
ITX-i290D

Mini ITX Industrial Motherboard

User's Manual

Version 1.0

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Chapter 1

Introduction

1.1 Copyright Notice

All Rights Reserved.

The information in this document is subject to change without prior notice in order to improve the reliability, design and function. It does not represent a commitment on the part of the manufacturer.

Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

1.2 Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. This kind of cable is available from ARBOR. Please contact your local supplier for ordering information. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class B

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class 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 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 is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RoHS

ARBOR Technology Corp. certifies that all components in its products are in compliance and conform to the European Union's Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2002/95/EC.

The above mentioned directive was published on 2/13/2003. The main purpose of the directive is to prohibit the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) in electrical and electronic products. Member states of the EU are to enforce by 7/1/2006.

ARBOR Technology Corp. hereby states that the listed products do not contain unintentional additions of lead, mercury, hex chrome, PBB or PBDB that exceed a maximum concentration value of 0.1% by weight or for cadmium exceed 0.01% by weight, per homogenous material. Homogenous material is defined as a substance or mixture of substances with uniform composition (such as solders, resins, plating, etc.). Lead-free solder is used for all terminations (Sn(96-96.5%), Ag(3.0-3.5%) and Cu(0.5%)).

SVHC / REACH

To minimize the environmental impact and take more responsibility to the earth we live, Arbor hereby confirms all products comply with the restriction of SVHC (Substances of Very High Concern) in (EC) 1907/2006 (REACH --Registration, Evaluation, Authorization, and Restriction of Chemicals) regulated by the European Union.

All substances listed in SVHC < 0.1 % by weight (1000 ppm)

1.3 About This User's Manual

This user's manual provides general information and installation instructions about the product. This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this booklet. please consult your vendor before further handling.

1.4 Warning

Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside.
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry.
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that comes with the Single Board Computer, whenever components are separated from the system.

1.5 Replacing the Lithium Battery

Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.

Do not throw lithium batteries into the trash-can. It must be disposed of in accordance with local regulations concerning special waste.

1.6 Technical Support

If you have any technical difficulties, please do not hesitate to call or e-mail our customer service.

<http://www.arbor.com.tw>

E-mail: info@arbor.com.tw

1.7 Warranty

This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

1.8 Packing List

Before you begin to install your single board, please make sure that the following materials have been shipped:



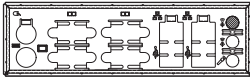
1 x ITX-i290D Mini-ITX industrial motherboard



1 x Driver CD



1 x Quick Installation Guide



1 x I/O bracket



1 x SATA cable

If any of the above items is damaged or missing, contact your vendor immediately.

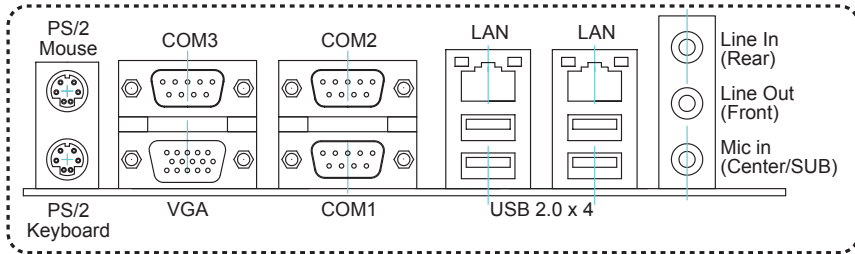
1.9 Ordering Information

| | |
|----------------|---|
| ITX-i290D | Intel® Atom™ D510 Embedded Mini-ITX Motherboard |
| CBK-08-290D-00 | Cable Kit 1 x USB Cable 1 x Parallel 1 x SATA Cable 1 x LPT Cable 1 x IDE Cable 3 x COM Cable |

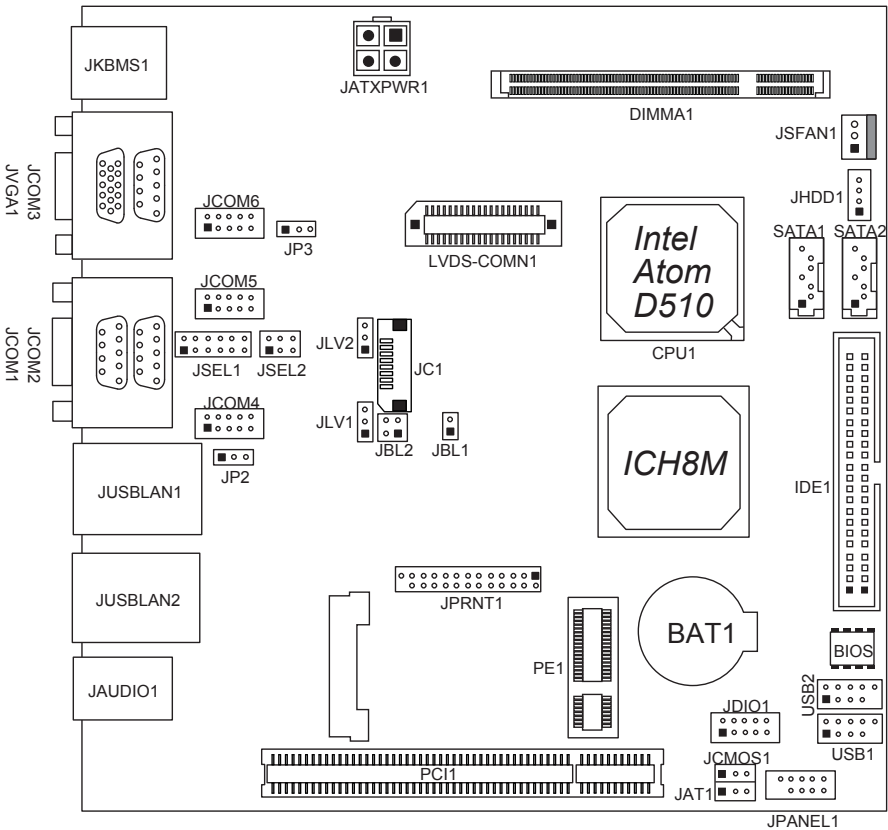
1.10 Specifications

| | |
|----------------------|--|
| Form Factor | Mini-ITX industrial motherboard |
| CPU | Soldered onboard Intel® Atom™ D510 1.66GHz CPU |
| Chipset | Southbridge : Intel® ICH8M |
| System Memory | 1 x 200-pin DDR2 SO-DIMM vertical type Socket up to 2GB at 667/800 MHz |
| VGA/ LCD Controller | Intel® Graphics Media Accelerator 3150 graphics core w/ Analog RGB and 18bit LVDS (Dual independent display) |
| Ethernet | 2 x Realtek 8111DL Gigabit Ethernet controller |
| I/O Chips | ITE IT8718F |
| BIOS | AMI 8Mb Flash BIOS |
| Audio | Realtek ALC662 Audio CODEC, Mic-in/Line-in/Line-out |
| IDE Interface | 1 x Ultra ATA 100 port, support 2 IDE devices (44pin) |
| Serial ATA | 2 x Serial ATA ports with 300MB/s HDD transfer rate |
| Serial Port | 5 x RS-232 ports, 1 x RS-232/422/485 selectable port |
| Parallel Port | SPP/EPP/ECP mode |
| KBMS | 2 x Standard PS/2 Keyboard and Mouse |
| Universal Serial Bus | 8 x USB 2.0 ports (on board 4 USB ports) |
| DIO | 8-bit programmable Digital Input/Output, 4 in/4 out |
| Expansion Interface | 1 x PCI slot 1 x Mini-card slot |
| Power Requirement | 4-pin ATX 12V connector |
| Operation Temp. | 0 ~ 60°C (32 ~ 140°F) w/ fan |
| Operating Humidity | 10 ~ 90% @ 40°C (non-condensing) |
| Watchdog Timer | 65536-level Reset |
| Dimension (L xW) | 170 x 170 mm (6.7" x 6.7") |

1.11 Rear Panel



1.12 MainBoard Layout



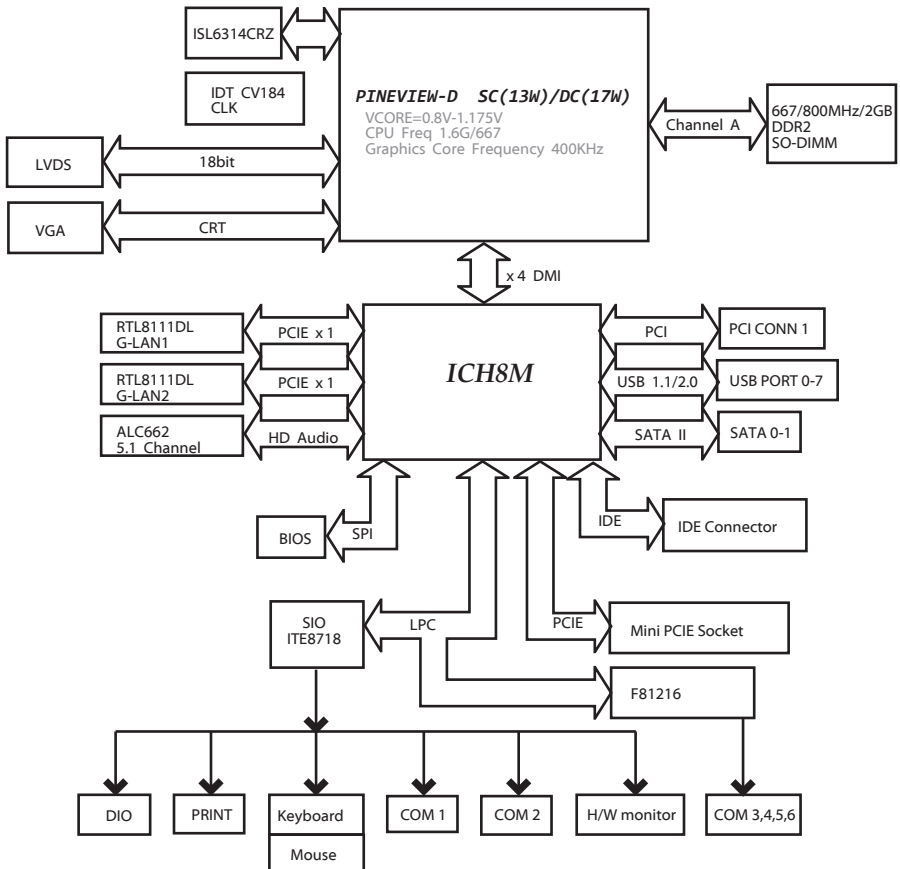
Note: ■ represents the 1st pin.



Chapter 2

Installation

2.1 Block Diagram



2.2 CPU

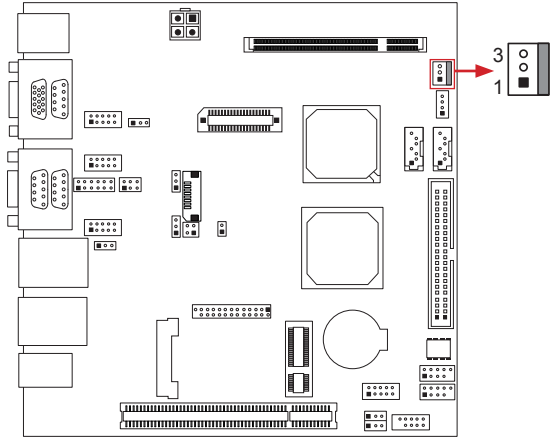
The mainboard includes an embedded Intel Atom D510 processor, and a heatsink has been installed to provide sufficient cooling.

2.3 FAN HEADER

The fan header supports cooling-fans built in the system. The fan cable and connector may be different due to the fan manufacturer.

JSFAN1: System Fan Header

| Pin | Assignment |
|-----|--------------------|
| 1 | Ground |
| 2 | +12V |
| 3 | FAN RPM rate sense |



2.4 SYSTEM MEMORY

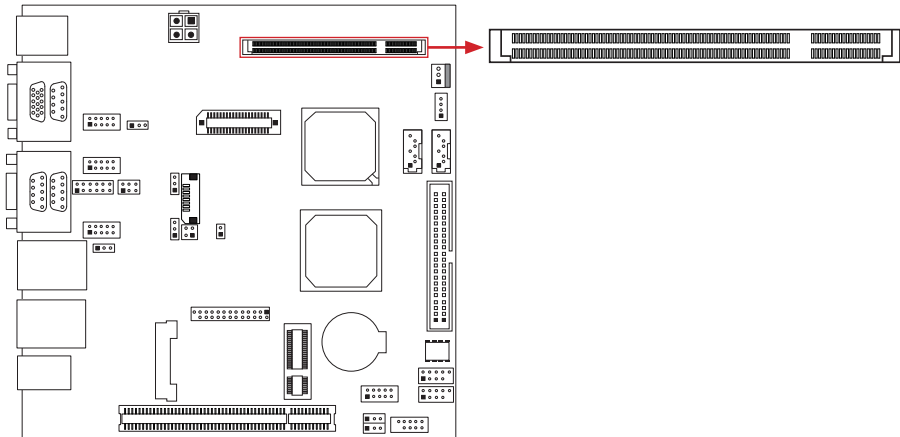
Align a DIMM with the slot so that the notch on the DIMM matches the break on the Slot.

Insert the DIMM firmly into the slot until the retaining chip snaps back in place and the DIMM is properly seated.

Memory Capacity

| DIMM Socket Location | DDR2 Module | Total Memory Size |
|----------------------|---------------------|-------------------|
| DIMMA1 | 256MB/512MB/1GB/2GB | Max is 2GB |

DIMMA1: MemoryModule (200pin SO-DIMM)

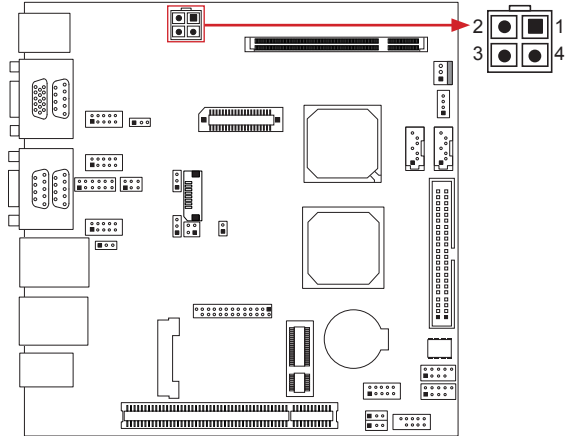


2.5 POWER SUPPLY

JATXPWR1: ATX Power Source Connector

This connector provides +12V to system power circuit.

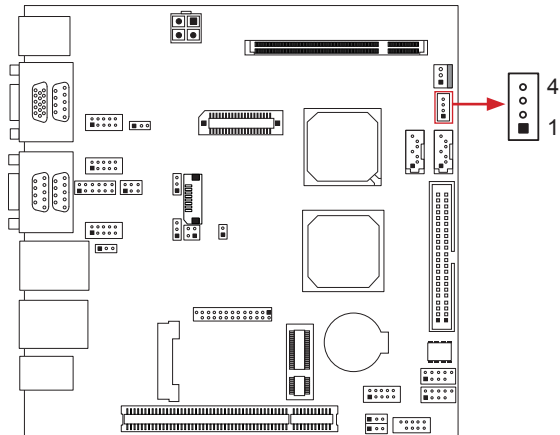
| Pin | Assignment |
|-----|------------|
| 1 | +12V |
| 2 | +12V |
| 3 | Ground |
| 4 | Ground |



JHDD1: SATA Power Connector

This connector provides power for SATA devices.

| Pin | Assignment |
|-----|------------|
| 1 | +12V |
| 2 | GND |
| 3 | +3.3V |
| 4 | +5V |



Note: Be careful not to plug wrong cable in this connector by mistake for its pin definition is different from ordinary power connector.

2.6 ONBOARD SLOT/CONNECTOR/HEADER/JUMPER

* How to Setup Jumpers

The illustration shows how to set up jumpers. When the jumper cap is placed on pins, the jumper is “close”; if not, that means the jumper is “open”.

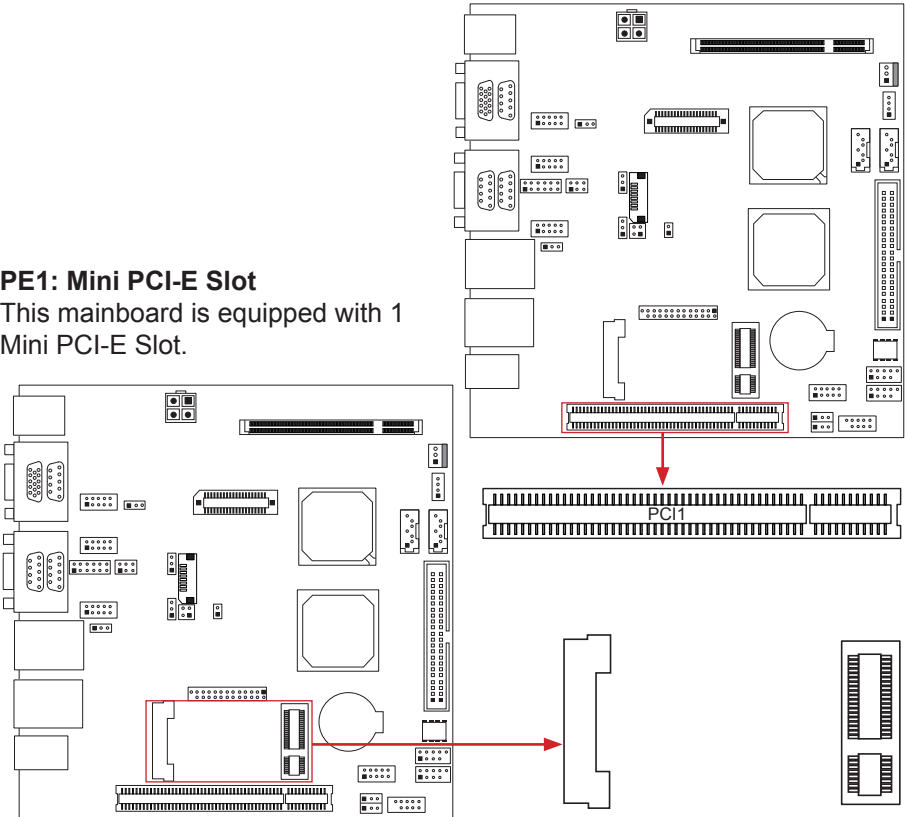


PCI: Peripheral Component Interconnect Slot

This mainboard is equipped with 1 standard PCI slot. PCI stands for Peripheral Component Interconnect, and it is a bus standard for expansion cards. This PCI slot is designated as 32 bits.

PE1: Mini PCI-E Slot

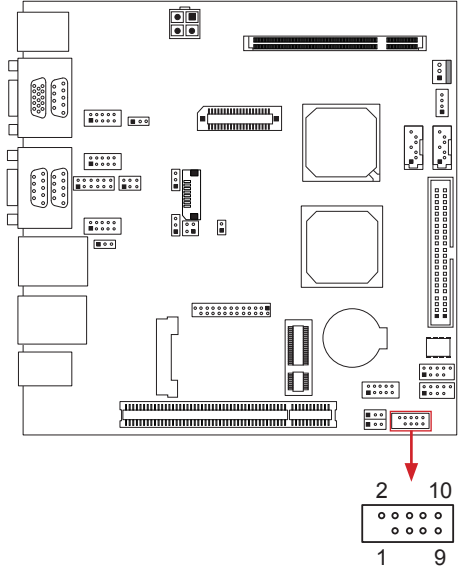
This mainboard is equipped with 1 Mini PCI-E Slot.



JANEL1: Front Panel Header

This 10-pin header includes Power-on, Reset, HDD LED, and Power LED connection. It allows user to connect the system case's front panel switch functions.

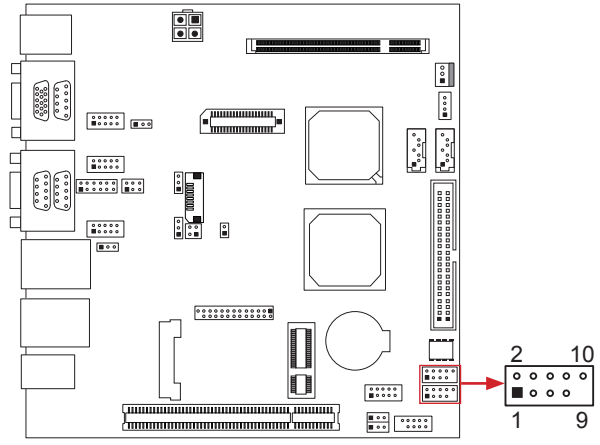
| Pin | Assignment | Function |
|-----|------------|--------------|
| 1 | Key | N/A |
| 3 | HD LED+ | HDD LED |
| 5 | HD LED- | |
| 7 | Reset GND | Reset Button |
| 9 | Reset | |
| Pin | Assignment | Function |
| 2 | Power LED+ | Power LED |
| 4 | Power LED+ | |
| 6 | Power LED- | |
| 8 | Power | Reset Button |
| 10 | Power GND | |



USB1/USB2: USB 2.0 Headers

The mainboard provides 2 front USB pin header, allowing to add 4 additional USB 2.0 ports, up to 480 Mbps transfer rate. Connect the USB cable with the pin header for using high-speed USB interface peripherals.

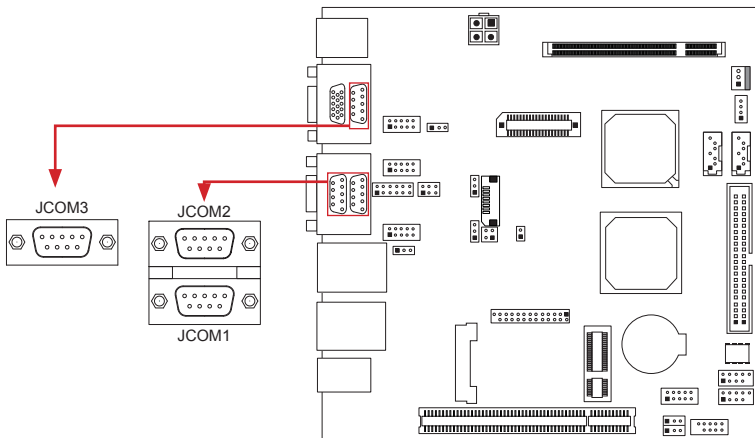
| Pin | Assignment |
|-----|-------------|
| 1 | +5V (fused) |
| 2 | +5V (fused) |
| 3 | USB6- |
| 4 | USB7- |
| 5 | USB6+ |
| 6 | USB7+ |
| 7 | Ground |
| 8 | Ground |
| 9 | Key |
| 10 | NC |



JCOM1 / JCOM2 / JCOM3: Serial Port Connectors

The motherboard has Serial Port Connectors for connecting RS-232 Port. JCOM1 supports RS-232/422/485 (Optional); JCOM2 and JCOM3 only support RS-232.

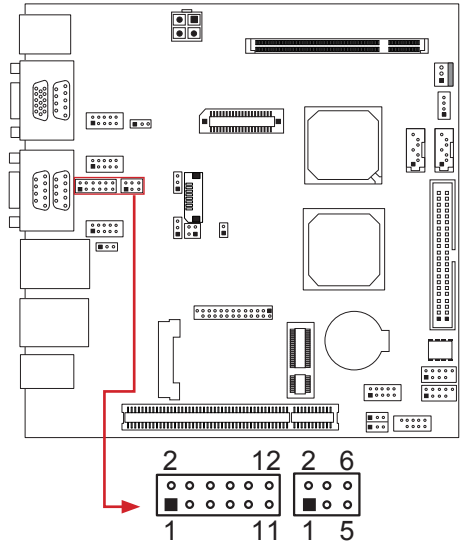
| | RS-232 | RS-422 | RS-485 |
|------------|---------------------------|--------|--------|
| Pin | | | |
| 1 | Carrier detect (DCD) | TX- | TX- |
| 2 | Received data (RXD) | TX | TX |
| 3 | Transmitted data (TXD) | RX | NC |
| 4 | Data terminal ready (DTR) | RX- | NC |
| 5 | Signal ground (GND) | GND | GND |
| 6 | Data set ready (DSR) | NC | NC |
| 7 | Request to send (RTS) | NC | NC |
| 8 | Clear to send (CTS) | NC | NC |
| 9 | Ring | NC | NC |



JSEL1/JSEL2: RS-232/422/485 Switch Headers (Optional)


The headers determine that JCOM1 belongs to RS-232 (Default), 422, or 485.


| JSEL1 | | |
|--------|--------|--------|
| RS-232 | RS-422 | RS-485 |
| 1-3 | 3-5 | 3-5 |
| 2-4 | 4-6 | 4-6 |
| 7-9 | 9-11 | 9-11 |
| 8-10 | 10-12 | 10-12 |
| JSEL2 | | |
| 1-2 | RS-232 | |
| 3-4 | RS-422 | |
| 5-6 | RS-485 | |

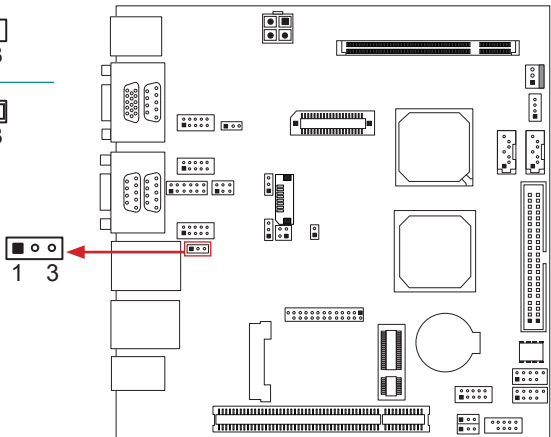


JP2: Voltage Switch Header for JCOM2

This header is for controlling the Pin9 of JCOM2 to switch between Ring or 5V.

Pin 1-2 Closed Pin9=5V 


Pin 2-3 Closed Pin9=Ring (Default) 




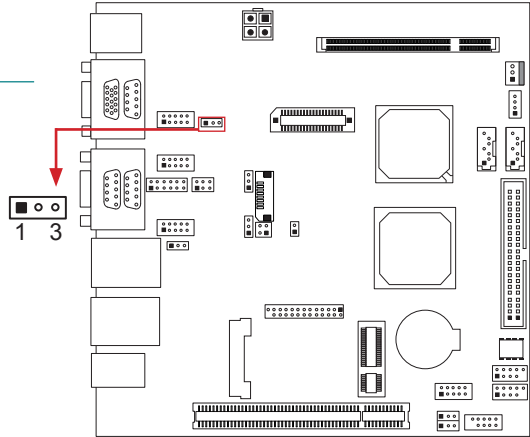
JP3: Voltage Switch Header for JCOM3

This header is for controlling the Pin9 of JCOM3 to switch between Ring or 5V.

Pin 1-2 Closed Pin9=5V



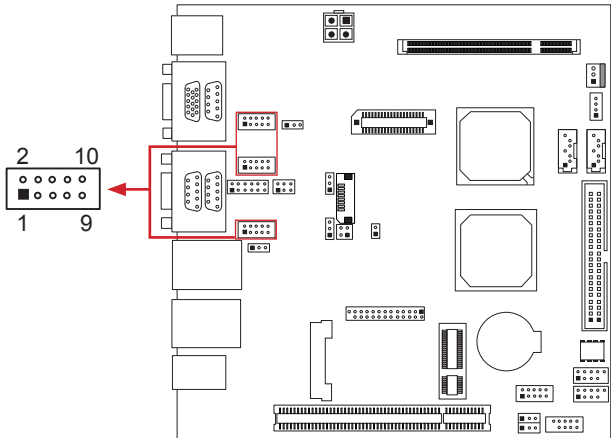
Pin 2-3 Closed Pin9=Ring (Default)

JCOM4 ~ JCOM6: Serial Port Connectors

The motherboard has 3 Serial Port Connectors for connecting RS-232 Port.

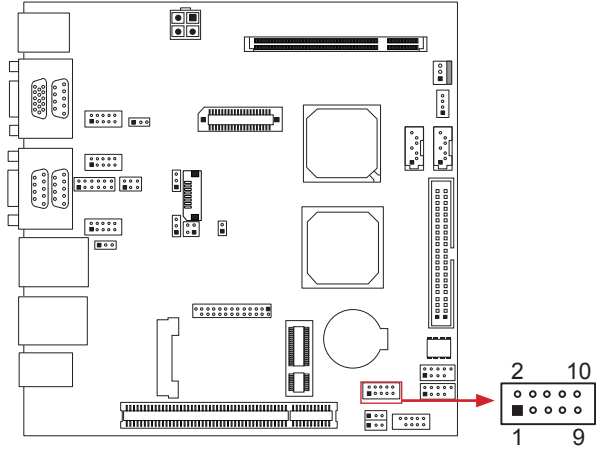
| Pin | Assignment |
|-----|-----------------------------|
| 1 | -PDCD |
| 2 | PSIN |
| 3 | PSOUT data |
| 4 | -PDTR |
| 5 | GND |
| 6 | -PDSR |
| 7 | -PRTS |
| 8 | -PCTS |
| 9 | -PRI |
| 10 | 5V (JCOM4/5) 12V (JCOM6) |



JDIO1: Digital I/O Connector



This connector offers 4 pairs of digital I/O whose functions and addresses are set in BIOS. The default address is: A21H: Output bit0~3; A22H: Input bit0~3.

| Pin | Assignment |
|-----|----------------|
| 1 | 5V |
| 2 | Digital-In-30 |
| 3 | Digital-Out-20 |
| 4 | Digital-In-31 |
| 5 | Digital-Out-21 |
| 6 | Digital-In-32 |
| 7 | Digital-Out-22 |
| 8 | Digital-In-33 |
| 9 | Digital-Out-23 |
| 10 | GND |



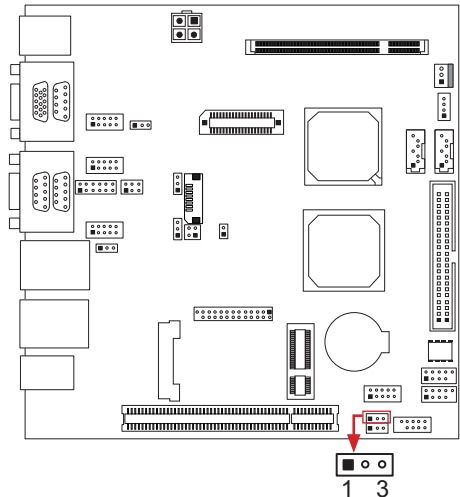
JCMOS1: Clear CMOS Header *

Placing the jumper on pin2-3 allows user to restore the BIOS safe setting and the CMOS data. Please carefully follow the procedures to avoid damaging the mainboard.

| | | |
|-------------------|----------------------------------|---|
| Pin 1-2 Closed | Normal Operation (Default) |  |
| Pin 2-3 Closed | Clear CMOS data |  |

Note: Clear CMOS Procedures

1. Remove AC power line.
2. Set the jumper to "Pin 2-3 closed".
3. Wait for five seconds.
4. Set the jumper to "Pin 1-2 closed".
5. Reconnect AC.
6. Reset your desired password or clear the CMOS data.



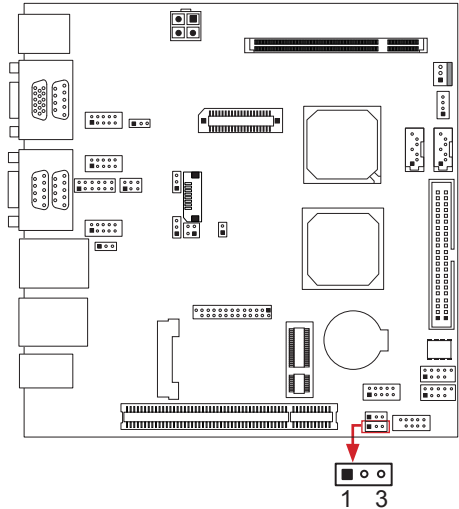
JAT1: AT/ATX Power Switch Header *

This header is for switching between AT and ATX power.

Pin 1-2 Closed For AT Power



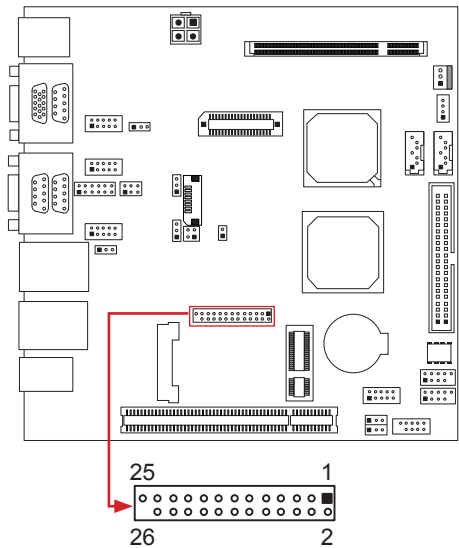
Pin 2-3 Closed For ATX Power (Default)



JPRNT1: Printer Port Connector

This header allows you to connect printer port on the PC.

| Pin | Assign. | Pin | Assign. |
|-----|---------|-----|---------|
| 1 | -Strobe | 14 | Ground |
| 2 | -ALF | 15 | Data 6 |
| 3 | Data 0 | 16 | Ground |
| 4 | -Error | 17 | Data 7 |
| 5 | Data 1 | 18 | Ground |
| 6 | -Init | 19 | -ACK |
| 7 | Data 2 | 20 | Ground |
| 8 | -Scltin | 21 | Busy |
| 9 | Data 3 | 22 | Ground |
| 10 | Ground | 23 | PE |
| 11 | Data 4 | 24 | Ground |
| 12 | Ground | 25 | SCLT |
| 13 | Data 5 | 26 | Key |

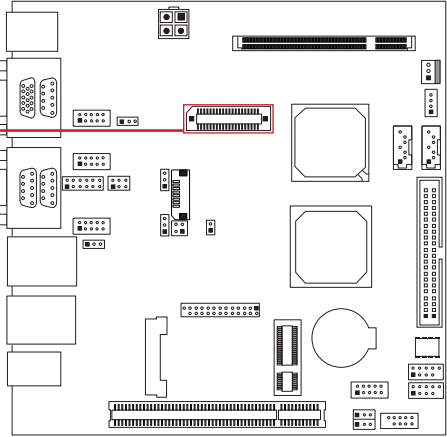
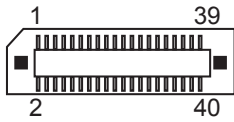


LVDS-COMN1: LVDS Connector

This connector is for devices requiring display interface such as LVDS. This connector supports only 18-bit single-channel panels up to WXGA (1366 x 768)

It is strongly recommended to use the matching JOY DAY INDUSTRIAL - A1252WV-SF-2X20PD01 connector.

| Pin | Assignment | Pin | Assignment |
|-----|---------------------|-----|----------------------------------|
| 1 | NC | 2 | PVDD (+3.3V or +5V) |
| 3 | NC | 4 | PVDD (+3.3V or +5V) |
| 5 | GND | 6 | GND |
| 7 | NC | 8 | GND |
| 9 | NC | 10 | LVDS1_TX0- (Differential signal) |
| 11 | GND | 12 | LVDS1_TX0+ (Differential signal) |
| 13 | NC | 14 | GND |
| 15 | NC | 16 | LVDS1_TX1- (Differential signal) |
| 17 | GND | 18 | LVDS1_TX1+ (Differential signal) |
| 19 | NC | 20 | GND |
| 21 | NC | 22 | LVDS1_TX2- (Differential signal) |
| 23 | GND | 24 | LVDS1_TX2+(Differential signal) |
| 25 | NC | 26 | GND |
| 27 | NC | 28 | LVDS1_CLK- (Differential signal) |
| 29 | +5V | 30 | LVDS1_CLK+(Differential signal) |
| 31 | I2C_CLK | 32 | GND |
| 33 | +3.3V | 34 | SMDATA |
| 35 | NC | 36 | SMCLK |
| 37 | PVDD (+3.3V or +5V) | 38 | NC |
| 39 | PVDD (+3.3V or +5V) | 40 | I2C_DATA |



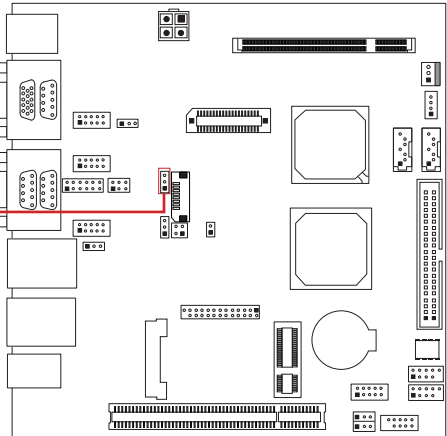
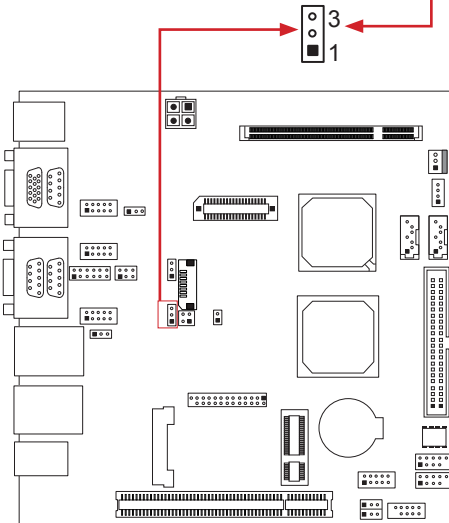
JLV2: LCD Power Select Header *

This header allows you to select LCD Power.

Pin 1-2 Closed PVDD=3.3V (Default)



Pin 2-3 Closed PVDD=5V



JLV1: LCD Backlight Inverter Power Select Header *

This header is for selecting LCD Backlight Inverter Power.

Pin 1-2 Closed Inverter Power=5V





Pin 2-3 Closed Inverter Power=12V (Default)

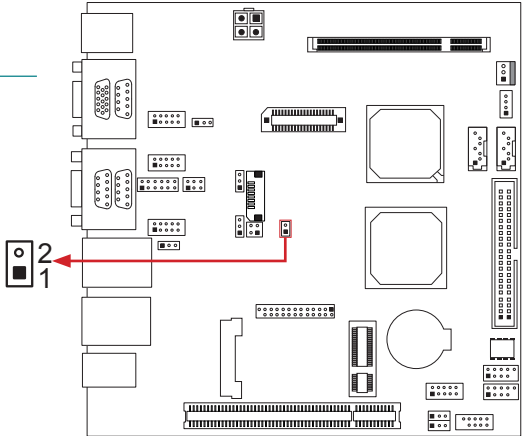


JBL1: LCD Backlight Power ON/OFF Header *

This header allows you to control the LCD Backlight Power ON/OFF.


| | | |
|----------------------|---------------------|---|
| Header Closed | Backlight Power OFF | 1  |
|----------------------|---------------------|---|


| | | |
|--------------------|--------------------|---|
| Header Open | Backlight Power ON | 1  |
|--------------------|--------------------|---|

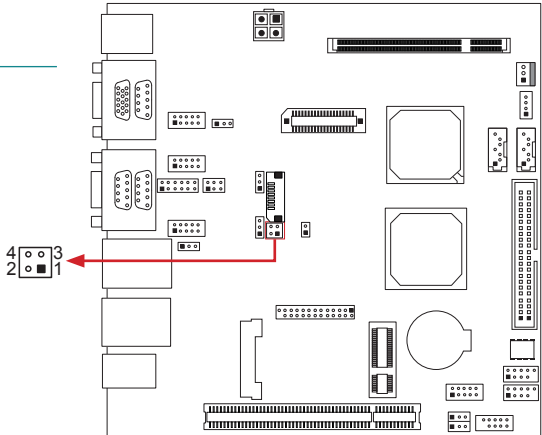


JBL2: LCD Backlight Brightness Adjust Header *

This header is for adjusting LCD backlight brightness.

| | | |
|----------------------|---------------------|---|
| Short Pin 1-2 | Increase Brightness | 4  |
|----------------------|---------------------|---|

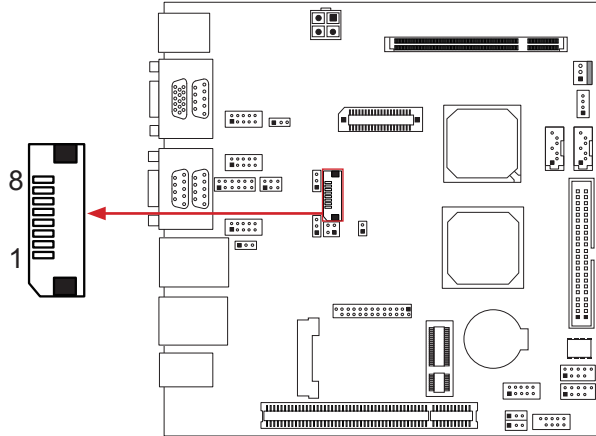
| | | |
|----------------------|---------------------|---|
| Short Pin 3-4 | Decrease Brightness | 4  |
|----------------------|---------------------|---|



JC1: LCD Backlight Inverter Connector

This connector is for connecting to LCD for providing backlight control function.

| Pin | Assignment |
|-----|-------------------|
| 1 | 5V/12V DC |
| 2 | 5V/12V DC |
| 3 | NC |
| 4 | NC |
| 5 | Backlight On |
| 6 | Brightness Adjust |
| 7 | GND |
| 8 | GND |



2.7 The Installation Paths of CD Driver

Windows 2000 & XP

| Driver | Path |
|---------|---|
| CHIPSET | \\Driver\\Chipset\\Intel\\Infnst |
| VGA | \\Driver\\Chipset\\Intel\\Graphics\\945\\2KXP |
| LAN | \\Driver\\LAN\\Realtek\\PCIE_LAN\\2KXP |
| AUDIO | \\Driver\\Audio\\Realtek\\Azalia\\2KXP |

Windows 7

| Driver | Path |
|---------|--|
| CHIPSET | \\Driver\\Chipset\\Intel\\Infnst |
| VGA | \\Driver\\Chipset\\Intel\\Graphics\\945\\Win7 32Bit \\Driver\\Chipset\\Intel\\Graphics\\945\\Win7 64Bit |
| LAN | \\Driver\\Lan\\Realtek\\PCIE_LAN\\Win7 |
| AUDIO | \\Driver\\Audio\\Realtek\\Azalia\\2KXP |

Chapter 3

BIOS

3.1 BIOS Introduction

The purpose of this chapter is to describe the settings in the AMI BIOS Setup program of this motherboard. The Setup program allows users to modify the basic system configuration and save these settings to CMOS RAM.

The power of CMOS RAM is supplied by a battery so that it retains the Setup information when the power is turned off.

Basic Input-Output System (BIOS) determines what a computer can do without accessing programs from a disk. This system controls most of the input and output devices such as keyboard, mouse, serial ports and disk drives. BIOS activates at the first stage of the booting process, loading and executing the operating system. Some additional features, such as virus and password protection or chipset fine-tuning options are also included in BIOS. The rest of this manual will guide you through the options and settings in BIOS Setup.

Plug and Play Support

This AMI BIOS supports the Plug and Play Version 1.0A.

EPA Green PC Support

This AMI BIOS supports Version 1.03 of the EPA Green PC.

ACPI Support

AMI ACPI BIOS support Version 1.0/2.0 of Advanced Configuration and Power interface (ACPI). It provides ASL code for power management and device configuration capabilities as defined in the ACPI, developed by Microsoft, Intel and Toshiba.

PCI Bus Support

This AMI BIOS also supports Version 2.3 of the Intel PCI (Peripheral Component Interconnect) local bus.

DRAM Support

DDR2 SDRAM (Double Data Rate II Synchronous DRAM) is supported.

Supported CPUs

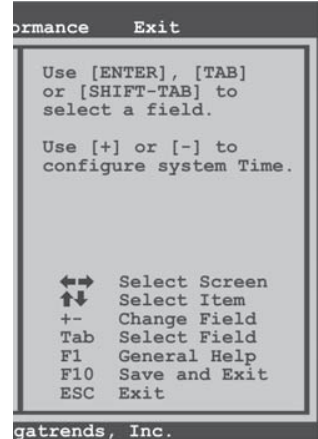
This AMI BIOS supports the Intel CPU.

Using Setup

When starting up the computer, press during the **Power-On Self-Test (POST)** to enter the BIOS setup utility. In the BIOS setup utility, you will see **General Help** description at the top right corner, and this provides a brief description of the selected item. **Navigation Keys** for that particular menu are at the bottom right corner, and you can use these keys to select item and change the settings.

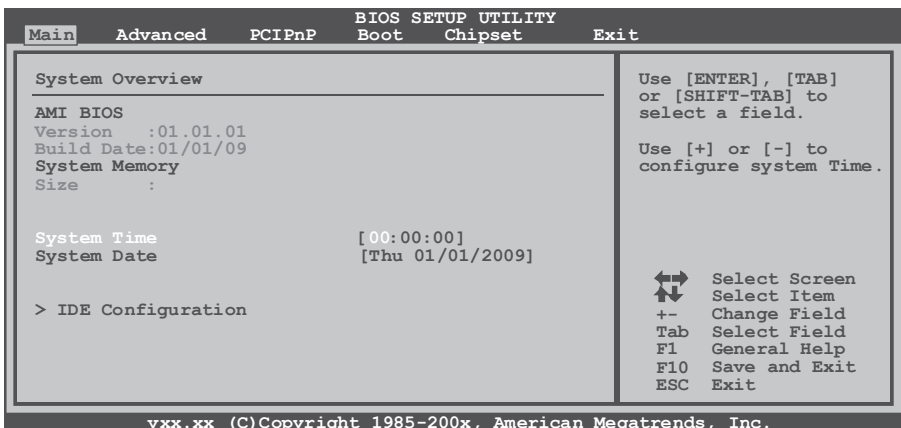
Note: The default BIOS settings apply for most conditions to ensure optimum performance of the motherboard. If the system becomes unstable after changing any settings, please load the default settings to ensure system's compatibility and stability. Use Load Setup Default under the Exit Menu.

For better system performance, the BIOS firmware is being continuously updated. The BIOS information described in this manual is for your reference only. The actual BIOS information and settings on board may be slightly different from this manual. The content of this manual is subject to be changed without notice. We will not be responsible for any mistakes found in this user's manual and any system damage that may be caused by wrong-settings.



3.2 MAIN MENU

Once you enter AMI BIOS Setup Utility, the Main Menu will appear on the screen providing an overview of the basic system information.



AMI BIOS

Shows system information including BIOS version, built date, etc.

SystemMemory

Shows system memory size, VGA share memory will be excluded.

SystemTime

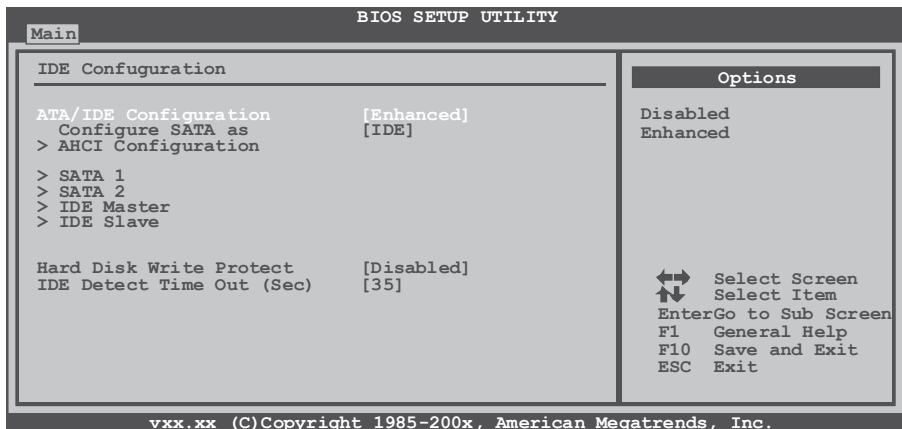
Set the system internal clock.

SystemDate

Set the system date. Note that the 'Day' automatically changes when you set the date.

3.2.1 IDE Configuration

The BIOS will automatically detect IDE/SATA devices. There is a sub-menu for each IDE/SATA device. Select a device and press <Enter> to enter the sub-menu for further options.



ATA/IDE Configuration

This item allows you to activate ATA/IDE function.

Options: Enhanced (Default) / Disabled

Configure SATA as

This item allows you to determine the control mode of SATA#1.

Options: IDE (Default) / AHCI

Hard Disk Write Protect

Disable or enable device write protection. This will be effective only if the device is accessed through BIOS.

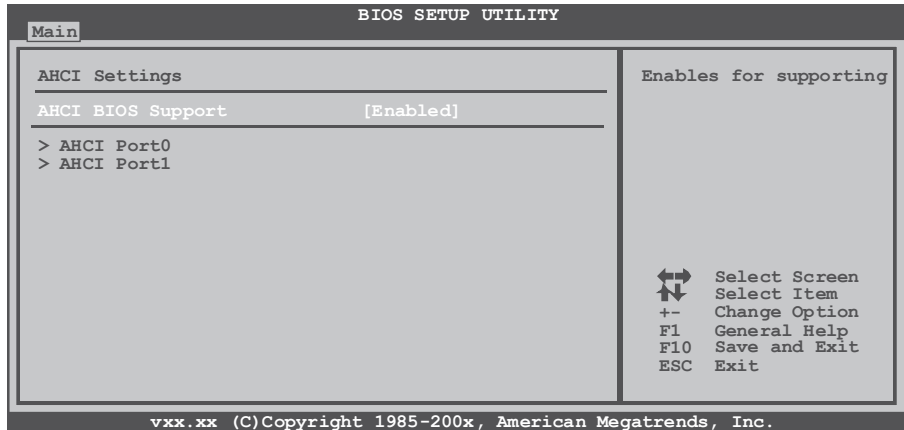
Options : Disabled (Default) / Enabled

IDE Detect Time Out (Sec)

Select the time out value for detecting IDE/SATA devices

Options : 35 (Default) /30/25/20/15/10/5/0

AHCI Configuration

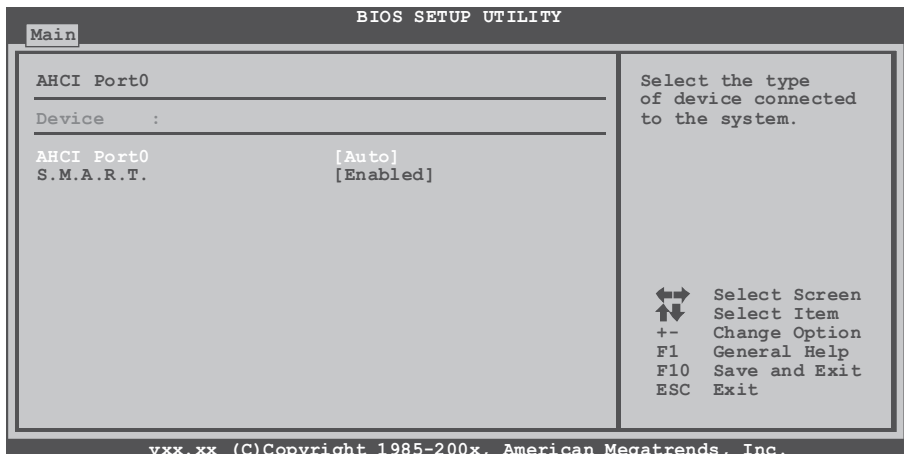


AHCI BIOS Support

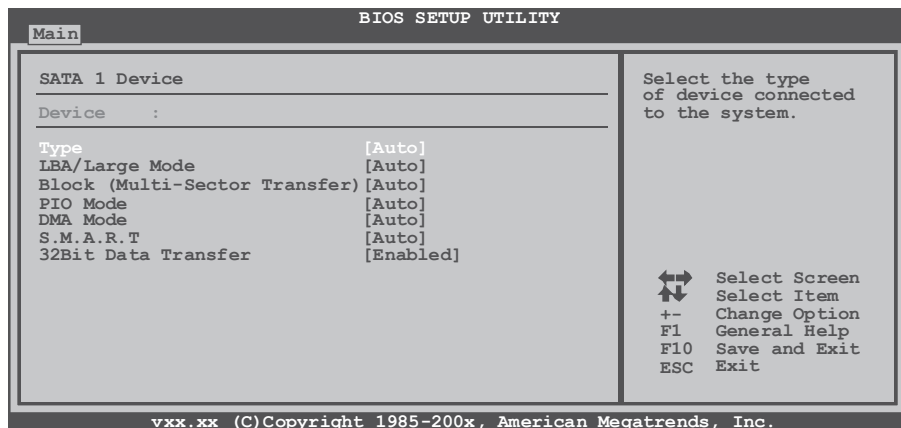
This BIOS feature controls the AHCI function of the SATA controller.

Options: Enabled (Default) / Disabled

AHCI Port0/Port1



SATA 1/2 & IDE Master/Slave Devices



The BIOS detects the information and values of respective devices, including:

Type

Select the type of the SATA drive.

Options: Auto (Default) ; CD/DVD ; ARMD ; Not Installed

LBA/Large Mode

Enable or disable the LBA mode. Options: Auto (Default) / Disabled

Block (Multi-Sector Transfer)

Enable or disable multi-sector transfer. Options: Auto (Default) / Disabled

PIO Mode

Select the PIO mode.

Options: Auto (Default) / 0 / 1 / 2 / 3 / 4

DMA Mode

Select the DMA mode

Options: Auto (Default) / SWDMA0 ~ SWDMA2 / MWDMA0 ~ MWDMA2 /
UDMA0 ~ UDMA5

S.M.A.R.T

Set the Smart Monitoring, Analysis, and Reporting Technology.

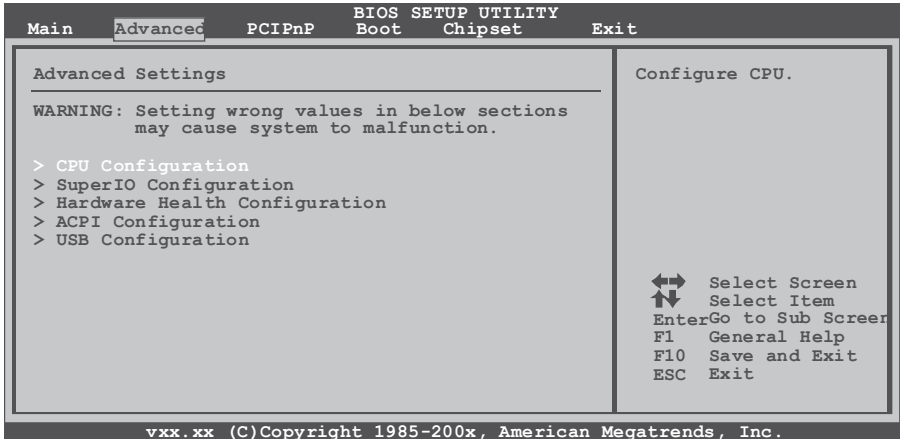
Options : Auto (Default) / Disabled / Enabled

32Bit Data Transfer

Enable or Disable 32-bit data transfer.
Options : Enabled (Default) / Disabled

3.3 ADVANCED MENU

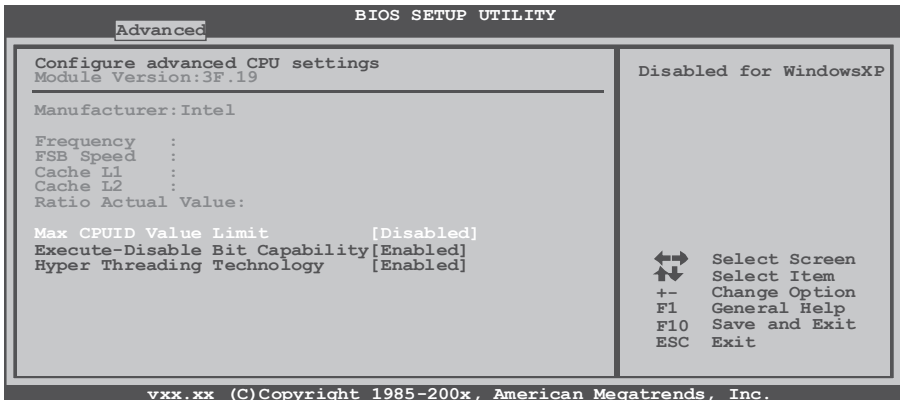
The Advanced Menu allows you to configure the settings of CPU, Super I/O, and other system devices.



Note: Beware of that inappropriate setting in this menu may cause system malfunction.

3.3.1 CPU Configuration

This item shows the CPU information that the BIOS automatically detects.



Max CPUID Value Limit

When the computer boots up, the operating system will execute the CPUID instruction to identify the processor and its capabilities. Before it can do so, it must first query the processor to find out the highest input value CPUID recognized. This determines the kind of basic information CPUID can provide to the operating system.

Options: Disabled (Default) / Enabled

Execute-Disable Bit Capability

This item allows you to configure the Execute-Disabled Bit function, which protects your system from buffer overflow attacks.

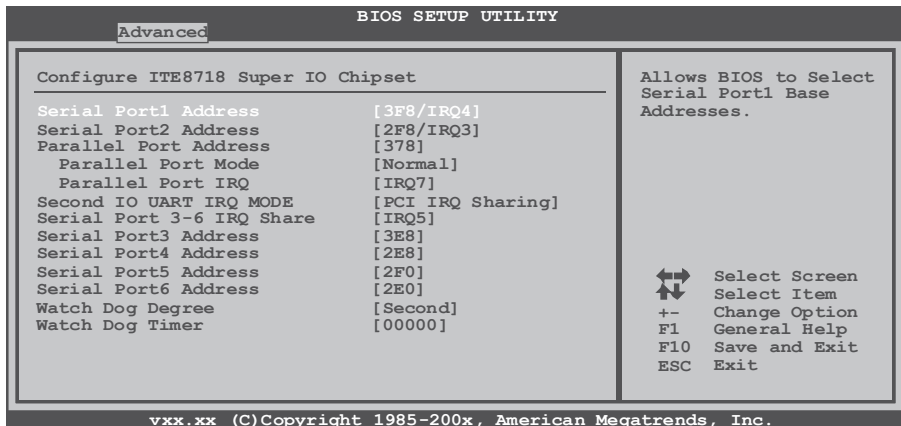
Options: Enabled (Default) / Disabled

Hyper Threading Technology

Enabled for Windows XP and Linux (OS optimized for Hyper Threading Technology) and disabled for other OS (OS not optimized for Hyper Threading Technology).

Options: Enabled (Default) / Disabled

3.3.2 SuperIO Configuration



Serial Port1 Address

Select an address and corresponding interrupt for Serial Port 1.

Options: 3F8/IRQ4 (Default) ; 3E8/IRQ4 ; 2E8/IRQ3 ; Disabled

Serial Port2 Address

Select an address and corresponding interrupt for Serial Port 2.

Options: 2F8/IRQ3 (Default) ; 3E8/IRQ4 ; 2E8/IRQ3 ; Disabled

Parallel Port Address

This item allows you to determine access onboard parallel port controller with which I/O Address.

Options: 378 (Default) / 278 / 3BC / Disabled

Parallel Port Mode

This item allows you to determine how the parallel port should function.

Options: Normal (Default) Using Parallel port as Standard Printer Port.

EPP Using Parallel Port as Enhanced Parallel Port.

ECP Using Parallel port as Extended Capabilities Port.

ECP+EPP Using Parallel port as ECP & EPP mode.

ECP Mode DMA Channel

This item allows you to select parallel port ECP DMA.

Options: DMA3 (Default) / DMA0 / DMA1

Parallel Port IRQ

This item allows you to select the IRQ for the onboard parallel port.

Options: IRQ7 (Default) / IRQ5

Second IO UART IRQ Mode

PCI IRQ Sharing for OS (EX. WinXP); ISA IRQ Sharing for Dos.

Options: PCI IRQ Sharing (Default) / ISA IRQ

Serial Port 3-6 IRQ Share

This item allows you to determine whether Serial Port 3-6 share IRQ.

Options: IRQ5 (Default) / Disabled / IRQ3 / IRQ4 / IRQ7 / IRQ9 / IRQ10 / IRQ11 / IRQ12

Serial Port3 Address

This item allows you to select the address of Serial Port3.

Options: 3E8 (Default) / 2E8 / 2F0 / 2E0

Serial Port3 IRQ

This item allows you to select IRQ of Serial Port3.

Options: IRQ5 (Default) / IRQ3 / IRQ4 / IRQ7 / IRQ9 / IRQ10 / IRQ11 / IRQ12

Serial Port4 Address

This item allows you to select the address of Serial Port4.

Options: 2E8 (Default) / 3E8 / 2F0 / 2E0

Serial Port4 IRQ

This item allows you to select IRQ of Serial Port4.

Options: IRQ5 (Default) / IRQ3 / IRQ4 / IRQ7 / IRQ9 / IRQ10 / IRQ11 / IRQ12

Serial Port5 Address

This item allows you to select the address of Serial Port5.

Options: 2F0 (Default) / 3E8 / 2E8 / 2E0

Serial Port5 IRQ

This item allows you to select IRQ of Serial Port5.

Options: IRQ5 (Default) / IRQ3 / IRQ4 / IRQ7 / IRQ9 / IRQ10 / IRQ11 / IRQ12

Serial Port6 Address

This item allows you to select the address of Serial Port6.

Options: 2E0 (Default) / 3E8 / 2E8 / 2F0

Serial Port6 IRQ

This item allows you to select IRQ of Serial Port6.

Options: IRQ5 (Default) / IRQ3 / IRQ4 / IRQ7 / IRQ9 / IRQ10 / IRQ11 / IRQ12

Watch Dog Degree

This item allows you to determine the functional degree of Watch Dog.

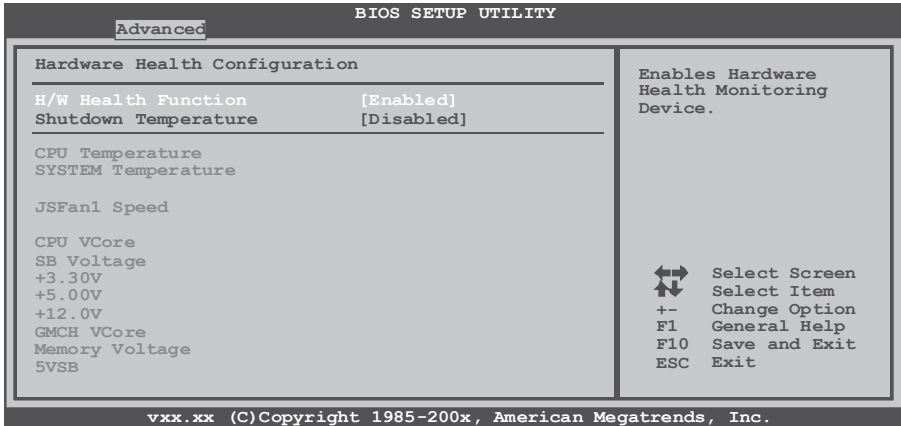
Options: Second (Default) / Minute

Watch Dog Timer

Options: 0 for disabled (Default) / Min=1, Max=65536

3.3.3 Hardware Health Configuration

This item shows the system temperature, fan speed, and voltage information.



H/W Health Function

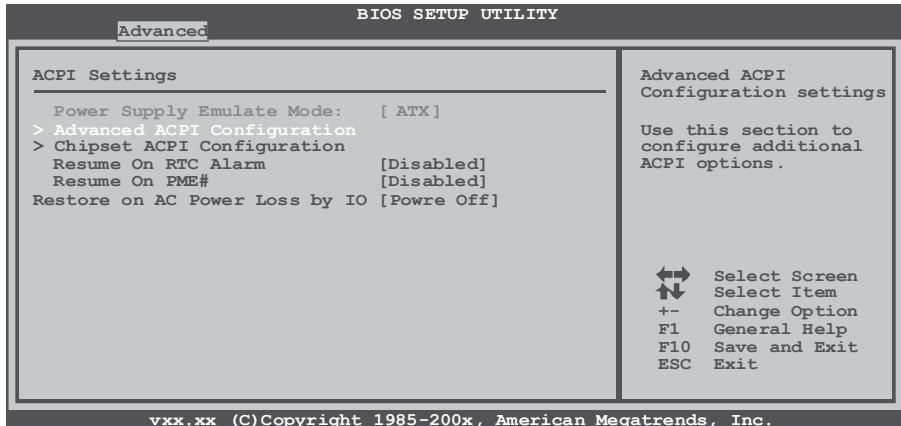
With a monitoring system, it will show PC health status during POST stage.
Options: Enabled (Default) / Disabled

Shutdown Temperature Function

This item allows you to set up the CPU shutdown temperature. This item is only effective under Windows 98 ACPI mode.

Options: Disabled (Default) ; 60°C/140°F ; 65°C/149°F ; 70°C/158°F ; 5°C/167°F ; 80°C/176°F ; 85°C/185°F ; 90°C/194°F

3.3.4 ACPI Configuration



Resume On RTC Alarm

When "Enabled", you can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

Options: Disabled (Default) / Enabled

RTC Alarm Date (Days)

You can choose which date the system will boot up.

RTC Alarm Time

You can choose the system boot up time by inputting hour, minute and second.

Resume On PME#

This item allows you to disable or enable PME to generate a wake event.

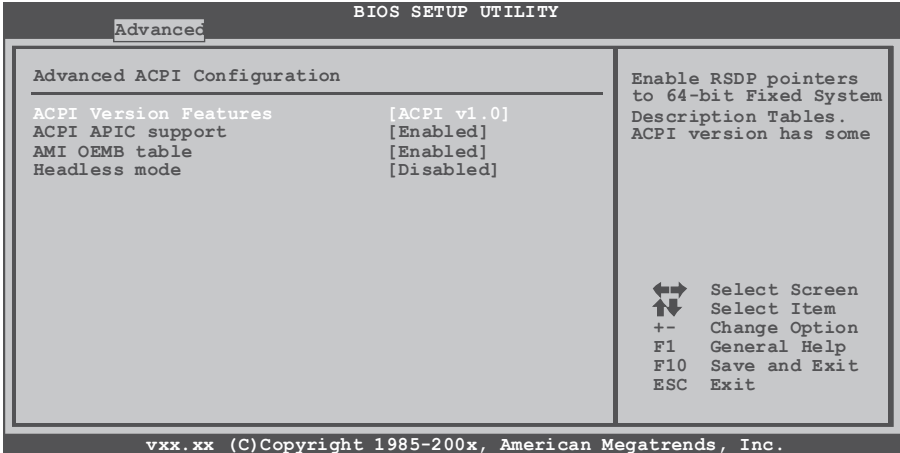
Options: Disabled (Default) / Enabled

Restore on AC Power Loss by IO

This setting specifies how your system should behave after the power failure or interrupt occurs. Choosing Disabled will leave the computer in the power-off state. Choosing Enabled will restore the system to the status before power failure or interrupt occurs.

Options: Power Off (Default) / Power ON / Last State

Advanced ACPI Configuration



ACPI Version Features

The item allows you to select the version of ACPI.
Options: ACPI v1.0 (Default) / ACPI v2.0 / ACPI v3.0

ACPI APIC support

This item is used to enable or disable the motherboard's APIC (Advanced Programmable Interrupt Controller). The APIC provides multiprocessor support, more IRQs and faster interrupt handling.
Options: Enabled (Default) / Disabled

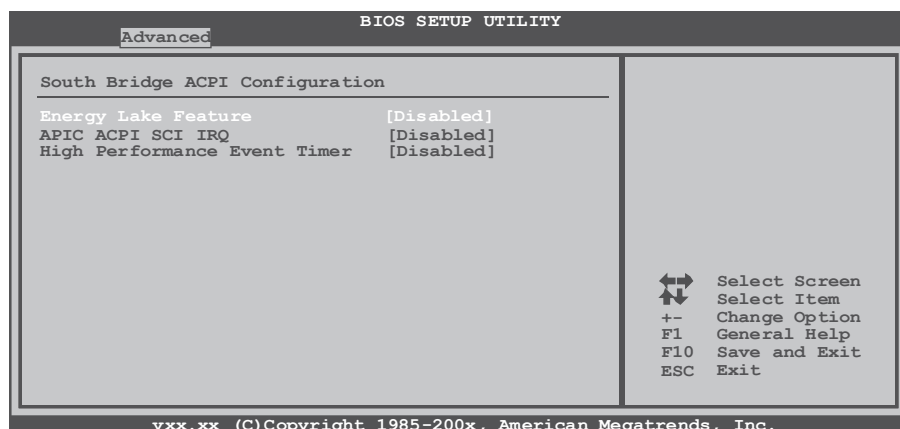
AMI OEMB table

Set this value to allow the ACPI BIOS to add a pointer to an OEMB table in the Root System Description Table (RSDT).
Options: Enabled (Default) / Disabled

Headless mode

This is a server-specific feature. A headless server is one that operates without a keyboard, monitor or mouse. To run in headless mode, both BIOS and operating system (e.g. Windows Server 2003) must support headless operation.
Options: Disabled (Default) / Enabled

Chipset ACPI Configuration



Energy Lake Feature

This item allows you to enable or disable the Energy Lake technology feature.

Options: Disabled (Default) / Enabled

APIC ACPI SCI IRQ

This item is used to set APIC ACPI SCI by IRQ.

Options: Disabled (Default) / Enabled

High Performance Event Timer

This item allows you to enable or disable the HPET.

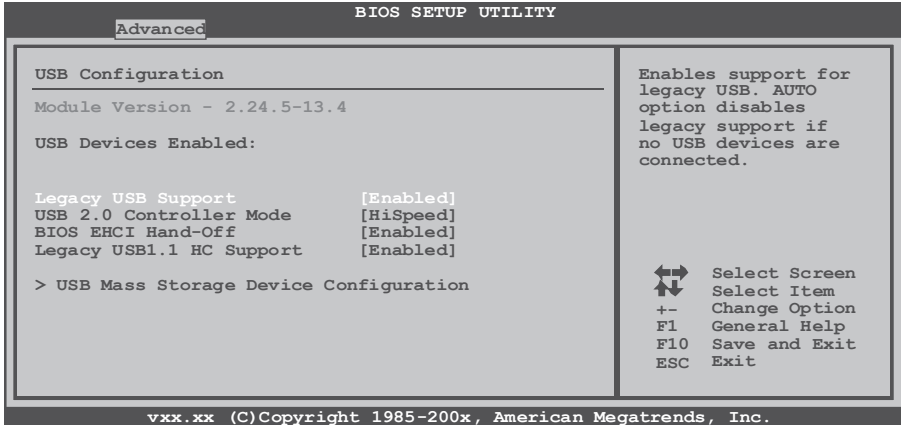
Options: Disabled (Default) / Enabled

HPET Memory Address

Options: FED00000h (Default) / FED01000h / FED02000h / FED03000h

3.3.5 USB Configuration

This item shows the USB controller and USB device information.



Legacy USB Support

This item determines if the BIOS should provide legacy support for USB devices like the keyboard, mouse, and USB drive. This feature is useful for using USB devices with operating systems that do not natively support USB (e.g. Microsoft MS-DOS or Windows NT).

Options: Enabled (Default) / Disabled / Auto

USB 2.0 Controller Mode

This item allows you to select the operation mode of the USB 2.0 controller.

Options: HiSpeed (Default) USB 2.0-480Mbps
FullSpeed USB 1.1-12Mbps

BIOS EHCI Hand-Off

This item allows you to enable support for operating systems without an EHCI hand-off feature.

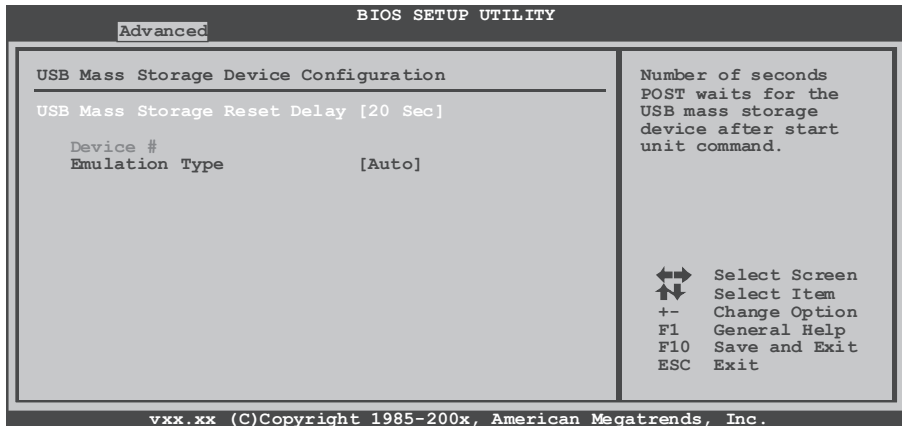
Options: Enabled (Default) / Disabled

Legacy USB1.1 HC Support

This item allows you to activate USB1.1 HC support.

Options: Enabled (Default) / Disabled

USB Mass Storage Device Configuration



USB Mass Storage Reset Delay

This item allows you to set the reset delay for USB mass storage device.
Options: 20 Sec (Default) / 10 Sec / 30 Sec / 40 Sec

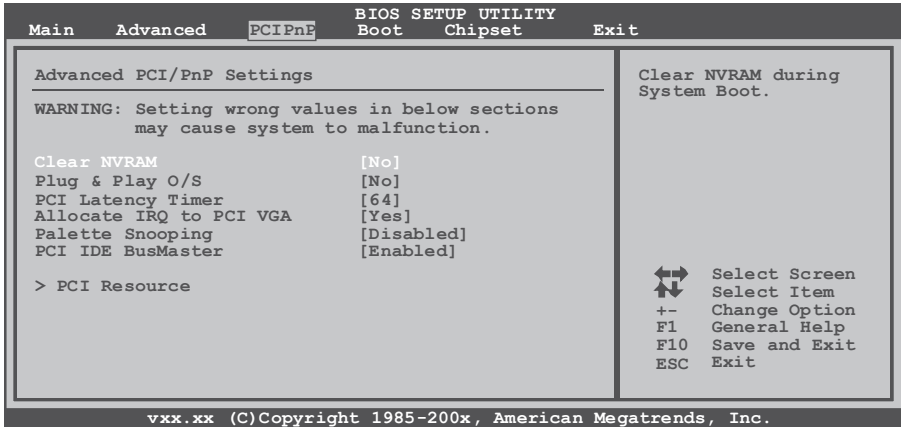
Emulation Type

This item allows you to select the emulation type of the USB mass storage device.

Options: Auto (Default) / Floppy / Forced FDD / Hard Disk / CDROM

3.4 PCI/PNP MENU

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds near the speed of the CPU itself when communicating with its own special components.



Note: Beware of that inappropriate setting in this menu may cause system malfunction.

Clear NVRAM

This item allows you to clear the data in the NVRAM (CMOS) by selecting “Yes”.

Options: No (Default) / Yes

Plug & Play O/S

When set to YES, BIOS will only initialize the PnP cards used for the boot sequence (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Window™ 95. When set to NO, BIOS will initialize all the PnP cards. For non-PnP operating systems (DOS, Netware™), this option must set to NO.

Options: No (Default) / Yes

PCI Latency Timer

This item controls how long a PCI device can hold the PCI bus before another takes over. The longer the latency, the longer the PCI device can retain control of the bus before handing it over to another PCI device.

Options: 64 (Default) / 32 / 96 / 128 / 160 / 192 / 224 / 248

Allocate IRQ to PCI VGA

This item allows BIOS to choose a IRQ to assign for the PCI VGA card.

Options: Yes (Default) / No

Palette Snooping

Some old graphic controllers need to “snoop” on the VGA palette and then map it to their display as a way to provide boot information and VGA compatibility. This item allows such snooping to take place.

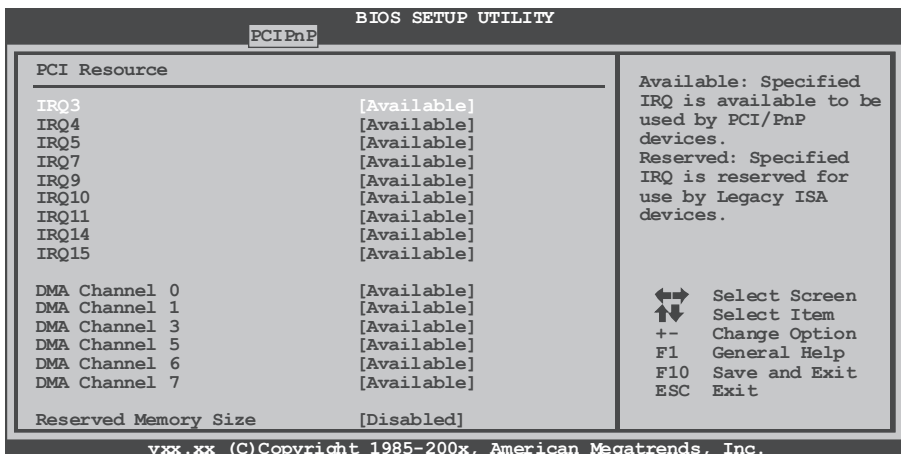
Options: Disabled (Default) / Enabled

PCI IDE BusMaster

This item is a toggle for the built-in driver that allows the onboard IDE controller to perform DMA (Direct Memory Access) transfers.

Options: Enabled (Default) / Disabled

3.4.1 PCI Resource



IRQ3/4/5/7/9/10/11/14/15

These items will allow you to assign each system interrupt a type, depending on the type of device using the interrupt. The option “Available” means the IRQ is going to assign automatically.

Options: Available (Default) / Reserved

DMA Channel 0/1/3/5/6/7

These items will allow you to assign each DMA channel a type, depending on the type of device using the channel. The option “Available” means the channel is going to assign automatically.

Options: Available (Default) / Reserved

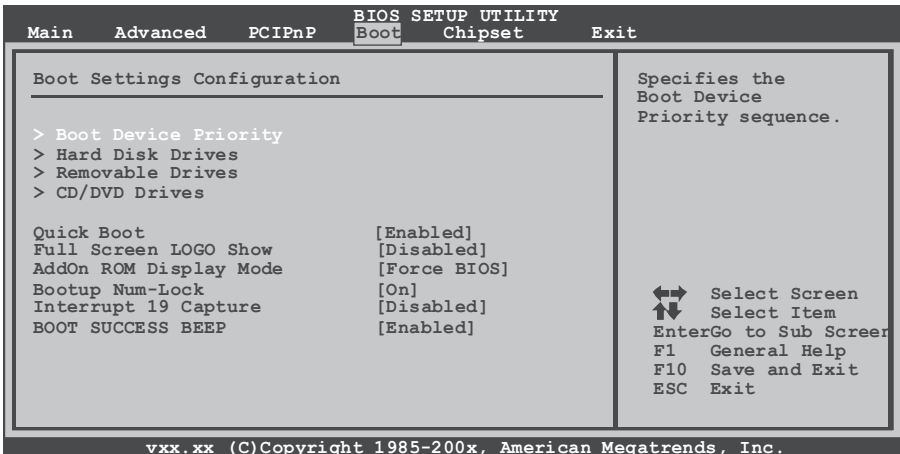
Reserved Memory Size

This item allows BIOS to reserve certain memory size for specific PCI device.

Options: Disabled (Default) / 16K / 32K / 64K

3.5 BOOT MENU

This menu allows you to setup the system boot options.



Boot Device Priority

Items in this sub-menu specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

Hard Disk Drives

The BIOS will attempt to arrange the hard disk boot sequence automatically. You can also change the booting sequence. The number of device items that appears on the screen depends on the number of devices installed in the system.

Removable Drives

The BIOS will attempt to arrange the removable drive boot sequence automatically. You can also change the booting sequence. The number of device items that appears on the screen depends on the number of devices installed in the system.

CD/DVD Drives

The BIOS will attempt to arrange the CD/DVD drive boot sequence automatically. You can also change the booting sequence. The number of device items that appears on the screen depends on the number of devices installed in the system.

Quick Boot

Enabling this option will cause an abridged version of the Power On Self-Test (POST) to execute after you power up the computer.

Options: Enabled (Default) / Disabled

Full Screen LOGO Show

This item allows you to enable/disable Full Screen LOGO Show function.

Options: Disabled (Default) / Enabled

AddOn ROM Display Mode

This item sets the display mode for option ROM.

Options: Force BIOS (Default) / Keep Current

Bootup Num-Lock

Selects the NumLock State after the system is switched on.

Options: On (Default) / Off

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When set to Enabled, this item allows the option ROMs to trap interrupt 19.

Options: Disabled (Default) / Enabled

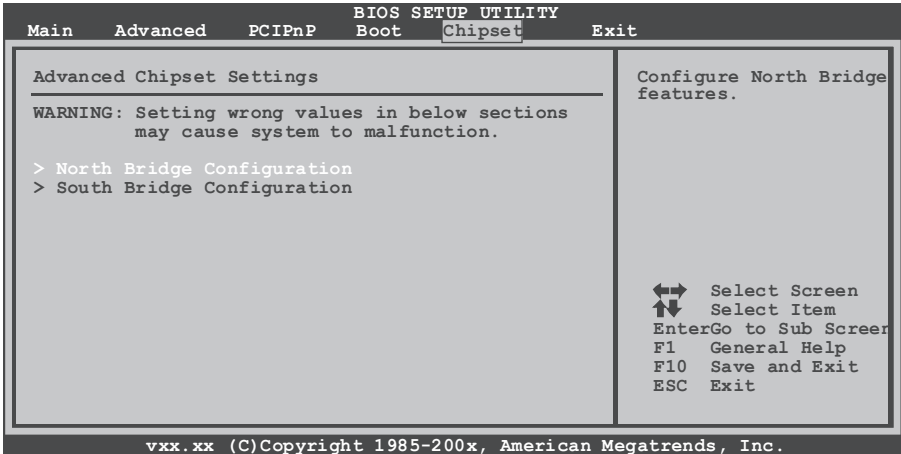
BOOT SUCCESS BEEP

When this item is set to Enabled, BIOS will let user know boot success with beep.

Options: Enabled (Default) / Disabled

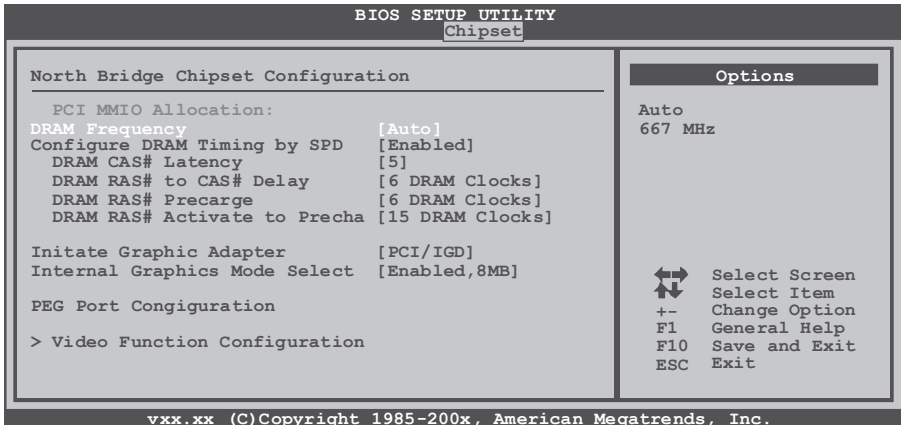
3.6 CHIPSET MENU

This submenu allows you to configure the specific features of the chipset installed on your system. This chipset manages bus speeds and access to system memory resources, such as DRAM. It also coordinates communications with the PCI bus.



Note: Beware of that inappropriate setting in this menu may cause system malfunction.

3.6.1 North Bridge Configuration



DRAM Frequency

This item allows you to set the frequency of DRAM..

Options: Auto (Default) / 667MHz

Configure DRAM Timing by SPD

This item allows you .to determine DRAM timing by SPD

Options: Enabled (Default) / Disabled

DRAM CAS# Latency

Options: 5 (Default) / 3 / 4 / 6

DRAM RAS# to CAS# Delay

Options: 6 DRAM Clocks (Default) / 2 ~ 7DRAM Clocks

DRAM RAS# Precharge

Options: 6 DRAM Clocks (Default) / 2 ~ 7DRAM Clocks

DRAM RAS# Activate to Precharge

Options: 15 DRAM Clocks (Default) / 4 ~ 14 DRAM Clocks

Initate Graphic Adapter

Select which graphics controller to use as the primary boot device.

Options: PCI/IGD (Default) / IGD

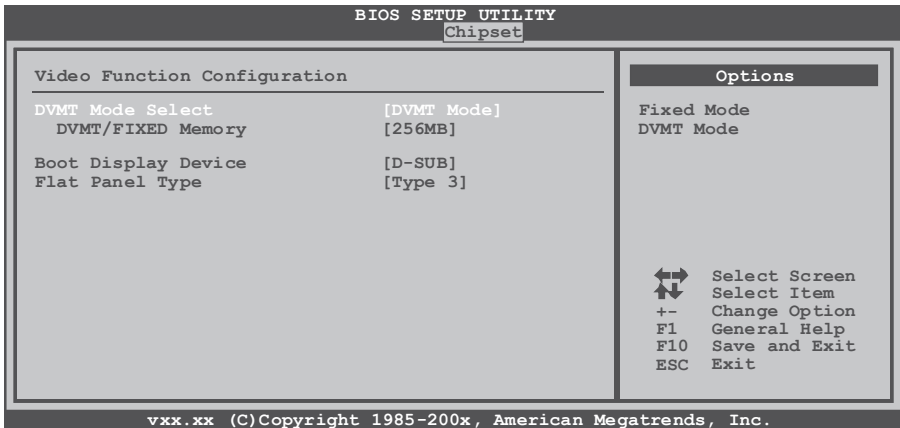
Internal Graphics Mode Select

Select the amount of system memory used by the Internal graphics device.

This item will be different as your memory modules. When the memory size is decided, this frame buffer size will also be fixed.

Options: Enabled, 8MB (Default)

Video Function Configuration



DVMT Mode Select

This item allows you to select the DVMT mode.

Options: DVMT Mode (Default) / Fixed Mode

DVMT/FIXED Memory

DVMT stands for "Dynamic Video Memory Technology". This is an enhancement of the unified memory architecture (UMA) concept. DVMT will set the optimum amount of memory to be allocated for a balance between graphics and system performance. DVMT dynamically responds to system requirements and applications demands by allocating the proper amount of display, texturing and buffer memory after the operating system boots up.

Options: 256MB (Default) / 128MB / Maximum DVMT

Boot Display Device

This item allows you to select the display device.

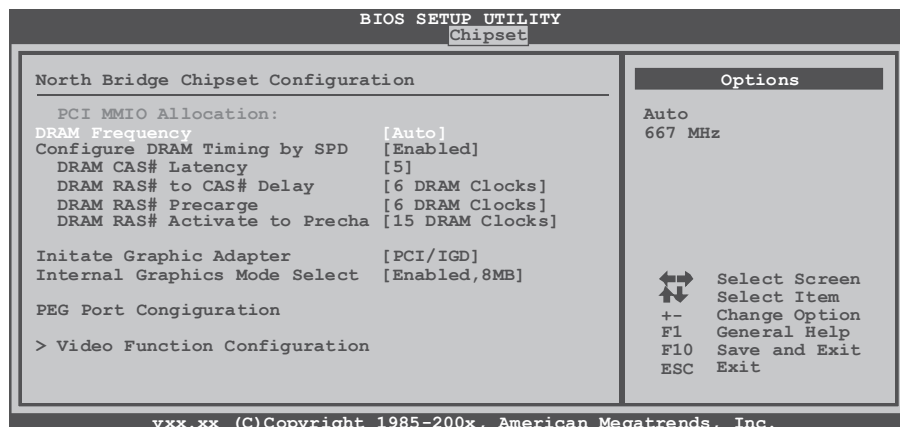
Options: D-SUB (Default) / LVDS / D-SUB + LVDS

Flat Panel Type

This item allows you to select flat panel type.

Options: Type 3(Default) / Type 1 ~ 16

3.6.2 South Bridge Configuration



USB Functions

The item determines the activation of USB port.

Options: 10 USB Ports (Default) / 2 USB Ports / 4 USB Ports / 6 USB Ports / 8 USB Port / Disabled

USB 2.0 Controller

This entry is only used to enable/disable EHCI controller. The BIOS itself may may not have high speed USB support. If the BIOS has high speed USB support, the controller will be automatically turned on when high speed devices are connected.

Options: Enabled (Default) / Disabled

HDA Controller

This item allows you to control the Audio support.

Options: Enabled (Default) / Disabled

SMBUS Controller

This BIOS feature controls the I/O buffers for the SMBus.

Options: Enabled (Default) / Disabled

SLP_S4# Min. Assertion Width

Options : 1 to 2 seconds (Default) / 4 to 5 seconds / 3 to 4 seconds / 2 to 3 seconds

Onboard LAN 1/2

This item allows you to enable or disable the Onboard LAN.

Options : Enabled (Default) / Disabled

Onboard LAN ROM1/2

This item allows you to select the Onboard LAN Boot ROM.

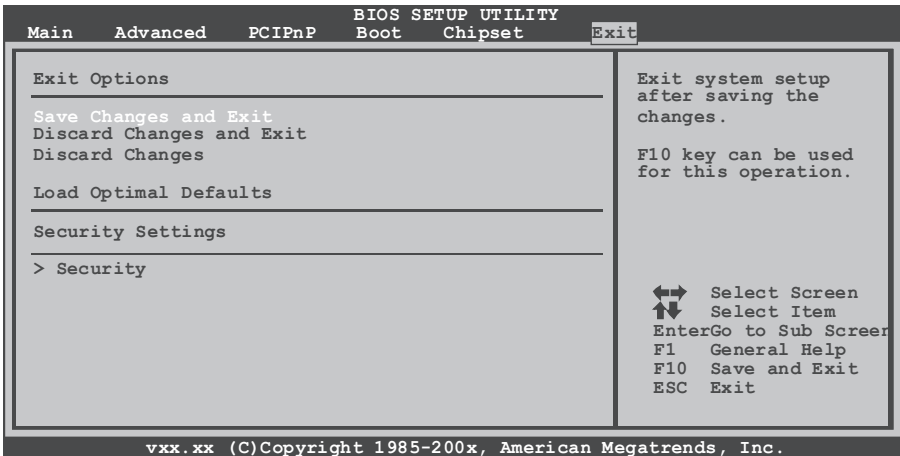
Options : Disabled (Default) / Enabled

PCIE High Priority Port

Options : Disabled (Default) / Port 0 ~ Port 5

3.7 EXIT MENU

This menu allows you to load the optimal default settings, and save or discard the changes to the BIOS items.



Save Changes and Exit

Save all configuration changes to CMOS RAM and exit setup.

Discard Changes and Exit

Abandon all changes made during the current session and exit setup.

Discard Changes

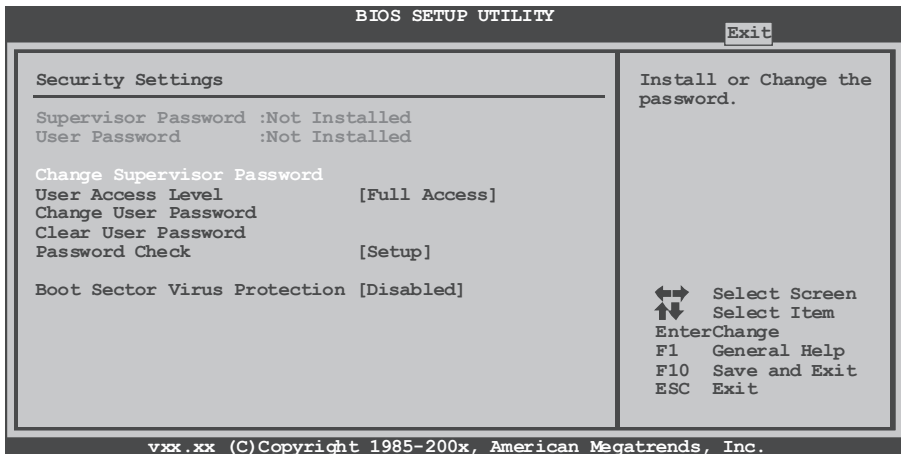
Abandon all changes made during the current session and restore the previously-saved values.

Load Optimal Defaults

This selection allows you to reload the BIOS when problem occurs during system booting sequence. These configurations are factory settings optimized for this system.

3.7.1 Security

This sub-menu allows you to provide/revise supervisor and user password.



Change Supervisor Password

Setting the supervisor password will prohibit everyone except the supervisor from making changes using the CMOS Setup Utility. You will be prompted to enter a password.

User Access Level

This item allows supervisor to set the user level.

Options: Full Access (Default) / No Access / View Only / Limited

Change User Password

If the Supervisor Password is not set, then the User Password will function in the same way as the Supervisor Password. If the Supervisor Password is set and the User Password is set, the "User" will only be able to view configurations but won't be able to change them.

Clear User Password

This item is for clearing user password.

Password Check

This item is for setting the timing that checks password.

Options: Setup (Default) / Always

Boot Sector Virus Protection

This option allows you to choose the VIRUS Warning feature that is used to protect the IDE Hard Disk boot sector. If this function is enabled and an attempt is made to write to the boot sector, BIOS will display a warning message on the screen and sound an alarm beep.

Options: Disabled (Default) / Enabled

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Appendix

Useful Help

Appendix A: AMI BIOS BEEP CODE

Boot Block Beep codes

| Number of Beeps | Description |
|-----------------|--|
| 1 | No media present. (Insert diskette in floppy drive A:) |
| 2 | “AMIBOOT.ROM” file not found in root directory of diskette in A: |
| 3 | Insert next diskette if multiple diskettes are used for recovery |
| 4 | Flash Programming successful |
| 5 | File read error |
| 7 | No Flash EPROM detected |
| 10 | Flash Erase error |
| 11 | Flash Program error |
| 12 | “AMIBOOT.ROM” file size error |
| 13 | BIOS ROM image mismatch (file layout does not match image present in flash device) |

POST BIOS Beep codes

| Number of Beeps | Description |
|-----------------|---|
| 1 | Memory refresh timer error |
| 3 | Base memory read/write test error |
| 6 | Keyboard controller BAT command failed |
| 7 | General exception error (processor exception interrupt error) |
| 8 | Display memory error (system video adapter) |

Troubleshooting POST BIOS Beep codes

| Number of Beeps | Description |
|-----------------|---|
| 1, 3 | Reseat the memory, or replace with known good modules. |
| 6, 7 | <p data-bbox="387 336 1014 528">Fatal error indicating a serious problem with the system. Consult your system manufacturer. Before declaring the motherboard beyond all hope, eliminate the possibility of interference by a malfunctioning add-in card. Remove all expansion cards except the video adapter.</p> <ul data-bbox="387 536 1014 783" style="list-style-type: none"><li data-bbox="387 536 1014 624">● If beep codes are generated when all other expansion cards are absent, consult your system manufacturer's technical support.<li data-bbox="387 632 1014 783">● If beep codes are not generated when all other expansion cards are absent, one of the add-in cards is causing the malfunction. Insert the cards back into the system one at a time until the problem happens again. This will reveal the malfunctioning card. |
| 8 | If the system video adapter is an add-in card, replace or reseat the video adapter. If the video adapter is an integrated part of the system board, the board may be faulty. |

Appendix B: TROUBLESHOOTING

| Probable | Solution |
|---|--|
| <p>1. There is no power in the system. Power LED does not shine; the fan of the power supply does not work.</p> <p>2. Indicator light on keyboard does not shine.</p> | <p>1. Make sure power cable is securely plugged in.</p> <p>2. Replace cable.</p> <p>3. Contact technical support.</p> |
| <p>System is inoperative. Keyboard lights are on, power indicator lights are lit, and hard drives are running.</p> | <p>Using even pressure on both ends of the DIMM, press down firmly until the module snaps into place.</p> |
| <p>System does not boot from a hard disk drive, but can be booted from optical drive.</p> | <p>1. Check cable running from disk to disk controller board. Make sure both ends are securely plugged in; check the drive type in the standard CMOS setup.</p> <p>2. Backing up the hard drive is extremely important. All hard disks are capable of breaking down at any time.</p> |
| <p>System only boots from an optical drive. Hard disks can be read, applications can be used, but system fails to boot from a hard disk.</p> | <p>1. Back up data and applications files.</p> <p>2. Reformat the hard drive. Re-install applications and data using backup disks.</p> |
| <p>Screen message shows “Invalid Configuration” or “CMOS Failure.”</p> | <p>Review system’s equipment. Make sure correct information is in setup.</p> |
| <p>System cannot boot after user installs a second hard drive.</p> | <p>1. Set master/slave jumpers correctly.</p> <p>2. Run SETUP program and select correct drive types. Call the drive manufacturers for compatibility with other drives.</p> |

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