

ML936-B Series

System Board User's Manual

935-ML9361-000G
A10500920

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FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

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About this Manual

An electronic file of this manual is included in the CD. To view the user's manual in the CD, insert the CD into a CD-ROM drive. The autorun screen (Main Board Utility CD) will appear. Click "User's Manual" on the main menu.

Warranty

1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.



Important:

Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

Safety Measures

To avoid damage to the system:

- Use the correct AC input voltage range.

To reduce the risk of electric shock:

- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

Battery:

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

About the Package

The system board package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- ☑ One system board
- ☑ One IDE cable
- ☑ One USB cable
- ☑ One bracket mounted with a COM port
- ☑ One I/O shield
- ☑ One user's manual
- ☑ One CD
- ☑ One QR (Quick Reference)

The system board and accessories in the package may not come similar to the items listed above. This may differ in accordance to the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

Before Using the System Board

Before using the system board, prepare basic system components.

If you are installing the system board in a new system, you will need at least the following internal components.

- Memory module
- Storage device

You will also need external system peripherals you intend to use which will normally include at least a keyboard, a mouse and a video display monitor.

Chapter 1 - Introduction

Specifications

Processor	<ul style="list-style-type: none">• Intel® Low Power (IA-32 microarchitecture) processor<ul style="list-style-type: none">- ML936-B11C<ul style="list-style-type: none">: Intel® Z510P processor: 400MHz system front side bus: Speed supports 1.1GHz- ML936-B16C<ul style="list-style-type: none">: Intel® Z530P processor: 533MHz system front side bus: Speed supports 1.6GHz
Chipset	<ul style="list-style-type: none">• Intel® US15WP SCH single chip
System Memory	<ul style="list-style-type: none">• One 200-pin SODIMM socket• Supports 400/533MHz DDR2 SDRAM• Supports maximum of 2GB system memory
Expansion Slot (ECX Type 1)	<ul style="list-style-type: none">• 1 expansion slot for EXT-ECX2 daughterboard<ul style="list-style-type: none">- 1 Mini PCI Express x1 slot- 4 USB ports- 1 8-bit Digital I/O connector- 1 SDIO/MMC socket- 4 COM connectors- Audio (Line-out and Mic-in)
Graphics	<ul style="list-style-type: none">• Intel® GMA 500 integrated graphics engine• Estimated 200MHz core render clock at 1.05V core voltage• Ultra low power integrated 3D graphics• High definition hardware video decode engine• Supports LVDS and SDVO interfaces<ul style="list-style-type: none">- LVDS: Supports pixel clock depths of 18 or 24 bits, max. pixel clock of 112MHz, equates to 1376x768 @ 85Hz- SDVO: Up to 160MHz pixel clock, equates to 1280x1024 @ 85Hz
Audio	<ul style="list-style-type: none">• Realtek ALC262 High Definition audio CODEC• 2-channel audio output• 1 stereo DAC supports 16/20/24-bit PCM format with 44.1/48/96/192KHz sample rate• 2 stereo ADCs support 16/20-bit PCM format with 44.1/48/96/192KHz sample rate
LAN	<ul style="list-style-type: none">• One Realtek RTL8111C PCI Express Gigabit controller• Supports 10Mbps, 100Mbps and 1Gbps data transmission• IEEE 802.3 (10/100Mbps) and IEEE 802.3ab (1Gbps) compliant
IDE	<ul style="list-style-type: none">• Supports up to two Ultra ATA 33 IDE devices <p>Note: We do not recommend using IDE devices and CF card at the same time.</p>

Rear Panel I/O Ports	<ul style="list-style-type: none"> • 1 mini-DIN-6 port for PS/2 mouse and PS/2 KB ports • 1 DVI-I port (DVI-D signal only) • 1 RJ45 LAN port • 2 USB ports • 1 line-out audio jack • 1 DC-in 12V jack
I/O Connectors	<ul style="list-style-type: none"> • 1 connector for 2 additional external USB 2.0/1.1 ports • 2 connectors for 2 external serial ports (RS232/RS422/RS485 selectable) • 1 LVDS LCD panel connector • 1 LCD/inverter power connector • 1 S/PDIF-in/out connector • 1 CD-in internal audio connector • 1 44-pin IDE connector • 1 front panel connector • 1 CompactFlash socket • 1 SDIO/MMC expansion port • 1 expansion slot
BIOS	<ul style="list-style-type: none"> • Award BIOS • 8Mbit flash memory
Energy Efficient Design	<ul style="list-style-type: none"> • Supports ACPI specification 2.0/1.0 • Enhanced Intel®SpeedStep Technology
Damage Free Intelligence	<ul style="list-style-type: none"> • Monitors CPU/system temperature and overheat alarm • Monitors CPU(V)/1.05V/1.8V/5V/12V voltages and failure alarm
Temperature	<ul style="list-style-type: none"> • 0°C to 60°C
Humidity	<ul style="list-style-type: none"> • 10% to 90%
PCB	<ul style="list-style-type: none"> • 10-layers, ECX form factor • 10.5cm (4.14") x 14.6cm (5.75")

Features

CompactFlash

The system board is equipped with the CompactFlash™ socket for inserting a CompactFlash™ card. CompactFlash™ card is a small removable mass storage device designed with flash technology - a non-volatile storage solution that does not require a battery to retain data indefinitely. The CompactFlash™ technology is widely used in products such as portable and desktop computers, digital cameras, handheld data collection scanners, PDAs, Pocket PCs, handy terminals and personal communicators.

DDR2

DDR2 is a higher performance DDR technology whose data transfer rate delivers bandwidth of 4.3 GB per second and beyond. That is twice the speed of the conventional DDR without increasing its power consumption. DDR2 SDRAM modules work at 1.8V supply compared to 2.6V memory voltage for DDR modules. DDR2 also incorporates new innovations such as the On-Die Termination (ODT) as well as larger 4-bit pre-fetch against DDR which fetches 2 bits per clock cycle.

Graphics

The Intel SCH's integrated Intel GMA 500 provides integrated graphics (2D and 3D) and high-definition video decode capabilities with minimal power consumption. It supports DVI and LVDS LCD interfaces.

DVI

DVI (Digital Visual Interface) is a form of video interface technology made to maximize the quality of flat panel LCD monitors and modern video graphics cards. Data is transmitted using the TMDS (Transition Minimized Differential Signaling) protocol, providing a digital signal from the PC's graphics subsystem to the display.

LVDS

The Intel SCH supports a Low-Voltage Differential Signaling (LVDS) interface that allows the Intel Graphics Media Adapter to communicate directly to the flat-panel display. The LVDS interface supports pixel color depths of 18 and 24 bits.

Secure Digital I/O (SDIO) / Multimedia Card (MMC)

The SDIO/MMC expansion port is used to insert a Secure Digital Input/Output (SDIO) or Multimedia Card (MMC) device. Aside from storing data files, an SDIO card is also capable of storing powerful software applications.

PCI Express

PCI Express is a high bandwidth I/O infrastructure that possesses the ability to scale speeds by forming multiple lanes. The x1 PCI Express lane supports transfer rate of 2.5 Gigabytes (250MBbps) per second which is nearly 4 times faster than the traditional PCI.

S/PDIF

S/PDIF is a standard audio file transfer format that transfers digital audio signals to a device without having to be converted first to an analog format. This prevents the quality of the audio signal from degrading whenever it is converted to analog. S/PDIF is usually found on digital audio equipment such as a DAT machine or audio processing device. The S/PDIF connector on the system board sends surround sound and 3D audio signal outputs to amplifiers and speakers and to digital recording devices like CD recorders.

Gigabit LAN

The Realtek RTL8111C PCI Express Gigabit controller supports up to 1Gbps data transmission.

USB

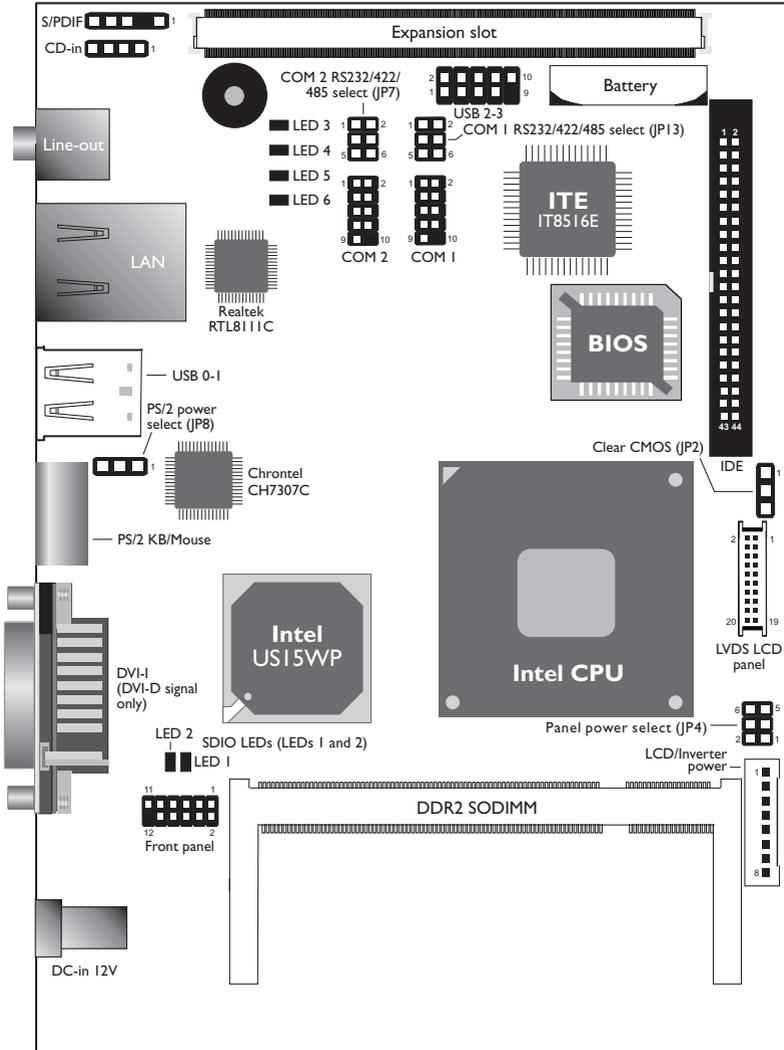
The system board supports USB 2.0 and USB 1.1 ports. USB 1.1 supports 12Mb/second bandwidth while USB 2.0 supports 480Mb/second bandwidth providing a marked improvement in device transfer speeds between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

ACPI

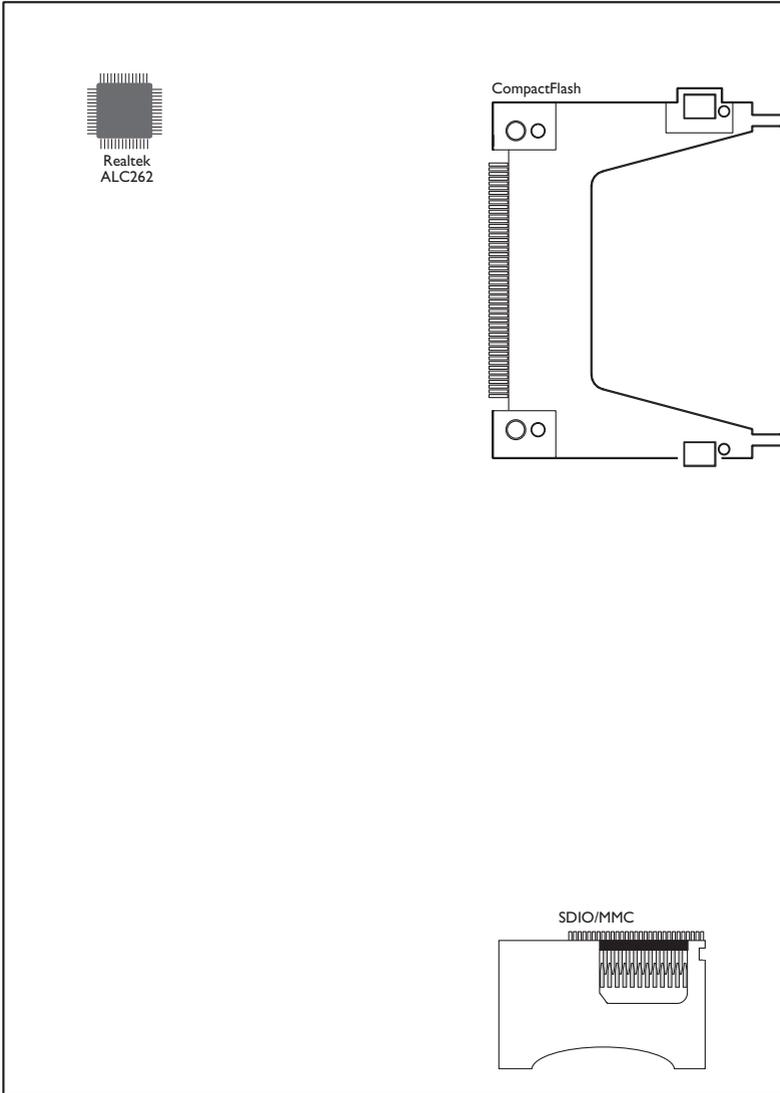
The system board is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enables PCs to implement Power Management and Plug-and-Play with operating systems that support OS Direct Power Management.

Chapter 2 - Hardware Installation

System Board Layout

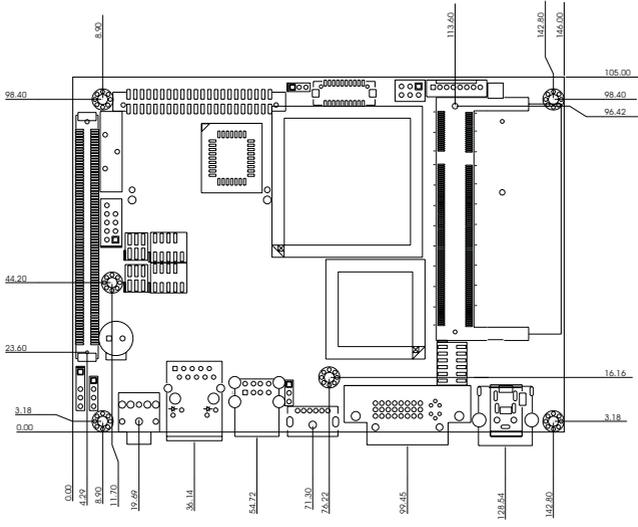


Component Side

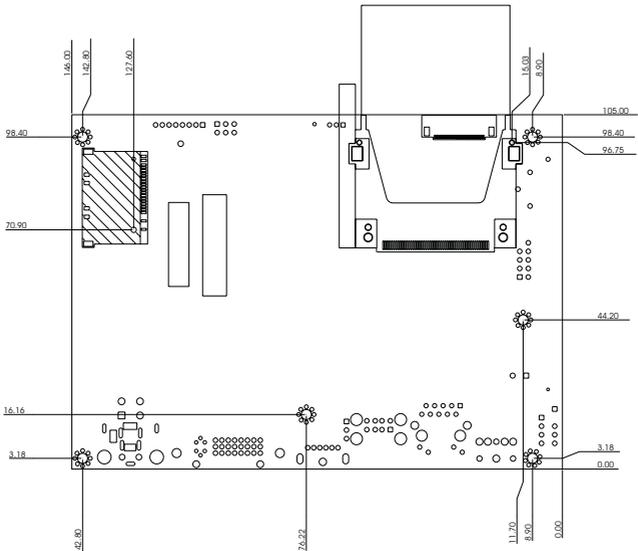


Solder Side

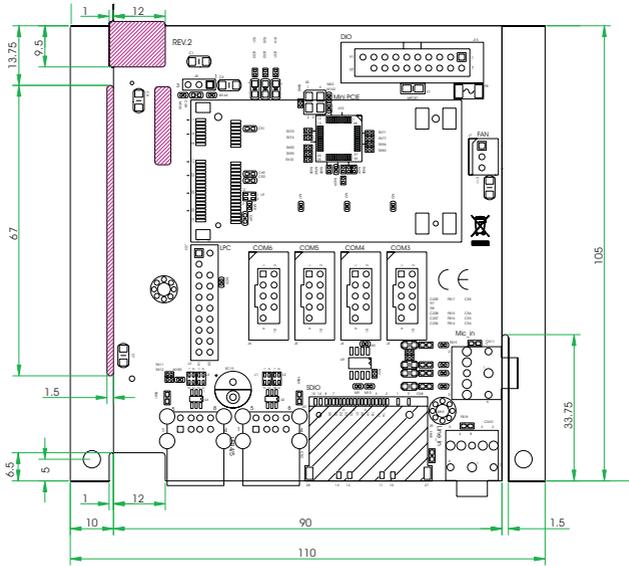
Mechanical Diagram



ML936-B - Component Side



ML936-B - Solder Side

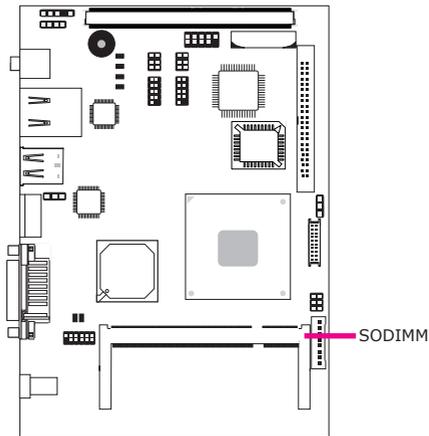


EXT-ECX2

**Important:**

Electrostatic discharge (ESD) can damage your system board, processor, disk drives, add-in boards, and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

System Memory



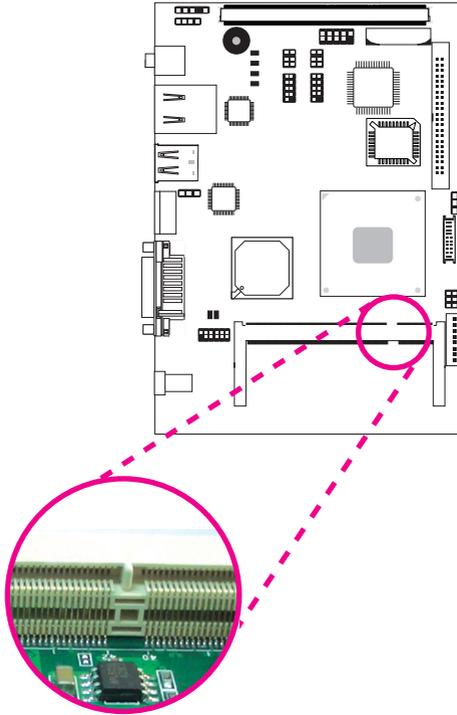
The system board is equipped with a 200-pin SODIMM socket that supports DDR2 module.

BIOS Setting

Configure the system memory in the Advanced Chipset Features submenu of the BIOS.

Installing the SODIMM DDR2 Module

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the SODIMM socket on the board.
4. Note the key on the socket. The key ensures the module can be plugged into the socket in only one way.



5. Grasping the module by its edges, align the module into the socket at an approximately 30 degrees angle. Note that the socket and module are both keyed, which means the module can be plugged into the socket in only one direction.

- To seat the module into the socket, apply firm even pressure to each end of the module until it slips down into the socket. The contact fingers on the edge of the module will almost completely disappear inside the socket.

**Note:**

The board used in the following illustrations may not resemble the actual one. These illustrations are for reference only.

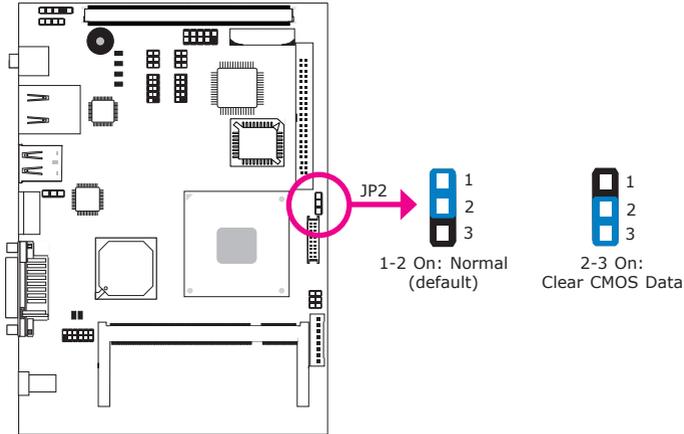


- Push the module down until the clips at each side of the socket lock into position. You will hear a distinctive “click”, indicating the module is correctly locked into position



Jumper Settings

Clear CMOS Data



If you encounter the following,

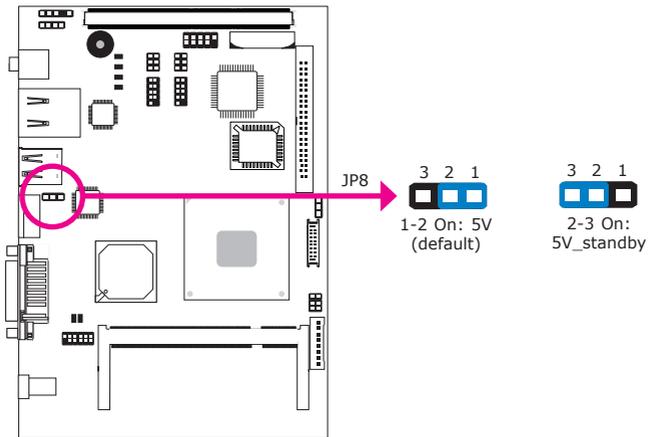
- a) CMOS data becomes corrupted.
- b) You forgot the supervisor or user password.

you can reconfigure the system with the default values stored in the ROM BIOS.

To load the default values stored in the ROM BIOS, please follow the steps below.

1. Power-off the system and unplug the power cord.
2. Set JP2 pins 2 and 3 to On. Wait for a few seconds and set JP2 back to its default setting, pins 1 and 2 On.
3. Now plug the power cord and power-on the system.

PS/2 Power Select



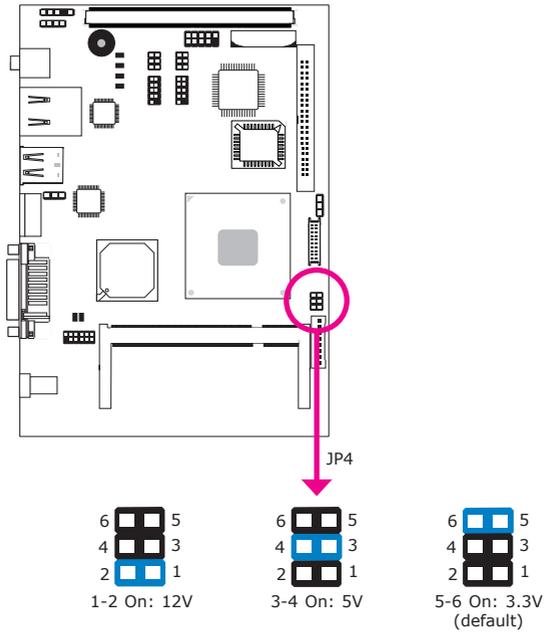
JP8 is used to select the power of the PS/2 keyboard/mouse port. Selecting 5V_standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.



Important:

The 5VSB power source of your power supply must support $\geq 720\text{mA}$.

Panel Power Select



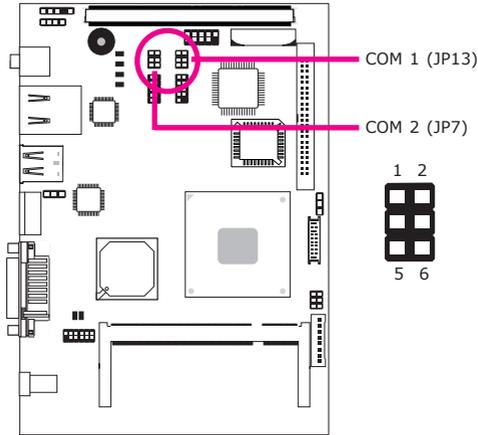
JP4 is used to select the power supplied to the LCD panel.



Important:

Before powering-on the system, make sure JP4's setting matches the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.

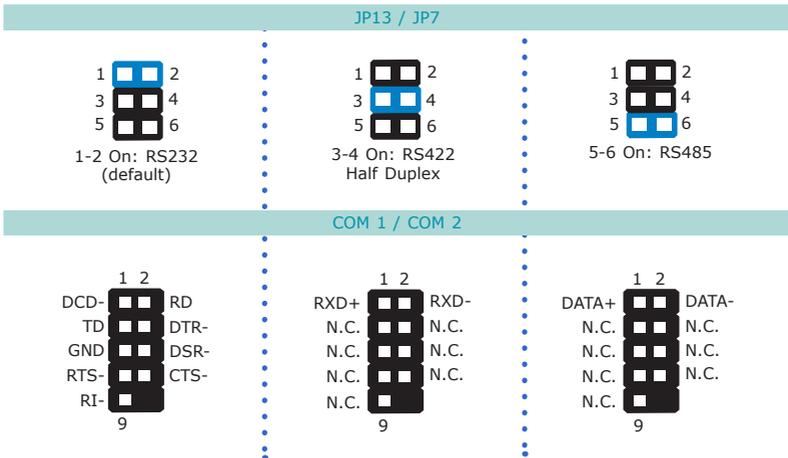
COM 1 / COM 2 RS232/RS422/RS485 Select



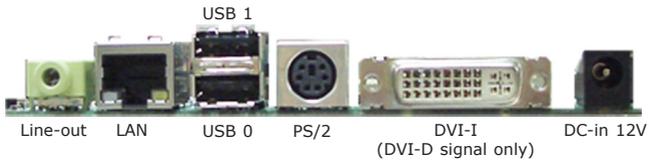
JP13 is used to configure COM 1 to RS232, RS422 (Half Duplex) or RS485.

JP7 is used to configure COM 2 to RS232, RS422 (Half Duplex) or RS485.

The pin function of COM 1 / COM 2 will vary according to the jumper's setting.



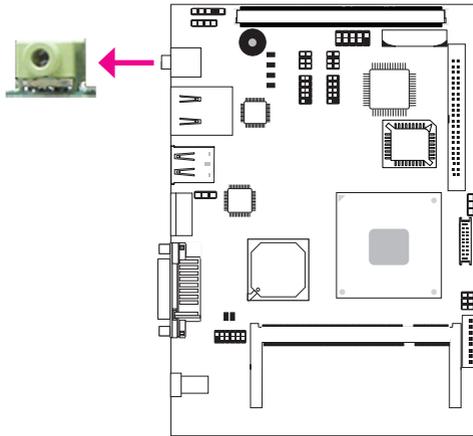
Rear Panel I/O Ports



The rear panel I/O ports consist of the following:

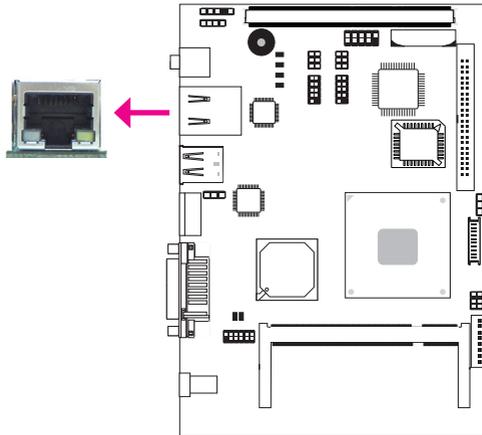
- Line-out jack
- LAN port
- 2 USB ports
- PS/2 port
- DVI-I port (DVI-D signal only)
- DC-in 12V jack

Line-out Jack



This jack is used to connect a headphone or external speakers.

LAN Port



The LAN ports allow the system board to connect to a local area network by means of a network hub.

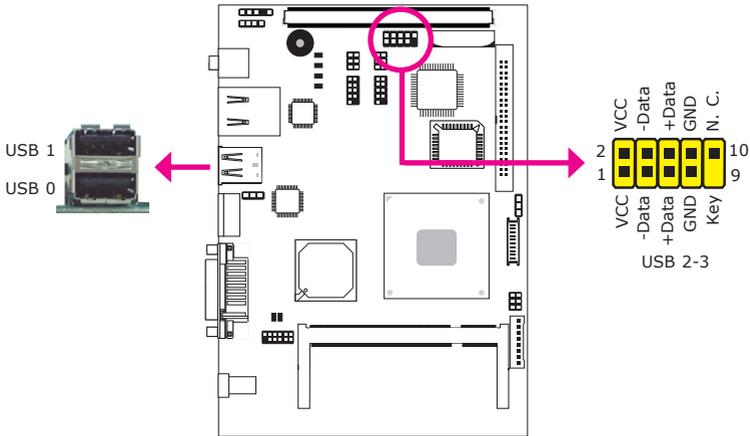
BIOS Setting

Configure the onboard LAN in the Integrated Peripherals submenu ("PCI Express Root Port Func" section) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the LAN drivers. Refer to chapter 4 for more information.

USB Ports



USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The system board is equipped with two onboard USB 2.0/1.1 ports. The USB 2-3 connector allows you to connect 2 additional USB 2.0/1.1 ports. The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the USB port cables to the connector.

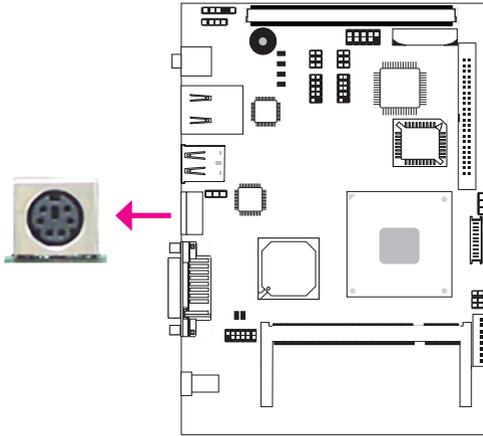
BIOS Setting

Configure the onboard USB in the Integrated Peripherals submenu ("USB Device Setting" section) of the BIOS. Refer to chapter 3 for more information.

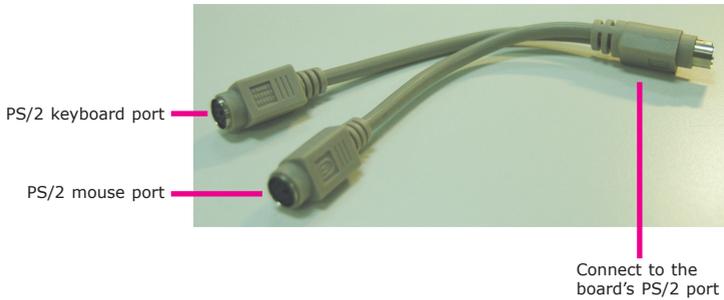
Driver Installation

You may need to install the proper drivers in your operating system to use the USB device. Refer to your operating system's manual or documentation for more information.

PS/2 Port

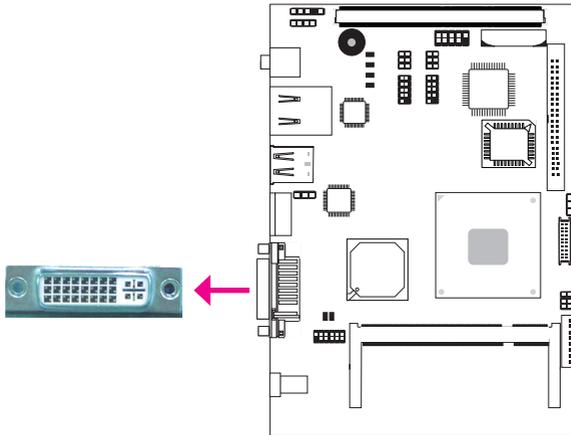


The PS/2 port is used to connect a PS/2 keyboard and a PS/2 mouse by means of the provided cable.

**Important:**

Make sure to turn off your computer prior to connecting or disconnecting a mouse or keyboard. Failure to do so may damage the system board.

DVI-I Port



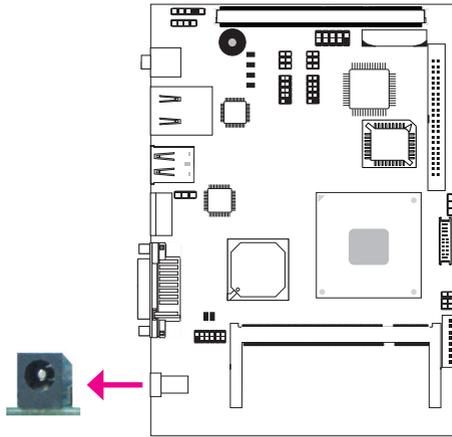
The DVI-I port is used to connect an LCD monitor. This port supports DVI-D signal only.

Connect the display device's cable connector to the DVI-I port. After you plug the cable connector into the port, gently tighten the cable screws to hold the connector in place.

BIOS Setting

Configure the display device in the Advanced Chipset Features submenu of the BIOS. Refer to chapter 3 for more information.

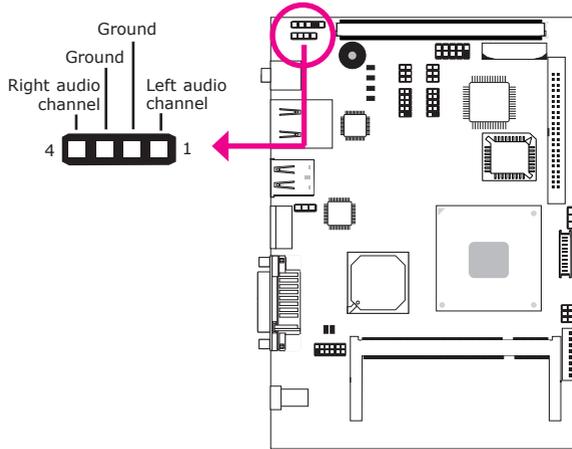
DC-in 12V



This jack provides maximum of 60W power and is considered a low power solution. Connect a DC power cord to this jack. Use a power adapter with 16V-22V DC output voltage. Using a voltage higher than the recommended one may fail to boot the system or cause damage to the system board.

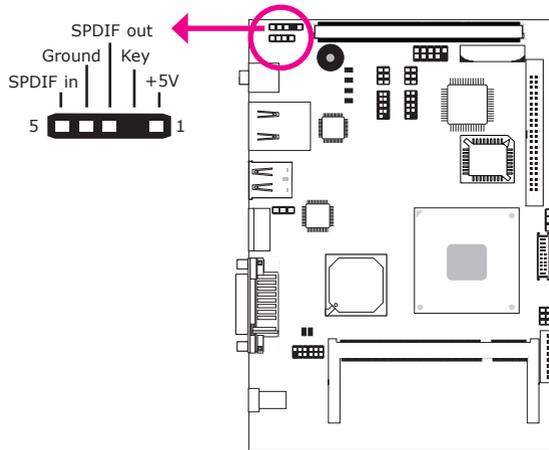
I/O Connectors

CD-in Internal Audio Connector



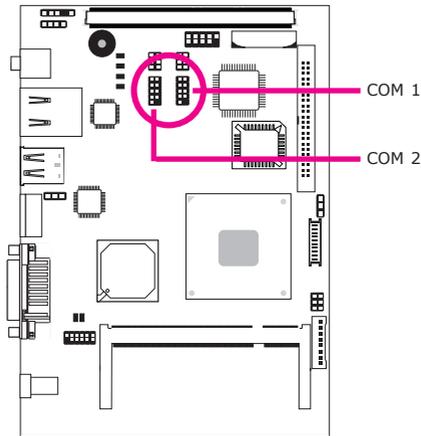
The CD-in connector is used to receive audio from a CD-ROM drive, TV tuner or MPEG card.

S/PDIF Connector



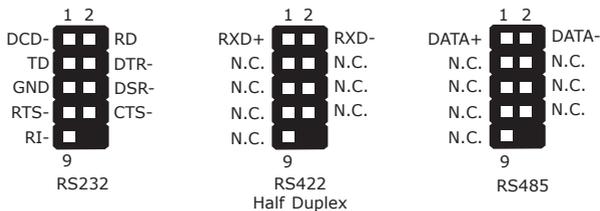
The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned with pin 1 of the S/PDIF connector.

COM Connectors



The serial ports are asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.

The pin function of COM 1 and COM 2 will vary according to the JP13 and JP7 settings. Refer to “COM 1 / COM 2 RS232/RS422/RS485 Select” in this chapter for more information.



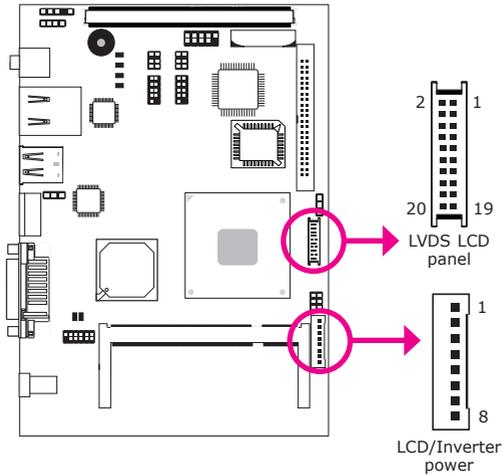
Connecting External COM Ports

Your COM port may come mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the serial port cable to a COM connector. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of the COM connector.

BIOS Setting

Configure the serial ports in the Integrated Peripherals submenu (“Onboard I/O Chip Setup” section) of the BIOS. Refer to chapter 3 for more information.

LVDS LCD Panel Connector LCD/Inverter Power Connector



The system board allows you to connect a LCD Display Panel by means of the LVDS LCD panel connector and the LCD/Inverter power connector. These connectors transmit video signals and power from the system board to the LCD Display Panel.

Refer to the next page for the pin functions of these connectors.

BIOS Setting

Configure the LCD panel in the Advanced Chipset Features submenu of the BIOS. Refer to chapter 3 for more information.

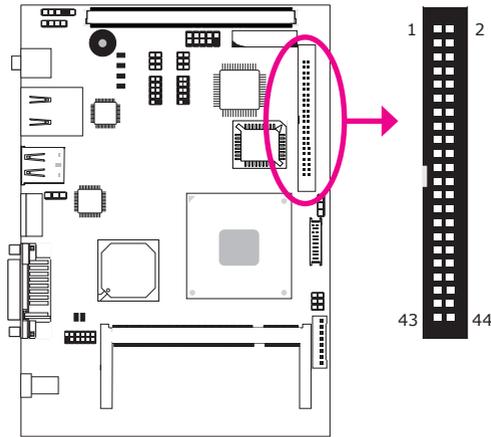
LVDS LCD Panel Connector

Pins	Function	Pins	Function
1	LVDS_D3+	2	LVDS_D2+
3	LVDS_D3-	4	LVDS_D2-
5	GND	6	GND
7	LVDS_D1+	8	LVDS_D0+
9	LVDS_D1-	10	LVDS_D0-
11	GND	12	GND
13	LVDS_CLK+	14	LVDS_DDC_CLK
15	LVDS_CLK-	16	LVDS_DDC_DATA
17	GND	18	GND
19	Panel Power	20	Panel Power
21	GND	22	GND

LCD/Inverter Power Connector

Pins	Function
1	GND
2	GND
3	Panel Inverter Brightness Voltage Control
4	Panel Power
5	+3.3V
6	Panel Backlight On/Off Control
7	+12V
8	+12V

IDE Connector

**Important:**

We do not recommend using IDE devices and CF card at the same time.

The IDE connector is used to connect hard drives. The connector on the IDE cable can be inserted into this connector only if pin 1 of the cable is aligned with pin 1 of this connector.

The IDE connector supports 2 devices, a Master and a Slave. Use an IDE ribbon cable to connect the drives to the system board. An IDE ribbon cable has 3 connectors on them, one that plugs into the IDE connector on the system board and the other 2 connect to IDE devices. The connector at the end of the cable is for the Master drive and the connector in the middle of the cable is for the Slave drive.

**Note:**

Refer to your disk drive user's manual for information about selecting proper drive switch settings.

Adding a Second IDE Disk Drive

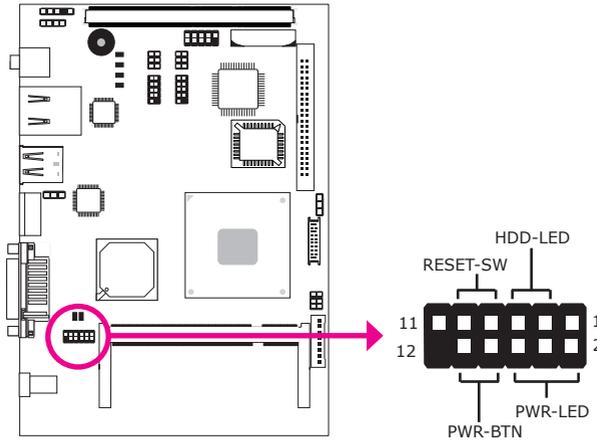
When using two IDE drives, one must be set as the master and the other as the slave. Follow the instructions provided by the drive manufacturer for setting the jumpers and/or switches on the drives.

The system board supports Enhanced IDE or ATA-2 and ATA/33 hard drives. We recommend that you use hard drives from the same manufacturer. In a few cases, drives from two different manufacturers will not function properly when used together. The problem lies in the hard drives, not the system board.

**Important:**

If you encountered problems while using an ATAPI CD-ROM drive that is set in Master mode, please set the CD-ROM drive to Slave mode. Some ATAPI CD-ROMs may not be recognized and cannot be used if incorrectly set in Master mode.

Front Panel Connectors



HDD-LED - HDD LED

This LED will light when the hard drive is being accessed.

RESET SW - Reset Switch

This switch allows you to reboot without having to power off the system.

PWR-BTN - Power Switch

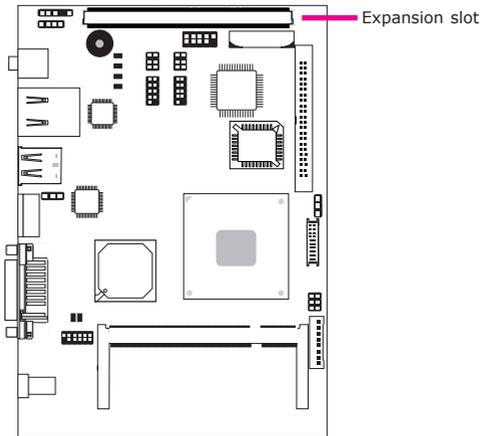
This switch is used to power on or off the system.

PWR-LED - Power/Standby LED

When the system's power is on, this LED will light. When the system is in the S1 (POS - Power On Suspend) state, it will blink every second. When the system is in the S3 (STR - Suspend To RAM) state, it will blink every 4 seconds.

	Pin	Pin Assignment		Pin	Pin Assignment
N. C.	1	N. C.	PWR-LED	2	LED Power
				4	LED Power
				6	Signal
HDD-LED	3	HDD Power	PWR-BTN	8	GND
	5	Signal		10	Signal
RESET SW	7	Ground			
	9	RST Signal			
N. C.	11	N. C.	Key	12	Key

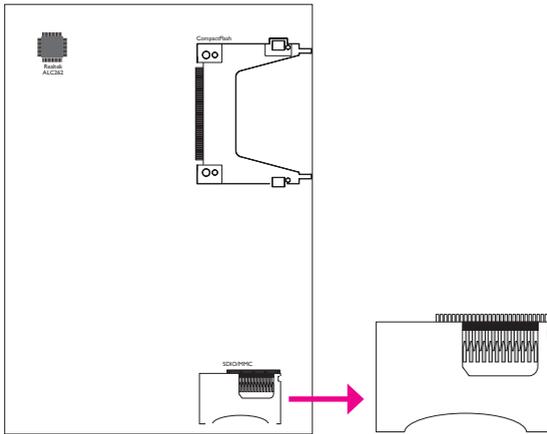
ECX Type 1 Expansion Slot (for EXT-ECX2 Daughterboard)



The ECX Type 1 expansion slot is an interface for the EXT-ECX2 daughterboard. The EXT-ECX2 daughterboard features:

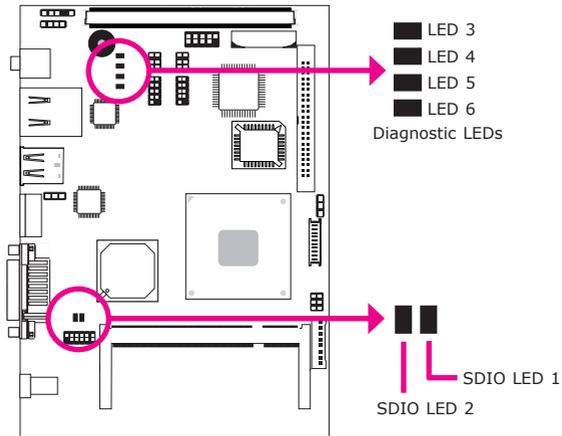
- 4 USB ports
- 1 SDIO/MMC socket
- 1 mic-in jack
- 1 line-out jack
- 4 COM connectors
- 1 Mini PCI Express x1 slot
- 1 8-bit Digital I/O connector

SDIO/MMC Expansion Port



This expansion port is used to insert a Secure Digital Input/Output (SDIO) or Multimedia Card (MMC) device. Aside from storing data files, an SDIO card is also capable of storing powerful software applications.

LEDs



SDIO LEDs

SDIO LED 1 will light when the SDIO/MMC device on the ML936 series board is being accessed.

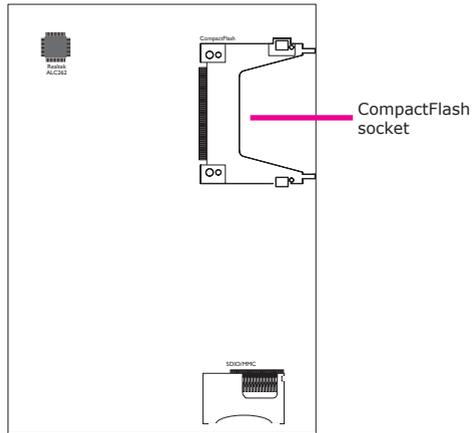
SDIO LED 2 will light when the SDIO/MMC device on the ECX daughterboard is being accessed.

Diagnostic LEDs

The Diagnostic LEDs display POST codes. POST (Power-On Self Tests) which is controlled by the BIOS is performed whenever you power-on the system. POST will detect the status of the system and its components. Each code displayed on the LED corresponds to a certain system status. Refer to the table on the next page for the POST codes.

		LED 3	LED 4	LED 5	LED 6
1	Program chipset registers before POST.	OFF	OFF	OFF	ON
2	Testing memory presence.	OFF	OFF	ON	OFF
3	Some RTC are not ready at this moment. Check the CMOS byte's storage, if the CPU type is ok or not. If not, the system will stop till it's ok.	OFF	OFF	ON	ON
4	Initialize system memory.	OFF	ON	OFF	OFF
5	Determine DRAM configuration.	OFF	ON	OFF	ON
6	Program the DRAM timing and configuration data into the SCH.	OFF	ON	ON	OFF
7	An error occurred during initialization.	OFF	ON	ON	ON
8	Checking CMOS checksum and battery.	ON	OFF	OFF	OFF
9	Initializing the clock generator.	ON	OFF	OFF	ON
10	Initializing USB.	ON	OFF	ON	OFF
11	Testing all memory. (Cleared all extended memory to 0)	ON	OFF	ON	ON
12	Initializing the onboard IO.	ON	ON	OFF	OFF
13	Detect and install IDE device.	ON	ON	OFF	ON
14	Final Init.	ON	ON	ON	OFF
15	Booting the system.	ON	ON	ON	ON

CompactFlash Socket

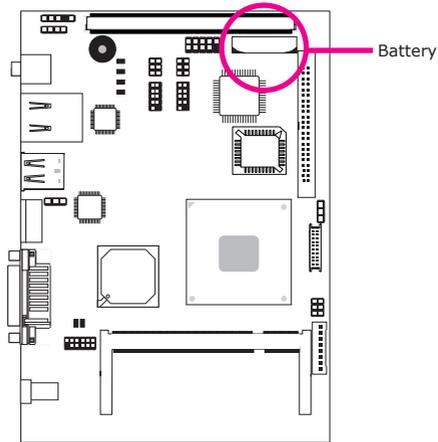


The CompactFlash™ socket is used for inserting a CompactFlash™ card. CompactFlash™ card is a small removable mass storage device designed with flash technology - a non-volatile storage solution that does not require a battery to retain data indefinitely. The CompactFlash™ technology is widely used in products such as portable and desktop computers, digital cameras, handheld data collection scanners, PDAs, Pocket PCs, handy terminals and personal communicators.

**Important:**

We do not recommend using IDE devices and CF card at the same time.

Battery



The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

Safety Measures

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

Installing EXT-ECX2 onto the ML936-B Board

The expansion slot located at the bottom side of EXT-ECX2 is used to interface to the ML936-B board.



Expansion slot

EXT-ECX2

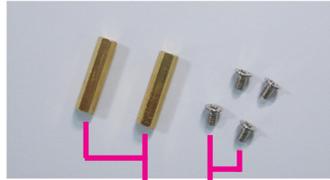


Expansion slot

ML936-B

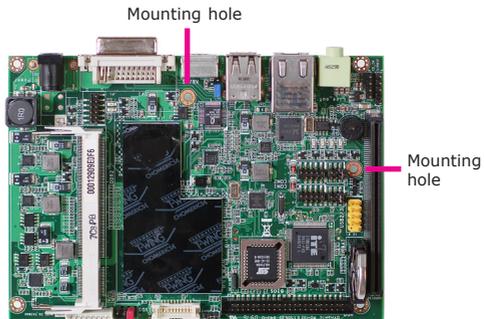
Installation

1. You will need 2 bolts and 4 mounting screws to secure EXT-ECX2 onto ML936-B.

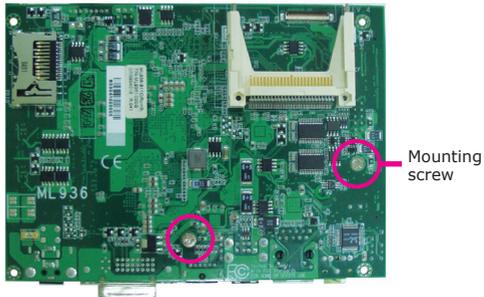


Bolts
Mounting screws

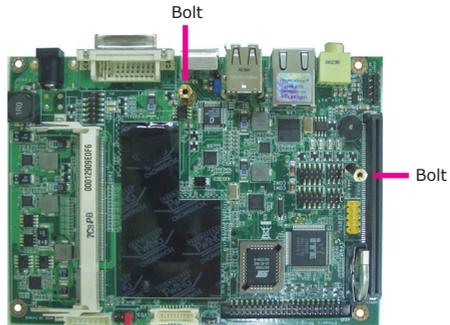
2. Align the bolts to the mounting holes on ML936-B.



3. From the solder side of the board, use the provided mounting screws to secure the bolts in place.

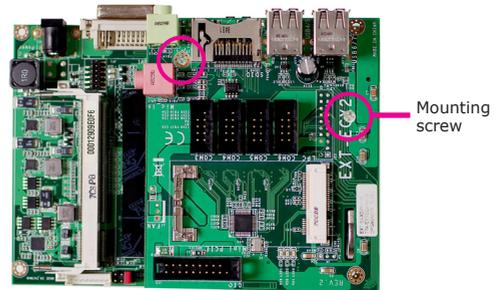


- The right photo shows the bolts secured on the board.

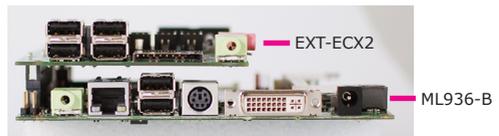


- Align the expansion slot of EXT-ECX2 and ML936-B to each other.

Press EXT-ECX2 down firmly until it is completely seated into the expansion slot of ML936-B. Use the provided mounting screws to secure EXT-ECX2.



- The rear I/O side will appear similar to the one on the right.



Chapter 3 - BIOS Setup

Award BIOS Setup Utility

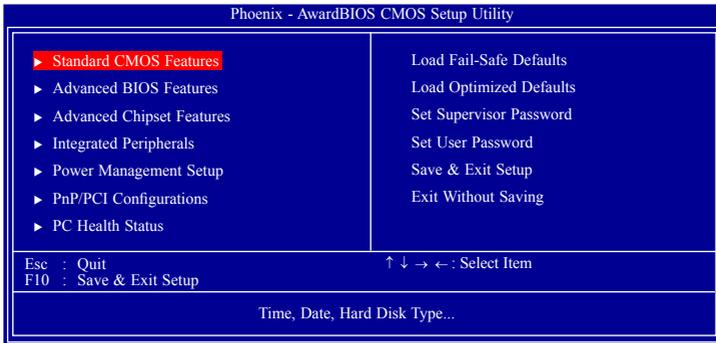
The Basic Input/Output System (BIOS) is a program that takes care of the basic level of communication between the processor and peripherals. In addition, the BIOS also contains codes for various advanced features found in this system board. This chapter explains the Setup Utility for the Award BIOS.

After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the following message will appear on the screen:

Press DEL to enter setup

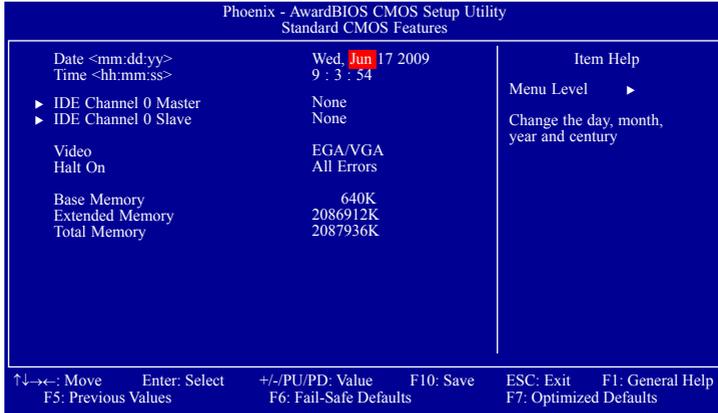
If the message disappears before you respond, restart the system or press the "Reset" button. You may also restart the system by pressing the <Ctrl> <Alt> and keys simultaneously.

When you press , the main menu screen will appear.



Standard CMOS Features

Use the arrow keys to highlight "Standard CMOS Features" and press <Enter>. A screen similar to the one below will appear.



The settings on the screen are for reference only. Your version may not be identical to this one.

Date

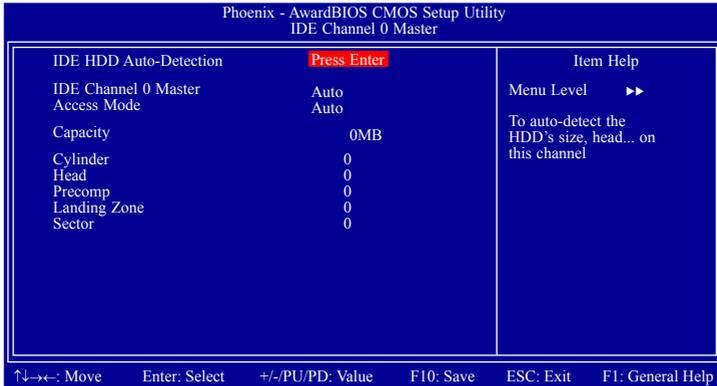
The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

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 to IDE Channel 0 Slave

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



The settings on the screen are for reference only. Your version may not be identical to this one.

IDE HDD Auto-Detection

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

IDE Channel 0 Master and 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.

All, But Diskette

The system boot will not stop for a disk error; it will stop for all other errors.

All, But Disk/Key

The system boot will not stop for a disk or 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

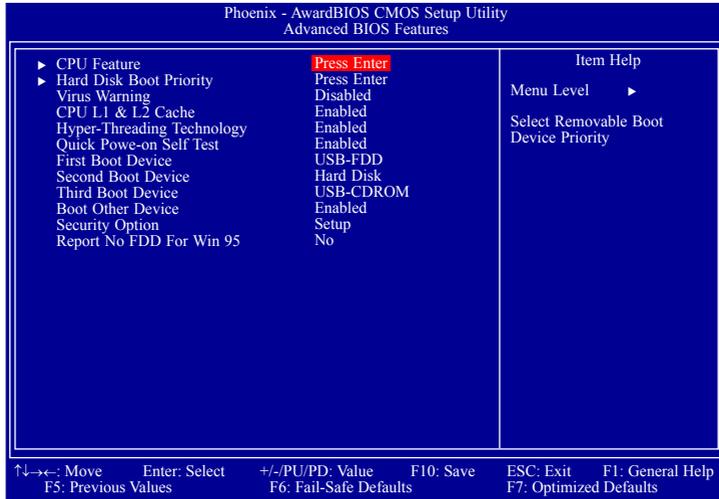
Displays the amount of extended memory detected during boot-up.

Total Memory

Displays the total memory available in the system.

Advanced BIOS Features

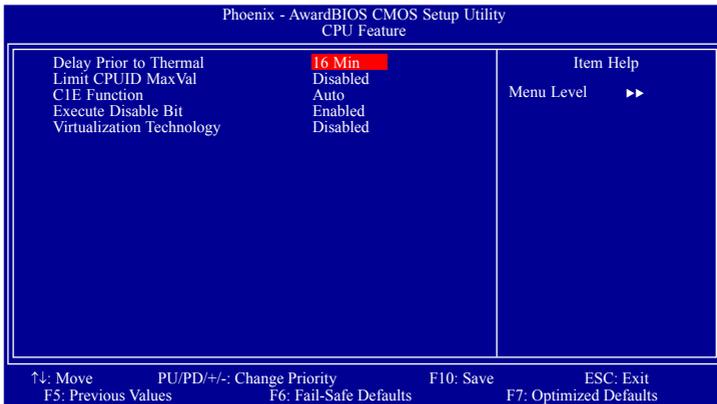
The Advanced BIOS Features allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.



The settings on the screen are for reference only. Your version may not be identical to this one.

CPU Feature

This field is used to configure the CPU that is installed on the system board. Move the cursor to this field then press <Enter>.



The settings on the screen are for reference only. Your version may not be identical to this one.

Delay Prior To Thermal

This field is used to select the time that would force the CPU to a 50% duty cycle when it exceeds its maximum operating temperature therefore protecting the CPU and the system board from overheating to ensure a safe computing environment..

Limit CPUID MaxVal

The CPUID instruction of some newer CPUs will return a value greater than 3. The default is Disabled because this problem does not exist in the Windows series operating systems. If you are using an operating system other than Windows, this problem may occur. To avoid this problem, enable this field to limit the return value to 3 or lesser than 3.

C1E Function

The options are Auto and Disabled.

Execute Disable Bit

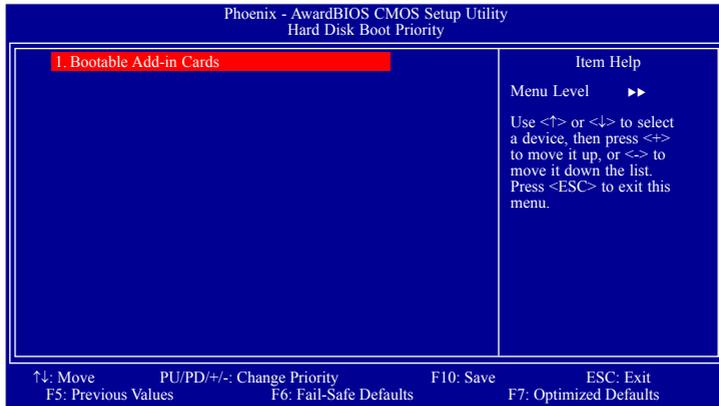
When this field is set to Disabled, it will force the XD feature flag to always return to 0.

Virtualization Technology

When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

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.



The settings on the screen are for reference only. Your version may not be identical to this one.

Virus Warning

This field protects the boot sector and partition table of your hard disk drive. When this field is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive. If an attempt is made to write to the boot sector or partition table of the hard disk drive, the BIOS will halt the system and an error message will appear.

After seeing the error message, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done. Many disk diagnostic programs which attempt to access the boot sector table will cause the warning message to appear. If you are running such a program, we recommend that you first disable this field.

CPU L1 and L2 Cache

This field is used to speed up the memory access. Enable the external cache for better performance.

Hyper-Threading Technology

This field is used to enable the functionality of an Intel® processor that supports Hyper-Threading Technology and will appear only when using this processor.

Quick Power On Self Test

This field speeds up Power On Self Test (POST) after you power on the system. When Enabled, the BIOS will shorten or skip some check items during POST.

First Boot Device, Second Boot Device, Third Boot Device and Boot Other 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. Set "Boot Other Device" to Enabled if you wish to boot from another device.

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.

Report No FDD For WIN 95

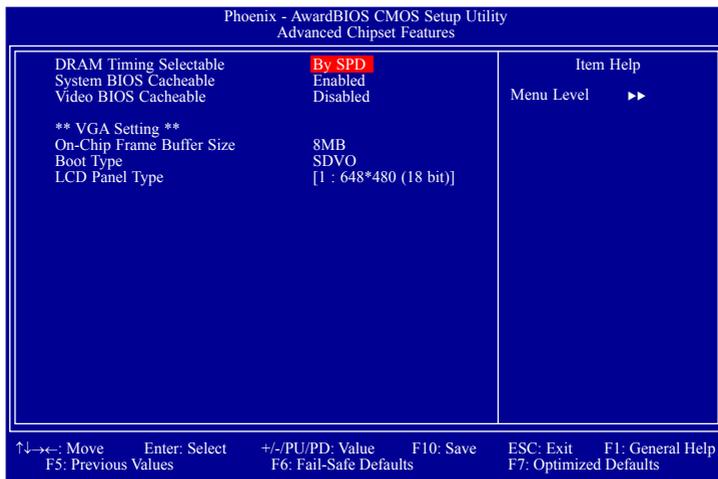
Yes

Will report no FDD for Windows®95.

No

Will not report no FDD for Windows®95.

Advanced Chipset Features



The settings on the screen are for reference only. Your version may not be identical to this one.

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources. These items should not be altered unless necessary. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered some incompatibility or that data was being lost while using your system.

DRAM Timing Selectable

This field is used to select the timing of the DRAM.

By SPD

The EEPROM on a DIMM has SPD (Serial Presence Detect) data structure that stores information about the module such as the memory type, memory size, memory speed, etc. When this option is selected, the system will run according to the information in the EEPROM. This option is the default setting because it provides the most stable condition for the system. The "CAS Latency Time" to "System Memory Frequency" fields will show the default settings by SPD.

Manual

If you want better performance for your system other than the one "by SPD", select "Manual" then select the best option in the "CAS Latency Time" to "System Memory Frequency" fields.

System BIOS Cacheable

When this field is enabled, accesses to the system BIOS ROM addressed at F0000H-FFFFFH are cached, provided that the cache controller is enabled. The larger the range of the Cache RAM, the higher the efficiency of the system.

Video BIOS Cacheable

As with caching the system BIOS, enabling the Video BIOS cache will allow access to video BIOS addressed at C0000H to C7FFFH to be cached, if the cache controller is also enabled. The larger the range of the Cache RAM, the faster the video performance.

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.

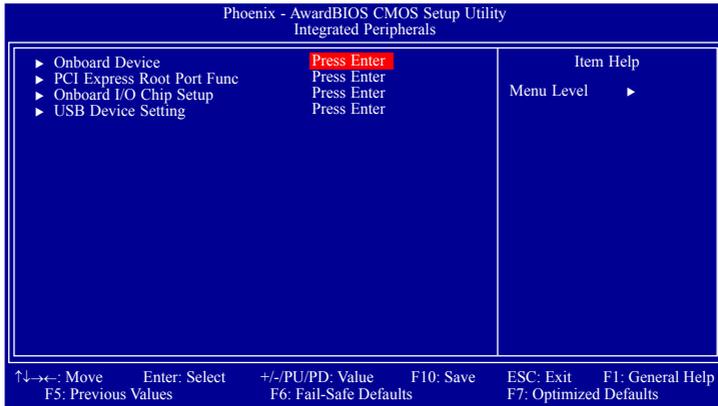
Boot Type

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

LCD Panel Type

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

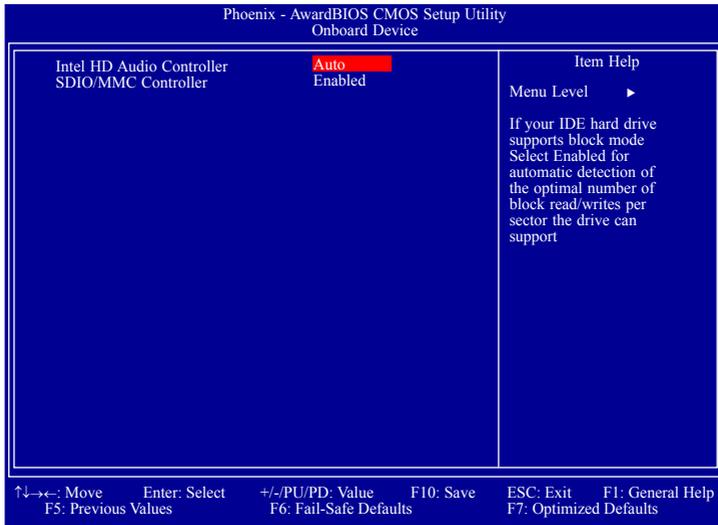
Integrated Peripherals



The settings on the screen are for reference only. Your version may not be identical to this one.

Onboard Device

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



The settings on the screen are for reference only. Your version may not be identical to this one.

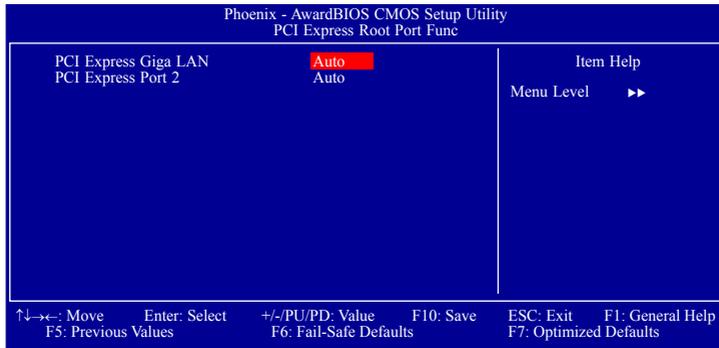
Intel HD Audio Controller

This field is used to enable or disable the onboard audio.

SDIO/MMC Controller

This field is used to enable or disable the SDIO/MMC controller.

PCI Express Root Port Func



The settings on the screen are for reference only. Your version may not be identical to this one.

PCI Express Giga LAN

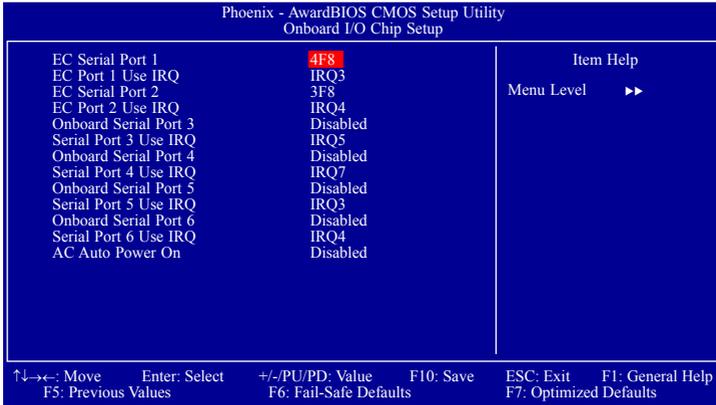
This field is used to enable or disable the onboard LAN.

PCI Express Port 2

This field is used to enable or disable the PCI Express port 2.

Onboard I/O Chip Setup

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



The settings on the screen are for reference only. Your version may not be identical to this one.

EC Serial Port 1 and EC Serial Port 2

These fields are used to manually select an I/O address for the serial ports on the ECX daughterboard.

EC Port 1 Use IRQ and EC Port 2 Use IRQ

These fields are used to select an IRQ for the serial ports on the ECX daughterboard.

Onboard Serial Port 3/4/5/6

These fields are used to manually select an I/O address for the serial ports on the ML936 series board.

Serial Port 3/4/5/6 Use IRQ

These fields are used to select an IRQ for the serial ports on the ML936 series board.

AC Auto Power On

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

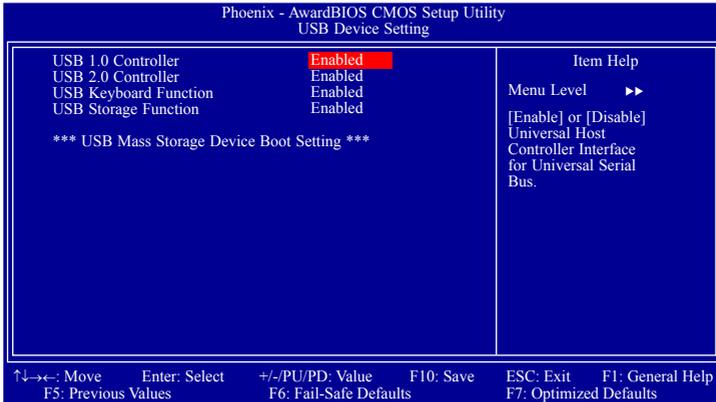
When power returns after an AC power failure, the system will automatically power-on.

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.

USB Device Setting

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



The settings on the screen are for reference only. Your version may not be identical to this one.

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.

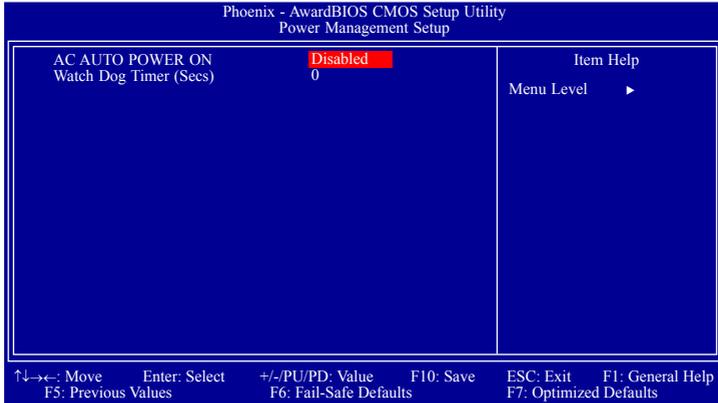
If a PS/2 keyboard is not available and you need to use a USB keyboard to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

USB Storage Function

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

Power Management Setup

The Power Management Setup allows you to configure your system to most effectively save energy.



The settings on the screen are for reference only. Your version may not be identical to this one.

AC Auto Power On

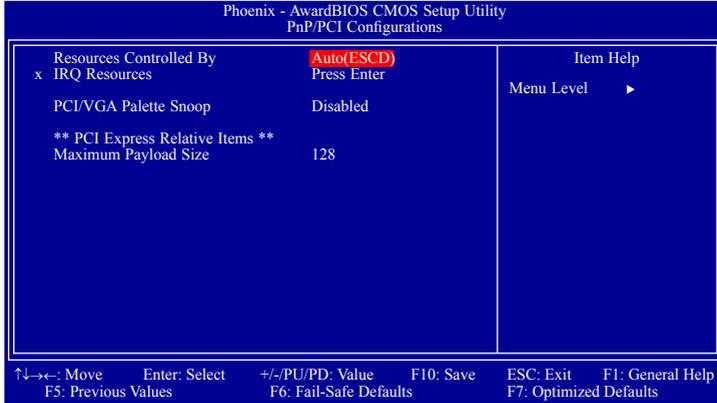
Set this field to Enabled if you want the system to power-on whenever AC power comes in.

Watch Dog Timer (Secs)

This field is used to select the time interval of the Watchdog timer. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

PnP/PCI Configurations

This section shows how to configure the PCI bus system. It covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



The settings on the screen are for reference only. Your version may not be identical to this one.

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)

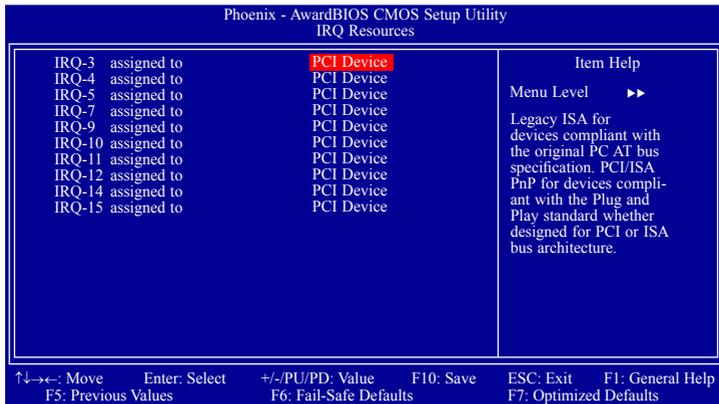
The system will automatically detect the settings for you.

Manual

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

IRQ Resources

Move the cursor to this field and press <Enter>. Set each system interrupt to either PCI Device or Reserved.



The settings on the screen are for reference only. Your version may not be identical to this one.

PCI/VGA Palette Snoop

This field determines whether the MPEG ISA/VESA VGA cards can work with PCI/VGA or not. The default value is Disabled.

Enabled

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

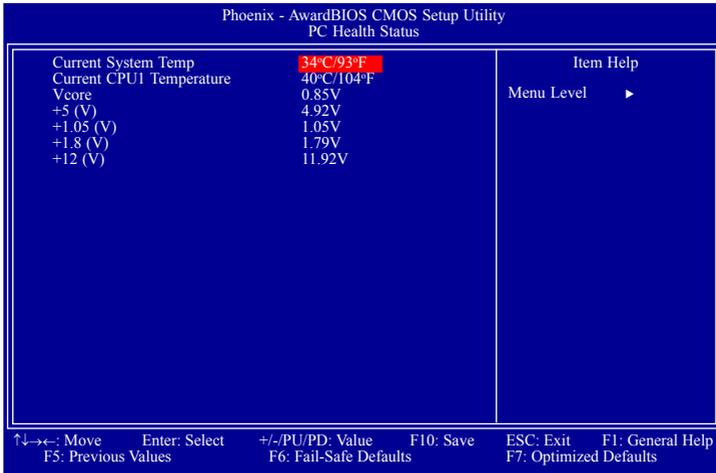
Disabled

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

Maximum Payload Size

This field is used to select the maximum TLP payload size of the PCI Express devices. The unit is byte.

PC Health Status



The settings on the screen are for reference only. Your version may not be identical to this one.

Current System Temp to +12 (V)

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

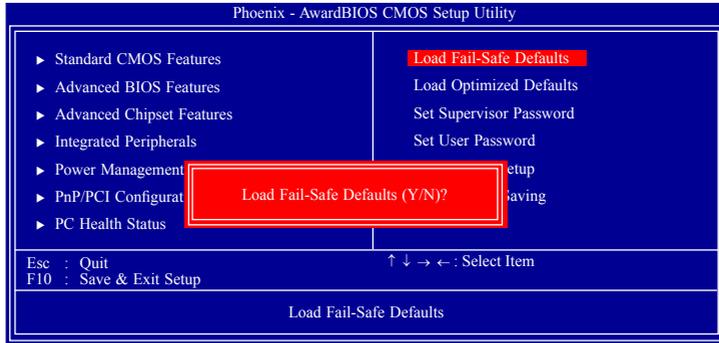


Note:

The onboard hardware monitor function is capable of detecting “system health” conditions but if you want a warning message to pop-up or a warning alarm to sound when an abnormal condition occurs, you must install the Hardware Monitor for Windows utility. This utility is included in the CD that came with the system board. Refer to the Hardware Monitor for Windows section in chapter 4 for more information.

Load Fail-Safe Defaults

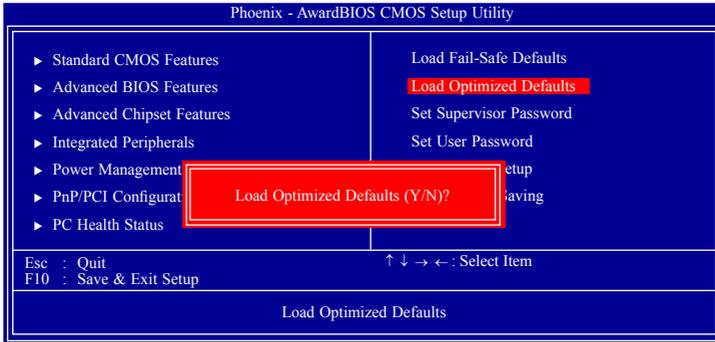
The "Load Fail-Safe Defaults" option loads the troubleshooting default values permanently stored in the ROM chips. These settings are not optimal and turn off all high performance features. You should use these values only if you have hardware problems. Highlight this option in the main menu and press <Enter>.



If you want to proceed, type <Y> and press <Enter>. The default settings will be loaded.

Load Optimized Defaults

The "Load Optimized Defaults" option loads optimized settings from the BIOS ROM. Use the default values as standard values for your system. Highlight this option in the main menu and press <Enter>.

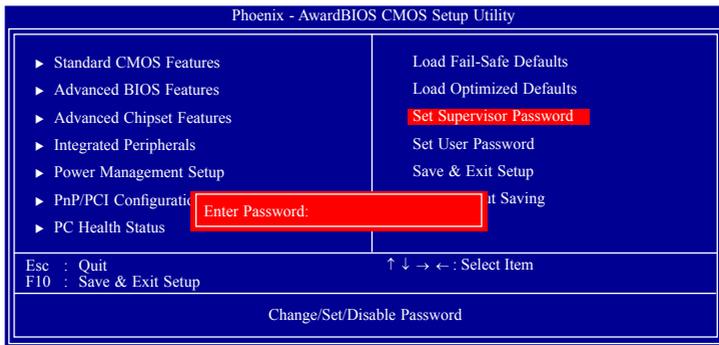


Type <Y> and press <Enter> to load the Setup default values.

Set Supervisor Password

If you want to protect your system and setup from unauthorized entry, set a supervisor's password with the "System" option selected in the Advanced BIOS Features. If you want to protect access to setup only, but not your system, set a supervisor's password with the "Setup" option selected in the Advanced BIOS Features. You will not be prompted for a password when you cold boot the system.

Use the arrow keys to highlight "Set Supervisor Password" and press <Enter>.



Type in the password. You are limited to eight characters. When done, the message below will appear:

Confirm Password:

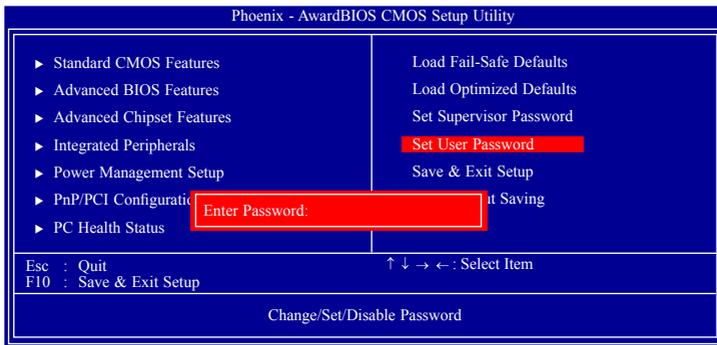
You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set Supervisor Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

Set User Password

If you want another user to have access only to your system but not to setup, set a user's password with the "System" option selected in the Advanced BIOS Features. If you want a user to enter a password when trying to access setup, set a user's password with the "Setup" option selected in the Advanced BIOS Features.

Using user's password to enter Setup allows a user to access only "Set User Password" that appears in the main menu screen. Access to all other options is denied.

Use the arrow keys to highlight "Set User Password" and press <Enter>.



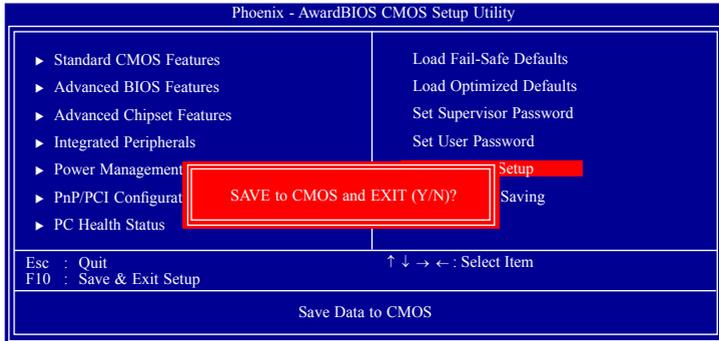
Type in the password. You are limited to eight characters. When done, the message below will appear:

Confirm Password:

You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set User Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

Save & Exit Setup

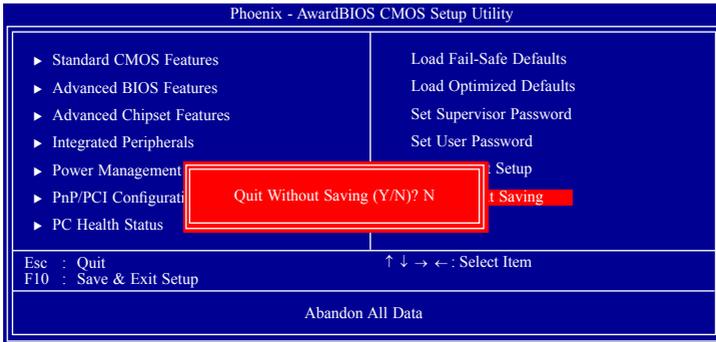
When all the changes have been made, highlight "Save & Exit Setup" and press <Enter>.



Type "Y" and press <Enter>. The modifications you have made will be written into the CMOS memory, and the system will reboot. You will once again see the initial diagnostics on the screen. If you wish to make additional changes to the setup, press <Ctrl> <Alt> simultaneously after memory testing is done.

Exit Without Saving

When you do not want to save the changes you have made, highlight "Exit Without Saving" and press <Enter>.

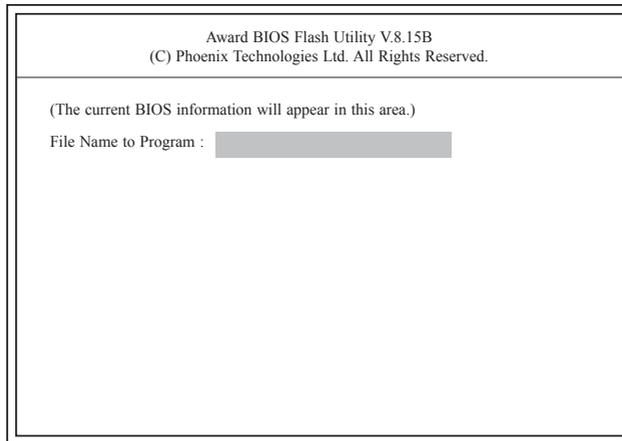


Type "Y" and press <Enter>. The system will reboot and you will once again see the initial diagnostics on the screen. If you wish to make any changes to the setup, press <Ctrl> <Alt> simultaneously after memory testing is done.

Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility, AWD-FLASH.EXE. Please contact technical support or your sales representative for the files.

1. Save the new BIOS file along with the flash utility AWDFLASH.EXE to a floppy disk.
2. Reboot the system and enter the Award BIOS Setup Utility to set the first boot drive to "Floppy".
3. Save the setting and reboot the system.
4. After the system booted from the floppy disk, execute the flash utility by typing AWDFLASH.EXE. The following screen will appear.



5. Type the new BIOS file name onto the gray area that is next to "File Name to Program" then press <Enter>.

6. The following will appear.

Do You Want to Save BIOS (Y/N)

This question refers to the current existing BIOS in your system. We recommend that you save the current BIOS and its flash utility; just in case you need to reinstall the BIOS. To save the current BIOS, press <Y> then enter the file name of the current BIOS. Otherwise, press <N>.

7. The following will then appear.

Press "Y" to Program or "N" to Exit

8. Press <Y> to flash the new BIOS.

Chapter 4 - Supported Software

The CD that came with the system board contains drivers, utilities and software applications required to enhance the performance of the system board.

Insert the CD into a CD-ROM drive. The autorun screen (Mainboard Utility CD) will appear. If after inserting the CD, "Autorun" did not automatically start (which is, the Mainboard Utility CD screen did not appear), please go directly to the root directory of the CD and double-click "Setup".



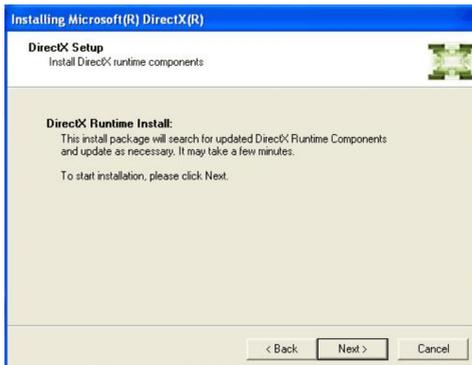
Microsoft DirectX 9.0C Driver

To install the utility, click "Microsoft DirectX 9.0C Driver" on the main menu.

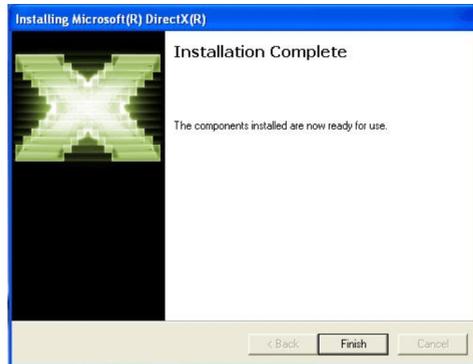
1. Click "I accept the agreement" then click Next.



2. To start installation, click Next.



3. Click Finish. Reboot the system for DirectX to take effect.



Intel Chipset Software Installation Utility

The Intel Chipset Software Installation Utility is used for updating Windows[®] INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, click "Intel Chipset Software Installation Utility" on the main menu.

1. Setup is now ready to install the utility. Click Next.



2. Read the license agreement then click Yes.



- Go through the readme document for system requirements and installation tips then click Next.



- Setup is now installing the driver. Click Next to continue.



- Click "Yes, I want to restart this computer now" then click Finish.

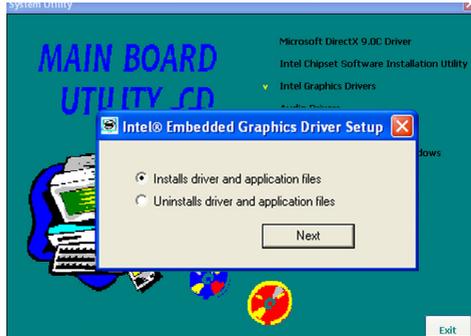
Restarting the system will allow the new software installation to take effect.



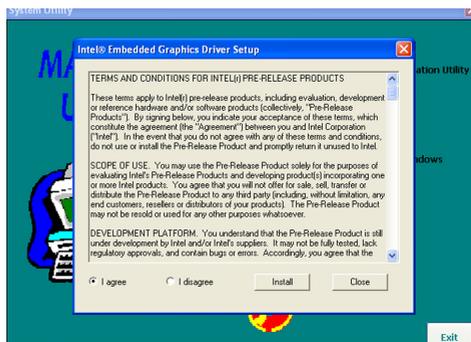
Intel Graphics Drivers

To install the utility, click "Intel Graphics Drivers" on the main menu.

1. Select "Installs driver and application files" then click Next.



2. Read the license agreement, select "I agree" then click Install.



3. Click "Continue Anyway".



4. Click Yes to restart the computer.

Restarting the system will allow the new software installation to take effect.



Audio Drivers

To install the utility, click "Audio Drivers" on the main menu.

1. Setup is extracting the files needed to install the driver.



2. Click Next to start the installation.



3. Setup is configuring the new software installation.



4. Click "Yes, I want to restart my computer now" then click Finish.

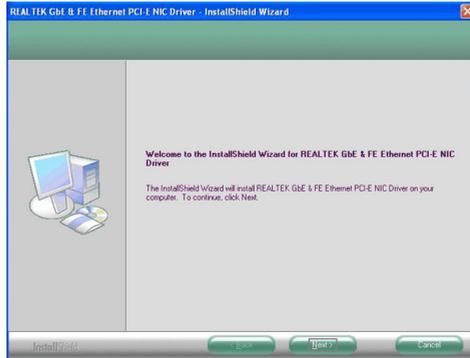
Restarting the system will allow the new software installation to take effect.



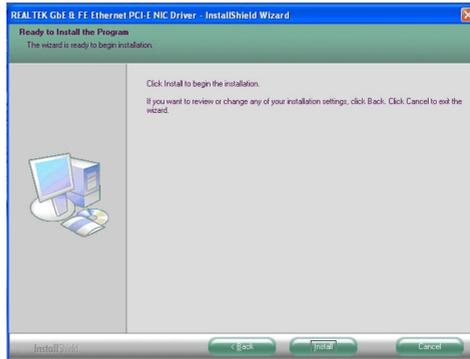
LAN Drivers

To install the driver, click "LAN Drivers" on the main menu.

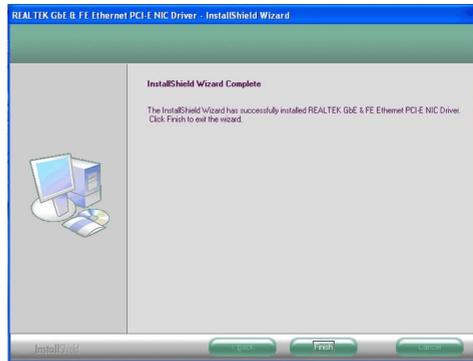
1. Setup is now ready to install the driver. Click Next.



2. Click Install to begin installation.



3. After completing installation, click Finish to exit setup.



DFI Hardware Monitor for Windows

The Hardware Monitor for Windows utility is capable of monitoring the system's temperature, fan speed, voltage, etc. and allows you to manually set a range (Highest and Lowest Limit) to the items being monitored. If the settings/values are over or under the set range, a warning message will pop-up. The utility can also be configured so that a beeping alarm will sound whenever an error occurs. We recommend that you use the "Default Setting" which is the ideal setting that would keep the system in good working condition.

To install the utility, click "DFI Hardware Monitor for Windows" on the main menu.

1. Setup is now ready to install the utility. Click Next.



2. Click Install to continue.



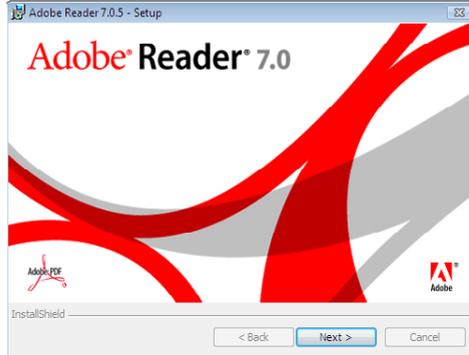
3. After completing installation, click Finish to exit setup.



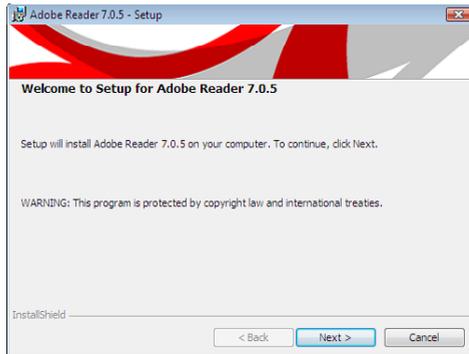
Adobe Acrobat Reader 7.0

To install the reader, click “Adobe Acrobat Reader 7.0” on the main menu.

1. Click Next to continue.



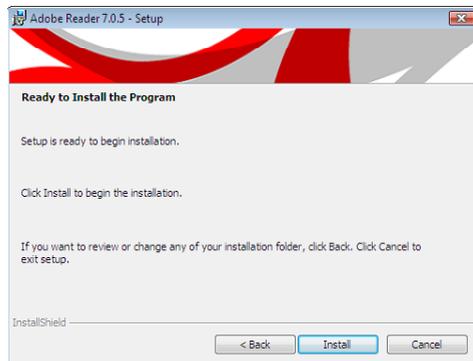
2. Setup is now ready to install. Click Next.



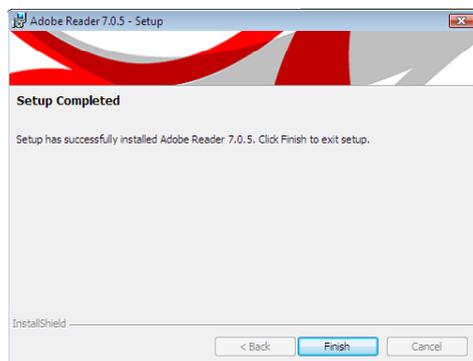
3. Click Next to install or click Change Destination Folder to select another folder.



4. Click Install to begin installation.



5. Click Finish to exit installation.



Appendix A - System Error Message

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message, PRESS F1 TO CONTINUE, CTRL-ALT-ESC or DEL TO ENTER SETUP, will be shown in the information box at the bottom. Enter Setup to correct the error.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list indicates the error messages for all Awards BIOSes:

CMOS BATTERY HAS FAILED

The CMOS battery is no longer functional. It should be replaced.



Important

Danger of explosion if battery incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the battery manufacturer's instructions.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISPLAY SWITCH IS SET INCORRECTLY

The display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, either turn off the system and change the jumper or enter Setup and change the VIDEO selection.

Hard Disk(s) fail (80)

HDD reset failed.

Hard Disk(s) fail (40)

HDD controller diagnostics failed.

Hard Disk(s) fail (20)

HDD initialization error.

Hard Disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out - Unlock the key

The BIOS detects that the keyboard is locked. Keyboard controller is pulled low.

Keyboard error or no keyboard present

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

Manufacturing POST loop

System will repeat POST procedure infinitely while the keyboard controller is pulled low. This is also used for the M/B burn in test at the factory.

BIOS ROM checksum error - System halted

The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail

The BIOS reports memory test fail if the memory has error(s).

Appendix B - Troubleshooting

Troubleshooting Checklist

This chapter of the manual is designed to help you with problems that you may encounter with your personal computer. To efficiently troubleshoot your system, treat each problem individually. This is to ensure an accurate diagnosis of the problem in case a problem has multiple causes.

Some of the most common things to check when you encounter problems while using your system are listed below.

1. The power switch of each peripheral device is turned on.
2. All cables and power cords are tightly connected.
3. The electrical outlet to which your peripheral devices are connected is working. Test the outlet by plugging in a lamp or other electrical device.
4. The monitor is turned on.
5. The display's brightness and contrast controls are adjusted properly.
6. All add-in boards in the expansion slots are seated securely.
7. Any add-in board you have installed is designed for your system and is set up correctly.

Monitor/Display

If the display screen remains dark after the system is turned on:

1. Make sure that the monitor's power switch is on.
2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.
3. Check that the video input cable is properly attached to the monitor and the system's display adapter.
4. Adjust the brightness of the display by turning the monitor's brightness control knob.

The picture seems to be constantly moving.

1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.
2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.
3. Make sure your video card's output frequencies are supported by this monitor.

The screen seems to be constantly wavering.

1. If the monitor is close to another monitor, the adjacent monitor may need to be turned off. Fluorescent lights adjacent to the monitor may also cause screen wavering.

Power Supply

When the computer is turned on, nothing happens.

1. Check that one end of the AC power cord is plugged into a live outlet and the other end properly plugged into the back of the system.
2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.
3. The power cord may have a "short" or "open". Inspect the cord and install a new one if necessary.

Hard Drive

Hard disk failure.

1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.
2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave. The master hard drive must have an active/bootable partition.

Excessively long formatting period.

If your hard drive takes an excessively long period of time to format, it is likely a cable connection problem. However, if your hard drive has a large capacity, it will take a longer time to format.

Serial Port

The serial device (modem, printer) doesn't output anything or is outputting garbled characters.

1. Make sure that the serial device's power is turned on and that the device is on-line.
2. Verify that the device is plugged into the correct serial port on the rear of the computer.
3. Verify that the attached serial device works by attaching it to a serial port that is working and configured correctly. If the serial device does not work, either the cable or the serial device has a problem. If the serial device works, the problem may be due to the onboard I/O or the address setting.
4. Make sure the COM settings and I/O address are configured correctly.

Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the keyboard is properly connected.
2. Make sure there are no objects resting on the keyboard and that no keys are pressed during the booting process.

System Board

1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.
2. Check the jumper settings to ensure that the jumpers are properly set.
3. Verify that all memory modules are seated securely into the memory sockets.
4. Make sure the memory modules are in the correct locations.
5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.
6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.