP_DSR3
23	SP_RXD3	24	SP_RTS3
25	SP_TXD3	26	SP_CTS3
27	SP_DTR3	28	SP_RI3
29	NC	30	NC

COM4 Power Select

Connector size: 5-pin header, 2.0 mm pitch
Connector location: JP2

1 □○○○○ 5

Pin	Definition
1	VCC5
2	SP_RI4
3	VCC12
4	SP_RI4
5	SP4_RI

Settings

1-2 short	RI Power = 5V
3-4 short	RI Power =12V
4-5 short	Normal (default)

Digital I/O Connector

Connector size: 10-pin header, 2.0 mm pitch
Connector location: J1

2 ○○○○○ 10
1 □○○○○ 9
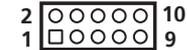
Pin	Definition	Pin	Definition
1	VCC5	2	GND
3	GPO54	4	GPI50
5	GPO55	6	GPI51
7	GPO56	8	GPI52
9	GPO57	10	GPI53

System Fan

Connector size: 3-pin Wafer, 2.54 mm pitch
Connector location: FAN1

Pin	Definition
1	GND
2	+12V
3	SENSE

CCFL Connector

Connector size: JST 7-pin, 2.54 mm pitch
Connector location: J2

Pin	Definition
1	+5V
2	+12V
3	+12V
4	Brightness Ctrl
5	GND
6	GND
7	Backlight Enable

CMOS Clear

Connector size: 3-pin header, 2.0 mm pitch
Connector location: JP3

1 ☐ ○ ○ **3**

Pin	Definition
1	Battery 3.3V
2	RTCVDD
3	GND

Panel Power

Connector size: 3-pin header, 1x3, 2.54 mm pitch
Connector location: JP5

1 ☐ ○ ○ **3**

Pin	Definition
1	VCC5
2	Panel power
3	VCC3

LVDS Connector

Connector size: 2.0 mm pitch
Connector location: CN4
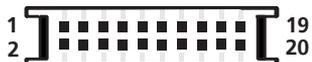
Pin	Definition	Pin	Definition
1	DDCCLK	2	DDC_DATA
3	VDD	4	LB_DATAP0
5	PULL LOW	6	LB_DATAN0
7	PULL LOW	8	VDD
9	GND	10	LB_DATAP1
11	LB_CLK_P	12	LB_DATAN1
13	LB_CLK_N	14	GND
15	GND	16	VCC12_INV
17	LB_DATAP2	18	VCC12_INV
19	LB_DATAN2	20	GND

USB DOM Connector

Connector size: 10-pin header, 2.0 mm pitch
Connector location: J3
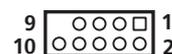
Pin	Definition	Pin	Definition
1	USBVCC	2	USBVCC
3	USB4DN	4	USB5DN
5	USB4DP	6	USB5DP
7	GND	8	GND
9	NC	10	uDOC_OC#

PCI Connector

Connector size: DF13-40DS-1.25DSA
Connector location: CN16
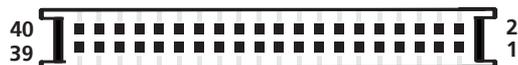
Pin	Definition	Pin	Definition
1	SMBDATA_PCI	2	VCC3
3	GND	4	PCI_SERR#
5	PCI_PAR	6	VCC3
7	PCI_AD15	8	PCI_CBE#1
9	VCC3	10	PCI_AD14
11	PCI_AD13	12	GND
13	PCI_AD11	14	PCI_AD12
15	GND	16	PCI_AD10
17	PCI_AD9	18	GND
19	PCI_CBE#0	20	PCI_AD8
21	VCC3	22	PCI_AD7
23	PCI_AD6	24	VCC3
25	PCI_AD4	26	PCI_AD5
27	GND	28	PCI_AD3
29	PCI_AD2	30	GND

Pin	Definition	Pin	Definition
31	PCI_AD0	32	PCI_AD1
33	VCC5	34	VCC5
35	PU1_REQ64#	36	PU1ACK64#
37	VCC5	38	VCC5
39	VCC5	40	VCC5

PCI Connector

Connector size: DF13-40DS-1.25DSA
Connector location: CN15
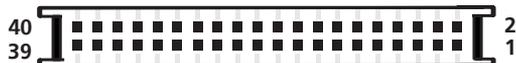
Pin	Definition	Pin	Definition
1	VCC3	2	PCI_AD29
3	PCI_AD28	4	GND
5	PCI_AD26	6	PCI_AD27
7	GND	8	PCI_AD25
9	VCC3	10	VCC3
11	PCI_A LOT_IDSEL	12	PCI_CBE#3
13	VCC3	14	PCI_AD23
15	PCI_AD22	16	GND
17	PCI_AD20	18	PCI_AD21
19	GND	20	PCI_AD19
21	PCI_AD18	22	VCC3
23	PCI_AD16	24	PCI_AD17
25	VCC3	26	PCI_CBE#2
27	PCI_FRAME#	28	GND
29	GND	30	PCI_IRDY

Pin	Definition	Pin	Definition
31	PCI_TRDY#	32	VCC3
33	GND	34	PCI_DEVSEL
35	PCI_STOP#	36	GND
37	VCC3	38	PCI_LOCK#
39	SMBCLK_PCI	40	PCI_PERR#

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PCI Connector

Connector size: DF13-40DS-1.25DSA
Connector location: CN14

```
40 ■■■■■■■■■■■■■■■■■■■  2
39 ■■■■■■■■■■■■■■■■■■■  1
```
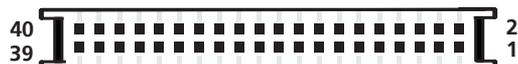
Pin	Definition	Pin	Definition
1	PCI_SLOT_TRST#	2	-12V
3	+12V	4	PCI_SLOT_TCK
5	PCI_SLOT_TMS	6	GND
7	PCI_SLOT_TDI	8	NC
9	VCC5	10	VCC5
11	PCI_IRQ#A	12	VCC5
13	PCI_IRQ#C	14	PCI_IRQ#B
15	VCC5	16	PCI_IRQ#D
17	PCI_SLOT_RSV1	18	PCI_SLOT_PRSNT1#
19	VCC5	20	PCI_SLOT_RSV5
21	PCI_SLOT_RSV2	22	PCI_SLOT_PRSNT2#
23	GND	24	GND
25	GND	26	GND
27	3VSB	28	PCI_SLOT_CLK1
29	PCI_SLOT_RST#	30	GND

Pin	Definition	Pin	Definition
31	VCC5	32	PCI_SLOT_CLK0
33	PCI_GNT#0	34	GND
35	GND	36	PCI_SLOT_REQ#0
37	PCI_SLOT_PME#	38	VCC5
39	PCI_AD30	40	PCI_AD31

Mini-PCIe Connector

Connector location: CN5
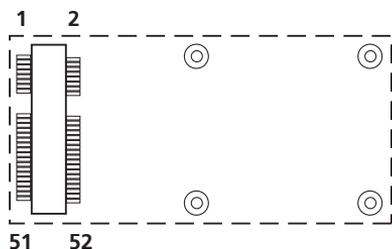
Pin	Definition	Pin	Definition
1	PCIE_WAKE#	2	+V3.3A_MINI
3	NC	4	GND
5	NC	6	+V1.5S_MINI
7	PCIE_MINI_CLKREQ#1	8	NC
9	GND	10	NC
11	CK_MPCIE_N	12	NC
13	CK_MPCIE_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD1_DIS#
21	GND	22	PLT_RST_BUF#
23	PER_N2	24	+V3.3A_MINI
25	PER_P2	26	GND
27	GND	28	+V1.5S_MINI
29	GND	30	SMB_CLK_RESUME

Pin	Definition	Pin	Definition
31	PET_N2	32	SMB_DATA_REAUME
33	PET_P2	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	LED_WLAN_N
45	NC	46	NC
47	NC	48	+V1.5S_MINI
49	NC	50	GND
51	NC	52	+V3.3A_MINI
MH1	GND	MH2	GND
MH3	GND	MH4	GND
MH6	GND		

Mechanical Dimensions of the Main Board
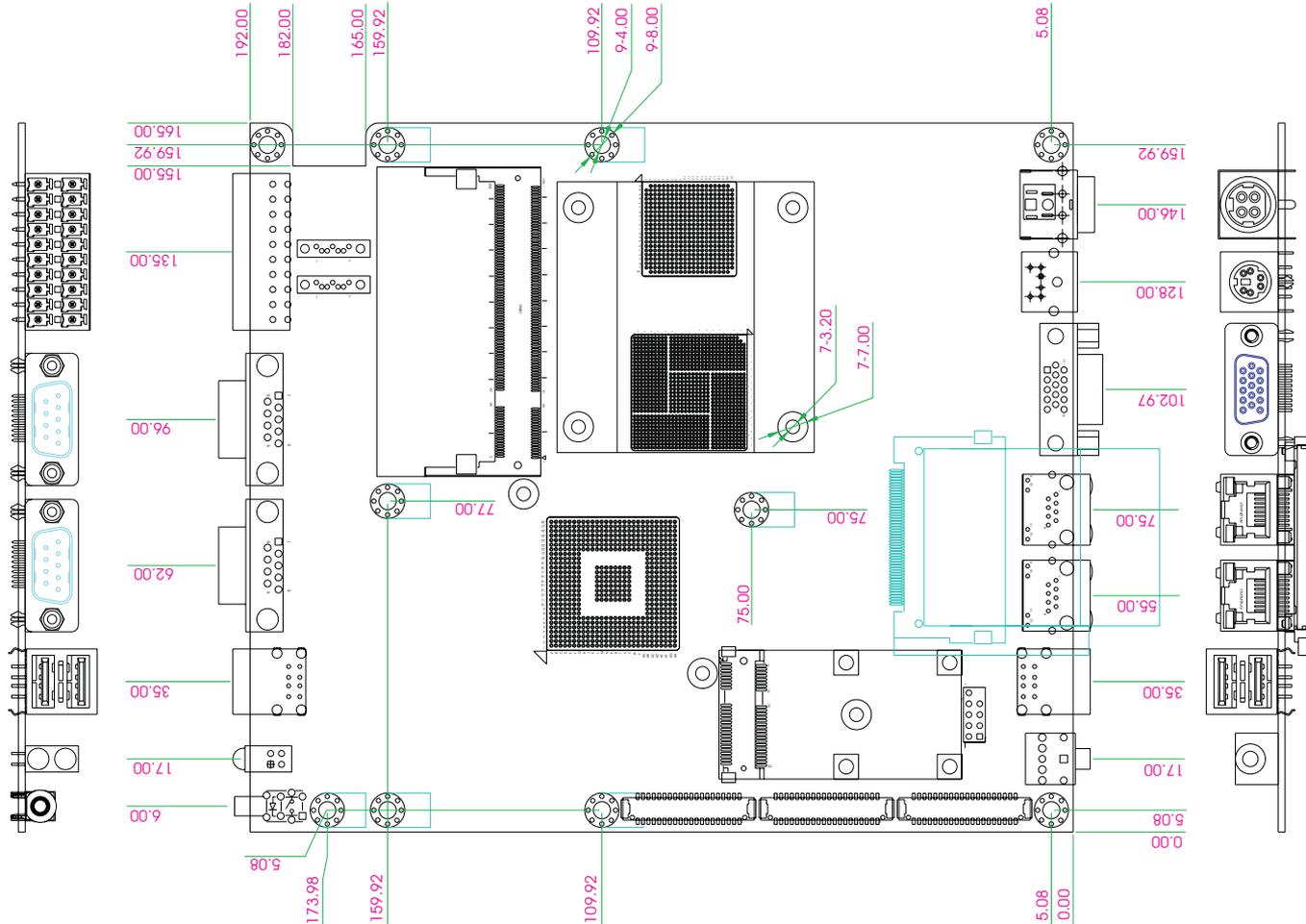
CHAPTER 3: SYSTEM SETUP

Removing the Chassis Cover

CAUTION! Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

1. The screws on the cover are used to secure the cover to the chassis.

2. Remove these screws and put them in a safe place for later use.

3. Lift up the cover then remove it from the chassis.

Installing a SODIMM

1. Locate the SODIMM socket on the board.
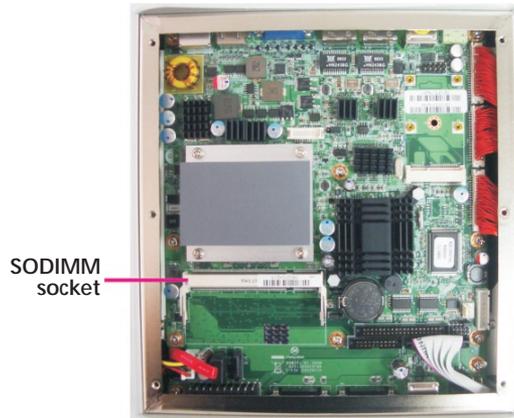
2. Insert the module into the socket at an approximately 30 degrees angle. Apply firm even pressure to each end of the module until it slips into the socket. The gold-plated connector on the edge of the module will almost completely disappear inside the socket.
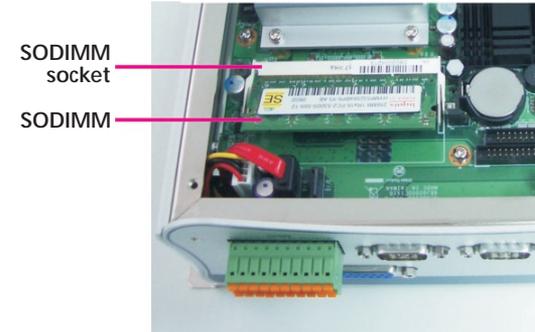
3. Push the module down until the clips on both sides of the socket lock into position. You will hear a distinctive "click", indicating the module is correctly locked into position.

Clip   Clip

Installing a SATA Hard Drive

NISE 2010 / NISE 2020

1. With the bottom side of the chassis facing up, remove the screws of the bottom cover.
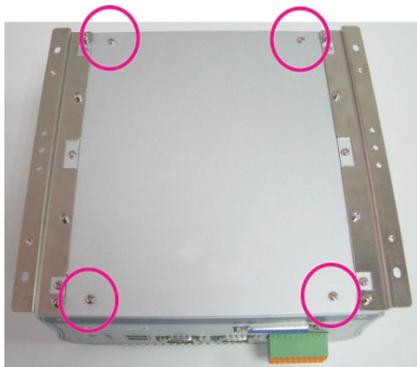
2. Remove the mounting screws that secure the drive bay to the chassis then remove the drive bay. The drive bay is used to hold a SATA hard drive.

Mounting screw
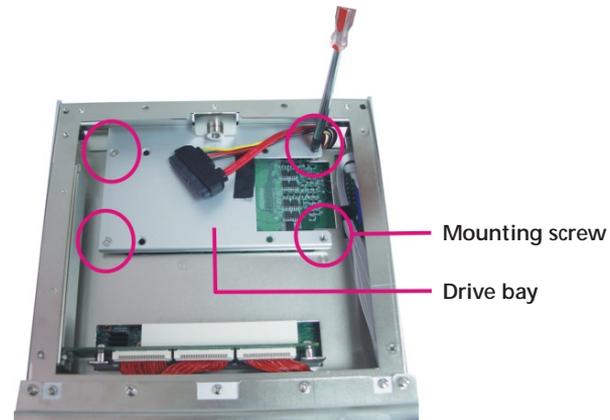
Drive bay

3. Place the SATA hard drive under the drive bay. Align the mounting holes that are on the SATA drive with the mounting holes on the drive bay then use the provided mounting screws to secure the drive in place.

Drive bay

SATA drive

Mounting hole

4. Connect the SATA data/power cable to the connectors on the SATA drive.

SATA cable
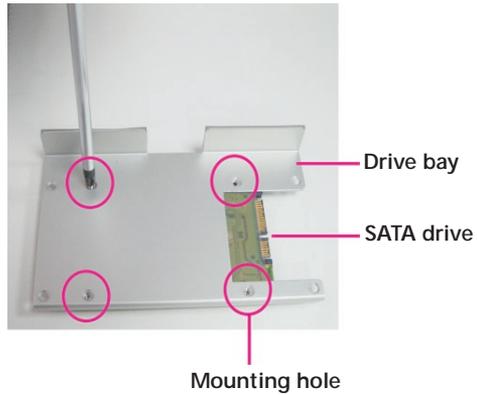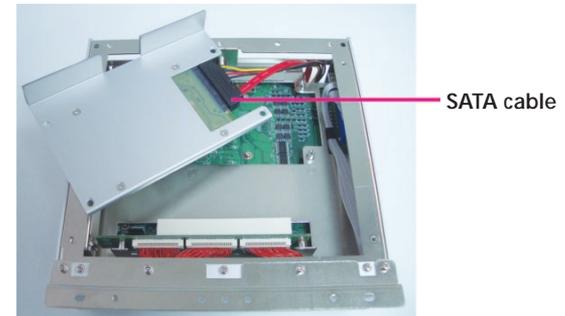
5. Mount the drive back into the chassis.

   Align the mounting holes that are on the drive bay with the mounting holes on the chassis then use the provided screws to secure the drive in place.

NISE 2000

1. With the bottom side of the chassis facing up, remove the screws of the bottom cover.
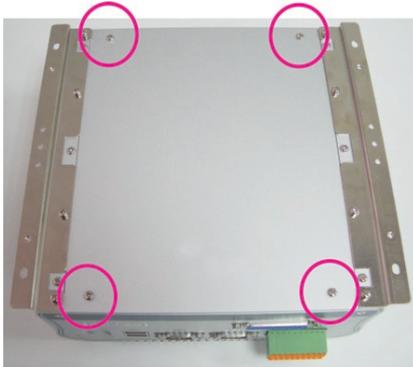
2. Remove the mounting screws that secure the drive bay to the chassis then remove the drive bay. The drive bay is used to hold a SATA hard drive.

Drive bay
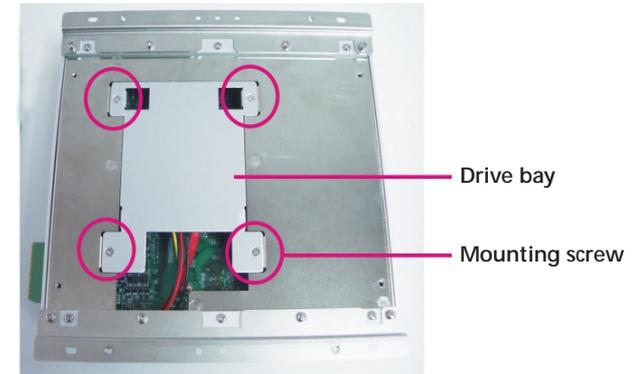
Mounting screw

3. Place the SATA hard drive onto the drive bay. Align the mounting holes that are on the sides of the SATA drive with the mounting holes on the drive bay then use the provided mounting screws to secure the drive in place.

Mounting hole

SATA drive

4. Connect the SATA data/power cable to the connectors on the SATA drive.

SATA cable
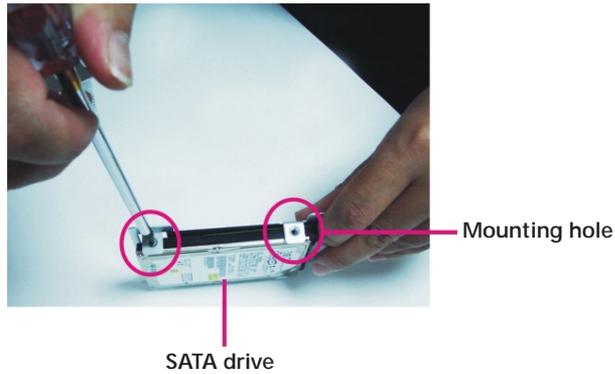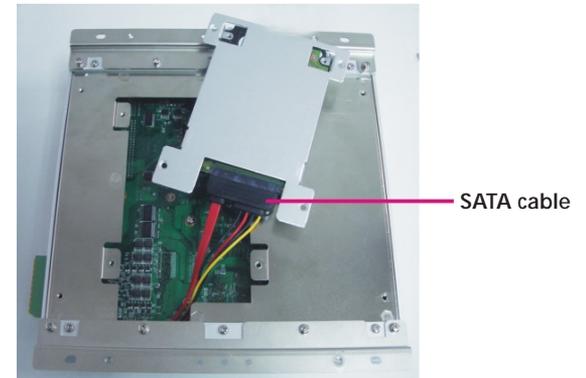
5. Mount the drive back into the chassis.

Align the mounting holes that are on the drive bay with the mounting holes on the chassis then use the provided mounting screws to secure the drive in place.
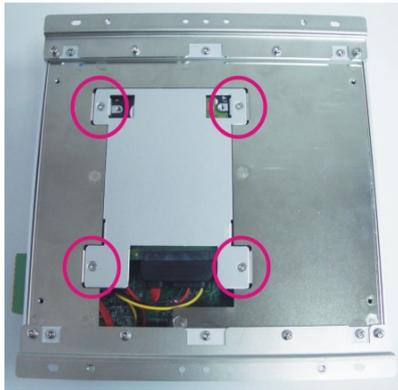
Installing a PCI Expansion Card

NISE 2010 is equipped with 1 PCI expansion slot.
NISE 2020 is equipped with 2 PCI expansion slots.

The illustrations shown in this section used the NISE 2010 system.

1. With the bottom side of the chassis facing up, remove the screws of the bottom cover and the screws of the rackmount bracket on one side of the chassis.

Bottom cover
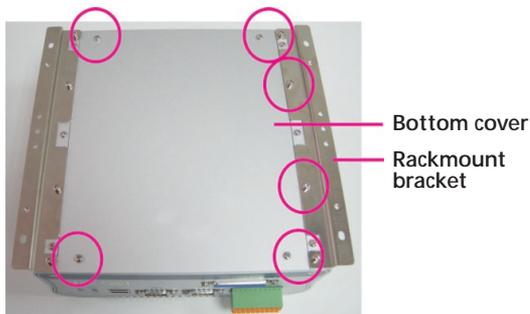
Rackmount bracket

2. Lift the bottom cover and remove the rackmount bracket to access the PCI expansion slot.

PCI expansion slot

3. Remove the screw of the slot cover then remove the slot cover.

PCI slot

Slot cover

Screw

Top view
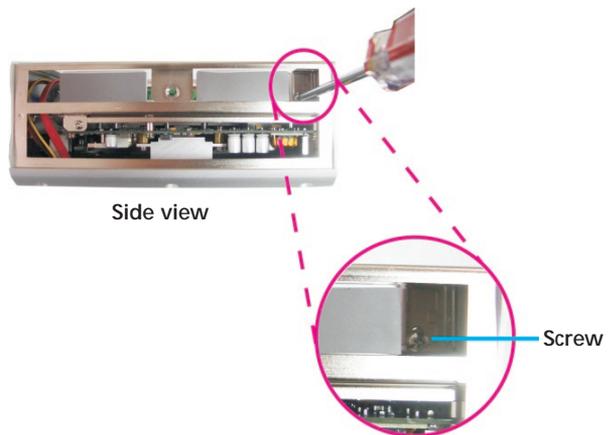
Side view

Screw

4. Align the PCI expansion card with the PCI slot then apply firm even pressure to each end of the card until it slips into the slot.

PCI card

PCI slot
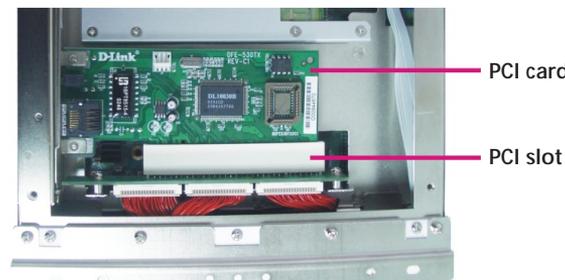
5. Secure the PCI card with the screw you removed in step 3.

Installing a CompactFlash Card

1. The CompactFlash card must be inserted from the rear side of the chassis.

CompactFlash socket cover

2. Remove the mounting screws of the CompactFlash socket's cover.
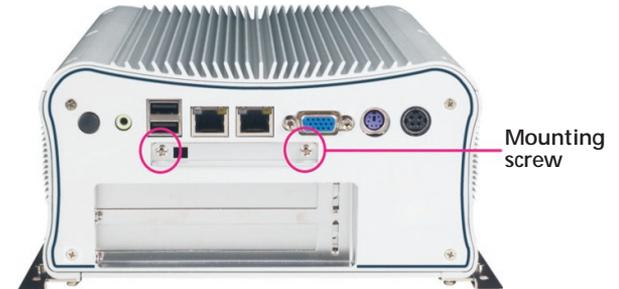
Mounting screw

3. Remove the CompactFlash socket's cover to access the CF socket.

CompactFlash socket
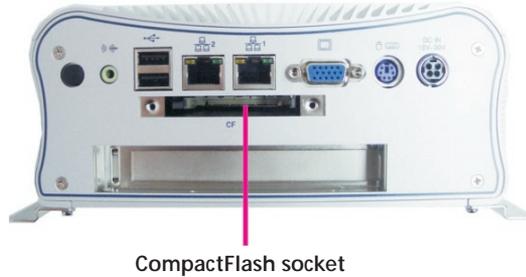
4. With the CompactFlash card's label facing up, insert the card into the socket.

CompactFlash card

5. Replace the cover and secure it with the mounting screws you removed in step 2.

Phoenix Contact Terminal Block for COM Port

1. Unplug the Phoenix Contact Terminal Block.

Phoenix Contact
Terminal Block

2. Insert a flat-bladed screwdriver in-between the dual bridge rail located in the middle of the terminal block then insert a wire into its corresponding feedthrough.

Screwdriver

Phoenix contact
terminal block

Dual bridge rail

Wire
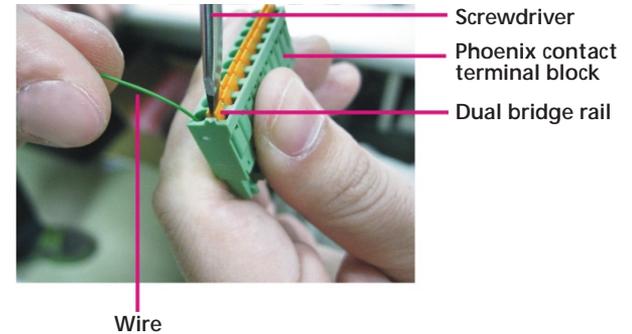
CHAPTER 4: BIOS SETUP

This chapter describes how to use the BIOS setup program for NISE 2000 Series. 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.
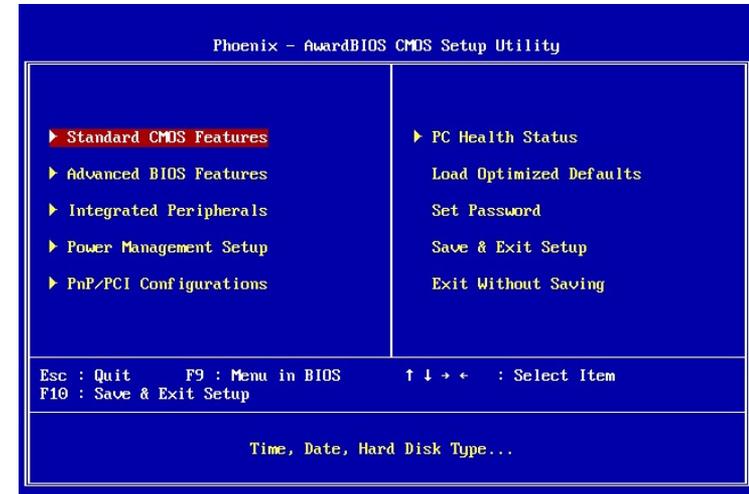
The following table lists the available options on the main menu.

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

Use This Key	To Do This
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

```
          Phoenix - AwardBIOS CMOS Setup Utility
                  Standard CMOS Features

   Date (mm:dd:yy)        Wed, May 12 1999         Item Help
   Time (hh:mm:ss)         19 : 16 : 6
                                             Menu Level    ▶
 ▶ IDE Channel 0 Master
 ▶ IDE Channel 0 Slave                        Change the day, month,
                                              year and century
   Video                  [EGA/VGA]
   Halt On                [No Errors]

   Base Memory                  1K
   Extended Memory              1K
   Total Memory               512K


 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
            F5:Previous Values               F7: Optimized Defaults
```

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 Slave and IDE Channel 2 Slave

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

```
          Phoenix - AwardBIOS CMOS Setup Utility
                   IDE Channel 2 Master

   IDE HDD Auto-Detection    [Press Enter]          Item Help

   IDE Channel 0 Master       Auto            Menu Level    ▶▶
   Access Mode                Auto
                                              To auto-detect the
   Capacity                   0 MB            HDD's size, head... on
                                              this channel
   Cylinder                   0
   Head                       0
   Precomp                    0
   Landing Zone               0
   Sector                     0




 ↑↓→←: Move    Enter: Select  +/-/PU/PD: Value   F10: Save   ESC: Exit   F1: General Help
               F5: Previous Values               F7: Optimized Defaults
```
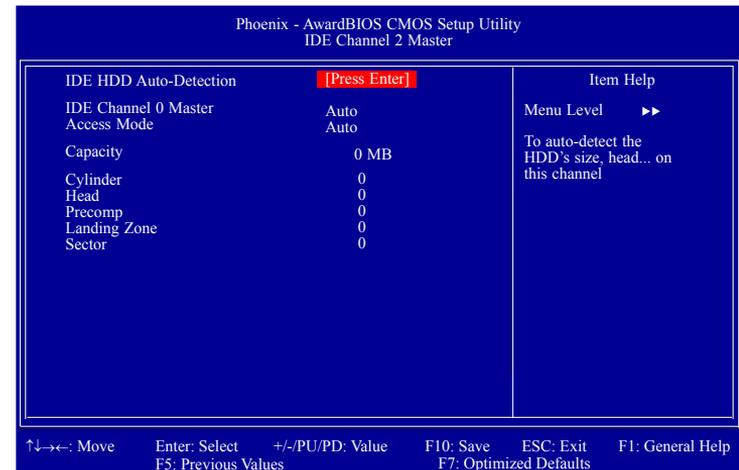
IDE HDD Auto-Detection

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


```
        Phoenix - AwardBIOS CMOS Setup Utility
                 Advanced BIOS Features
┌─────────────────────────────────────┬──────────────────────┐
│▶ Hard Disk Boot Priority  [Press Enter]│      Item Help       │
│  First Boot Device        [USB-CDROM]  │                      │
│  Second Boot Device       [CDROM]      │ Menu Level    ▶      │
│  Third Boot Device        [Hard Disk]  │                      │
│  Boot Up NumLock Status   [On]         │ Select Hard Disk Boot│
│  Security Option          [Setup]      │ Device Priority      │
│  ** VGA Setting **                     │                      │
│  On-Chip Frame Buffer Size [ 8MB]      │                      │
│  Boot Display             [CRT]        │                      │
│  Panel Number             [800x600  18bit S]│                 │
│                                        │                      │
└─────────────────────────────────────┴──────────────────────┘
 ↑↓←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
         F5:Previous Values            F7: Optimized Defaults
```

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
```

Boot Up NumLock Status

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

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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.

Boot Display

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

CRT
Select this option if you want the system to boot the CRT display.

CRT+LVDS
Select this option if you want the system to boot both the CRT and LCD flat panel display.

Panel Number

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

800x600 18bit S
1024x768 18bit S

Integrated Peripherals

```
              Phoenix - AwardBIOS CMOS Setup Utility
                     Integrated Peripherals
  ┌────────────────────────────────────────────┬────────────────────┐
  │ ▶ USB Device Setting      [Press Enter]     │     Item Help      │
  │ ▶ OnChip IDE Device       [Press Enter]     │                    │
  │   Onboard Lan Boot ROM    [Disabled]        │ Menu Level   ▶     │
  │   Onboard Serial Port 1   [3F8/IRQ4]        │                    │
  │   Onboard Serial Port 2   [2F8/IRQ3]        │                    │
  │   Onboard Serial Port 3   [3E8/IRQ5]        │                    │
  │   Onboard Serial Port 4   [2E8/IRQ6]        │                    │
  │   COM3 232/422/485        [RS232]           │                    │
  │   COM4 232/422/485        [RS232]           │                    │
  │   COM1 Max Baud Rate      [115200  bps]     │                    │
  │   COM2 Max Baud Rate      [115200  bps]     │                    │
  │   COM3 Max Baud Rate      [115200  bps]     │                    │
  │   COM4 Max Baud Rate      [115200  bps]     │                    │
  │   Onboard Parallel Port   [378/IRQ7]        │                    │
  │   Parallel Port Mode      [SPP]             │                    │
  │   ECP Mode Use DMA        [3]               │                    │
  │                                             │                    │
  ├────────────────────────────────────────────┴────────────────────┤
  │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help │
  │          F5:Previous Values              F7: Optimized Defaults   │
  └──────────────────────────────────────────────────────────────────┘
```

USB Device Setting

```
              Phoenix - AwardBIOS CMOS Setup Utility
                       USB Device Setting
  ┌────────────────────────────────────────────┬────────────────────┐
  │   USB 1.0 Controller          Enabled       │     Item Help      │
  │   USB 2.0 Controller          Enabled       │                    │
  │   USB Operation Mode          High Speed    │ Menu Level   ▶▶    │
  │   USB Keyboard Function        Enabled       │                    │
  │   USB Storage Function        Enalbed       │ [Enable] or [Disable] │
  │                                             │ Universal Host     │
  │   *** USB Mass Storage Device Boot Setting *** │ Controller Interface │
  │   UFDDA                       USB Floppy    │ for Universal Serial │
  │   UFDDB                       USB Floppy    │ Bus.               │
  │   No Device                   Auto mode     │                    │
  │   No Device                   Auto mode     │                    │
  │   No Device                   Auto mode     │                    │
  │   No Device                   Auto mode     │                    │
  │   No Device                   Auto mode     │                    │
  │   No Device                   Auto mode     │                    │
  │   No Device                    Auto mode    │                    │
  │   No Device                   Auto mode     │                    │
  │                                             │                    │
  ├────────────────────────────────────────────┴────────────────────┤
  │ ↑↓→←: Move   Enter: Select   +/-/PU/PD: Value   F10: Save   ESC: Exit   F1: General Help │
  │          F5: Previous Values              F7: Optimized Defaults  │
  └──────────────────────────────────────────────────────────────────┘
```

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 Operation Mode

High Speed
If the USB device is a high speed device, it will operate in high speed mode. If it is a full/low speed device, it will operate in full/low speed mode.

Full/Low Speed
Regardless of the speed of the USB device, it will always operate in full/low speed mode.

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.

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USB Storage Function

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

USB Mass Storage Device Boot Setting

Auto Mode
The USB device will boot according to the device type.

USB Floppy
The USB device will always boot as a floppy drive.

OnChip IDE Device

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

```
          Phoenix - AwardBIOS CMOS Setup Utility
                   OnChip IDE Device

   IDE HDD Block Mode              Enabled              Item Help
   IDE DMA Transfer Access         Enabled
   On-Chip Primary PCI IDE         Enabled         Menu Level    ▶▶
   IDE Primary Master PIO          Auto
   IDE Primary Slave PIO           Auto            If your IDE hard drive
   IDE Primary Master UDMA         Auto            supports block mode
   IDE Primary Slave UDMA          Auto            select Enabled for auto-
                                                   matic direction of
   *** On-Chip Serial ATA Setting ***             the optimal number of
   On-Chip Serial ATA              Enhanced Mode   block read/writes per
                                                   sector the drive can
                                                   support



   ↑↓→←: Move      Enter: Select    +/-/PU/PD: Value    F10: Save    ESC: Exit    F1: General Help
                   F5: Previous Values                   F7: Optimized Defaults
```

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.

IDE DMA Transfer Access

This field, when Enabled, will enhance the IDE DMA transfer of an IDE hard disk drive.

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.

`Auto`
The system will detect the existing SATA and IDE drives then auto-matically set them to the available master/slave mode.

`Enhanced Mode`
This option allows you to use both IDE and SATA 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.

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.

```
         Phoenix - AwardBIOS CMOS Setup Utility
                  Power Management Setup

  Run VGABIOS if S3 Resume  [Auto]              Item Help
  MODEM Use IRQ             [3]
  Soft-Off by PWR-BTTN      [Instant-Off]    Menu Level    ▶
  PWRON After PWR-Fail      [On]
  Wake-Up by PCI card       [Enabled]
  Power On by Ring          [Enabled]
  Wake Up On LAN            [Enabled]




  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
            F5:Previous Values              F7: Optimized Defaults
```
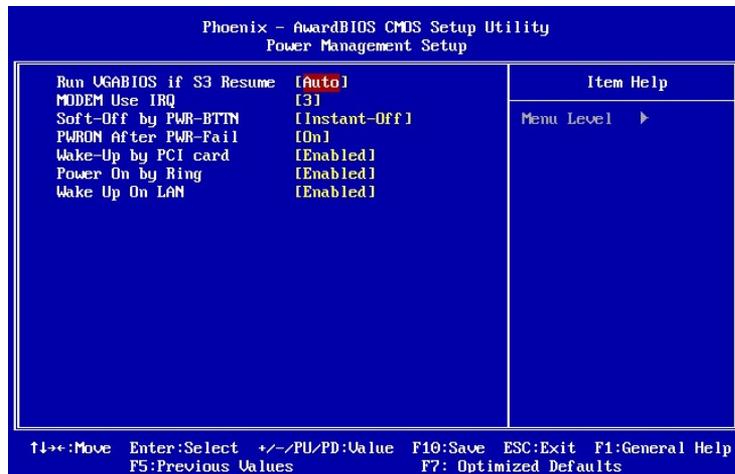
PCI Express PME

This field is used to configure the PCI Express PME.

ACPI Suspend Type

This field is used to select the type of Suspend mode.

S1(POS)
Enables the Power On Suspend function.

S3(STR)
Enables the Suspend to RAM function.

Run VGABIOS if S3 Resume

When this field is set to Auto, the system will initialize the VGA BIOS when it wakes up from the S3 state. This can be configured only if the "ACPI Suspend Type" field is set to "S3(STR)". When this feature is disabled, the system resume time is shortened but system will need an AGP driver to initialize the VGA card. Therefore, if the AGP driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming from S3.

MODEM Use IRQ

This field is used to select an IRQ channel for the modem installed in your system.

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.

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.

Wake-Up by PCI Card

`Enabled`
This field should be set to Enabled only if your PCI card such as LAN card or modem card uses the PCI PME (Power Management Event) signal to remotely wake up the system. Access to the LAN card or PCI card will cause the system to wake up. Refer to the card's documentation for more information.

`Disabled`
The system will not wake up despite access to the PCI card.

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.

Wake Up On LAN

Set this field to Enabled to wake up the system via the onboard LAN or via a LAN card that supports the remote wake up function.

USB KB Wake-Up From S3

This field, when enabled, allows you to use a USB keyboard to wake up a system that is in the S3 (STR - Suspend To RAM) state. This can be configured only if the "ACPI Suspend Type" field is set to "S3(STR)".

PnP/PCI Configurations

```
             Phoenix - AwardBIOS CMOS Setup Utility
                     PnP/PCI Configurations

   Reset Configuration Data   [Disabled]              Item Help

   Resources Controlled By    [Auto(ESCD)]     Menu Level  ▶
 x IRQ Resources              Press Enter
                                               Default is Disabled.
   PCI/VGA Palette Snoop      [Disabled]       Select Enabled to
   INT Pin 1 Assignment       [Auto]           reset Extended System
   INT Pin 2 Assignment       [Auto]           Configuration Data
   INT Pin 3 Assignment       [Auto]           ESCD) when you exit
   INT Pin 4 Assignment       [Auto]           Setup if you have
   INT Pin 5 Assignment       [Auto]           installed a new add-on
   INT Pin 6 Assignment       [Auto]           and the system
   INT Pin 7 Assignment       [Auto]           reconfiguration has
   INT Pin 8 Assignment       [Auto]           caused such a serious
                                               conflict that the OS
                                               cannot boot


 ↑↓←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
              F5:Previous Values            F7: Optimized Defaults
```

Init Display First

PCIEx
When the system boots, it will first initialize the PCI Express x16 graphics card.

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

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.

```
                  Phoenix - AwardBIOS CMOS Setup Utility
                              IRQ Resources

    IRQ-3   assigned to       PCI Device              Item Help
    IRQ-4   assigned to       PCI Device
    IRQ-5   assigned to       PCI Device      Menu Level   ▶▶
    IRQ-7   assigned to       PCI Device
    IRQ-9   assigned to       PCI Device      Legacy ISA for devices
    IRQ-10  assigned to       PCI Device      compliant with the
    IRQ-11  assigned to       PCI Device      original PC AT bus
    IRQ-12  assigned to       PCI Device      specification. PCI/ISA
    IRQ-14  assigned to       PCI Device      PnP for devices
    IRQ-15  assigned to       PCI Device      compliant with the
                                              Plug and Play standard
                                              whether designed for
                                              PCI or ISA bus
                                              architecture.




 ↑↓→←: Move    Enter: Select    +/-/PU/PD: Value    F10: Save    ESC: Exit    F1: General Help
                F5: Previous Values                  F7: Optimized Defaults
```

PCI/VGA Palette Snoop

This field determines whether the MPEG ISA/VESA VGA cards can work with PCI/VGA or not.

Enabled
MPEG ISA/VESA VGA cards work with PCI/VGA.

Disabled
MPEG ISA/VESA VGA cards does not work with PCI/VGA.

INT Pin 1 Assignment to INT Pin 8 Assignment

By default, a device is automatically assigned to each INT. You can also manually assign an INT for each device.

PC Health Status

```
            Phoenix - AwardBIOS CMOS Setup Utility
                       PC Health Status
   ┌────────────────────────────────────┬─────────────────────┐
   │ Vcore                              │     Item Help       │
   │ +3.3V                              ├─────────────────────┤
   │ + 12V                              │ Menu Level    ▶     │
   │ +  5V                              │                     │
   │ CPU    Temperature                 │                     │
   │ System Temperature                 │                     │
   │ Fan Speed                          │                     │
   │                                    │                     │
   │                                    │                     │
   │                                    │                     │
   │                                    │                     │
   │                                    │                     │
   └────────────────────────────────────┴─────────────────────┘
   ↑↓←←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
              F5:Previous Values             F7: Optimized Defaults
```
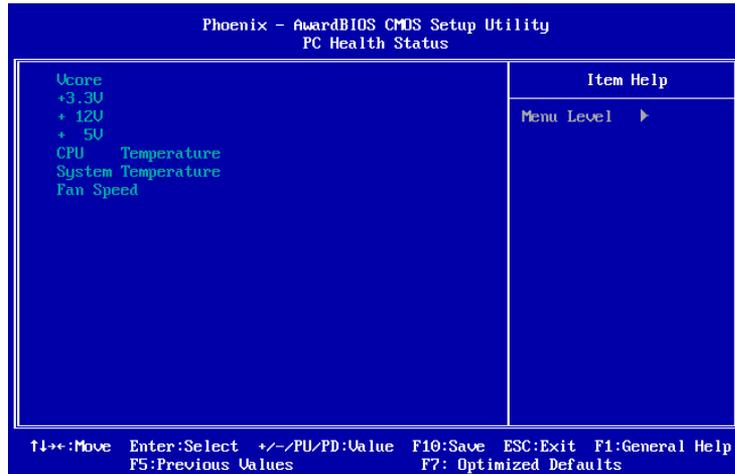
Current System Temp to 3.3V

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

Load Optimized Defaults

```
            Phoenix - AwardBIOS CMOS Setup Utility

   ┌──────────────────────────────┬──────────────────────────────┐
   │ ▶ Standard CMOS Features     │ ▶ PC Health Status           │
   │                              │                              │
   │ ▶ Advanced BIOS Features     │   Load Optimized Defaults    │
   │                              │                              │
   │ ▶ Integrated Peripherals     │   Set Password               │
   │                              │                              │
   │ ▶ Power Management      ┌─────────────────────────┐  etup   │
   │                         │ Load Optimized Defaults (Y/N)?    │
   │ ▶ PnP/PCI Configura     │                         │  aving  │
   │                         └─────────────────────────┘         │
   │                              │                              │
   ├──────────────────────────────┴──────────────────────────────┤
   │ Esc : Quit       F9 : Menu in BIOS     ↑ ↓ → ←   : Select Item │
   │ F10 : Save & Exit Setup                                       │
   ├──────────────────────────────────────────────────────────────┤
   │                   Load Optimized Defaults                     │
   └──────────────────────────────────────────────────────────────┘
```
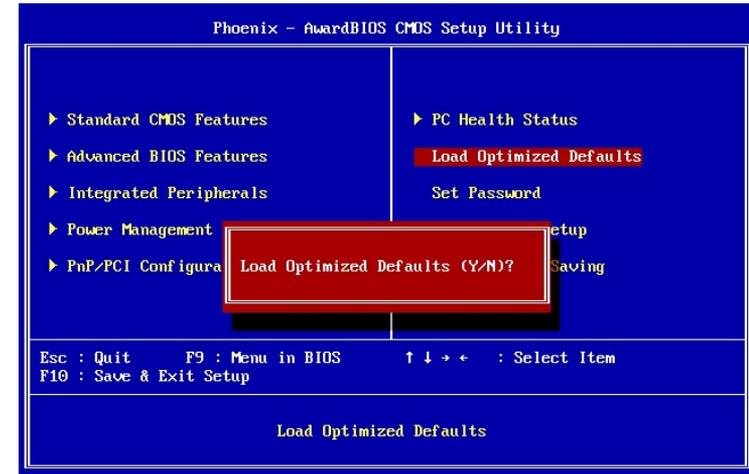
This option opens a dialog box that lets you install optimized defaults for all appropriate items in the whole setup utility. Press the <Y> key and then <Enter> to install the defaults. Press the <N> key and then <Enter> if you do not want to install the defaults. The optimized defaults place demands 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

```
          Phoenix - AwardBIOS CMOS Setup Utility
 ┌──────────────────────────────────┬──────────────────────────────────┐
 │                                  │                                  │
 │  ▶ Standard CMOS Features        │  ▶ PC Health Status              │
 │                                  │                                  │
 │  ▶ Advanced BIOS Features        │    Load Optimized Defaults       │
 │                                  │                                  │
 │  ▶ Integrated Peripherals        │    Set Password                  │
 │                                  │                                  │
 │  ▶ Power Management Setup         │    Save & Exit Setup             │
 │                                  │                                  │
 │  ▶ PnP/PCI Configurati┌──────────────────────────┐ut Saving         │
 │                       │ Enter Password:          │                  │
 │                       └──────────────────────────┘                  │
 ├──────────────────────────────────┴──────────────────────────────────┤
 │ Esc : Quit      F9 : Menu in BIOS      ↑ ↓ → ←   : Select Item       │
 │ F10 : Save & Exit Setup                                             │
 ├──────────────────────────────────────────────────────────────────────┤
 │               Change/Set/Disable Password                           │
 └──────────────────────────────────────────────────────────────────────┘
```
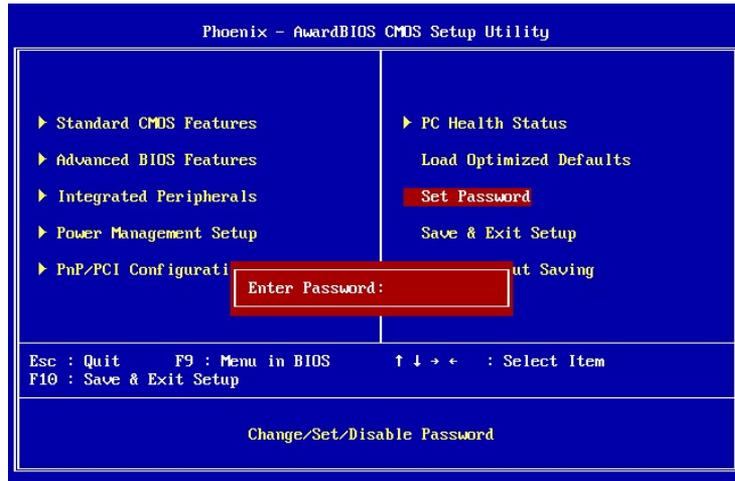
The User Password utility sets the password. The main board is shipped with the password disabled. If you want to change the password, you must first enter the current password, then at the prompt enter your new password. The password is case sensitive. You can use up to eight alpha-numeric characters. 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

```
          Phoenix - AwardBIOS CMOS Setup Utility
 ┌──────────────────────────────────┬──────────────────────────────────┐
 │                                  │                                  │
 │  ▶ Standard CMOS Features        │  ▶ PC Health Status              │
 │                                  │                                  │
 │  ▶ Advanced BIOS Features        │    Load Optimized Defaults       │
 │                                  │                                  │
 │  ▶ Integrated Peripherals        │    Set Password                  │
 │                                  │                                  │
 │  ▶ Power Management┌──────────────────────────────┐Setup            │
 │                    │ SAVE to CMOS and EXIT (Y/N)? Y │                 │
 │  ▶ PnP/PCI Configura└──────────────────────────────┘ Saving          │
 ├──────────────────────────────────┴──────────────────────────────────┤
 │ Esc : Quit      F9 : Menu in BIOS      ↑ ↓ → ←   : Select Item       │
 │ F10 : Save & Exit Setup                                             │
 ├──────────────────────────────────────────────────────────────────────┤
 │                  Save Data to CMOS                                  │
 └──────────────────────────────────────────────────────────────────────┘
```
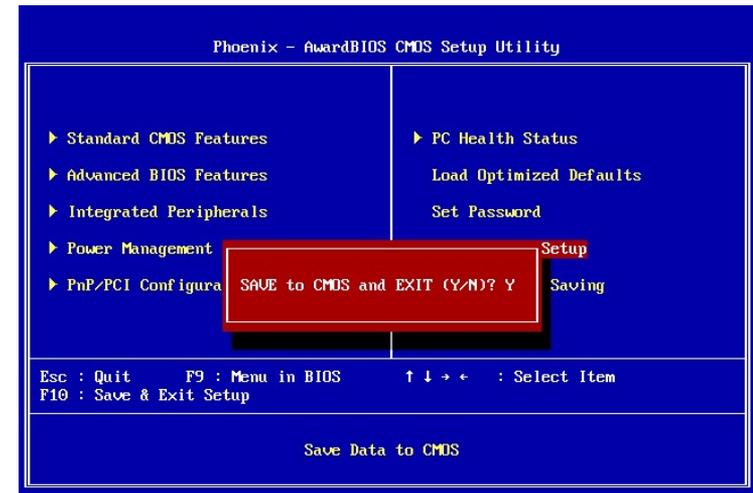
Selecting this option and pressing <Enter> will save the new setting information in the CMOS memory and continue with the bootup process.

Exit Without Saving

```
            Phoenix - AwardBIOS CMOS Setup Utility
  ┌─────────────────────────────────────────────────────────┐
  │                                                         │
  │  ▶ Standard CMOS Features        ▶ PC Health Status     │
  │                                                         │
  │  ▶ Advanced BIOS Features          Load Optimized Defaults │
  │                                                         │
  │  ▶ Integrated Peripherals          Set Password         │
  │                                                         │
  │  ▶ Power Management S┌──────────────────────┐ Setup     │
  │                      │ Quit Without Saving (Y/N)? N │   │
  │  ▶ PnP/PCI Configurat│                      │ t Saving  │
  │                      └──────────────────────┘           │
  │                                                         │
  │  Esc : Quit      F9 : Menu in BIOS    ↑↓→← : Select Item │
  │  F10 : Save & Exit Setup                                │
  ├─────────────────────────────────────────────────────────┤
  │                   Abandon all Data                      │
  └─────────────────────────────────────────────────────────┘
```
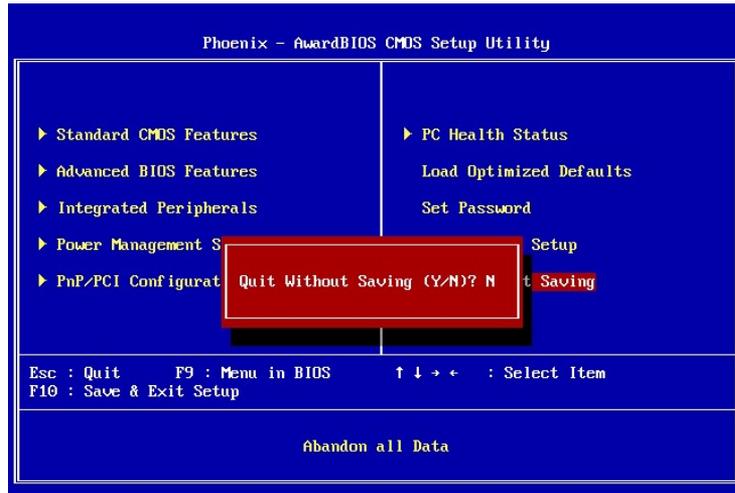
Selecting this option and pressing <Enter> will exit the Setup utility without recording any new values or changing old ones.

APPENDIX A: POWER CONSUMPTION

Key Component Power Consumption

Onboard Chips	Vcore 1.1	Vtt 1.05	+1.05V	+1.5V	+1.8V	+2.5V	+3.3V	+5V	+1.05VSB	+3.3VSB	+5VSB
Atom CPU 7.025W	4	2.5		0.13							
945GSE 8.051W		0.8	2.94	1.844		0.332	0.16				
SO-DIMM x1 3.163W					1.757						
ICH7-M 4.766W	0.014		0.987	1.695			0.355		0.024	0.028	0.10
CLOCK GEN. (CK-408B)							0.56				
82562EM 0.3W							0.1				
Audio Codec 0.392W							0.028	0.06			
Super IO (ITE8712F) 0.3W							0.1				
LPC-to-UART (F81216DG) 0.66W							0.12				
6x RS232							0.2				

Device

Onboard Chips	Vcore 1.1	Vtt 1.05	+1.05V	+1.5V	+1.8V	+2.5V	+3.3V	+5V	+1.05VSB	+3.3VSB	+5VSB
LVDS LCD1											
LVDS LCD2											
Mini-PCIe 3.5G Module											
CF											
2.5" SATA								1.2			
4x USB								2.5			
2x PS/2								0.5			
COM4 w/ 5V/12V											
Total Consumption	4.014	3.3	3.927	3.669	1.757	0.332	1.623	4.26	0.024	0.028	0.1
Total Watt (Unit: W)	4.415	3.465	4.123	5.504	3.163	0.83	4.89	21.3	0.025	0.0924	0.5
Transfer Voltage (Unit: V)	5	5	5	5	5	3.3	5		+3.3VSB	+5VSB	

System Power Consumption

Test Condition

1. Power up the system and boot Windows XP.
2. Enter the standby mode (HDD power down).
3. Measure the power consumption and record it.
4. Run the Burn-in test program to apply 100% full loading.
5. Measure the power consumption using a clamp meter and record it.

	NISE 2010	**Watts**
	+19V	Total
Full-Loading Mode	1.28A	1.28A
	24.36W	24.36W
Standby Mode	0.63A	0.63A
	12.1W	12.1W

Power Supply's Consumed Watts and Currents

Power Type	+5V	5V to 3.3V DC/DC	5V to 1.8V DC/DC	5V to 1.5V DC/DC	5v-to-1.05v DC/DC	5V to Vcore DC/DC	+5VSB
Consumed watts	21.3W	4.89W	2.163W	5.504W	8.588W	4.415W	0.76W
Consumed currents (Item A)	4.26A	0.98A	0.44A	1.1A	1.718A	0.883A	0.152A
Actual required currents (Item A/0.80)		1.225A	0.55A	1.136A	2.147A	1.104	0.152A
5V needed (Item A)	10.422A						

Hardware Monitor

Voltage	Temperature	Fan Speed
Vcore	CPU	System fan
+12V		
+5V	System	
+3.3V		

APPENDIX B: WATCHDOG TIMER SETTING

Watchdog Timer Configuration Sequence

```
                    ┌─────────────┐
                    │    Start    │
                    └──────┬──────┘
                           ▼
        ┌──────────────────────────────────────┐
        │    Enter the Extended Function Mode   │
        └──────────────────┬───────────────────┘
                           ▼
        ┌──────────────────────────────────────┐
        │           Init Watchdog Timer         │
        │       #Select WDT control mode with   │
        │              LDN 07, index 72         │
        │   Users can select second or minute mode │
        └──────────────────┬───────────────────┘
                           ▼
        ┌──────────────────────────────────────┐
        │           Set Watchdog Timer          │
        │      #Set WDT counter register with   │
        │          LDN 07, index 73, index 74   │
        │        Users can set time out value   │
        └──────────────────┬───────────────────┘
                           ▼
        ┌──────────────────────────────────────┐
        │     Exit the Extended Function Mode   │
        └──────────────────┬───────────────────┘
                           ▼
                    ┌─────────────┐
                    │     END     │
                    └─────────────┘
```
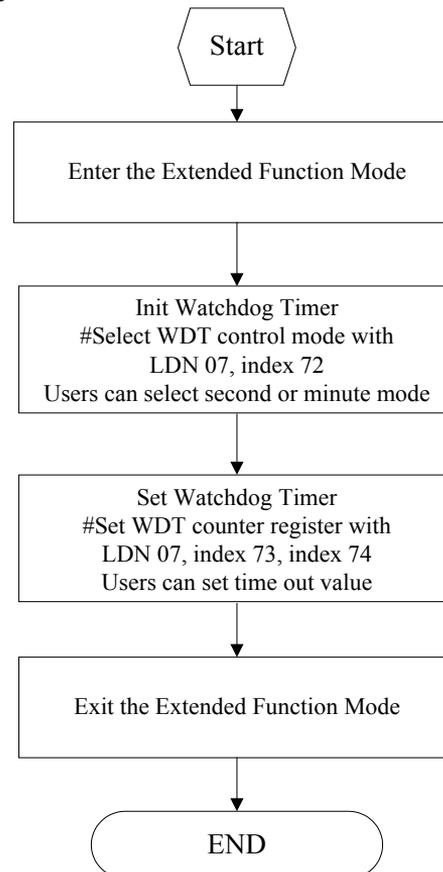
Programming Example

```
;---------------------------------------------------------------
;Enter the Extended Function Mode
;---------------------------------------------------------------
MOV DX, 2EH
MOV AL, 87H
OUT DX, AL

MOV DX, 2EH
MOV AL, 01H
OUT DX, AL

MOV DX, 2EH
MOV AL, 55H
OUT DX, AL
nop
nop

OUT DX, AL
;---------------------------------------------------------------
;Configuration Logical Device 7,
;set second or minute mode
;set counter
;---------------------------------------------------------------
MOV DX, 2EH
MOV AL, 07H
OUT DX, AL   ;set logical number
MOV DX, 2FH
MOV AL, 07H  ;Select Logical Device 7
OUT DX, AL
```

```
;set second or minute mode
MOV DX, 2EH
MOV AL, 72H
OUT DX, AL   ;Select index 72h
MOV DX, 2FH
MOV AL, 90H  ;Second mode(MOV AL, 10H is minute mode)
OUT DX, AL
;set counter
MOV DX, 2EH
MOV AL, 73H
OUT DX, AL   ;Select CRF6h
MOV DX, 2FH
MOV AL, 0F0H  ;240 (second/minute) (0xF0=240)
OUT DX, AL
;---------------------------------------------------------------
Exit the Extended Function Mode
;---------------------------------------------------------------

MOV DX, 02H
MOV AL, 02H
OUT DX, AL
```

Debug Condition

c:\>debug [enter]

-o 2e 87 ;Enter the Extended Function Mode

-o 2e 01

-o 2e 55

-o 2e 55

-o 2e 07 ;Logical Device Number Reg

-o 2f 07 ;LDN=7

-o 2e 72 ;Watch dog configuration

-o 2f XX ;minute mode (-o 2f 00 second mode)

-o 2e 73 ;LSB for Watch dog tme out value

-o 2f YY

-o 2e 74 ;MSB for Watch dog tme out value

-o 2f ZZ

XX: 90 : Second mode

    10 : minute mode

ex:

10 second timeout:

xx=90

yy=0a

zz=00

Digital IO Programming Guide

c:\>debug [enter]

-o 801 yy ;gpio data port mapping address

-i 801 zz

-q

C:>

input

zz : bit4 = GPIO24 , bit5 = GPIO25 , bit6 = GPIO26 , bit7 = GPIO27

example:

  zz=1x GPIO24=HIGH, GPIO25=LOW , GPIO26=LOW , GPIO27=LOW

  zz=2x GPIO24=LOW , GPIO25=HIGH, GPIO26=LOW , GPIO27=LOW

  zz=4x GPIO24=LOW , GPIO25=LOW , GPIO26=HIGH, GPIO27=LOW

  zz=8x GPIO24=LOW , GPIO25=LOW , GPIO26=LOW , GPIO27=HIGH

x is for GPIO output pin

output

yy : bit0 = GPIO20 , bit1 = GPIO21 , bit2 = GPIO22 , bit3 = GPIO23

example:

  yy=x1 GPIO20=HIGH, GPIO21=LOW , GPIO22=LOW , GPIO23=LOW

  yy=x2 GPIO20=LOW , GPIO21=HIGH, GPIO22=LOW , GPIO23=LOW

  yy=x4 GPIO20=LOW , GPIO21=LOW , GPIO22=HIGH, GPIO23=LOW

  yy=x8 GPIO20=LOW , GPIO21=LOW , GPIO22=LOW , GPIO23=HIGH

x is for GPIO input pin