



NEXCOM International Co., Ltd.

Industrial Computing Solutions

PICMG Single Board Computer (PICMG 1.3)

PEAK 876VL2/877VL2

User Manual

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PREFACE

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Disclaimer

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Acknowledgements

PEAK 876VL2/877VL2 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

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

Declaration of Conformity

FCC

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

CE

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

RoHS Compliance



NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union

RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2002/95/EU, to be your trusted green partner and to protect our environment.

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

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

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

How to recognize NEXCOM RoHS Products?

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

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

Warranty and RMA

NEXCOM Warranty Period

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

NEXCOM Return Merchandise Authorization (RMA)

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

- ❌ Any products returned by NEXCOM to other locations besides the customers’ site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

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

System Level

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

Board Level

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

Warnings

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

Cautions

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

Safety Information

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

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

Installation Recommendations

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

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

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

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

Safety Precautions

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

Technical Support and Assistance

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

Conventions Used in this Manual



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



Caution: Information to avoid damaging components or losing data.



Note: Provides additional information to complete a task easily.

Global Service Contact Information

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<http://www.nexcom-jp.com>

PACKAGE CONTENTS

Before continuing, verify that the PEAK 876VL2/877VL2 package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Name	Description	Qty
1	60233PS215X00	PS2 Y CABLE VERA TECH:GSE090505B	W/BRACKET PS2 TO JST 6PIN 2.0mm L:250mm+-10mm	1
2	60233PRT15X00	PRINT CABLE BEST	W/BRACKET PRINT 25 TO 2.0mm 26PIN L:150mm	1
3	60233SIO03X00	CABLE EDI:13420901511-RS	W/BRACKET COM PORT. 9PIN TO HOUSING 10PIN PIT:2.0mmx2 L:150mm+-10mm	1
4	60233USB60X00	USB CABLE CONNTEK:A02-B001-V01	USB CONx2+BRACKET TO JST 6PIN 2.5mm L:240+-15mm	1
5	60233ATA17X00	SATA CABLE BEST:148-0707-300R	Standard L:300mm	1

ORDERING INFORMATION

The following provides ordering information for PEAK 876VL2/877VL2.

- **PEAK 876VL2 (P/N : 10P0876VL00X0) RoHS Compliant**
PICMG 1.3 Full-Size SHB, Intel® LGA 1156, Core™ i5/i3/Pentium® processors with Max 8GB DDR3 DIMM, VGA, Intel® 82574L PCI Express Gigabit Ethernet x 1, 82578DM Gigabit Ethernet x 1, Serial ATA x 6
- **PEAK 877VL2 (P/N : 10P0877VL00X0) RoHS Compliant**
PICMG 1.3 Full-Size SHB, Intel® LGA 1156, Core™ i7/i5/i3/Pentium® processors with Max 8GB DDR3 DIMM, VGA, Intel® 82574L PCI Express Gigabit Ethernet x 1, 82578DM Gigabit Ethernet x 1, Serial ATA x 6

CHAPTER 1: PRODUCT INTRODUCTION

Overview



Key Features

- Intel® Core™ i5/ i3/ Pentium Integrated Graphics (PEAK 876VL2)
 - Onboard XGI Z11 graphics for Intel® Core™ i7 processors (PEAK 877VL2)
- Intel® LGA 1156, Core™ i7/ i5/ i3/ Pentium®
- 1 x 82574 PCI Express Gigabit Ethernet
- 1 x 82578DM Gigabit Ethernet
- 6 x SATA, 8 x USB 2.0, 2 x COM, 1 x Parallel
- Non-ECC Dual Channel DIMM DDR3 1066/1333MHz up to 8GB
- Intel® AMT 6.0

Hardware Specifications

CPU

- Intel® LGA1156, Core™ i7/ i5/ i3/ Pentium® processors

Chipset

- Intel® Q57 Express Chipset PCH

Main Memory

- 2x 240-pin DDR3 DIMM sockets
- Supports up to 8GB 1066/1333 dual channel DIMM
- Supports non-ECC unbuffered DIMM

Onboard LAN

- 1 x Intel® 82578DM PHY for AMT 6.0
- 1 x Intel® 82574L PCI Express Gigabit Ethernet
- Support boot from LAN (PXE)
- 2x RJ45 with LED

Display

- PEAK 876VL2
 - Intel® Core™ i5/ i3/ Pentium® processors Integrated graphics
 - Analog display support up to 2048x1536 @ 75Hz for CRT
- PEAK 877VL2
 - Intel® Core™ i7/ i5/ i3/ Pentium® processors Integrated graphics
 - Integrated graphic engine by XGI Volari Z11 GPU with DDR2 SDRAM through PCIe x1 Interface
 - Analog VGA Interface: 230MHz pixel clocksupports CRT display up to 1600x1200 @ 70Hz 16M colors

I/O Interfaces

- USB 2.0: 8 ports (2 onboard, 4 to backplane), 2 ports through I/O bracket
- Serial port: 2 ports, with 2x5 pin headers (COM 1 and COM 2)
- SATA HDD: 6 ports (4 onboard, 2 to backplane), supports RAID 0/1/5/10 and Intel® Matrix Storage Technology (Intel® MST)
- Parallel port: 1 x 26-pin connector
- IrDA: 1 x 5-pin header
- GPIO: supports 4 sets of general purpose I/O each with TTL level (5V) interface
- Onboard buzzer x 1
- Power LED/Power On/Reset/SMBUS: 2x8 pin header
- 1 x 4-pin fan connector (for CPU); 1 x 3-pin fan connector (for System)
- IPMB interface through PICMG 1.3 Golden-finger
- I/O On SBC Bracket
 - 1 x VGA DB-15 connector
 - 2 x RJ45 Gigabit Ethernet LAN ports
 - 2 x USB 2.0 Ports

BIOS

- AMI BIOS
- Plug and play support
- Advanced Power Management and Advanced Configuration & Power Interface support

Watchdog Timer

- 1-minute increment from 1 to 255 minutes
- 1-second increment from 1 to 255 seconds
- On-chip RTC with battery backup
- 1 x External Li-Ion battery

System Monitor

- 4 Voltages (+3.3V, +5V, +12V, Vcore)
- 2 Temperatures (For CPU and System)
- 2 FAN speed monitors (1 for CPU and 1 for System FAN)

Power Input

- Power source from backplane through golden finger and AUX +12V
- Supports ATX/AT power supplies
- +12V/+5V/+3.3V/+5Vsb

Dimensions

- PICMG 1.3 SHB
- 338.58mm (L) x 126.39mm (W) (13.3" x 4.9")

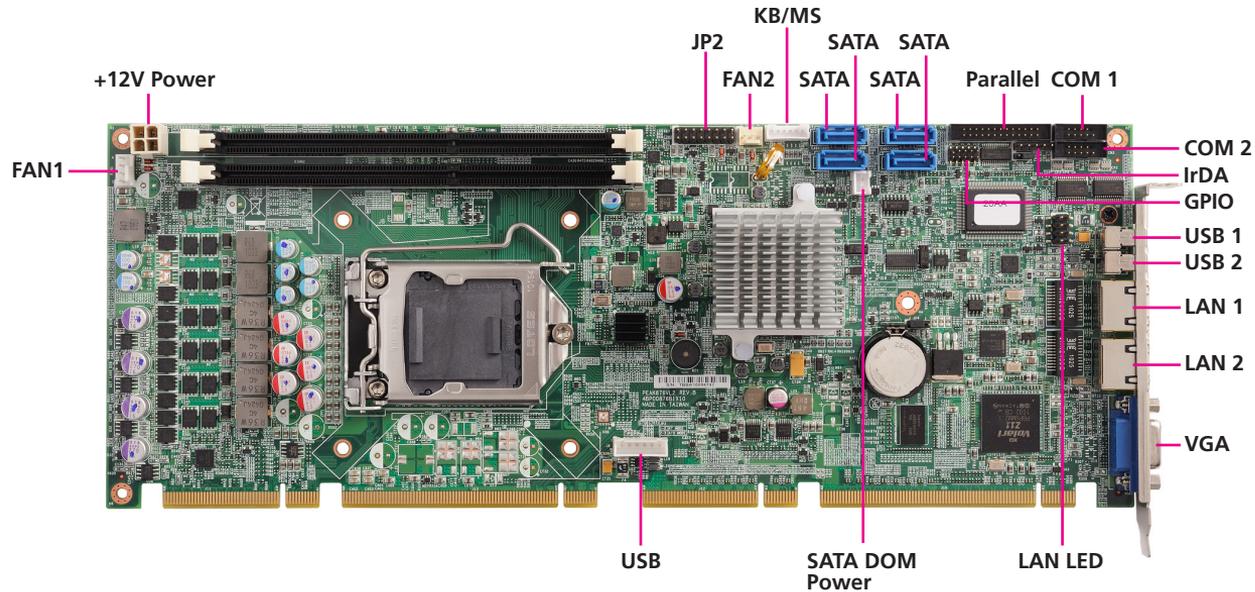
Environment

- Board level operating temperatures: 0°C to 60°C
- Storage temperature: -20°C to 85°C
- Relative humidity: 10% to 90%, (Non-condensing)

Certifications

- CE approval
- FCC Class A

Getting to Know PEAK 876VL2/877VL2



CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the PEAK 876VL2/877VL2 motherboard.

Before You Begin

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

tronic components. Humid environment tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

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

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

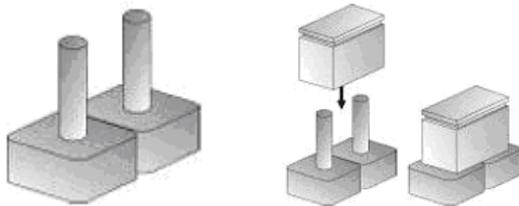
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

Jumper Settings

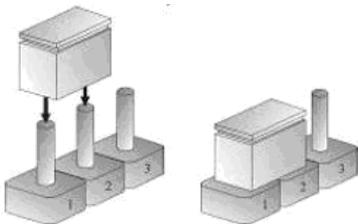
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is **short**. If you remove the jumper cap, or place the jumper cap on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

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

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

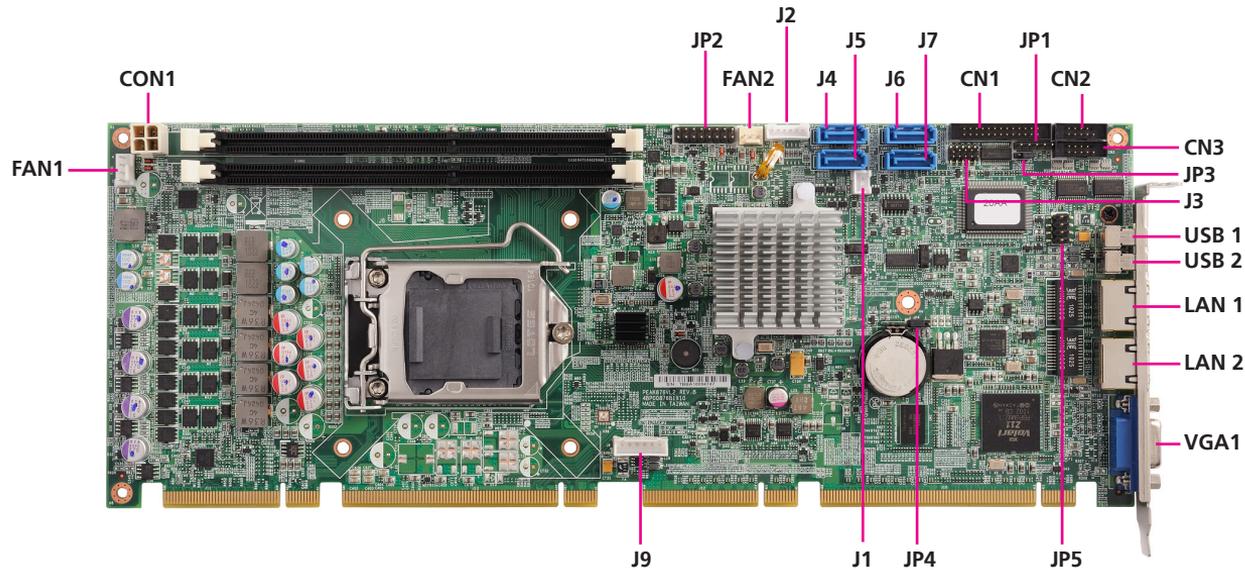


Three-Pin Jumpers: Pins 1 and 2 Are Short



Locations of the Jumpers and Connectors

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



Jumpers

CMOS Clear Select

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

Connector location: JP4

1  3

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

1-2 On: default

Pin	Definition
1	NC
2	RTCRST#
3	GND

Power Type Select

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

Connector location: JP3

1  3

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

Pin	Definition
1	AT_PWRBT#
2	PWRBT#
3	PWRBTOUT1

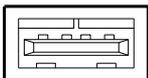
Connector Pin Definitions

External I/O Interfaces

USB 1 Port

Connector type: Single USB port, Type A

Connector location: USB1

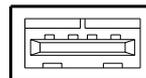


Pin	Definition	Pin	Definition
1	VCC5	MH1	GND
2	USB0N	MH2	GND
3	USB0P	MH3	GND
4	GND		

USB 2 Port

Connector type: Single USB port, Type A

Connector location: USB2

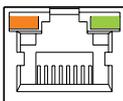


Pin	Definition	Pin	Definition
1	VCC5	MH1	GND
2	USB1N	MH2	GND
3	USB1P	MH3	GND
4	GND		

LAN 1 Port

Connector type: RJ45 port with LEDs

Connector location: LAN1

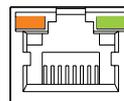


Pin	Definition	Pin	Definition
1	LAN1_M0P	2	LAN1_M0N
3	LAN1_M1P	4	LAN1_M2P
5	LAN1_M2N	6	LAN1_M1N
7	LAN1_M3P	8	LAN1_M3N
9	LAN1LINK#	10	3V3M_LAN
11	LAN1_LED_LNK#_ACT	12	3V3M_LAN
MH1	GND	MH2	GND

LAN 2 Port

Connector type: RJ45 port with LEDs

Connector location: LAN2

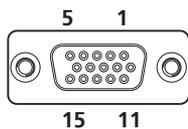


Pin	Definition	Pin	Definition
1	LAN2_M0P	2	LAN2_M0N
3	LAN2_M1P	4	LAN2_M2P
5	LAN2_M2N	6	LAN2_M1N
7	LAN2_M3P	8	LAN2_M3N
9	LAN2_LINK#	10	3VSB
11	LAN2_LED1	12	3VSB
MH1	GND	MH2	GND

VGA Port

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

Connector location: VGA1



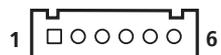
Pin	Definition	Pin	Definition
1	CRT_RED	2	CRT_GREEN
3	CRT_BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	5V	10	GND
11	NC	12	CRT_SDA
13	CRT_HSYNC	14	CRT_VSYNC
15	CRTDDCLK		

Internal Connectors

USB Connector

Connector type: 1x6 6-pin, 2.5 mm JST

Connector location: J9



Pin	Definition
1	VCC5
2	USB2N
3	USB2P
4	USB3N
5	USB3P
6	GND

PS/2 Keyboard/Mouse Connector

Connector size: 1x6 6-pin, 2.0 mm JST

Connector location: J2

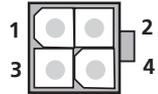


Pin	Definition	Pin	Definition
1	VCC5	2	KDAT
3	KCLK	4	MDAT
5	MCLK	6	GND

+12V Power Connector

Connector size: 2x2 4-pin Wafer (4.2mm)

Connector location: CON1

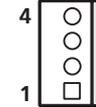


Pin	Definition
1	GND
2	GND
3	+12V
4	+12V

Smart Fan Connector

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

Connector location: FAN1



Pin	Definition
1	GND
2	+12V
3	S1_FANIO1
4	S1_FANPWM1

Fan Connector

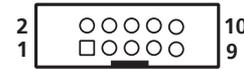
Connector type: 1x3 3-pin Wafer, 2.54 mm pitch
 Connector location: FAN2



Pin	Definition
1	GND
2	+12V
3	S1_FANIO3

COM 1 Connector

Connector type: 2x5 10-pin boxed header, 2.0 mm
 Connector location: CN3

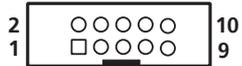


Pin	Definition	Pin	Definition
1	COM1DCD#	2	COM1RX
3	COM1TX	4	COM1DTR#
5	GND	6	COM1DSR#
7	COM1RTS#	8	COM1CTS#
9	COM1RI#	10	NC

COM 2 Connector

Connector type: 2x5 10-pin boxed header, 2.0 mm

Connector location: CN2

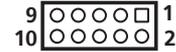


Pin	Definition	Pin	Definition
1	COM2DCD#	2	COM2RX
3	COM2TX	4	COM2DTR#
5	GND	6	COM2DSR#
7	COM2RTS#	8	COM2CTS#
9	COM2RI#	10	NC

GPIO Connector

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

Connector location: J3

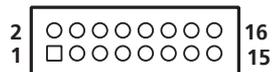


Pin	Definition	Pin	Definition
1	VCC5	2	GND
3	S1GPIO10	4	S1GPIO14
5	S1GPIO11	6	S1GPIO15
7	S1GPIO12	8	S1GPIO16
9	S1GPIO13	10	S1GPIO17

2x8 Pin Connector

Connector type: 2x8 16-pin header, 2.54 mm

Connector location: JP2



Pin	Definition	Pin	Definition
1	GND	2	VCC5
3	SATALED#	4	VCC5
5	GND	6	PWRBT#
7	GND	8	RESET#
9	VCC5	10	SMB_DATA
11	GND	12	SMB_CLK
13	GND	14	S1_VIN2
15	SPKR	16	SL_AGND

SATA DOM Power Connector

Connector type: 1x2 2-pin boxed header, 2.5 mm JST

Connector location: J1



Pin	Definition
1	VCC5
2	GND

IrDA Pin Header

Connector size: 1x5 5-pin, 2.54mm

Connector location: JP1

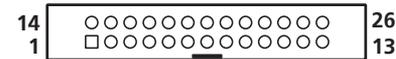


Pin	Definition
1	VCC5
2	S1CIRRX
3	S1RRX
4	GND
5	S1IRTX

Parallel Connector

Connector size: 2x13, 26-pin box header, 2.54 mm pitch

Connector location: CN1

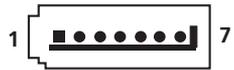


Pin	Definition	Pin	Definition
1	Line Print Strobe	14	Auto Feed#
2	Parallel Data 0	15	Error#
3	Parallel Data 1	16	Initialize#
4	Parallel Data 2	17	Select Input#
5	Parallel Data 3	18	GND
6	Parallel Data 4	19	GND
7	Parallel Data 5	20	GND
8	Parallel Data 6	21	GND
9	Parallel Data 7	22	GND
10	Acknowledge#	23	GND
11	Busy	24	GND
12	Paper empty	25	GND
13	Select	26	NC

SATA Port

Connector type: Standard Serial ATAII 7P (1.27mm, SATA-M-180)

Connector location: J4

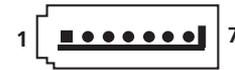


Pin	Definition
1	GND
2	TXP0
3	TXN0
4	GND
5	RXN0
6	RXP0
7	GND

SATA Port

Connector type: Standard Serial ATAII 7P (1.27mm, SATA-M-180)

Connector location: J5

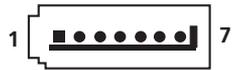


Pin	Definition
1	GND
2	TXP1
3	TXN1
4	GND
5	RXN1
6	RXP1
7	GND

SATA Port

Connector type: Standard Serial ATAII 7P (1.27mm, SATA-M-180)

Connector location: J6

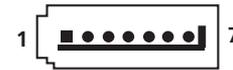


Pin	Definition
1	GND
2	TXP2
3	TXN2
4	GND
5	RXN2
6	RXP2
7	GND

SATA Port

Connector type: Standard Serial ATAII 7P (1.27mm, SATA-M-180)

Connector location: J7

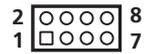


Pin	Definition
1	GND
2	TXP3
3	TXN3
4	GND
5	RXN3
6	RXP3
7	GND

LAN LED Connector

Connector size: 2x4, 8-pin box header, 2.54 mm pitch

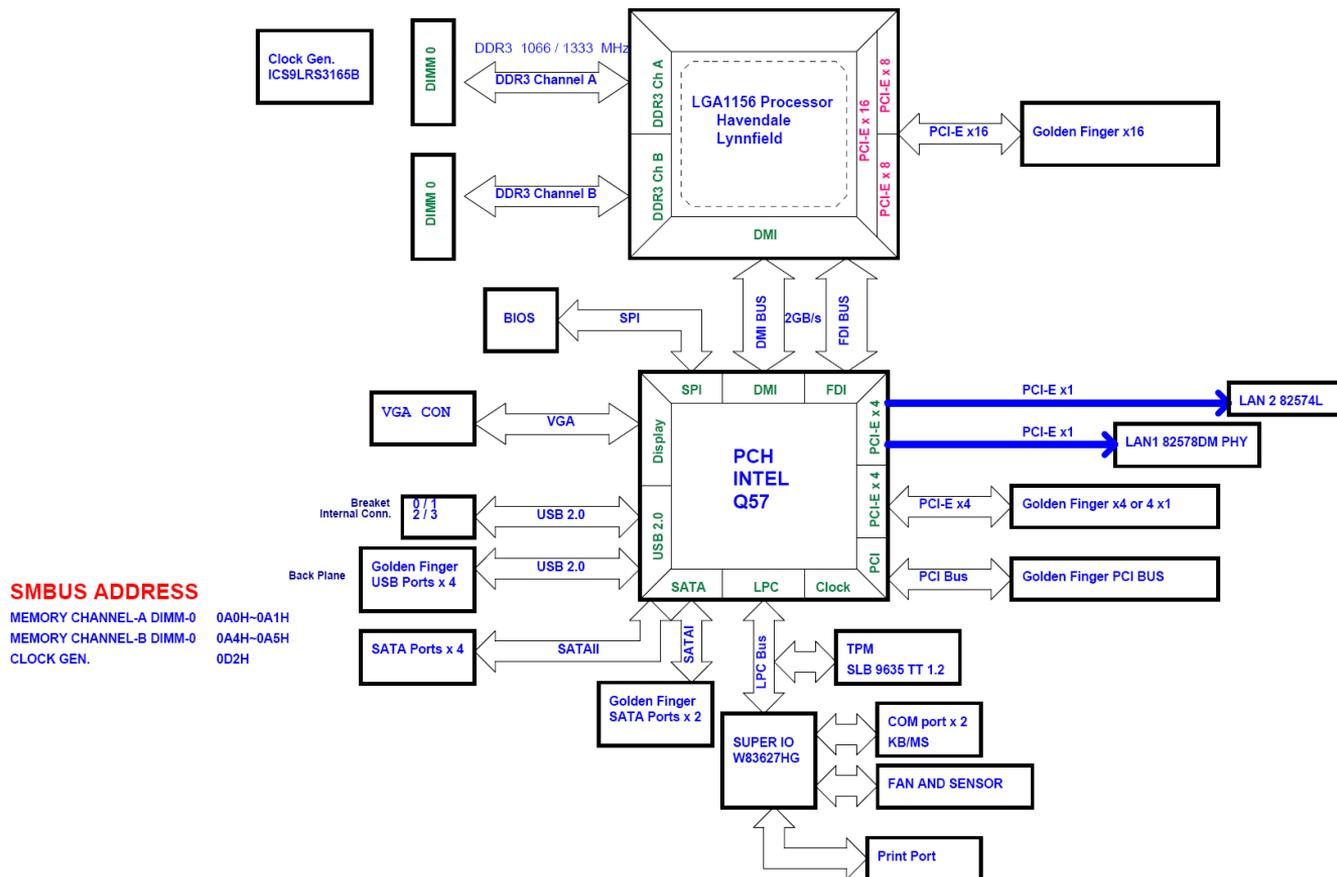
Connector location: JP5



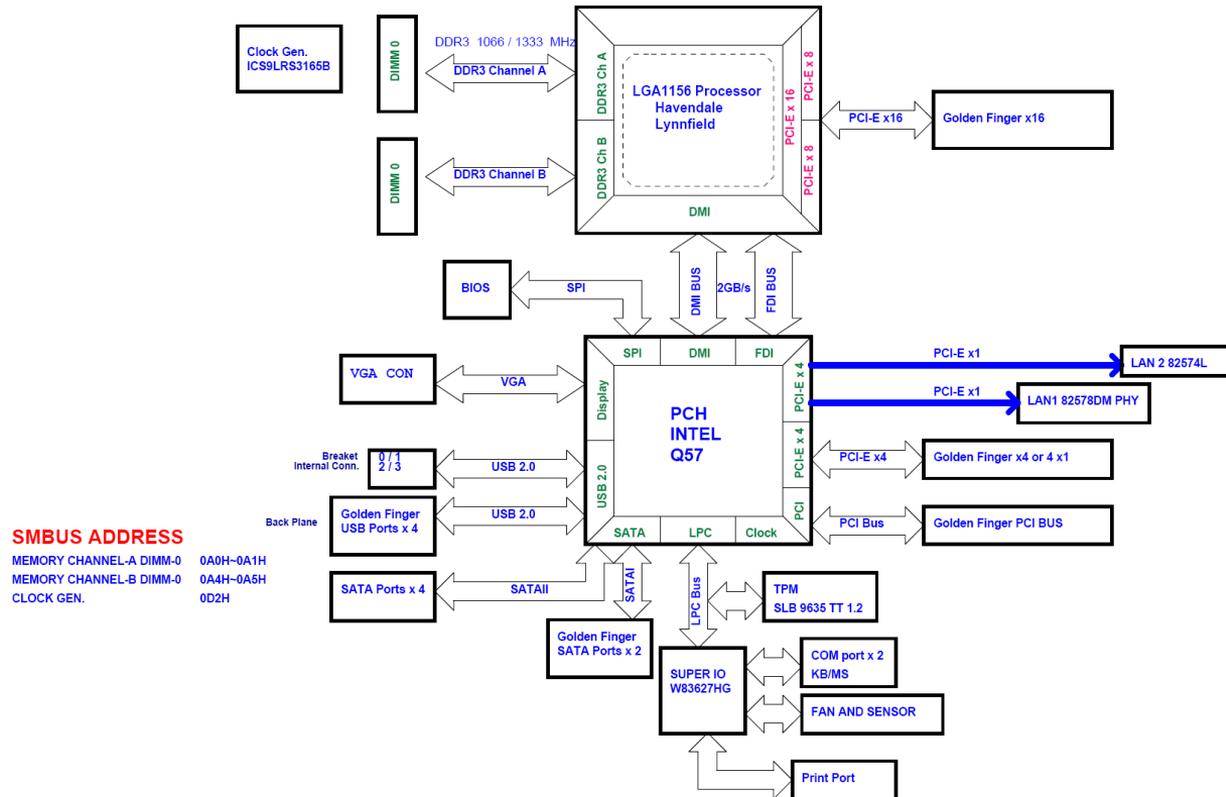
Pin	Definition	Pin	Definition
1	3V3M_LAN	2	LAN1_LED_LNK#_ACT
3	3V3M_LAN	4	LAN1LINK#
5	3VSB	6	LAN2_LED1
7	3VSB	8	LAN2_LINK#

Block Diagram

PEAK 876VL2



PEAK 877VL2



CHAPTER 3: BIOS SETUP

This chapter describes how to use the BIOS setup program for the PEAK 876VL2/877VL2. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

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

About BIOS Setup

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

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

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

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

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

When to Configure the BIOS

This program should be executed under the following conditions:

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

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

Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering Setup

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

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

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

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

Legends

Key	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the highlight up or down between sub-menus or fields.
<Esc>	Exits to the BIOS Setup Utility.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
<F1>	Displays General Help.
<F10>	Saves and exits the Setup program.
<Enter>	Press <Enter> to enter the highlighted sub-menu.

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

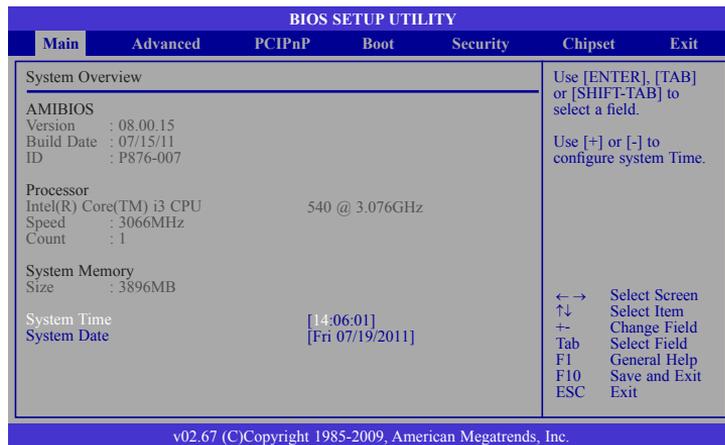
When "►" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from six setup functions and one exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the submenu.

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



AMI BIOS

Displays the detected BIOS information.

Processor

Displays the detected processor information.

System Memory

Displays the detected system memory information.

System 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.

System Date

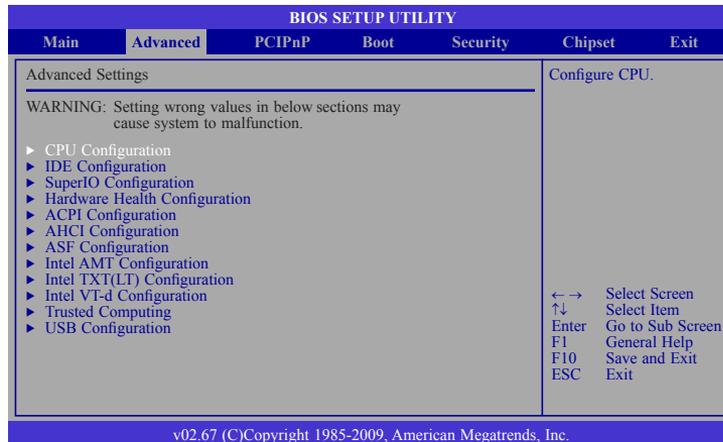
The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

Advanced

The Advanced menu 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.

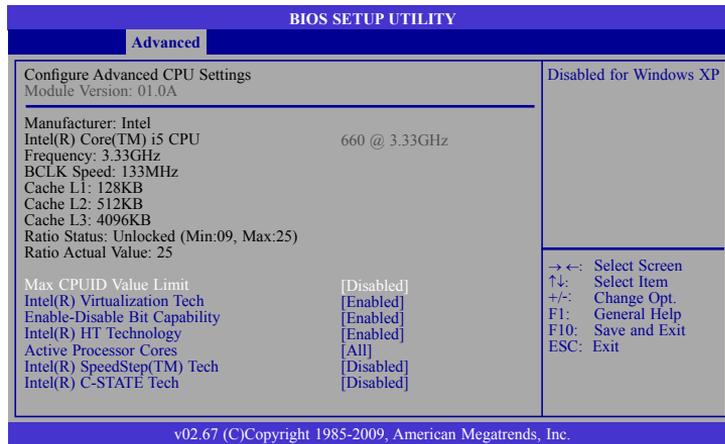


Setting incorrect field values may cause the system to malfunction.



CPU Configuration

This section is used to configure the CPU. It will also display detected CPU information.



Max CPUID Value Limit

Set this field to Disabled when using Windows XP. Set this field to Enabled when using legacy operating systems so that the system will boot even when it doesn't support CPUs with extended CPUID function.

Intel(R) Virtualization Tech

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

Execute-Disable Bit Capability

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

Intel(R) HT Technology

Enable this field for Windows XP and Linux which are optimized for Hyper-Threading technology. Select disabled for other OSes not optimized for Hyper-Threading technology. When disabled, only one thread per enabled core is enabled.

Active Processor Cores

Used to enter the number of cores to enable in each processor package.

Intel(R) SpeedStep(tm) Tech

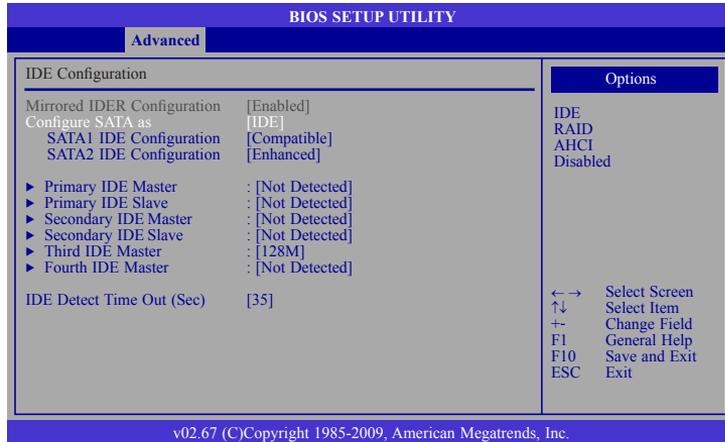
Enables or disables GV3.

Intel(R) C-STATE Tech

When enabled, CPU idle is set to C2/C3/C4.

IDE Configuration

This section is used to configure the IDE drives.



Mirrored IDER Configuration

The options are Enabled and Disabled.

Configure SATA As

IDE This option configures the Serial ATA drives as Parallel ATA physical storage device.

RAID This option allows you to create RAID or Intel Matrix Storage configuration on Serial ATA devices.

AHCI This option configures the Serial ATA drives to use AHCI (Advanced Host Controller Interface). AHCI allows the storage driver to enable the advanced Serial ATA features which will increase storage performance.

SATA1 IDE Configuration and SATA2 IDE Configuration

Configures the Serial ATA controller to Compatible or Enhanced mode

Primary IDE Master to Fourth IDE Master

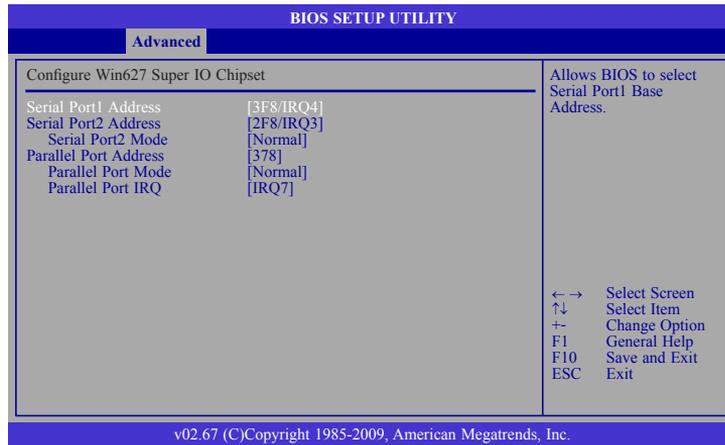
When you enter the BIOS Setup Utility, the BIOS will auto detect the existing IDE devices then displays the status of the detected devices. To configure an IDE drive, move the cursor to a field then press <Enter>.

IDE Detect Time Out (Sec)

Selects the time out value for detecting ATA/ATAPI devices.

Super IO Configuration

This section is used to configure the I/O functions supported by the on-board Super I/O chip.



Serial Port1 Address and Serial Port2 Address

- Auto The system will automatically select an I/O address for the on-board serial port.
- 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3 Allows you to manually select an I/O address for the onboard serial port.
- Disabled Disables the onboard serial port.

Serial Port2 Mode

COM port functions as a serial port or IrDA. You cannot use both at the same time.

- Normal Sets the COM port to serial port mode.
- IrDA Sets the COM port to IrDA mode.
- ASK IR Sets the COM port to ASK IR mode.

Parallel Port Address

This field is used to select an I/O address for the parallel port.

Parallel Port Mode

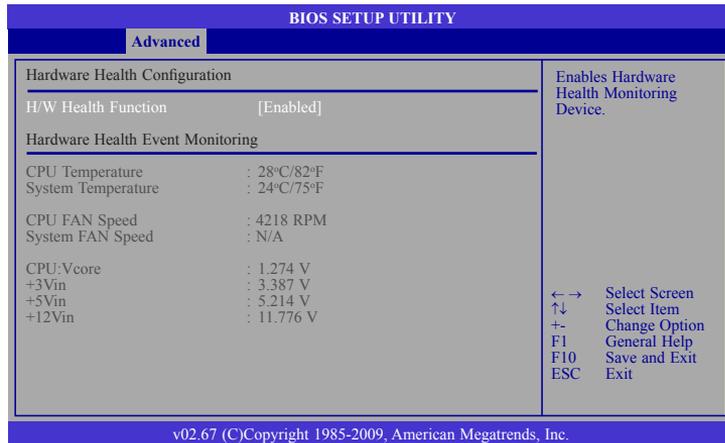
This field is used to select normal, ECP or EPP mode of the parallel port.

Parallel Port IRQ

This field is used to select an IRQ for the parallel port.

Hardware Health Configuration

This section is used to configure the hardware monitoring events such as temperature, fan speed and voltages.



H/W Health Function

Enables or disables the hardware monitoring function.

CPU Temperature and System Temperature

Detects and displays the current temperature of the CPU and the internal temperature of the system.

CPU Fan Speed and System Fan Speed

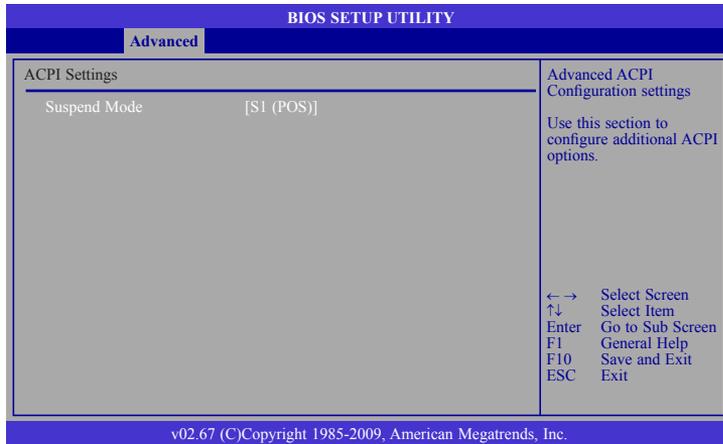
Detects and displays the fan speed.

CPU:Vcore to +12Vin

Detects and displays the output voltages.

ACPI Configuration

This section is used to configure the ACPI features.



Suspend Mode

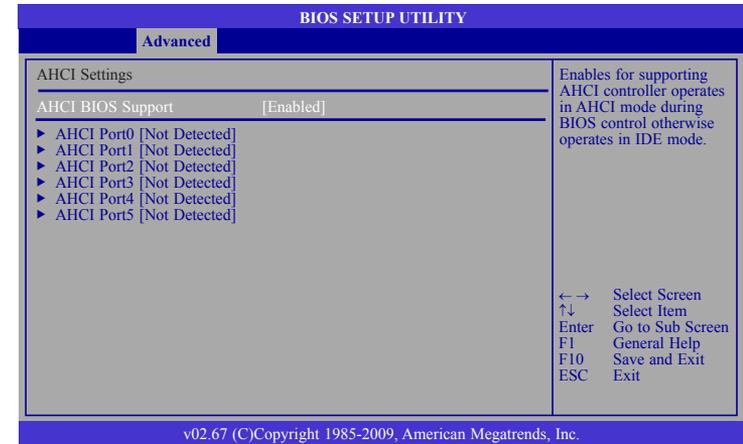
Selects the highest ACPI sleep state the system will enter when the Suspend button is pressed.

S1(POS) Enables the Power On Suspend function.

S3(STR) Enables the Suspend to RAM function.

AHCI Configuration

This section is used to configure the AHCI features.

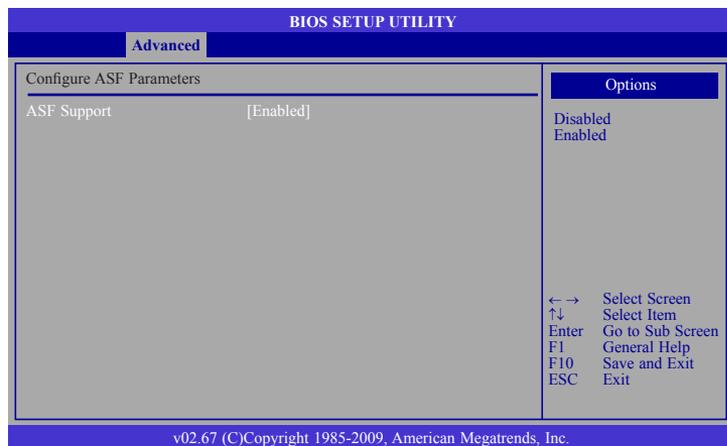


AHCI BIOS Support

Enables the AHCI controller to operate in AHCI mode.

ASF Configuration

This section is used to configure the ASF features.

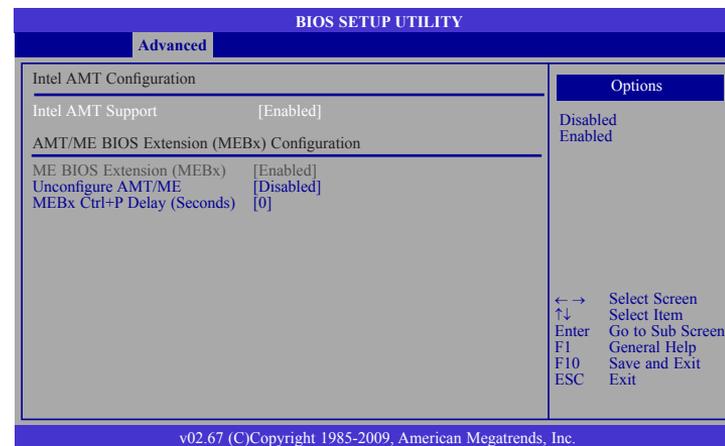


ASF Support

Enables or disables the ASF feature.

Intel AMT Configuration

This section is used to configure the AMT features.



Intel AMT Support

Enables or disables the AMT function.

ME BIOS Extension (MEBx)

Enables or disables the ME BIOS Extension.

Unconfigure AMT/ME

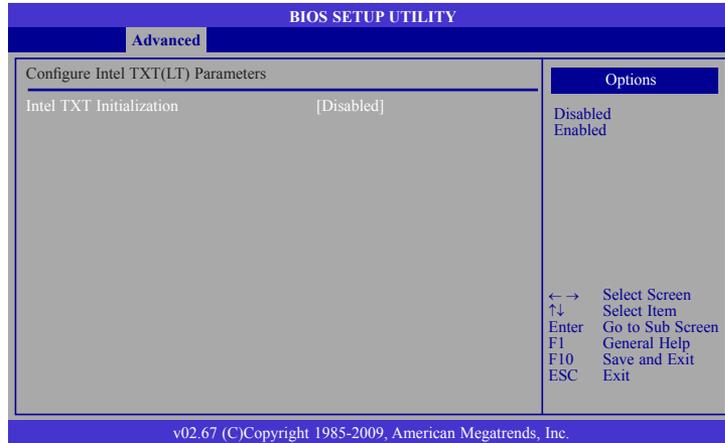
Used to unconfigure AMT/ME even without a password.

MEBx Ctrl+P Delay (Seconds)

Selects the MEBx delay time.

Intel TXT(LT) Configuration

This section is used to configure the Intel TXT(LT).

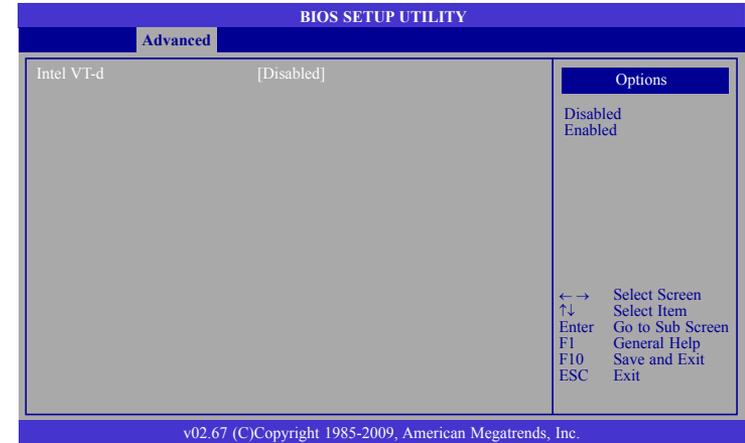


Intel TXT Initialization

Enables or disables Intel TXT(LT).

Intel VT-d Configuration

This section is used to configure the Intel VT-d.

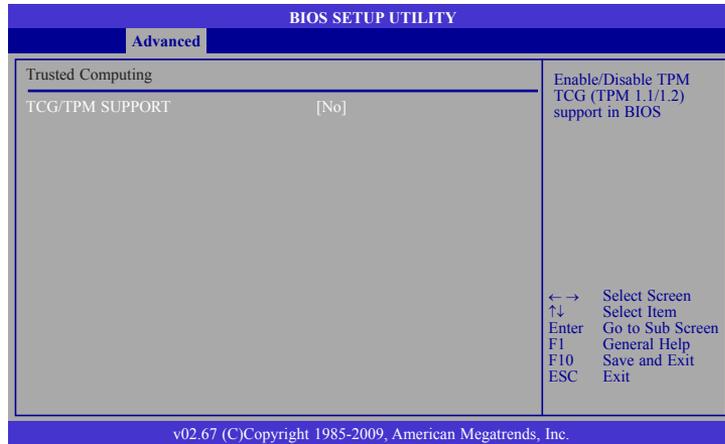


Intel VT-d

Enables or disables Intel VT-d.

Trusted Computing

This section is used to configure Trusted Computing.

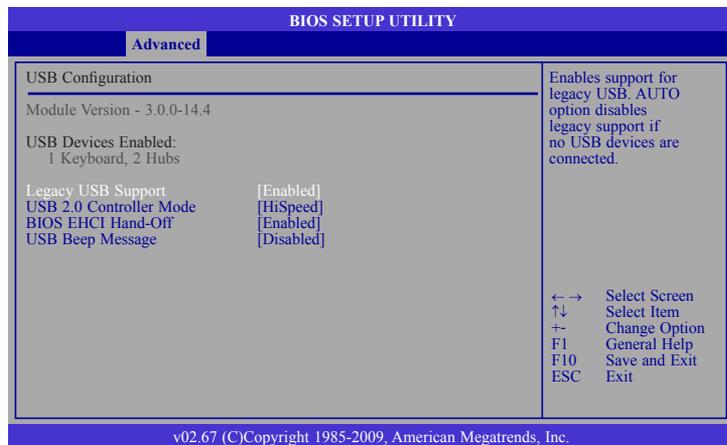


TCG/TPM Support

Enables or disables TPM TCG support in the BIOS.

USB Configuration

This section is used to configure USB devices.



Legacy USB Support

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 2.0 Controller Mode

Sets the USB 2.0 controller mode to HiSpeed (480 Mbps) or FullSpeed (12 Mbps).

BIOS EHCI Hand-Off

Enable this field when using operating systems without the EHCI hand-off support.

USB Beep Message

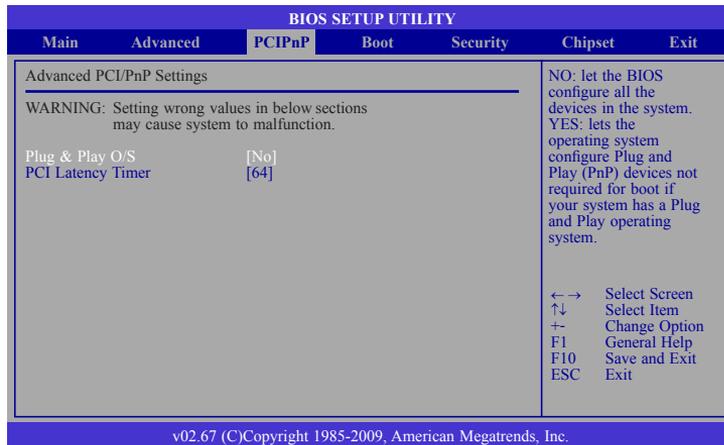
Enables or disables the USB beep message.

PCIPnP

This section is used to configure settings for PCI/PnP devices.



Setting incorrect field values may cause the system to malfunction.



Plug & Play O/S

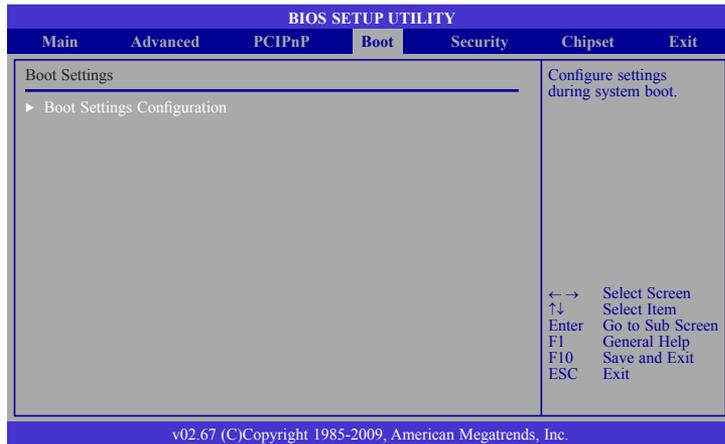
Yes Configures Plug and Play (PnP) devices that are not required to boot in a Plug and Play supported operating system.

No The BIOS configures all the devices in the system.

PCI Latency Timer

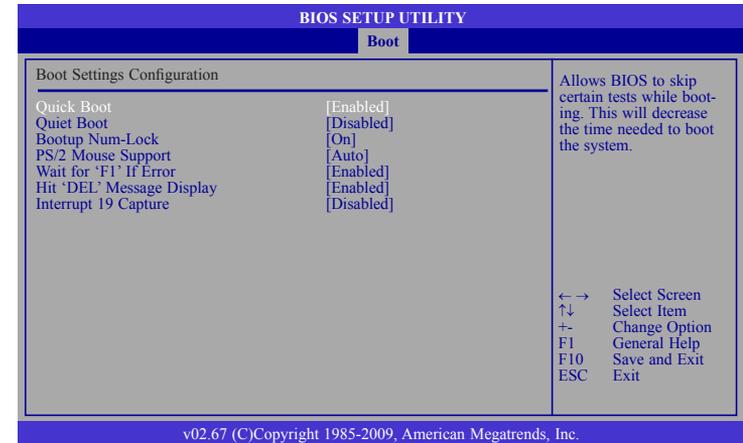
This feature is used to select the length of time each PCI device will control the bus before another takes over. The larger the value, the longer the PCI device can retain control of the bus. Since each access to the bus comes with an initial delay before any transaction can be made, low values for the PCI Latency Timer will reduce the effectiveness of the PCI bandwidth while higher values will improve it.

Boot



Boot Settings Configuration

This section is used to configure settings during system boot.



Quick Boot

When Enabled, the BIOS will shorten or skip some check items during POST. This will decrease the time needed to boot the system.

Quiet Boot

Enabled Displays OEM logo instead of the POST messages.
 Disabled Displays normal POST messages.

Bootup Num-Lock

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

PS/2 Mouse Support

Enables or disables the PS/2 mouse.

Wait for 'F1' If Error

When enabled, the system will wait for the <F1> key to be pressed when an error occurs.

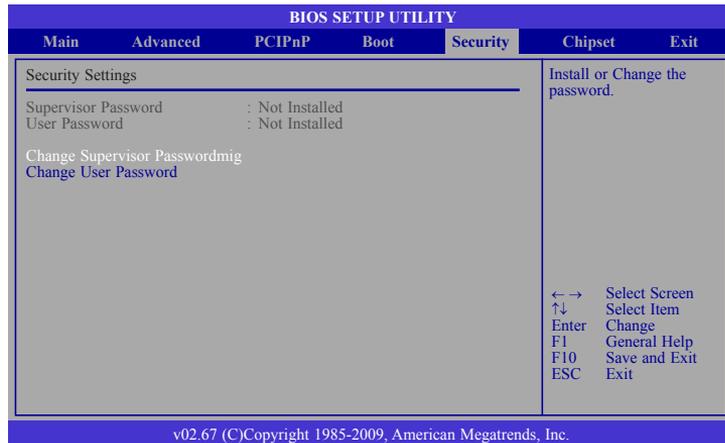
Hit 'DEL' Message Display

When enabled, the system displays the "Press DEL to run Setup" message during POST.

Interrupt 19 Capture

When enabled, it allows the optional ROM to trap interrupt 19.

Security



Change Supervisor Password

This field is used to set or change the supervisor password.

To set a new password:

1. Select the Change Supervisor Password field then press <Enter>.
2. Type your password in the dialog box then press <Enter>. You are limited to eight letters/numbers.
3. Press <Enter> to confirm the new password.
4. When the Password Installed dialog box appears, select OK.

To change the password, repeat the same steps above.

To clear the password, select Change Supervisor Password then press <Enter>. The Password Uninstalled dialog box will appear.

If you forgot the password, you can clear the password by erasing the CMOS RTC (Real Time Clock) RAM using the RTC Clear jumper. Refer to chapter 2 for more information.

Change User Password

This field is used to set or change the user password.

To set a new password:

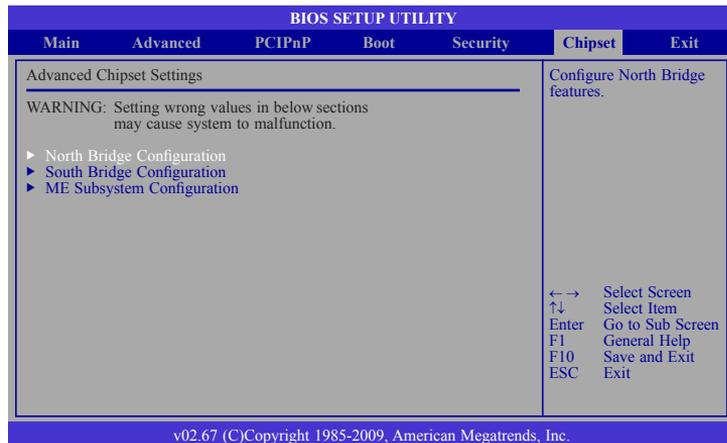
1. Select the Change User Password field then press <Enter>.
2. Type your password in the dialog box then press <Enter>. You are limited to eight letters/numbers.
3. Press <Enter> to confirm the new password.
4. When the Password Installed dialog box appears, select OK.

Chipset

This section is used to configure the system based on the specific features of the chipset.

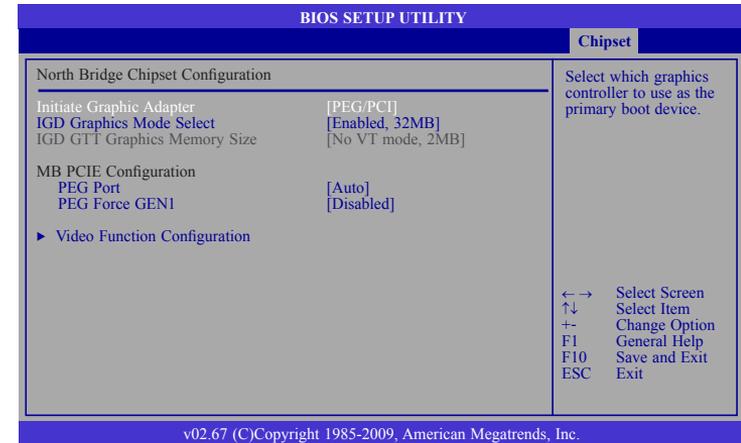


Setting incorrect field values may cause the system to malfunction.



North Bridge Configuration

This section is used to configure the north bridge features.



Initiate Graphic Adapter

Selects the graphics controller to use as the primary boot device.

IGD Graphics Mode Select

Selects the amount of system memory used by the internal graphics device.

IGD GTT Graphics Memory Size

Selects the internal graphics device's shared memory size.

PEG Port

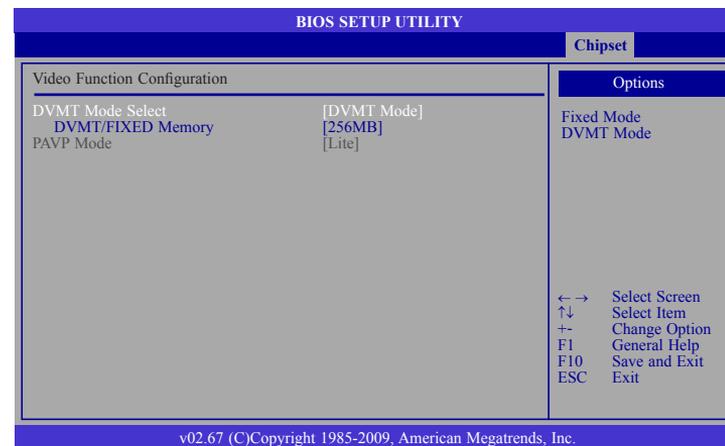
Enables or disables the PCI Express port.

PEG Force Gen1

Enables or disables the PCI Express port Force Gen1.

Video Function Configuration

This section is used to configure the north bridge features.



DVTM Mode Select

The options are Fixed mode and DVTM mode.

DVTM/Fixed Memory

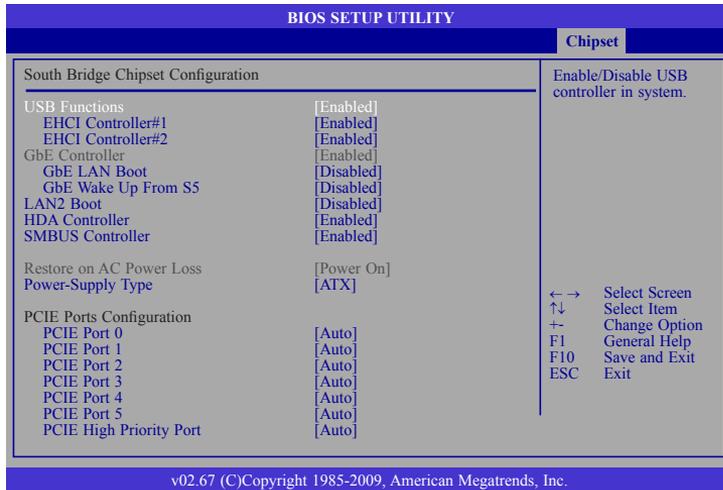
This field is used to select the graphics memory size used by DVTM/Fixed mode.

PAVP Mode

Configures the PAVP mode.

South Bridge Configuration

This section is used to configure the south bridge features.



USB Functions

Enables or disables the USB controller.

EHCI Controller#1 and EHCI Controller#2

Enables or disables the Enhanced Host Controller Interface (USB 2.0).

GbE Controller

Enables or disables the Gigabit LAN controller.

GbE LAN Boot

Select Enabled to allow the system to boot from LAN.

GbE Wake Up From S5

Select Enabled to allow the system to wake up from S5 using LAN.

LAN2 Boot

Select Enabled to allow the system to boot via LAN2.

HDA Controller

Enables or disables the HDA controller.

SMBUS Controller

Enables or disables the SMBUS controller.

Restore on AC Power Loss

- Power 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.
- Power 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.

Power-Supply Type

Selects the type of power used.

PCI Express Port 0 and PCI Express Port 5

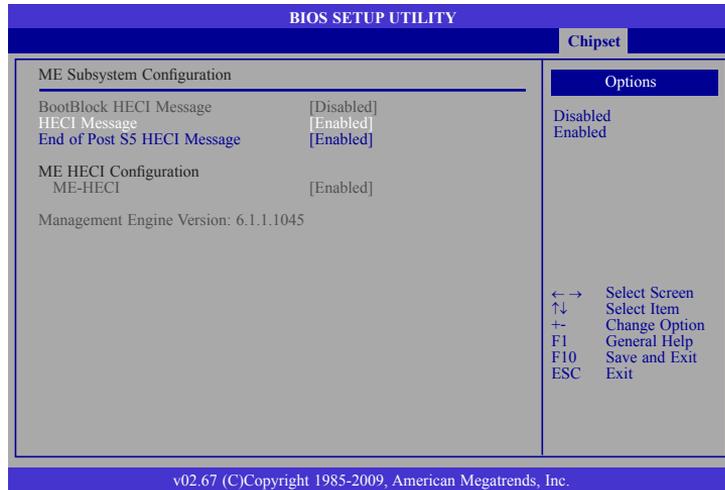
Enables or disables the PCI Express port.

PCI Express High Priority Port

Selects the USB port to detect first.

ME Subsystem Configuration

This section is used to configure the south bridge features.



ME-HECI

Enables or disables ME-HECI.

BootBlock HECI Message

Enables or disables the BootBlock HECI message.

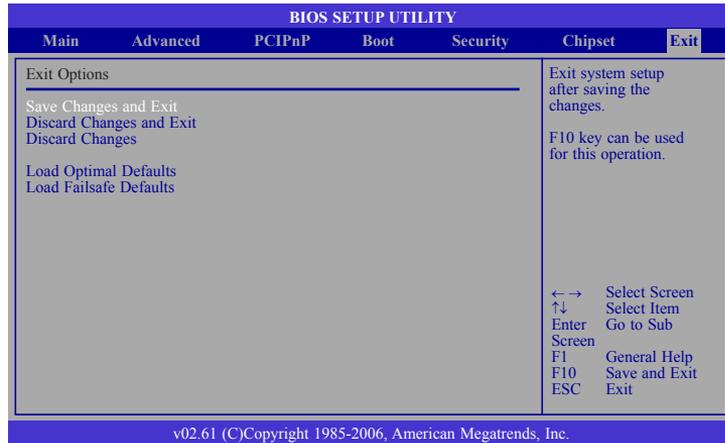
HECI Message

Enables or disables the HECI message.

End of Post S5 HECI Message

Enables or disables the end of post message.

Exit



Save Changes and Exit

To save the changes and exit the Setup utility, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes. You can also press <F10> to save and exit Setup.

Discard Changes and Exit

To exit the Setup utility without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting. You can also press <ESC> to exit without saving the changes.

Discard Changes

To discard the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes to discard all changes made and restore the previously saved settings.

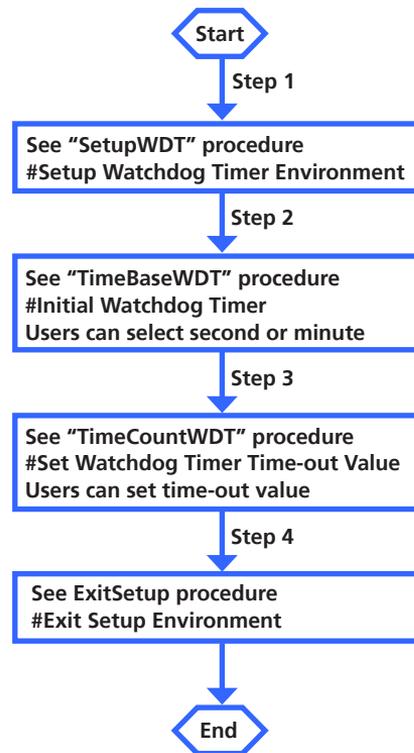
Load Optimal Defaults

Loads the optimal default values from the BIOS ROM.

Load Failsafe Defaults

Loads the optimal default values from the BIOS ROM.

APPENDIX A: WATCHDOG TIMER SETTING



```

SetupWDT      PROC
    mov     dx, 2eh
    mov     al, 087h
    out     dx, al
    nop
    nop
    out     dx, al          ;Write operations to special address port
(2E) for entering MB PnP Mode.

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

```

```

=====
TimeBaseWDT   PROC
    mov     al, 0F5h
    out     2eh, al
    mov     al, 04h      ; Here!! set 04h for second, set 0Ch for
minute(WDT output through WDTO)
    out     2fh, al
    ret
TimeBaseWDT   ENDP

```

```

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

```

```

    out     2fh, al
    ret
TimeCountWDT  ENDP

```

```

=====
ExitSetup PROC
    mov     al, 0AAh
    out     2eh, al
    ret
ExitSetup ENDP
=====

```

APPENDIX B: POWER CONSUMPTION

Power Consumption

Onboard Chips	Vcore 1.1	+1.05V	+1.5V	+1.8V	VTT	+3.3V	+5V	VAXG	+12V	0.75V	5VSB	3VSB
CPU 95W	100			2.3	35			20				
DDRIII DIMM 2x 3.163W			16.5							1.25		
Q57 (PCH) 4.766W		7.8		0.2		0.45	0.01				0.01	0.5
Clock Gen (ICS9LR3165B)						0.3						
82574LX2 0.73X2=1.46W												0.6
FAN 2x							1		1			
Super IO (W83627HG-AW) 0.3W							0.06					
Z11						1						
SATA DOM							0.6					
USB 4x							2					
PS/2 (KB/MS)							0.5					
Total Consumption (A)	100	7.8	16.5	2.5	35	1.75	4.7	20	1	1.25	0.01	1.1
Total Watt (Unit:W)	100	8.2	25	4.5	35	5.8	23.5	20	12	1	0.05	3.43
Source Power	+12V	VCC5	+12V	VCC5	+12V	VCC3	VCC5	+12V	+12V	+12V	5VSB	VCC3
Source Power Current (A)	12	3.6	2.56	1.5	10.6	1.75	4.7	2.6	1	0.1	0.01	1.1

Power Supply Must Consumed Watts and Currents

Power Type	ATX Power Supply			
	12VDC	5VDC	3.3VDC	5VSB
Consumed Watts (W)				
Consumed Currents	28.86	9.8	2.85	0.01
Actual Required Currents	36.1	12.25	3.56	0.0125
Actual Required Watt (W)	433.2	61.25	11.75	0.0625

APPENDIX C: GPIO PROGRAMMING GUIDE

PEAK 876VL2 GPIO

PIN	Description	PIN	Description
1	+5V	2	GND
3	GPI10	4	GPO14
5	GPI11	6	GPO15
7	GPI12	8	GPO16
9	GPI13	10	GPO17

SetGPIO PROC

```

mov     dx, 2eh
mov     al, 087h
out     dx, al
nop
nop
mov     dx, 2eh
mov     al, 087h
out     dx, al    ;Enter MB PnP Mode.

mov     al, 07h
out     2eh, al
mov     al, 07h    ;Select logical device for GPIO1.
out     2fh, al

```

```
ret
```

SetGPIO ENDP

=====

```

GetInput      PROC
    mov     al, 0F1h
    out    2eh, al
    in     2fh          ;Get GPIO1 input values.
    ret

```

```
GetInputENDP
```

Bit0 : GPI10

Bit1 : GP I11

Bit2 : GP I12

Bit3 : GP I13

Bit4 : Don't care

Bit5 : Don't care

Bit6 : Don't care

Bit7 : Don't care

```
=====
SetOutput      PROC
```

```

    mov     al, 0F1h
    out    2eh, al
    mov     al, 0xxh
    out    2fh, al    ;Set GPIO1 output values.
    ret

```

```
SetOutput      ENDP
```

```
xxh
```

Bit0 : Don't care

Bit1 : Don't care

Bit2 : Don't care

Bit3 : Don't care

Bit4 : GPO14

Bit5 : GPO15

Bit6 : GPO16

Bit7 : GPO17

```
ExitSetup      PROC
```

```
    mov     al, 0AAh
```

```
    out    2eh, al
```

```
    ret
```

```
ExitSetup      ENDP
```