

# **PCI - 960 Board**

User's Manual  
Version 1.02

Kontron Embedded Computers GmbH

0-0096-3989



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## 2. Introduction

Kontron Embedded Computers would like to point out that the information contained in this manual may be subject to technical changes, particularly as a result of continuous upgrades.

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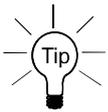
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## 2.1. Symbols used in this Manual

Symbol	Meaning
	This symbol indicates the danger of injury to the user or the risk of damage to the product if the corresponding warning notices are not observed.
	This symbol indicates that the product or parts thereof may be damaged if the corresponding warning notices are not observed.
	This symbol refers to general information on the device and manual.
	This symbol comes before useful information and tips for routine operation.
<i>format a:</i>	Commands are printed in <i>Courier</i> .

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Other product names cited in this manual may also be trademarks and are used here solely for identification purposes.

## 3. Safety Instructions

### 3.1. Safety Instructions for the Lithium Battery

The PCI-960 board is equipped with a Lithium battery. For the replacing of this battery please observe the instructions described in the chapter 10.1.4.1 "Replacing the Lithium Battery".

**Caution!**

Danger of explosion when replaced with wrong type of battery. Replace the battery only with UL listed Lithium battery that has the same or equivalent type recommended by Kontron.



Do not dispose of lithium batteries in domestic waste. Dispose of the battery according to the local regulations dealing with the disposal of these special materials (e.g. to the collecting points for the disposal of batteries).

### 3.2. Basic Safety and EMC Compatibility

The PCI-960 board is a fixed component that shall be installed into a stationary system by applying good engineering practices and respecting the information on the intended use of the components with a view to meeting the protection requirements [refer to (a) and (b)].

The PCI-960 board was designed and manufactured, having regard to the state of the art, as to ensure that:

- (a) the electromagnetic disturbance generated does not exceed the level above which radio and telecommunications equipment or other equipment cannot operate as intended;
- (b) it has a level of immunity to the electromagnetic disturbance to be expected in its intended use which allows it to operate without unacceptable degradation of its intended use.

The PCI-960 board was designed, manufactured and checked according to the basic safety requirements in the scope of the low-voltage (LVD) directive.

## 4. Important Instructions

The manufacturer's instructions provide useful information on your PCI-960 board.



### 4.1. Electrostatic Discharge (ESD)

The components on the board are sensitive to static electricity. Care must therefore be exercised at all times during handling and inspection of the PCI-960 board, in order to ensure the product integrity.

- Do not handle this product while it is outside its protective enclosure, while it is not used for operational purposes, unless it is otherwise anti-static protected.
- Unpack or install this product only at EOS/ESD safe workstations. When safe work station are not guaranteed, it is important for the user to be electrically discharged before touching the PCI-960 board with his/her hands or tools. This is most easily done by touching a metal part of your system housing.
- Only hold the assemblies at the edge.
- Do not touch any connection pins or conductors on the assembly.

### 4.2. Note on the Warranty

Due to their limited service life, parts which, by their nature, are especially subject to wear (wearing parts) are not included in the guarantee beyond the legal stipulations. This applies to the batteries, for example.

### 4.3. Exclusion of Accident Liability Obligation

Kontron Embedded Computers shall be exempted from the statutory accident liability obligation if the user fails to observe the safety instructions.

### 4.4. Liability Limitation / Exemption from the Warranty Obligation

In the event of damage to the device caused by failure to observe the hints in this manual and eventually on the device (especially the safety instructions), Kontron Embedded Computers shall not be required to honor the warranty even during the warranty period and shall be exempted from the statutory accident liability obligation.

### 4.5. General Instruction on Usage

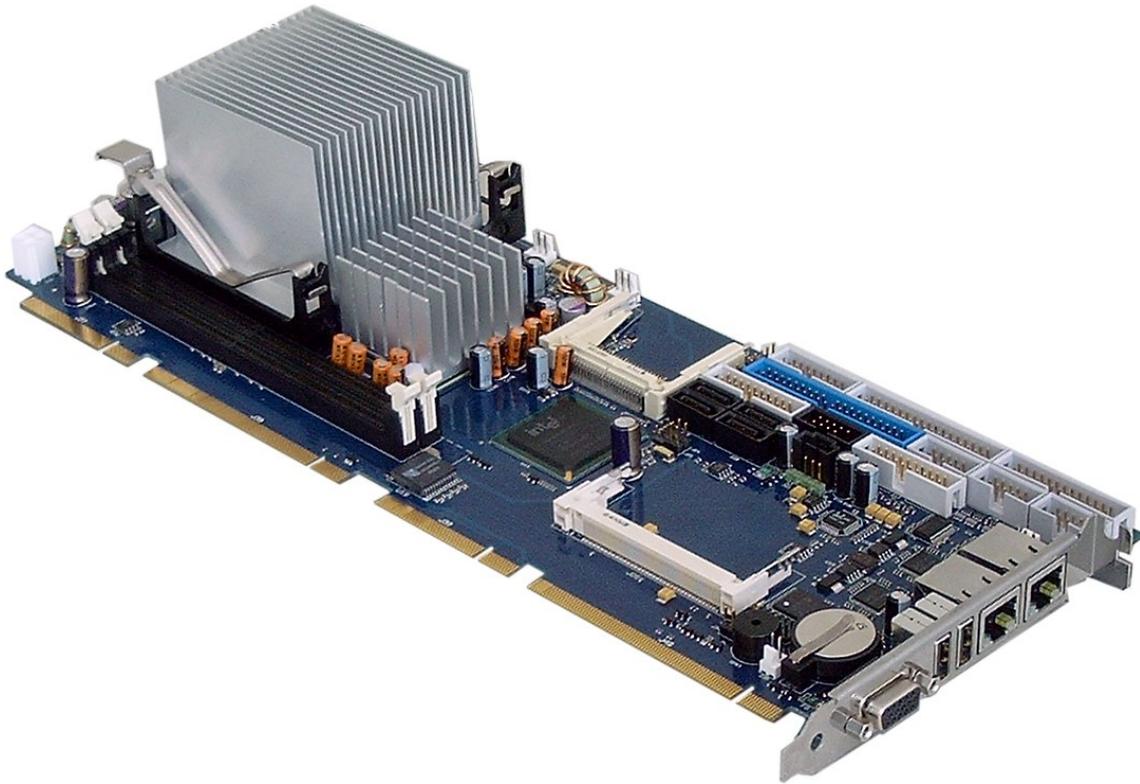
In order to ensure safe operation, the user must observe the instructions and warnings contained in this manual.

- The PCI-960 board must be used in accordance with the instructions for use.
- The PCI-960 board is designed to be built-in to a system, which fulfill all necessary technical and environmental requirements.
- When installing the board into a system, ensure that the system is switched off and the systems power cord is disconnected from the power source. Disconnect all cable connections of peripheral devices from the system.
- Ensure that the DC operating voltages adheres to the specification given in the "Electrical Specifications".
- Only devices and components which fulfill the requirements of a SELV circuit (security extra low voltage) in accordance with IEC / EN 60950-1 may be connected to the interfaces of the PCI-960 board.
- If extensions are made to the PCI-960 board, the legal stipulations and the board specifications must be observed.

## 5. Scope of Delivery

Please check that your package is complete, and contains the items below (according to the ordered unit configuration).  
If you discover damaged or missing items, please contact your dealer.

- 1x PCI-960 Board PICMG 1.0 (full-size)



*Fig. 1: PCI-960 board*

### Optional

- 1x Cable Set (Accessories)
- 1x Multimedia Bracket

## 5.1. Labeling Information

Two types of printed labels on the PCI-960 board must show the following information:

1. Board identification label that has implemented: Board Designation/Serial Number/Part Number/Product Revision/QM-Field/Bar Code/Datamatrix Code
2. 3x MAC-Address Label

## 6. Board Description

The PCI-960 is a multifunctional full-size PICMG 1.3 Slot-CPU, designed for use in highly integrated platforms for a wide range of application.

Depending on the ordered configuration, the board can be equipped with an "Intel® Core™ Duo/Solo" or an "Intel® Core 2 Duo" processor. Adopting the Intel® 945GM in combination with Intel® ICH7R chipset the board provides a PSB (Processor Side Bus) of 667 MHz and a 32 bit @ 33MHz PCI-Bus.

This generic processing engine board is targeted at a broad range of applications requiring PCI-, PCIe x1- , PCIe x16-Bus support with low power while offering high performance processing, and with a good graphic solutions in a full-size environment.

The implemented Intel® 945GM chipset provides up to 2x 2GB DDR2 SDRAM (Double DATA Rate, second generation) memory.

The Intel® 945GM includes the "Intel® Gen 3.5 Integrated Graphics Engine", that offers 2D and 3D graphic acceleration and supports analog (VGA).

One PCIe x16 for external PCI Express-based graphics card (routed to the PICMG1.3 edge connector). LVDS and TV-out are also supported by the integrated graphics.

The used Intel® ICH7R supports one onboard IDE channel (IDE 0) [up to two IDE-devices (1x "Master", 1x "Slave")] and four SATA II channels. Each of the four SATA ports (two of them on-board and two routed to the PICMG 1.3 edge connector) supports one storage device such as: hard disk, DVD, CD-ROM, etc. The SATA connectors feature the clamp and latch design.

The ICH7R provides support for Intel® Matrix Storage Technology providing integrated RAID functionality (RAID 0, 1, 5 and 10). Several options for RAID (Redundant Array of Independent Disks) configuration are available in order to meet the needs of the end user.

The CompactFlash is shared with the IDE channel.

The supported USB 2.0 ports, serial ports and intrusion alarm connector (Intruder) offer more flexibility for the configuration of your system. The ALC655 is an AC'97 compatible Audio Codec and supports audio from ICH7R chipset providing analog Line-in/out, Mic-In, SPDIF and CD-In on-board connectors.

Other function consists of two Realtek RTL8111B Gigabit Ethernet Controllers for the 10/100/1000 Base-TX Gigabit Ethernet LAN ports. Each Gigabit Ethernet Controller is connected to a dedicated PCI Express x1 interface of the ICH7R chipset.

A third Gigabit Ethernet interface is supported (routed to the PICMG 1.3 edge connector) via PCI Bus and one Realtek RTL8110S Ethernet controller.

A 32 bit MiniPCI expansion slot is available for feature extension such as wireless LAN, DES, modem or capture card.

The PCI-960 always requires a backplane for powering.

## 7. Features

### Form Factor:

- Full size SHB PICMG 1.3 form factor (13.33 x 4.98 inch).

### Processor:

Intel® Core™ Duo/Solo (Code name: Yonah DC/ Yonah SC), or Intel® Core 2 Duo (Code name Merom) 65 nm,

- FSB of 533 or 667MHz
- In 478-pin µFCPGA package
- Up to 2MB L2 Cache
- CPU temperature is displayed in the BIOS

### Chipset:

Intel® 82945GM in 1466 balls µFCBGA package

I/O Controller Hub ICH7R (Intel® 82 801GR) in 652-pin mBGA

### System Memory

- Supports single/dual-channel DDR2-SDRAM
- Up to 4.0 GB at 400 MHz, 533 MHz or 667 MHz DDR2 SDRAM on up to two 240-pin DIMM socket; minimum memory supported is 128 MB
- Memory type: 256-Mb, 512-Mb and 1-Gb DDR2 SDRAM, using x8 or x16 devices
- SPD (Serial Presence Detect) scheme for DIMM detection

### Internal Graphics

2D Graphics Engine/3D Graphics Engine (Intel® 3.5 Gen)

- Max memory allocation support based on total system memory
- 400-MHz integrated RAMDAC that can drive a standard progressive scan analog monitor with pixel resolution up to 2048x1536 pixel (QXGA)
- Dedicated CRT interface with data-interface control: (15-pin SUB-D connector on I/O panel)
- Dual channel LVDS interface: (JILI on-board connector, 40-pin)
- TV-Out interface: (4-pin header on board) can be used with the additional Kontron Multimedia bracket)

#### 7.1.1.1. I/O Controller Hub ICH7R (Intel® 82 801GR)

The integrated Intel® Active Management Technology supports RAID functionality (RAID 0, 1, 5 and 10)

#### 7.1.1.2. Super-I/O

Winbond W83627HF with integrated hardware monitor

- Compliant with Microsoft PC98/PC99 Hardware Design Guide
- LPC-based Super-I/O, 2x COM, 1x LPT, PS/2-Keybaord, PS/2 Keyb.-Lock and PS2-Mouse, Floppy-Disk-Controller, System-Control ACPI, Watchdog, Hardware-Monitoring, Suspend-LED

#### 7.1.1.3. Hardware Monitor, Temperature Monitor

- Chassis Intruder, via ICH7R
- Monitoring of 3 fan tachometer outputs
- Two fan control outputs, maximum current: 750mA each
- Monitoring of 2 board temperatures (core voltage regulator and DDR-DIMM sockets)
- Remote diode temperature sense for the CPU temperature
- Voltage sense for +5V, +12V, +3.3V, +1.8 V, CPU coreA/B (1.05V), VBAT, +5VSB, +3.3VSB



The -5 V and -12V can not be monitored!

If a tool is used to read the on-board voltages, for the -5V and -12V you will get unpredictable results.

### **IDE-Hard-Disk Interface**

- One channel with Ultra ATA100/66/33 capabilities as master and slave [40-pin, 2.54mm PC 99 compatible connectors (Pin 20 keyed, 1<sup>st</sup> IDE blue)]
- The IDE interface supports PIO IDE transfers up to 16 Mbytes/sec and Ultra ATA transfers up to 100 Mbytes/sec
- Support for CompactFlash™ Hard Drive

#### **7.1.1.4. Compact-Flash Interface**

- One CompactFlash™ Socket shared with the IDE channel

#### **7.1.1.5. Serial ATA (SATAII)**

Two 7-pin connectors (lockable connectors) on board and two interface connections routed to the PICMG1.3 edge connector.

- RAID 0/1/5/10 functionality with ICH7R

#### **7.1.1.6. USB Ports**

Eight USB 2.0 Port (USB0 – USB7)

- Two ports on the I/O slot bracket, two ports on board
- Four USB signals routed to the PICMG1.3 edge connector
- Maximum continuous load current per port: 500mA
- Typical short-circuit current at 25°C: 900mA
- Overcurrent indicators
- Wake-up capability on the USB ports; The USB devices are supplied with standby power.

#### **7.1.1.7. Serial Communication Ports**

Two high-speed 16550 compatible UARTs with 16-byte send/receive FIFOs

- The serial ports support RS232 (COM1, COM2); COM2 is configurable RS422, RS485
- Fully programmable serial-interface characteristics
- Programmable baudrate up to 115kbit/s
- The pin 10 of the serial ports delivers 12V fused
- The serial ports have wake-up capability from any sleep state.

#### **7.1.1.8. Parallel Port**

One bi-directional LPT port, which is configurable for standard LPT

- Support Enhanced Parallel Port (EPP) - Compatible with IEEE 1284 specification
- Support Extended Capabilities Port (ECP) - Compatible with IEEE 1284 specification

#### **7.1.1.9. Floppy Disk**

- Supports standard IBM-AT floppy interface from 360kB to 1.44MB

#### **7.1.1.10. Keyboard and Mouse**

Interfaces (7-pin header on board) to standard AT keyboard and PS/2 mouse

- 8042 based with F/W from AMIKKEY
- Fast Gate A20 and Hardware Keyboard Reset
- Support port 92
- Keyboard Wake-up by programmable keys
- Mouse Wake-up by programmable buttons

#### **7.1.1.11. PS/2 Keyboard Lock**

2-pin row on board for PS/2 keyboard lock

#### 7.1.1.12. Multifunction Connector

- One hard drive activity LED for all IDE devices
- Power LED
- Keyboard & Mouse
- Reset switch

#### 7.1.1.13. Connector for Power Buttons

- 2-pin connector for additional power button



##### Power Button Control:

If an ATX power supply is used, the SBC can control it either through:

- the backplane via PICMG 1.3 edge connector or,
- its additional power button connector (J34) or,
- the jumper for power button configuration (JP1) or,
- the hardware monitor connector (J17) power button (PWRBT#) input.

#### 7.1.1.14. MiniPCI-Interface

Single MiniPCI Type IIIA connector

- 3.3 V / 5V (Mini PCI card must be 5 V tolerant)
- The additional USB signals on reserved pins for bluetooth **are not supported**

#### 7.1.1.15. PICMG PCI -Interface

32-bit/33 MHz PCI-Interface according to PCI Specification v2.3

- Supports 5V PCI backplanes
- Support for up to four PCI-masters

#### 7.1.1.16. LAN

Two REALTEK 8111B Gigabit Ethernet Controllers for PCI Express x1 interface

- Two RJ45 connector on I/O panel with integrated LEDs
- Configurable 48 KB deep buffer
- Wake-on LAN (WOL) power management support
- Package: 64-pin QFN

One REALTEK 8110S Gigabit Ethernet Controller for PCI 32bit, 33MHz

- Routed to the PICMG1.3 edge connector
- Wake-on LAN (WOL) power management support

#### 7.1.1.17. Audio

Realtek ALC655, AC'97 2.3 Audio Codec

- Available on boxed header on board for Line-In, Line-Out, Microphone
- ATAPI-style CD-ROM audio connector (CD-IN)
- SPDIF-In and SPDIF-Out header for coaxial and/or optical fiber connection via an adapter cable with slot mounting bracket (not included)
- A 47 Ohm inductive speaker is mounted on the board

### 7.1.1.18. Real Time Clock (RTC)

Motorola MC146818B-compatible RTC with 256 bytes of battery-backed RAM

- RTC supports a date alarm that allows for scheduling a wake-up event up to 30 days in advance
- A coin-cell battery (CR2032) powers the real-time clock and CMOS memory
- A battery socket eases replacing empty batteries
- Battery backup time > 5 years
- Accuracy better than 50ppm (max. deviation 4s/24 hours) within the whole temperature range

### 7.1.1.19. BIOS

The BIOS is based on the AMI BIOS Core Release 8.00.13.

- 1 MB x 8 (8MBit), TSOP40 Flash BIOS-ROM (Firmware Hub) connected to the LPC-Bus
- Upgradable via Flash updating tool

### 7.1.1.20. Power and System Management

- BIOS-support for CPU-Internal temperature-sensor/s
- Power management according to ACPI 3.0
- Two CPU-Fan controls, additional three FAN-Tacho inputs available on Hardware Monitor Connector
- Supports Full-on (S0), Suspend (S1), Suspend-To-RAM (S3), Suspend-To-Disk (S4) and Soft-Off (S5).
- Wake-up events from Keyboard, Mouse, LAN, power button and external SMI
- Optional customized logo in boot-screen feature

# 8. Functional Diagram

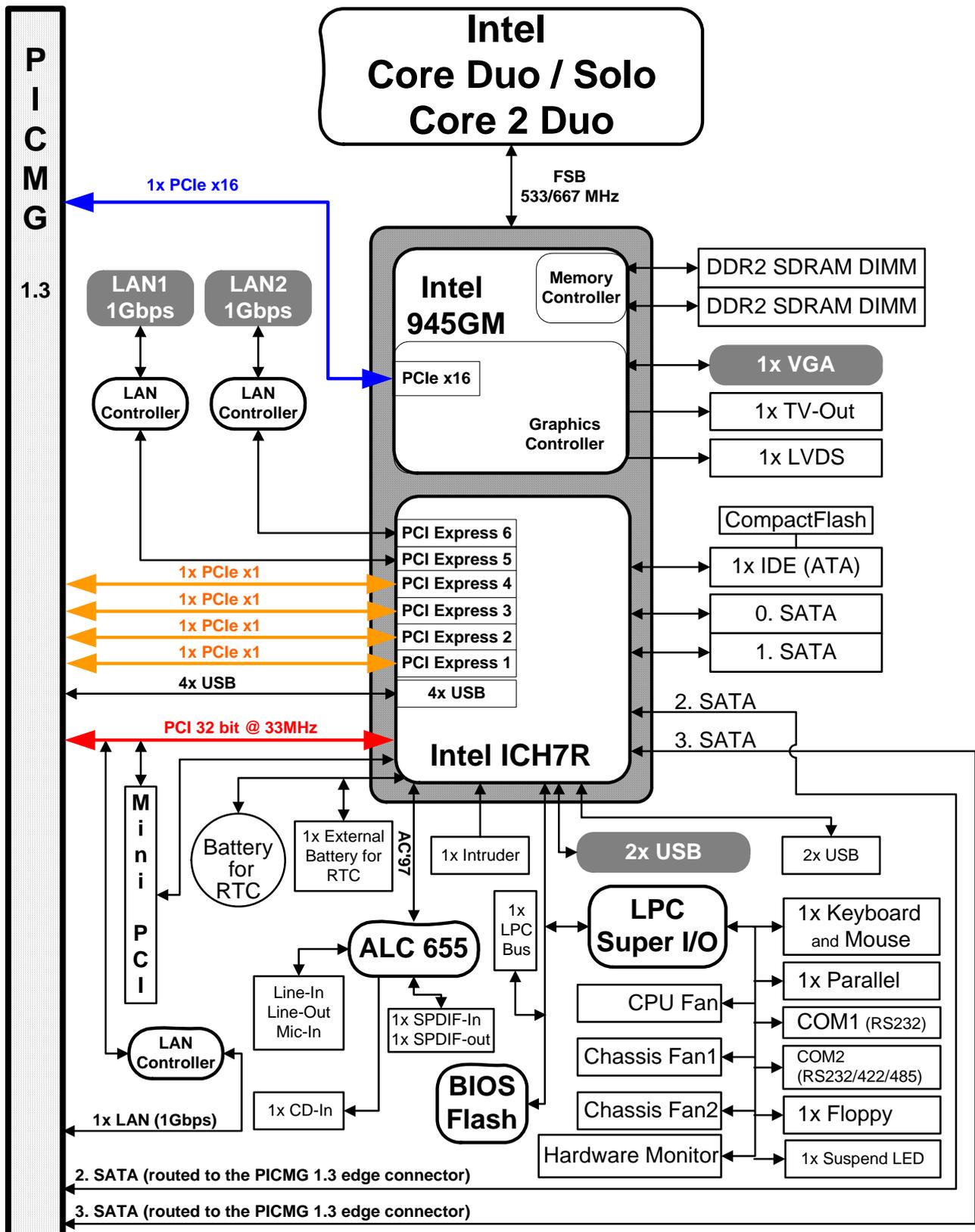


Fig. 2: PCI-960 – Functional diagram

## 9. Jumpers and Connectors Overview

The jumpers and connectors of the *PCI-960 board* will be described in detail below.



Signals suffixed by a pound (#) are active-low.

All headers will have a pitch of 0.100" (2.54mm), otherwise noted different.

<b>Connectors on the I/O Panel</b>	
J36	VGA Connector
J23	LAN1 Connector
J27	LAN2 Connector
J28	USB7 Connector
J29	USB6 Connector
<b>On-Board Jumpers</b>	
JP1	Power Button Configuration
JP2	COM2 (RS422) Enable termination resistors
JP3	COM2 (RS485/422) Enable termination resistors
JP4	CompactFlash Configuration
JP5	Disable Backup Restore Function
JP6	RTC Reset (Clear CMOS)
<b>On-Board Connectors</b>	
J21	SPDIF-IN&-Out Connector (5-pin)
J24	Keyboard Lock Connector (2-pin)
J25	Suspend-LED (2-pin)
J41	TV-out Connector (4-pin)
J9	Audio Connector (10-pin) (Line-in, Line-out, Mic.)
J2	LVDS Connector (JILI) (40-pin)
J16	USB header (USB4+USB5) (9-pin+key)
J8	IDE0 (40-pin)
J20	SATA0 Connector
J15	SATA1 Connector
J19 (not equipped)	SATA2 routed to the PICMG 1.3 edge connector
J13 (not equipped)	SATA3 routed to the PICMG 1.3 edge connector
J6	Floppy Connector (34-pin)
J5	Multifunctional Connector (16-pin)
J10	Serial Connector COM1(10-pin)
J7	Parallel Connector LPT (26-pin)
J11	Serial Connector COM2 (10-pin)
J1, J3, J18	12V Fan Connectors (3-pin)
J12	CompactFlash Connector (IDE0)
J22	CD-IN Connector (4-pin)
J26	MiniPCI Connector (124-pin)
J30	DDR2 DIMM0 Connector (240-pin)
J33	DDR2 DIMM1 Connector (240-pin)
J32	12V ATX Power Connector (4-pin)
J14	LPC-Bus Connector (20-pin) (reserved)
BAT1	Lithium Battery Socket
J17	Hardware Monitor Connector (20-pin)
J34	Additional Power Button Connector (2-pin)
J35	Ext battery Connector
J4	Keyboard&Mouse Connector

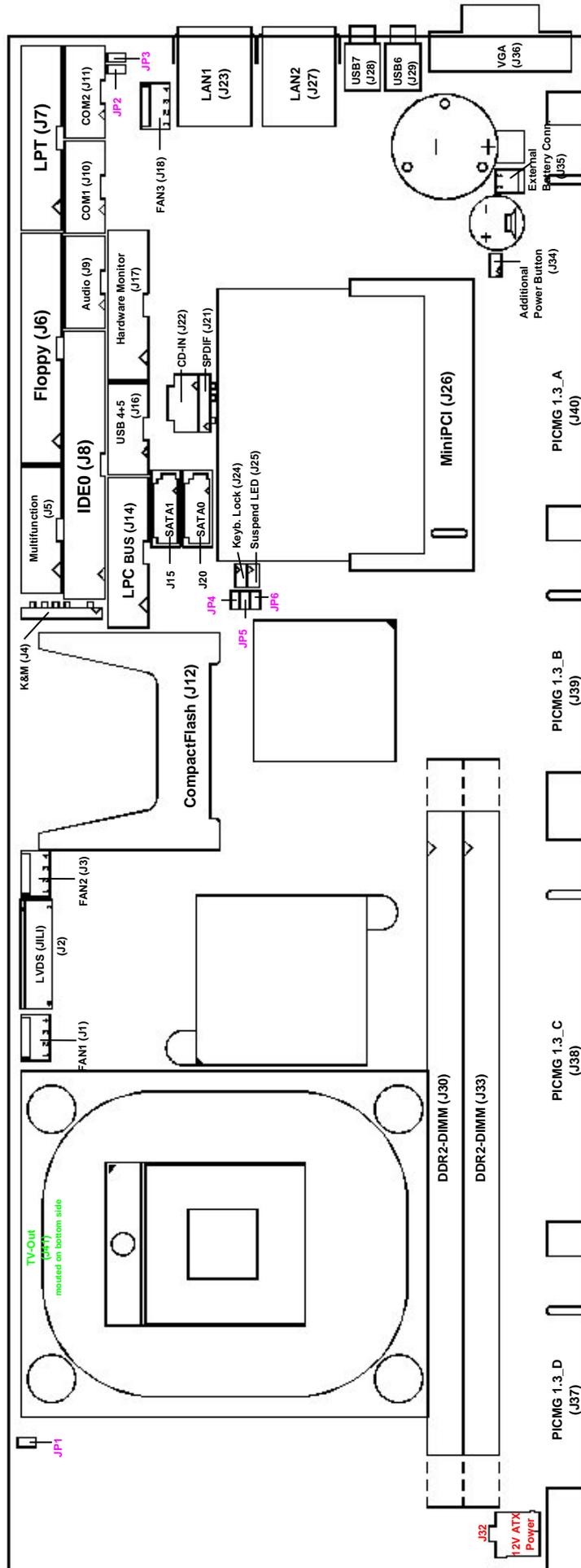


Fig. 3: PCI-960 - Jumpers and connectors location

9.1.1. Connectors located on Slot Bracket

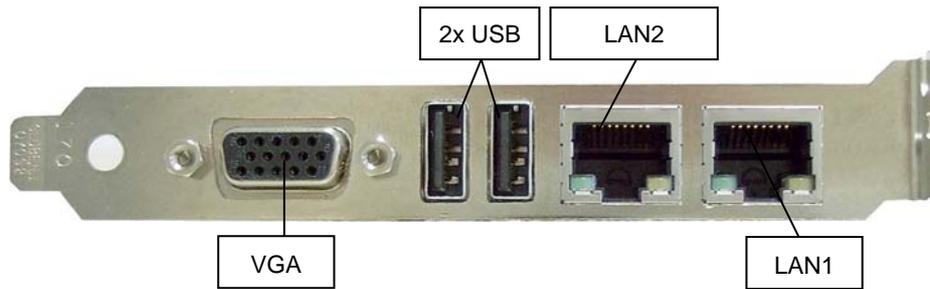


Fig. 4: PCI-960 – I/O panel connectors

9.1.1.1. J36: VGA Connector

An external (analog) monitor can be plugged into this interface which is provided as a 15-pin D-SUB socket.

Pin	Signal Name	15-pin D-SUB Socket (female)
1	Analog red output	
2	Analog green output	
3	Analog blue output	
4	NC	
5-8	GND	
9	VCC, fused for DDC	
10	GND	
11	NC	
12	SDA (DDC)	
13	TTL HSync	
14	TTL VSync	
15	SCL (DDC)	

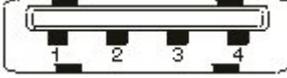
9.1.1.2. J23 and J27: Gigabit LAN Connectors

The PCI-960 is equipped with two LAN connectors. These interface connectors are provided as RJ45-sockets with integrated LEDs and support a data transfer rate of 10/100/1000Mbps.

Pin#	LAN1 and LAN2 Signal Name	RJ45 (female)
1	MDI0+	
2	MDI0-	
3	MDI1+	
4	MDI2+	
5	MDI2-	
6	MDI1-	
7	MDI3+	
8	MDI3-	
LED left (green)	LINK 100/1000/ACT	
LED right (yellow)	Link1000	

**9.1.1.3. J28 and J29: USB Connectors**

The PCI-960 board provides two external USB 2.0/1.1 interfaces. These connectors allow to connect USB-compatible devices to the PCI-960 Slot-CPU.

Pin	Signal Name	4-pin USB Socket Type A Version 2.0/1.1
1	VCC, fused	
2	Data-	
3	Data+	
4	GND	

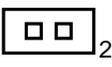
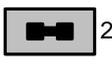
### 9.1.2. Jumpers on the PCI-960

The jumpers on the PCI-960 allow you to configure your CPU card according to the needs of your applications.



In order to change a jumper setting, turn off the computer by use of the ATX-power supply switch. If your power supply has no On/Off switch, disconnect the main power source. Otherwise, the board could be damaged.

The following examples show the conventions used in this section.

1  2	Jumper Open
1  2	Jumper Closed

#### 9.1.2.1. JP4: Jumper for CompactFlash™ Card Selection as Master or Slave

This jumper is used to connect the CompactFlash™ as master or slave device on the IDE.

JP4: Pin Row; DIP 2-pin	Setting	Function
1  2	Pin 1-2 Closed	Master
1  2	Pin 1-2 Open(Default)	Slave



When connecting a CompactFlash on J8 (IDE port), make sure that you configure one device as master and the other as slave. Two master devices (or two slave devices) must not be installed on the IDE channel at the same time.

If using CF, only one device is supported by J8.

#### 9.1.2.2. JP6: Jumper for RTC Reset (Clear CMOS Content)

This jumper allows you to clear the data (such as system password, date, time, and system setup parameters) in CMOS.



In order to change a jumper setting, please turn off the computer and unplug the power source to the board. Otherwise, the board could be damaged.

The board might not start with this jumper in “closed” position.

JP6: Pin Row, DIP 2-pin	Setting	Function
1  2	Pin 1-2 Open (Default)	Normal Operation
1  2	Pin 1-2 Short/Closed	Clear CMOS Content



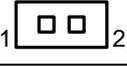
For clearing of content, please wait 10 sec.

### 9.1.2.3. JP5: Disable CMOS Backup Restore Function

This jumper prevents the use of CMOS backup (in the case that the CMOS data are invalid). Set jumper (JP5) prevents, that wrong settings of the backup are loading. The system boots using the “power on defaults” from onboard RAM.



In order to change a jumper setting, please turn off the computer and unplug the power source to the board. Otherwise, the board could be damaged.

JP5: Pin Row, DIP 2-pin	Setting	Function
	Pin 1-2 Open (Default)	CMOS Backup-Function is enabled
	Pin 1-2 Short/Closed	CMOS Backup-Function is disabled

### 9.1.2.4. JP1: Power Supply Configuration

The power button is used to switch the system between the off and on state. If the JP1 jumper is set, the ON/OFF function of the power button is ignored, and the system is always ON (power supply).

JP1:-Pin Row, DIP 2-pin	Setting	Function
	Pin 1-2 Open (Default)	The ON/OFF-button switches the system ON or OFF. (ATX Power Mode)
	Pin 1-2 Closed	The function of the ON/OFF-button is ignored. System behaviour: like an AT-system.

### 9.1.2.5. JP2 and JP3: Jumpers for COM2 Configuration as RS422 or RS485

The serial port COM2 (RS232 default setting) can be configured in the BIOS setup RS422 or RS485.

The JP2 and JP3 jumpers allow you to connect or disconnect the termination resistors (120 ohm) on / from the serial port COM2, when the operation mode in the BIOS is set to RS422 or RS485.



When installing the board at one end of the network, JP2 and JP3 jumper caps must be installed to connect the 120 ohm termination resistors.

**In RS422 mode, both jumper caps (JP2 and JP3) must be installed to connect the 120 ohm line termination resistors.**

JP2:-Pin Row, DIP 2-pin	Setting	Function COM2 (RS422)
	Pin 1-2 Short/Closed	RS422 with connected termination resistor
	Pin 1-2 Open (Default)	RS422 without connected termination resistor

JP3:-Pin Row; DIP 2-pin	Setting	Function COM2 (RS485 or RS422)
	Pin 1-2 Short/Closed	RS485 or RS422 with connected termination resistor
	Pin 1-2 Open (Default)	RS485 without connected termination resistor

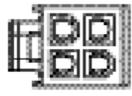


The serial port COM2 (RS232 default setting) can be configured in the BIOS setup RS422 or RS485. Refer to BIOS settings for COM2 configuration as RS422 and RS485.

### 9.1.3. Connectors On-Board

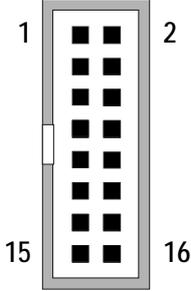
#### 9.1.3.1. J32: +12V ATX Power Connector

The ATX connector is used to connect the +12V ATX power supply to the board in order to provide power to the CPU.

J32: 4-pin Connector	Pin	Signal Name
	1	GND
	2	GND
	3	+12V
	4	+12V

#### 9.1.3.2. J5: Multifunctional Connector

A system chassis can be equipped with components, that provide acoustical or/and light indication of the computer activities, and switches to change the computer status. J5 is a 16-pin box header that provides following connections:

Signal Name	Pin #	J5: Boxed Header, DIP 16-pin	Pin #	Signal Name
KBCKL	1		2	GND
KBDATA	3		4	GND
VCC5V fused	5		6	PWRLED+
Speaker	7		8	VCC5V fused
MCKL	9		10	GND
MDATA	11		12	GND
PBRES#	13		14	GND
HDLED-	15		16	HDLED+

The multifunctional connector (J5) provides an interface:

- for a PS/2 keyboard and a PS/2 mouse connector
- to a speaker for audio tone generation
- to connect the Power LED
- to connect the hard drive activity LED
- to connect the reset button

#### Power LED: pins 4 and 6

These pins allow the connection of the power LED.

#### Reset Button: pins 13 and 14

To these pins can be connected a reset button. The reset button is used to restart the system without turning the main power switch off and on again.



Depending on the software and operating system, some data may be lost if the reset button is activated.

#### Hard Disk Drive LED: pins 15 and 16

To these pins can be connected a hard drive activity LED. This LED will flash when the HDD is being accessed.

**Speaker:-pins 7 and 8**

These-pins provide an interface to connect a speaker for audio tone generation. An 8-ohm speaker is recommended.

**Keyboard:-pins 1, 2, 3, and 5**

These-pins can be used to connect the cable connection for an external PS/2 keyboard connector.

**Mouse:-pins 9, 10, 11, and 5**

These-pins can be used to connect the cable connection for an external PS/2 mouse connector.

**Hard Disk Drive LED: pins 15 and 16**

To these pins can be connected a hard drive activity LED. This LED will flash when the HDD is being accessed.

**Speaker:-pins 7 and 8**

These-pins provide an interface to connect a speaker for audio tone generation. An 8-ohm speaker is recommended.

**Keyboard:-pins 1, 2, 3, and 5**

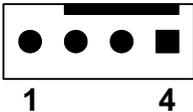
These-pins can be used to connect the cable connection for an external PS/2 keyboard connector.

**Mouse:-pins 9, 10, 11, and 5**

These-pins can be used to connect the cable connection for an external PS/2 mouse connector.

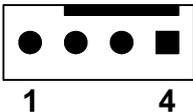
**9.1.3.3. J1: CPU Fan Power Connector**

It is a 4-pin header that allows the connection of the CPU fan. The CPU fan must be a 12V fan (max. 500 mA).

J1: 4-pin Molex Connector (friction lock)	Pin #	Signal Name
	1	CTRL (PWM)
	2	Rotation
	3	+12V
	4	GND

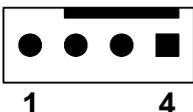
**9.1.3.4. J3: Chassis Fan1 Power Connector**

It is a 4-pin header that allows the connection of a chassis fan. The chassis fan must be a 12V fan (max. 500 mA).

J3: 4-pin Molex Connector (friction lock)	Pin #	Signal Name
	1	CTRL (PWM)
	2	Rotation
	3	+12V
	4	GND

**9.1.3.5. J18: Chassis Fan2 Power Connector**

It is a 4-pin header that allows the connection of a chassis fan. The chassis fan must be a 12V fan (max. 500 mA).

J18: 4-pin Molex Connector (friction lock)	Pin #	Signal Name
	1	CTRL (PWM)
	2	Rotation
	3	+12V
	4	GND



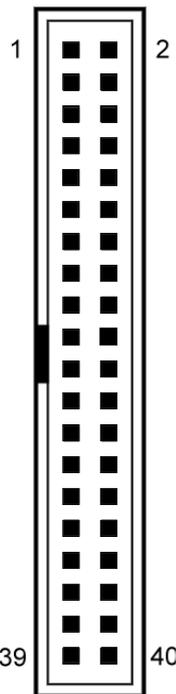
Also a 3-pin FAN connector cable can be connected to each of J1, J3 or J18. In this case the corresponding fan is operating with full speed.

**9.1.3.6. J34: Additional Power Button Connector**

This connection allows you to attach an external ATX power button.

J34: 2-pin Row	Pin #	Signal Name
1  2	1	GND

**9.1.3.7. J8: Primary IDE Connector**

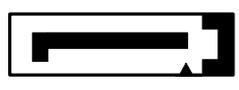
Signal Name	Pin #	J8: Box Header, (shrouded), DIP 40-pin	Pin #	Signal Name
Reset #	1		2	GND
Data 7	3		4	Data 8
Data 6	5		6	Data 9
Data 5	7		8	Data 10
Data 4	9		10	Data 11
Data 3	11		12	Data 12
Data 2	13		14	Data 13
Data 1	15		16	Data 14
Data 0	17		18	Data 15
GND	19		20	Key
DREQ	21		22	GND
IOWR#	23		24	GND
IORD#	25		26	GND
IORDY	27		28	P_ALE
DACK#	29		30	GND
IRQ	31		32	IOCS16#
ADDR1 A[1]	33		34	ATADET
ADDR0 A[0]	35		36	ADDR2 2 A[2]
CSO#	37		38	CS1
Active LED#	39		40	GND

**9.1.3.8. J15 and J20: Serial ATA Connectors**

These connectors allow you to connect Serial-ATA devices.

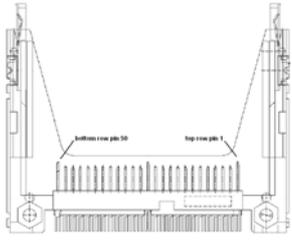


The PCI-960 board supports four Serial ATA ports. J15 and J20 are on board connectors. The J13 and J19 SATA ports are routed to the backplane via the PICMG 1.3 edge connector.

J15: SATA1 and J20: SATA0 Serial ATA: High Speed Headers Molex 67800-8001, Locking Latch)	Pin #	Signal Name
	1	GND
	2	TX+
	3	TX-
	4	GND
	5	RX-
	6	RX-
	7	GND

### 9.1.3.9. J12: CompactFlash Connector

The CompactFlash™ connector is located on the top side of the PCI-960 board.

Signal Name	Pin #	J12: CF Socket AMP 1470103-1	Pin #	Signal Name
GND	1		26	NC/CD1
D3	2		27	D11
D4	3		28	D12
D5	4		29	D13
D6	5		30	D14
D7	6		31	D15
CS1#	7		32	CS3#
GND	8		33	NC
GND (ATA#)	9		34	IOR#
GND	10		35	IOW#
GND	11		36	+5V (WE#)
GND	12		37	IRQ14
+5V	13		38	+5V
GND	14		39	CSEL0#
GND	15		40	NC
GND	16		41	RESET#
GND	17		42	IORDY
A2	18		43	DMAREQ
A1	19		44	DMAACK#
A0	20		45	IDE ACT#
D0	21		46	PDIAG#
D1	22		47	D8
D2	23		48	D9
IOCS16#	24		49	D10
NC/CD2	25		50	GND

**9.1.3.10. J7: Parallel Port Connector (LPT)**

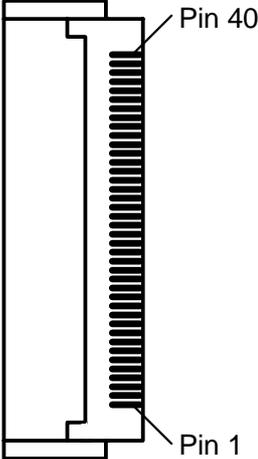
LPT is an IEEE1284 compatible interface and supports Normal/EPP/ECP mode.

This port is provided as a 26-pin boxed header.

Signal Name	Pin #	J7: Boxed Header, DIP 26-pin	Pin #	Signal Name
Strobe#	1		2	AutoFeed#
PD0, Data 0	3		4	Error#
PD1, Data 1	5		6	Initialize#
PD2, Data 2	7		8	SLIN
PD3, Data 3	9		10	GND
PD4, Data 4	11		12	GND
PD5, Data 5	13		14	GND
PD6, Data 6	15		16	GND
PD7, Data 7	17		18	GND
Acknowledge#	19		20	GND
Busy	21		22	GND
Paper empty	23		24	GND
SLCT	25		26	NC

### 9.1.3.11. J2: LVDS (JILI) Connector

The LVDS (JILI) connector complies with JILI Specification 2.0. This connector allows you to connect LVDS-compatible receivers. For the different required cable kits, please contact our GSS support.

J2: LVDS (JILI) Connector	Pin #	Signal Name
 <p style="text-align: center;"><b>LVDS (JILI)</b></p>	1	NC
	2	ODD_LVD0-
	3	ODD_LVD0+
	4	ENAVDD
	5	ODD_LVD1-
	6	ODD_LVD1+
	7	NC
	8	ODD_LVD2-
	9	ODD_LVD2+
	10	GND
	11	ODD_LVDC-
	12	ODD_LVDC+
	13	GND
	14	GND (odd LVD3-)
	15	GND (odd LVD3+)
	16	JILI_DAT
	17	EVEN_LVD0-
	18	EVEN_LVD0+
	19	JILI_CLK
	20	EVEN_LVD1-
	21	EVEN_LVD1+
	22	NC
	23	EVEN_LVD2-
	24	EVEN_LVD2+
	25	GND
	26	EVEN_LVDC-
	27	EVEN_LVDC+
	28	GND
	29	GND (even LVD3-)
	30	GND (even LVD3+)
	31	VCC_5V0
	32	VCC_5V0
	33	VCC_5V0
	34	VCC_5V0
	35	ENABKL#
	36	BKLGND
	37	BKLGND
	38	VCC_12V0
	39	VCC_12V0
	40	VCC_12V0

**9.1.3.12. J6: Floppy Disk Connector**

The Floppy disk connector supports up to two floppy disk drives: 5.25" (360KB and 1.2MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB).

Signal Name	Pin #	J6: Boxed Header, DIP 34-pin	Pin #	Signal Name
GND	1		2	Densel0#
GND	3		4	NC
GND	5		6	Densel1#
GND	7		8	Index
GND	9		10	Motor enable A
GND	11		12	Drive select B
GND	13		14	Drive select A
GND	15		16	Motor enable B
GND	17		18	Direction
GND	19		20	Step Pulse
GND	21		22	Write Data
GND	23		24	WGATE#
GND	25		26	Track 0
GND	27		28	Write Protect
NC	29		30	Read Data
GND	31		32	Head Select
NC	33		34	Floppy Disk Change

**9.1.3.13. J16: USB Extension**

The onboard J16, boxed pin-header supports two ports (Port 4 and Port 5). Pin 9 is removed for keying purposes. (A slot bracket with 2x USB type A connectors can be ordered separately.)



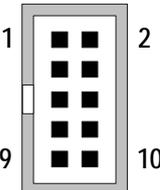
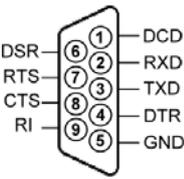
The PCI-960 board supports eight USB ports. J28 (USB7) and J29 (USB6) are available on the slot bracket. The J16 that supports two USB ports (USB4 and USB5) is on board. USB0, USB1, USB2 and USB3 ports are routed to the backplane via the PICMG 1.3 edge connector.

USB Port 5		J16: Boxed Header DIP 10-pin	USB Port 4	
Pin #	Signal Name		Pin #	Signal Name
1	VCC fused		2	VCC fused
3	D5-		4	D4-
5	D5+		6	D4+
7	GND		8	GND
9	Key		10	NC

**9.1.3.14. J10: Serial Port Connector COM1**

The 10-pin boxed header is to be used with the supplied serial cable.

**COM1 pin assignment RS232:**

J10: Boxed Header, DIP 10-pin	RS232 (Pinning on the on-board header)		D-SUB Connector
 <p style="text-align: center;"><b>COM1 (J10)</b></p>	<b>Pin #</b>	<b>Signal Name</b>	<p>Pining on the supplied cable connector:</p> 
	1	DCD, Data carrier detect	
	2	DSR, Data set ready	
	3	RxD, Receive data	
	4	RTS, Request to send	
	5	TxD, Transmit data	
	6	CTS, Clear to send	
	7	DTR, Data terminal ready	
	8	RI, Ring indicator	
	9	GND, ground	
10	12 V, fused		

**9.1.3.15. J11: Serial Port Connector COM2**

The 10-pin box header is to be used with the supplied serial cable. This interface is RS232 (default) and can be configured as RS422 or RS485 (BIOS Setup).



For RS422 and RS485 mode, please install the jumper caps (JP7 and JP8) to use the onboard termination resistors (120ohm).



**RS232 mode (default)**

**RS422 point-to-point mode:**

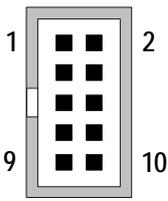
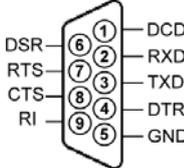
The RX signal is always enabled via application software.

**RS485 party line mode:**

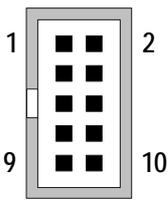
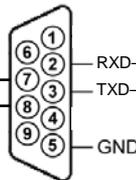
The RX signal is enabled when COM2 RTS is deasserted via application software.

The TX signal is enabled when COM2 RTS is asserted via application software.

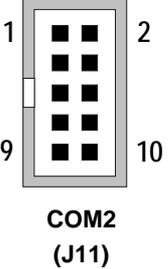
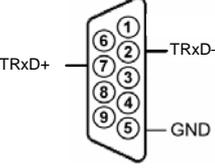
**COM2-pin assignment as RS232 (default):**

J11: Boxed Header, DIP 10-pin	RS232 (Pinning on the on-board header)		D-SUB Connector
	Pin #	Signal Name	
 <p><b>COM2 (J11)</b></p>	1	DCD, Data carrier detect	Pining on the supplied cable connector: 
	2	DSR, Data set ready	
	3	RxD, Receive data	
	4	RTS, Request to send	
	5	TxD, Transmit data	
	6	CTS, Clear to send	
	7	DTR, Data terminal ready	
	8	RI, Ring indicator	
	9	GND, ground	
	10	12 V, fused	

**COM2 pin assignment as RS422:**

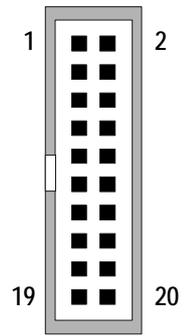
J11: Boxed Header, DIP 10-pin	RS422 (Pinning on the on-board header)		D-SUB Connector
	Pin #	Signal Name	
 <p><b>COM2 (J11)</b></p>	1	NC	Pining on the supplied cable connector: 
	2	NC	
	3	RxD-, Receive data	
	4	RxD+, Receive data	
	5	TxD-, Transmit data	
	6	TxD+, Transmit data	
	7	NC	
	8	NC	
	9	GND, ground	
	10	12 V fused	

**COM2 pin assignment as RS485:**

J11: Boxed Header, DIP 10-pin	RS485 (Pinning on the on-board header)		D-SUB Connector
	Pin #	Signal Name	
 <p><b>COM2 (J11)</b></p>	1	NC	Pining on the supplied cable connector:  
	2	NC	
	3	TRxD-, Transmit/Receive data	
	4	TRxD+, Transmit/Receive data	
	5	12 V, fused	
	6	NC	
	7	NC	
	8	NC	
	9	GND, ground	
	10	12 V, fused	

**9.1.3.16. J17: Hardware Monitor & GPIO Connector**

The hardware monitor & GPIO connector provides signals for hardware monitoring (2x Fan-Speed, Power Button, Chassis Intruder, SMBus) and allows you to monitor user defined function GPIO[0-7].

Signal Name	Pin#	J17: Box Header, DIP 20-pin	Pin#	Signal Name
GND	1	 <p><b>Hardware Monitor &amp; GPIO</b></p>	2	PWRBTN#
SMBALERT#	3		4	GND
EXT_SMBDATA	5		6	EXT_SMBCLK
GPIO[4]	7		8	GPIO[5]
GPIO[6]	9		10	GND
GPIO[7]	11		12	GND
CHASINT#	13		14	GND
FAN_TACH(J3)	15		16	FAN_TACH(J18)
GPIO[0]	17		18	GPIO[1]
GPIO[2]	19		20	GPIO[3]

**9.1.3.17. J4: Keyboard & Mouse for External Connector**

This connector provides an interface for additional PS/2 keyboard and PS/2 mouse.

J4: Pin Row; DIP 7-pin	Pin #	Signal Name
 <p><b>KBMS</b></p>	1	KB DAT
	2	Key
	3	MS DAT
	4	GND
	5	VCC fused
	6	KB-CLK
	7	MS-CLK

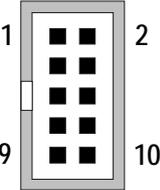
**9.1.3.18. J24: PS/2 Keyboard-Lock Connector**

The keyboard lock allows the user to lock the PS/2 keyboard (if the chassis is equipped with a keyboard lock), protecting the system from unauthorized use.

J24: Pin-Row: 2-pin	Pin #	Signal Name
	1	GND
	2	KB Lock

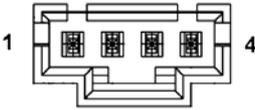
**9.1.3.19. J9: Audio Connector**

This is an interface for the I/O bracket audio cable that allows connection of audio devices (Line-In, Line-Out, Mic-In).

Signal Name	Pin #	J9: Header: 10-pin	Pin #	Signal Name
LINEOUT_R	1		2	LINEOUT_L
AUDIO_GND	3		4	AUDIO_GND
LINEIN_L	5		6	LINEIN_R
AUDIO_GND	7		8	AUDIO_GND
MIC_IN	9		10	MIC_BIAS

**9.1.3.20. J22: CD-In Connector**

This connector allows you (4-pin, male) to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.

J22: 4-pin Header, 2.54 mm; Molex 53261-0490 (male)	Pin #	Signal Name
	1	LEFT CD IN
	2	CD GND
	3	CD GND
	4	RIGHT CD IN

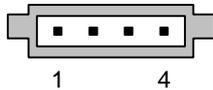
**9.1.3.21. J41: TV-Out**

TV-Out (J41) is an analog component video port that allows Composite-Video (CVBS) and S-Video connection via an adapter cable with slot mounting bracket for external connection (not included).

This connector is mounted on the rear side of the PCB.



The TV input/output type you choose depends on what type of input/output you are attempting to use. S-Video and composite video are the most popular analog video standards. Composite (CVBS): all video information is present in a single signal. S-Video (Y/C) carries the LUMA (Y) and CHROMA (C) as separate signals.

J41: Boxed Header; 4-pin, 1.25 mm (Right Angle); Molex 53261-0471; mounted on the solder side	Pin #	Signal Name
	1	CVBS
	2	LUMA (Y)
	3	CHROMA (C)
	4	GND

**9.1.3.22. J21: SPDIF-In & -Out**

The SPDIF connector (J21) allows digital audio input and output via an adapter cable with slot mounting bracket for coaxial and/or optical fiber connection (not included).

J21: Pin-Row: 5-pin	Pin #	Signal Name
	1	+5V
	2	Key
	3	SPDIF-out
	4	GND
	5	SPDIF-in

**9.1.3.23. J35: External Battery Connector (option)**

The PCI-960 is delivered with an on-board CMOS Lithium battery.

Depending on the configuration of your system, the CMOS Lithium battery can be connected to the J35 connector in order to have external accessibility.

J35: 2-pin Molex 22-23-2021 (friction lock)	Pin#	Signal Name
	1	V_BAT
	2	GND



If the J35 connector is used, remove the on-board CMOS Lithium battery!

**9.1.3.24. J25: Suspend LED**

J25 is available for connecting an LED, which indicates whether the system is in suspend mode or powered-up. The LED will be on when the system is in the suspend mode. If the system is fully powered up the LED will be dark.

J25: Pin-Row: 2-pin	Pin #	Signal Name
	1	GND
	2	SUSLED

## 9.1.3.25. J26: MiniPCI Connector

J26: MiniPCI Slot, 124-pin, Pin Assignments					
Pin	Signal	Pin	Signal	Pin	Signal
1	NC	51	AD21	101	GND
2	NC	52	AD22	102	GND
3	NC	53	AD19	103	AC97_SYNC
4	NC	54	AD20	104	GND (M66EN)
5	NC	55	GND	105	AC97_SDATAIN
6	NC	56	PAR	106	AC97_SDATAOUT
7	NC	57	AD17	107	AC97_BITCLK
8	NC	58	AD18	108	GND (ACCID0)
9	NC	59	-CEB2	109	PU (ACCID1)
10	NC	60	AD16	110	AC97_RESET
11	NC	61	-IRDY	111	MPCI_AUDMON
12	NC	62	GND	112	NC
13	NC	63	VCC3	113	GND
14	NC	64	-FRAME	114	GND
15	GND	65	-CLKRUN	115	MPCI_AUDOUT
16	NC	66	-TRDY	116	MPCI_AUDIN
17	-INTB	67	-SERR	117	GND
18	VCC	68	-STOP	118	GND
19	VCC3	69	GND	119	GND
20	-INTA	70	VCC3	120	GND
21	NC	71	-PERR	121	NC
22	NC	72	-DEVSEL	122	-MPCIACT
23	GND	73	-CBE1	123	VCC
24	V3.3Aux	74	GND	124	3.3VAUX
25	CLK	75	AD14		
26	-RST	76	AD15		
27	GND	77	GND		
28	VCC3	78	AD13		
29	-REQ	79	AD12		
30	-GNT	80	AD11		
31	VCC3	81	AD10		
32	GND	82	GND		
33	AD31	83	GND		
34	-PME	84	AD9		
35	AD29	85	AD8		
36	NC	86	-CBE0		
37	GND	87	AD7		
38	AD30	88	VCC3		
39	AD27	89	VCC3		
40	VCC3	90	AD6		
41	AD25	91	AD5		
42	AD28	92	AD4		
43	RESV	93	NC		
44	AD26	94	AD2		
45	-CBE3	95	AD3		
46	AD24	96	AD0		
47	AD23	97	VCC		
48	IDSEL	98	NC		
49	GND	99	AD1		
50	GND	100	NC		

### 9.1.4. PICMG 1.3 Connector (Edge Connector) PCI Express and PCI(-X) Interfaces

The “Side A” pins are on component side, the “Side B” pins are on solder side.

#### 9.1.4.1. SHB Express™ Connector Pinout

x16 PCIe Connector A			x8 PCIe Connector B		
	Side B	Side A		Side B	Side A
1	SMCLK	SMDAT	1	+5Vaux	+5Vaux
2	GND	GND	2	GND	RSVD NC*
3	TDI	TCK	3	a_PETp8	GND
4	TDO	TMS	4	a_PETn8	GND
5	TRST#	WAKE#	5	GND	a_PERp8
6	PWRBT#	PME#	6	GND	a_PERn8
7	PWRGD	PSON#	7	a_PETp9	GND
8	SHB_RST#	PERST#	8	a_PETn9	GND
9	CFG0	CFG1	9	GND	a_PERp9
10	CFG2	CFG3	10	GND	a_PERn9
11	RSVD NC*	GND	11	RSVD NC*	GND
	Mechanical Key			Mechanical Key	
12	GND	RSVD NC*	12	GND	RSVD NC*
13	b_PETp0	GND	13	a_PETp10	GND
14	b_PETn0	GND	14	a_PETn10	GND
15	GND	b_PERp0	15	GND	b_PERp10
16	GND	b_PERn0	16	GND	b_PERn10
17	b_PETp1	GND	17	a_PETp11	GND
18	b_PETn1	GND	18	a_PETn11	GND
19	GND	b_PERp1	19	GND	b_PERp11
20	GND	b_PERn1	20	GND	b_PERn11
21	b_PETp2	GND	21	a_PETp12	GND
22	b_PETn2	GND	22	a_PETn12	GND
23	GND	b_PERp2	23	GND	b_PERp12
24	GND	b_PERn2	24	GND	b_PERn12
25	b_PETp3	GND	25	a_PETp13	GND
26	b_PETn3	GND	26	b_PETn13	GND
27	GND	b_PERp3	27	GND	b_PERp13
28	GND	b_PERn3	28	GND	b_PERn13
29	REFCLK0+	GND	29	b_PETp14	GND
30	REFCLK0-	GND	30	b_PETn14	GND
31	GND	REFCLK1+	31	GND	b_PERp14
32	RSVD_G NC*	REFCLK1-	32	GND	b_PERn14
33	REFCLK2+	GND	33	b_PETp15	GND
34	REFCLK2-	GND	34	b_PETn15	GND
35	GND	REFCLK3+	35	GND	a_PERp15
36	RSVD-G NC*	REFCLK3-	36	GND	a_PERn15
37	REFCLK4+	GND	37	RSVD NC*	GND
38	REFCLK4-	GND	38	RSVD NC*	RSVD NC*
39	GND	REFCLK5+	39	GND	GND
40	RSVD-G NC*	REFCLK5-	40	GND	GND
41	REFCLK6+	GND	41	GND	GND
42	REFCLK6-	GND	42	GND	GND
43	GND	REFCLK7+	43	GND	GND
44	GND	REFCLK7-	44	+12V	+12V
45	a_PETp0	GND	45	+12V	+12V
46	a_PETn0	GND	46	+12V	+12V
47	GND	a_PERp0	47	+12V	+12V
48	GND	a_PERn0	48	+12V	+12V
49	a_PETp1	GND	49	+12V	+12V
50	a_PETn1	GND			
51	GND	a_PERp1			
52	GND	a_PERn1			
53	a_PETp2	GND			
54	a_PETn2	GND			
55	GND	a_PERp2			
56	GND	a_PERn2			

57	a_PETp3	GND
58	a_PETn3	GND
59	GND	a_PERp3
60	GND	a_PERn3
61	a_PETp4	GND
62	a_PETn4	GND
63	GND	a_PERp4
64	GND	a_PERn4
65	a_PETp5	GND
66	a_PETn5	GND
67	GND	a_PERp5
68	GND	a_PERn5
69	a_PETp6	GND
70	a_PETn6	GND
71	GND	a_PERp6
72	GND	a_PERn6
73	a_PETp7	GND
74	a_PETn7	GND
75	GND	a_PERp7
76	GND	a_PERn7
77	RSVD NC*	GND
78	+3.3V	+3.3V
79	+3.3V	+3.3V
80	+3.3V	+3.3V
81	+3.3V	+3.3V
82	+3.3Vaux NC*	+3.3Vaux NC*

x16 PCIe Connector C			x8 PCIe Connector D		
	Side B	Side A		Side B	Side A
1	USB0P	GND	1	INTB#	INTA#
2	USB0N	GND	2	INTD#	INTC#
3	GND	USB1P	3	GND	VIO
4	GND	USB1N	4	REQ3#	GNT3#
5	USB2P	GND	5	REQ2#	GNT2#
6	USB2N	GND	6	PCI_RST#	GNT1#
7	GND	USB3P	7	REQ1#	GNT0#
8	GND	USB3n	8	REQ0#	SERR#
9	USBOC0#	GND	9	SDONE NC*	+3.3v
10	GND	USBOC1#	10	GND	CLKFI
11	USBOC2#	GND	11	CLKFO	GND
	Mechanical Key			Mechanical Key	
12	GND	USBOC3#	12	CLKC	CLKD
13	SATHAT0P	GND	13	GND	+3.3V
14	SATAH0N	GND	14	CLKA	CLKB
15	GND	SATAHR0P	15	+3.3V	GND
16	GND	SATAHR0N	16	AD31	GND
17	SATAHT1P	GND	17	AD29	+3.3V
18	SATAHT1N	GND	18	M66EN	AD30
19	GND	SATAHR1P	19	AD27	AD28
20	GND	SATAHR1N	20	AD25	GND
21	a_MDI0p	GND	21	GND	AD26
22	a_MDI0n	GND	22	C/BE3#	AD24
23	GND	a_MDI1p	23	AD23	+3.3V
24	GND	a_MDI1n	24	GND	AD22
25	a_MDI2p	GND	25	AD21	AD20
26	a_MDI2n	GND	26	AD19	PCIXCAP
27	GND	a_MDI3p	27	+5V	AD18
28	GND	a_MDI3n	28	AD17	AD16
29	IPMB_CL	GND	29	C/BE2#	GND
30	IPMB_DA	GND	30	PCI_PRST#	FRAME#
31	GA0 NC*	GA1 NC*	31	IRDY#	TRDY#
32	GA2 NC*	GA4 NC*	32	DEVSEL#	+5V
33	GA3 NC*	GA5 NC*	33	LOCK#	STOP#
34	b_MDI0p NC*	GND	34	PERR#	GND
35	b_MDI0n NC*	GND	35	GND	C/BE1#
36	GND	b_MDI1p NC*	36	PAR	AD14
37	GND	b_MDI1n NC*	37	SB0# NC*	GND
38	b_MDI2p NC*	GND	38	GND	AD12
39	b_MDI2n NC*	GND	39	AD15	AD10
40	GND	b_MDI3p NC*	40	AD13	GND
41	GND	b_MDI3n NC*	41	GND	AD09
42	+3.3V	+3.3V	42	AD11	C/BE0#
43	+3.3V	+3.3V	43	AD08	GND
44	+3.3V	+3.3V	44	GND	AD06
45	+3.3V	+3.3V	45	AD07	AD05
46	+3.3V	+3.3V	46	AD04	GND
47	+3.3V	+3.3V	47	GND	AD02
48	+3.3V	+3.3V	48	AD03	AD01
49	+3.3V	+3.3V	49	AD00	GND
50	+3.3V	+3.3V			
51	GND	GND			
52	GND	GND			
53	GND	GND			
54	GND	GND			
55	GND	GND			
56	GND	GND			
57	GND	GND			
58	GND	GND			
59	+5V	+5V			
60	+5V	+5V			
61	+5V	+5V			
62	+5V	+5V			

## 9. Jumpers and Connectors Overview

---

63	GND	GND
64	GND	GND
65	GND	GND
66	GND	GND
67	GND	GND
68	GND	GND
69	GND	GND
70	GND	GND
71	GND	GND
72	GND	GND
73	+12V	+12V
74	+12V	+12V
75	+12V	+12V
76	+12V	+12V
77	+12V	+12V
78	+12V	+12V
79	+12V	+12V
80	+12V	+12V
81	+12V	+12V
82	+12V	+12V

NC\*: Not Connected

## 10. Peripherals

### 10.1.1. Temperature Sensors

The **CPU temperature sensor** is integrated in the CPU. It provides the most relevant CPU temperature readings and monitors the CPU temperature to make sure that the system is operating at a safe temperature level.

The **chassis temperature sensors** are available on-board as thermal diodes to measure the on-board environmental temperatures. If the temperature increases above a certain temperature level, the system will be hold in reset.



A support package is required to reads the motherboard hardware reporting of CPU temperature and on-board environmental temperatures, obtained from the corresponding thermal diode implemented on-board.

### 10.1.2. Real Time Clock

The real-time clock performs time-keeping functions and includes 256 bytes of general purpose battery-backed CMOS RAM. Features include an alarm function, programmable periodic interrupt and a 100-year calendar. **All battery-backed CMOS RAM data remains stored in an additional EEPROM.** This prevents loss of data.

### 10.1.3. Watchdog Timer

A watchdog timer is provided, which forces either an IRQ, SMI, or Reset condition (configurable in the watchdog register). The watchdog time can be programmed ranging from 1 up to 255 seconds/minutes.

### 10.1.4. Lithium Battery

PCI-960 is provided with a 3.0 V “coin cell” lithium battery for the RTC operation and CMOS Setup RAM. Please observe the chapter 3.1 “Safety Instructions for the Lithium Battery”.

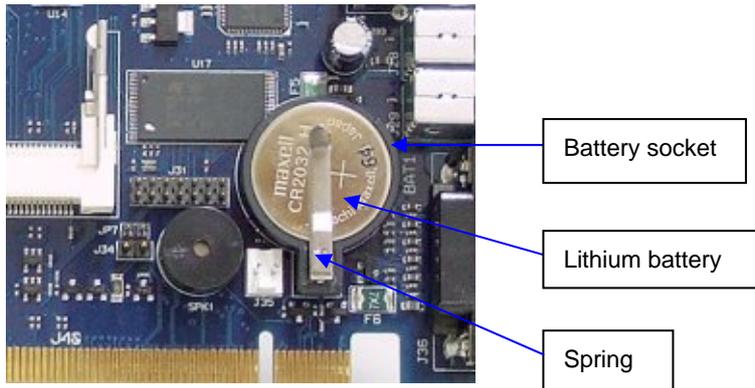


Fig. 5: Placement of the battery

#### 10.1.4.1. Replacing the Lithium Battery

To replace the battery please proceed as follows:

1. Turn the power off.
2. If your system is equipped with expansion cards, remove them first, if necessary.
3. Remove the battery by pressing outwards the ejector spring.
4. Insert the new battery into the socket.
5. Make sure that you insert the battery correctly. The minus pole must be as marked (with a white line on the battery) in the Fig. 5!

The lithium battery must be replaced with an identical battery or a battery type recommended by Kontron Embedded Computers (Lithium battery 3.0 V for RTC, type: CR2032). The Lithium battery type must be UL listed.



Do not dispose of lithium batteries in domestic waste. Dispose of the battery according to the local regulations dealing with the disposal of these special materials (e.g. to the collecting points for the disposal of batteries).

# 11. AMI BIOS Configuration

This chapter describes the settings available in the optional AMI BIOS for the PCI-960 board. The AMI BIOS (Basic Input/Output System) pre-installed in your computer system's ROM supports Intel® Core™ 2 Duo and Intel® Core™ Solo (Mobile) processors in a standard IBM AT compatible I/O system.

## 11.1. BIOS Setup

The AMI BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the AMI BIOS is activated.

Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press <DEL> to Enter Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various Setup functions and exit choices.

The BIOS Setup screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured. Blue options can be select and configured.

The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

### 11.1.1. Navigation

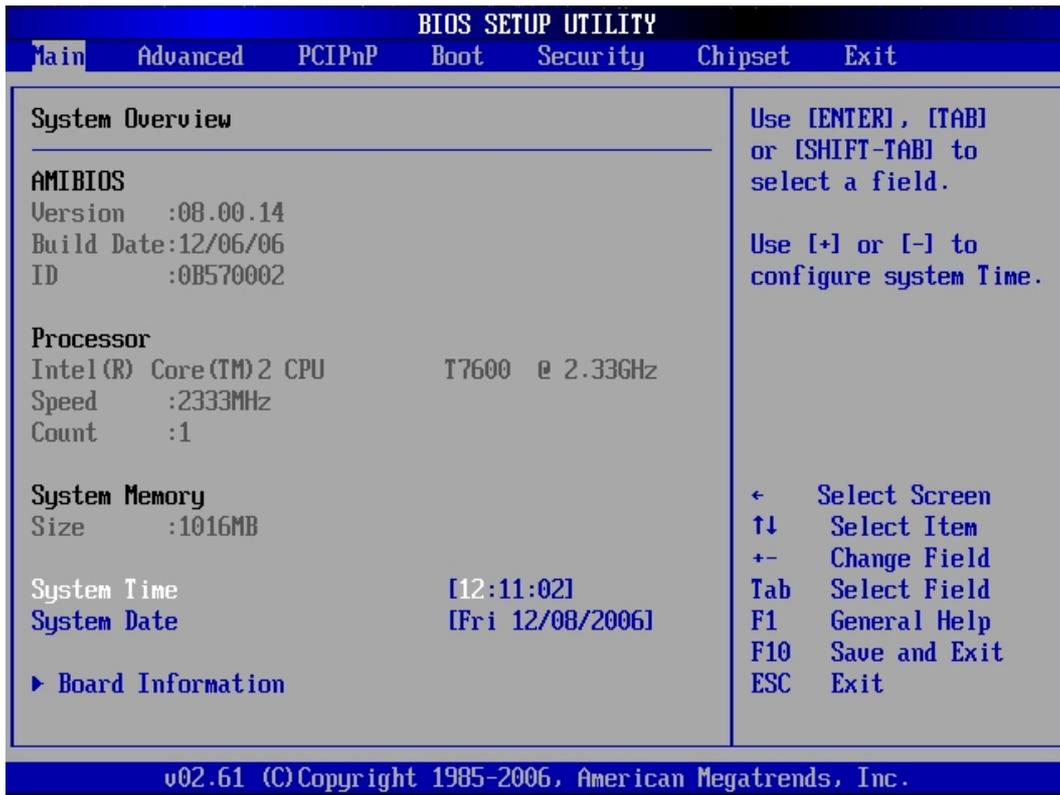
Hot Key	Description
→← Left/Right	The <i>Left and Right</i> <Arrow> keys allow you to select a BIOS Setup screen. For example: Main screen, Advanced screen, Chipset screen, and so on.
↑↓ Up/Down	The <i>Up and Down</i> <Arrow> keys allow you to select a BIOS Setup item or sub-screen.
+ / - Plus/Minus	The <i>Plus and Minus</i> <Keys> keys allow you to change the field value of a particular BIOS Setup item. For example: Date and Time.
Tab	The <Tab> key allows you to select BIOS Setup fields.



The <F8> key on your keyboard is the Fail-Safe key. It is not displayed on the key legend by default. To set the Fail-Safe settings of the BIOS, press the <F8> key on your keyboard. The Fail-Safe settings allow the motherboard to boot up with the least amount of options enabled. This can lessen the probability of conflicting settings.

The <F9> key on your keyboard is the Optimal-Default key. To set the Optimal-Default settings of the BIOS, press the <F9> key on your keyboard.

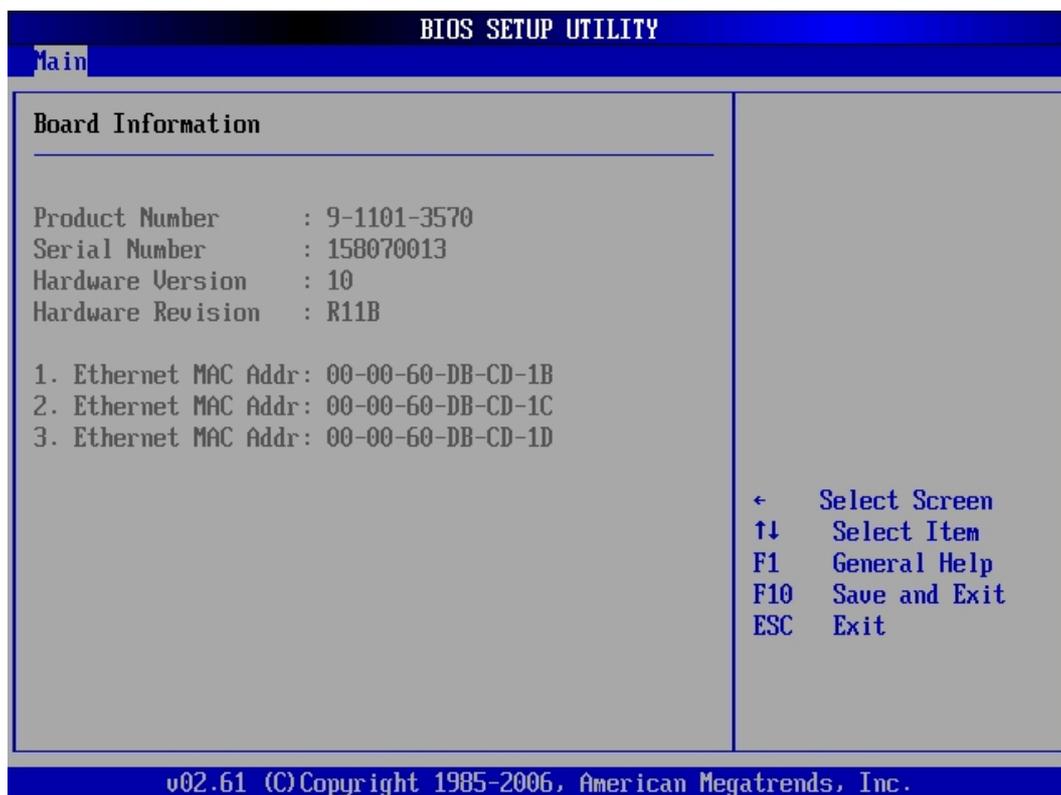
## 11.2. Main



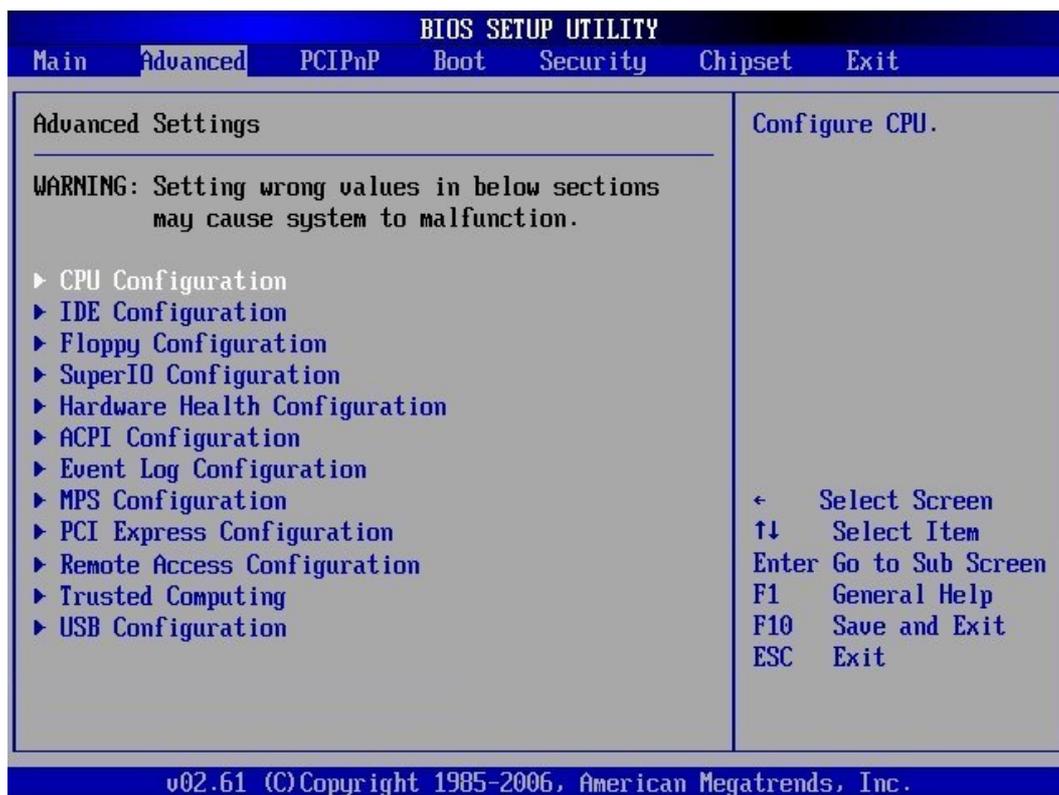
### 11.2.1. System Time / System Date

<p><i>System Time</i></p>	<p>This field indicates the time of the device. If you change the time setting, enter the time in the format <i>HH:MM:SS</i></p> <p>HH=Hours MM=Minutes SS=Seconds</p>
<p><i>System Date</i></p>	<p>This field indicates the date of the device. If you change the date setting, enter the date in the format <i>MM.DD.YYYY</i>.</p> <p>MM=Month DD=Day YYYY=Year</p> <p>The "System Date" format can be arbitrary configured.</p>

## ➤ Board Information



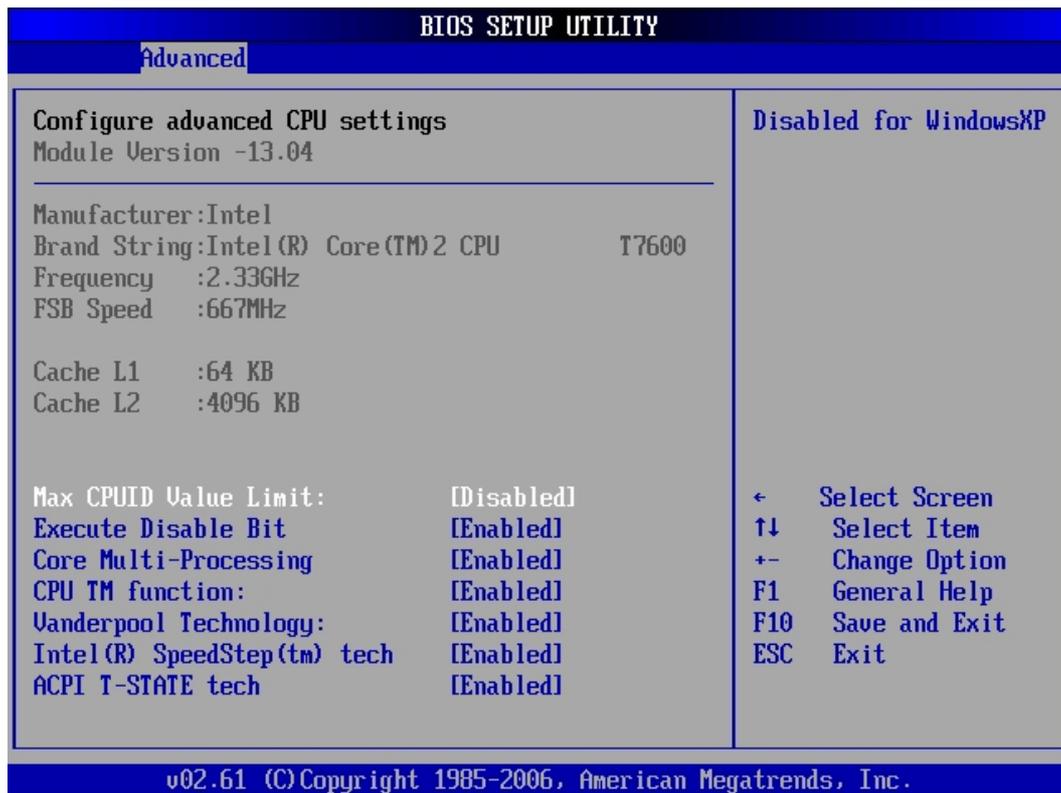
### 11.3. Advanced



You can select the sub menus of the *Advanced* BIOS Setup:

- CPU Configuration
- IDE Configuration
- Floppy Configuration
- SuperIO Configuration
- Hardware Health Configuration
- ACPI Configuration
- Event Log Configuration
- MPS Configuration
- PCI Express Configuration
- Remote Access Configuration
- Trusted Computing
- USB Configuration

### 11.3.1. CPU Configuration (Configure advanced CPU settings)



#### 11.3.1.1. Max CPUID Value Limit

Disabled for Windows XP

Available settings are: **Disabled** and *Enabled*.

#### 11.3.1.2. Execute Disable Bit

When "*Disabled*" is set, forces the Execute-Disable Bit Capability extended feature bit to always return 0.

Available settings are: **Enabled** and *Disabled*.

#### 11.3.1.3. Core Multi-Processing

When "*Disabled*" is set, disables one execution core of each CPU die.

Available settings are: **Enabled** and *Disabled*.

#### 11.3.1.4. CPU TM function

Available settings are: *Disabled* and **Enabled**.

#### 11.3.1.5. Vanderpool Technology

Available settings are: *Disabled* and **Enabled**.

#### 11.3.1.6. Intel® SpeedStep™ tech

If "*Disabled*" is set, disables GV3.

If "**Enabled**" is set, enables GV3

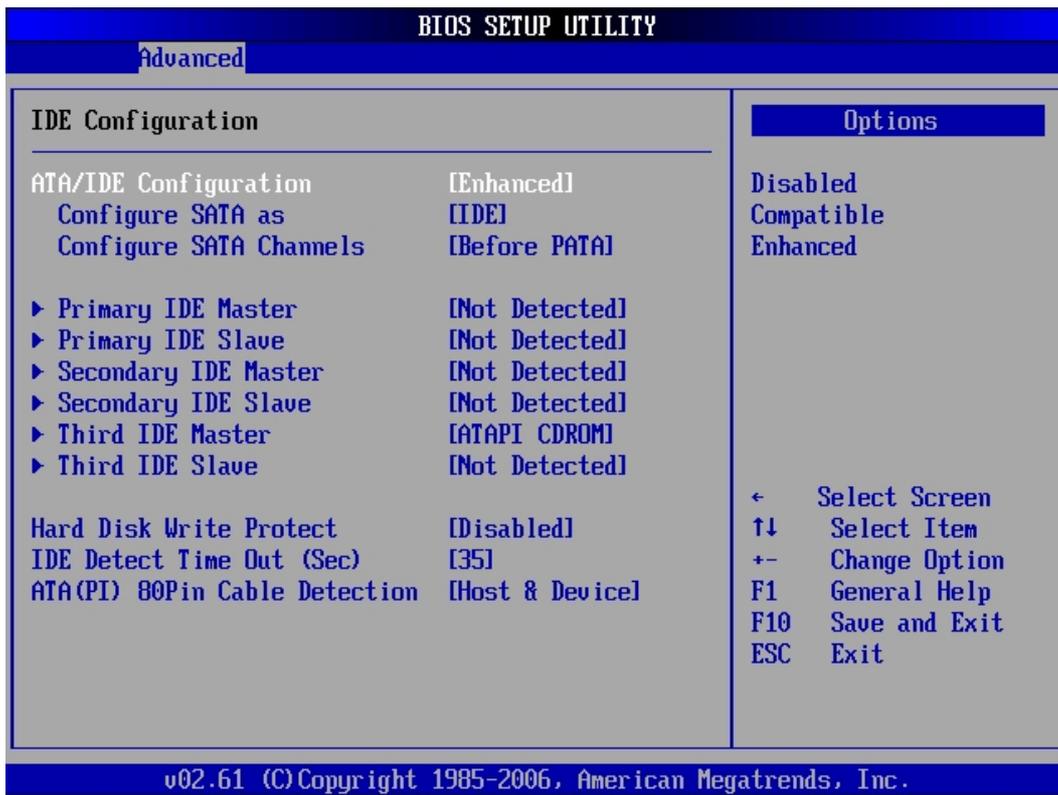
Available settings are: **Enabled** and *Disabled*.

#### 11.3.1.7. ACPI T-State tech

Available settings are: *Disabled* and **Enabled**.

### 11.3.2. IDE Configuration

This field can be used to select options for the IDE Configuration settings.



#### 11.3.2.1. ATA/IDE Configuration

Available settings are: **Enhanced**, *Compatible* and *Disabled*.

#### 11.3.2.2. Configure SATA as

Available settings are: **IDE**, *RAID* and *AHCI*.

#### 11.3.2.3. Configure SATA Channels

Available settings are: **Before PATA** and *Behind PATA*.

#### 11.3.2.4. Hard Disk Write Protect

This option allows you to enable or disable the device write protection. This will be effective only if the device is accessed through BIOS.

Available settings: *Enabled*, and **Disabled**.

### 11.3.2.5. IDE Detect Time Out (Sec)

Set this option to stop the AMI BIOS from searching for IDE devices within the specified number of seconds. Basically, this allows you to fine-tune the settings to allow for faster boot times.



Low settings can cause unreliable detection!

Possible settings are: 0, 5, 10, 15, 20, 25, 30 and **35**.

0	This is the optimal setting for systems whose onboard controllers point to a specific IDE device in the AMI BIOS.
5	Set this option to stop the BIOS from searching the IDE Bus for IDE devices in five seconds.
10	Set this option to stop the BIOS from searching the IDE Bus for IDE devices in ten seconds.
15	Set this option to stop the BIOS from searching the IDE Bus for IDE devices in 15 seconds.
20	Set this option to stop the BIOS from searching the IDE Bus for IDE devices in 20 seconds.
25	Set this option to stop the BIOS from searching the IDE Bus for IDE devices in 25 seconds.
30	Set this option to stop the BIOS from searching the IDE Bus for IDE devices in 30 seconds.
<b>35</b>	This setting is recommended for all IDE devices that are set to AUTO in the BIOS setting (because a Master waits 30 sec. max. for a slave device).

### 11.3.2.6. ATA(PI) 80Pin Cable Detection

Set this option to define the method used to detect an ATA (PI) 80-pin cable. Possible settings are: **Host & Device**, *Host* and *Device*.

<b>Host &amp; Device</b>	Set this value to use both the motherboard IDE controller and the IDE device to detect the type of IDE cable present.
<i>Host</i>	Set this value to use motherboard onboard IDE controller to detect the type of IDE cable present.
<i>Device</i>	Set this value to use IDE disk drive to detect the type of IDE cable present.

➤ **Primary IDE Master / Primary IDE Slave**

These fields call the submenu to make corresponding settings of the IDE devices.



You should change the default settings only if you are connecting an additional IDE drive (e.g. Hard disk drive).

The description of the setting options for *Primary IDE Master* also applies to *Primary IDE Slave*

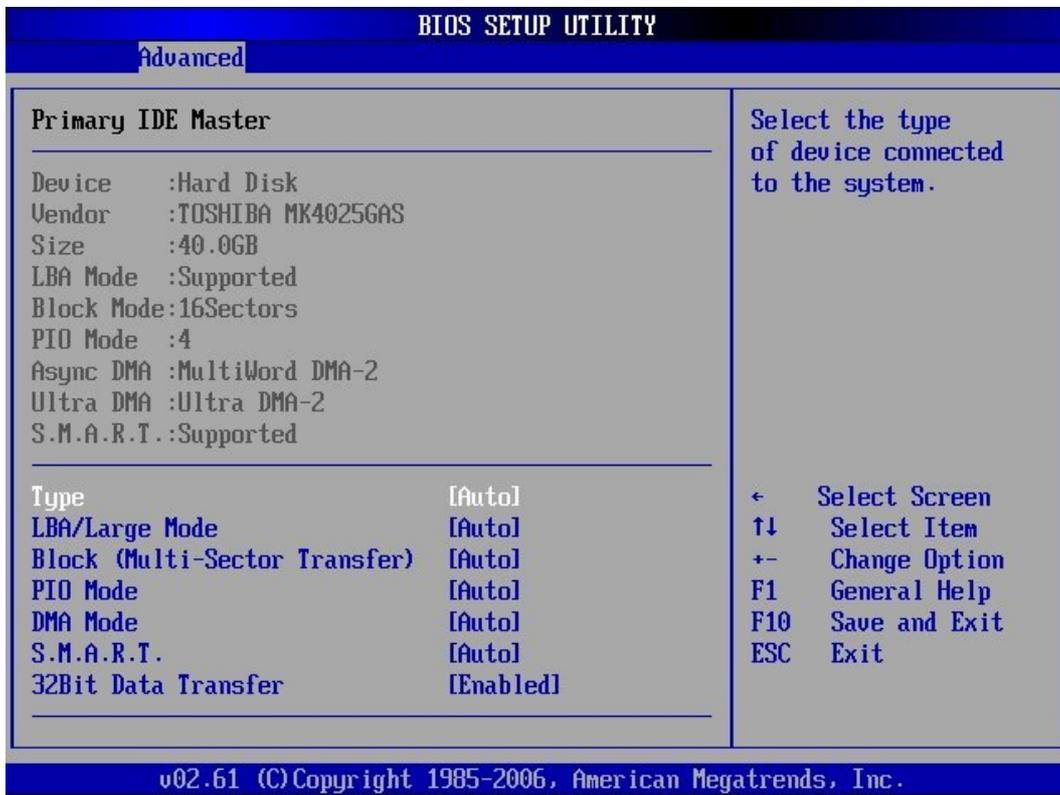


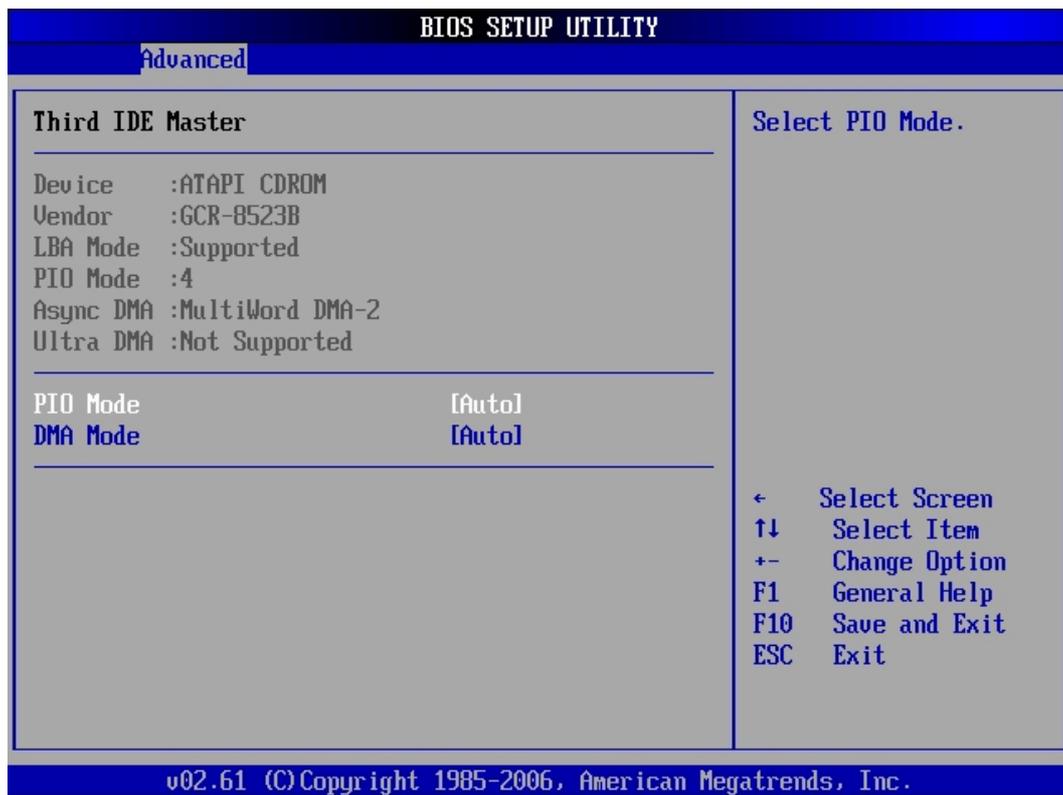
**The default settings strongly depend on the installed drive.**

**These entries are specific for each installed device as:**

- Primary IDE Master/Primary IDE Slave
- Secondary IDE Master/Secondary IDE Slave
- Third IDE Master/Third IDE Slave
- Fourth IDE Master/Fourth IDE Slave

The screens below are only an example for which entries could be available.





#### 11.3.2.7. Type

Select the type of device connected to the system.

*Not Installed, Auto, CD/DVD and ARMD (ATAPI Removable Media Device).*

#### 11.3.2.8. LBA/Large Mode

The LBA (Logical Block Addressing)/Large Mode option allows you to enable or disable support for IDE devices with capacities greater than 528MB. The maximum drive capacity in the LBA mode is 137GB.

<b>Auto</b>	This setting allows the BIOS to auto-detect LBA mode control on the specified channel (if the device supports it and the device is not already formatted with LBA Mode disabled).
<b>Disabled</b>	Disables the LBA Mode and prevent the BIOS from using LBA mode control on the specified channel.

#### 11.3.2.9. Block (Multi-Sector Transfer)

If your hard disk supports the block mode, select *Auto* for the automatic determination of the number of the blocks per request. Several sectors can be at the same time read/written. The data transfer rate will be increased.

Available settings are: **Auto** and **Disabled**.

<b>Auto</b>	The data transfer from and to the device occurs multiple sectors at a time if the device supports it. Block mode allows transfers of up to 64Kb per interrupt.
<b>Disabled</b>	The data transfer from and to the device occurs one sector at a time. Only 512 byte of data can be transferred per interrupt if block mode is not used. This setting should be used only if read and write failures occur with "Auto".

### 11.3.2.10. PIO Mode

These fields allow your system IDE controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the IDE drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 to 4, which primarily differ in timing. Available settings are: 0, 1, 2, 3, 4 and *Auto*. When *Auto* is selected, the BIOS will select the best available mode.

Available settings are: **Auto**, 0, 1, 2, 3 and 4.

<b>Auto</b>	This setting allows the BIOS to auto-detect the PIO mode. This setting is to be used if the IDE disk drive cannot be determined.
0	This setting allows the BIOS to use the PIO mode 0. It has a data transfer rate of 3.3MBs.
1	This setting allows the BIOS to use the PIO mode 1. It has a data transfer rate of 5.2MBs.
2	This setting allows the BIOS to use the PIO mode 2. It has a data transfer rate of 8.3MBs.
3	This setting allows the BIOS to use the PIO mode 3. It has a data transfer rate of 11.1MBs.
4	This setting allows the BIOS to use the PIO mode 4. It has a data transfer rate of 16.6MBs. This setting generally works with all hard disk drives manufactured after 1999. For other disk drive, such as IDE CD-ROM drives, check the specifications of the drive.



Do not change the default setting "**Auto**".

If some read and write failures occur, check the length and quality of the integrated device cable first or set this option to a setting with a lower data transfer rate as specified for your device.

### 11.3.2.11. DMA Mode

This option allows you to select the DMA mode option (depending on the integrated device). Available settings are:

**Auto**, SWDMA0, SWDMA1, SWDMA2, MWDMA0, MWDMA1, MWDMA2, UDMA0, UDMA1, UDMA2, UDMA3, UDMA4, UDMA5 and UDMA6.

<b>Auto</b>	If " <i>Auto</i> " is set, the BIOS auto-detects the DMA mode. This is the default setting.
<i>SWDMA0</i>	If " <i>SWDMA0</i> " is set the BIOS uses the Single Word DMA mode 0. It has a data transfer rate of 2.1MBs.
<i>SWDMA1</i>	If " <i>SWDMA1</i> " is set the BIOS uses the Single Word DMA mode 1. It has a data transfer rate of 4.2MBs.
<i>SWDMA2</i>	If " <i>SWDMA2</i> " is set the BIOS uses the Single Word DMA mode 2. It has a data transfer rate of 8.3MBs.
<i>MWDMA0</i>	If " <i>MWDMA0</i> " is set the BIOS uses the Multi Word DMA mode 0. It has a data transfer rate of 4.2MBs.
<i>MWDMA1</i>	If " <i>MWDMA1</i> " is set the BIOS uses the Multi Word DMA mode 1. It has a data transfer rate of 13.3MBs.
<i>MWDMA2</i>	If " <i>MWDMA2</i> " is set the BIOS uses the Multi Word DMA mode 2. It has a data transfer rate of 16.6MBs.
<i>UDMA0</i>	If " <i>UDMA0</i> " is set the BIOS uses the Ultra DMA mode 0. It has a data transfer rate of 16.6MBs (the same data transfer rate as PIO mode 4, and Multi Word DMA mode 2).
<i>UDMA1</i>	If " <i>UDMA1</i> " is set the BIOS uses the Ultra DMA mode 1. It has a data transfer rate of 25MBs.
<i>UDMA2</i>	If " <i>UDMA2</i> " is set the BIOS uses the Ultra DMA mode 2. It has a data transfer rate of 33.3MBs.
<i>UDMA3</i>	If " <i>UDMA3</i> " is set the BIOS uses the Ultra DMA mode 3. It has a data transfer rate of 44.4MBs. It is required to be used the 80-conductor ATA cable for this data transfer rate.
<i>UDMA4</i>	If " <i>UDMA4</i> " is set the BIOS uses the Ultra DMA mode 4. It has a data transfer rate of 66.6MBs. It is required to be used the 80-conductor ATA cable for this data transfer rate.
<i>UDMA5</i>	If " <i>UDMA5</i> " is set the BIOS uses the Ultra DMA mode 5. It has a data transfer rate of 99.9MBs. It is required to be used the 80-conductor ATA cable for this data transfer rate.
<i>UDMA6</i>	If " <i>UDMA6</i> " is set the BIOS uses the Ultra DMA mode 6. It has a data transfer rate of 133.2MBs. It is required to be used an 80-conductor ATA cable for this data transfer rate.

### 11.3.2.12. S.M.A.R.T.

S. M. A. R. T. (Self-Monitoring, Analysis and Reporting Technology) is used to predict drive failures. (The integrated drive has to support this feature).

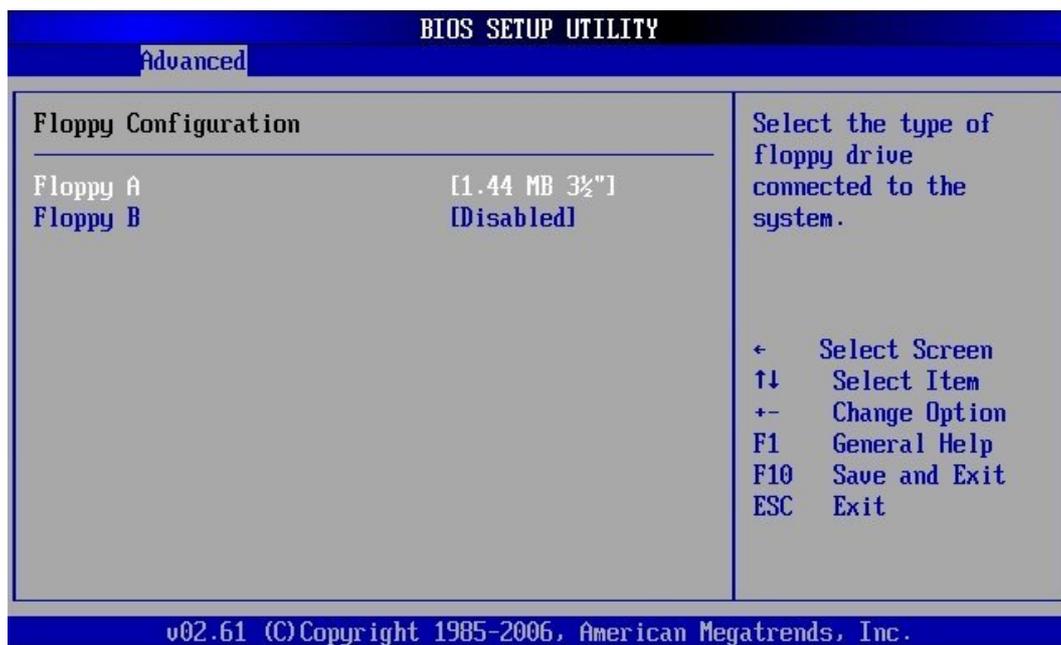
Available Settings are: **Auto**, *Disabled* and *Enabled*.

### 11.3.2.13. 32Bit Data Transfer

This option allows you to enable or disable the 32bit data transfer rate for the IDE devices. If this option is "*Enabled*" the data transfer is accelerated and the CPU (PCI Bus) is relieved.

Available settings are: **Enabled** and *Disabled*.

## 11.3.3. Floppy Configuration



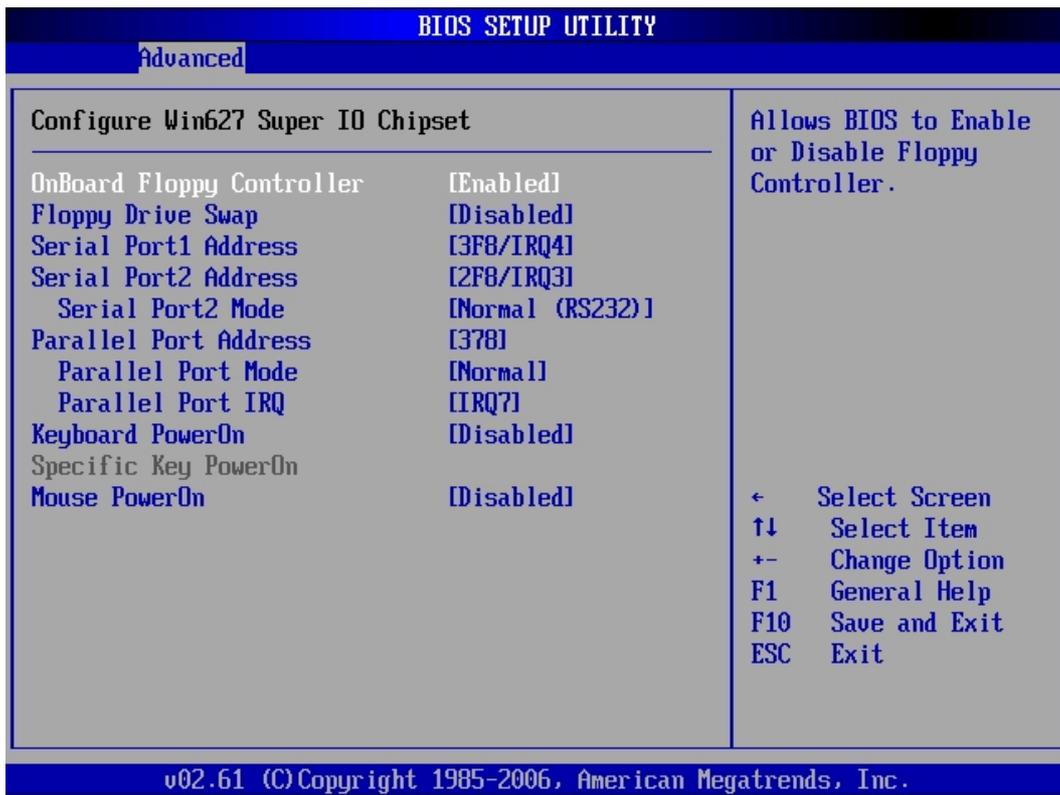
### 11.3.3.1. Floppy A / B

These options select the type of the floppy drive (for drive A or drive B). Possible settings are: *Disabled*, *720 KB 3 1/2"*, *1.44 MB 3 1/2"* and *2.88 MB 3 1/2"*.

<i>Disabled</i>	Set this value to prevent the use of the selected floppy disk drive channel. This option should be set if no floppy disk drive is installed on the specified channel. <b>This is the default setting for Floppy Drive B.</b>
<i>360KB 5 1/4"</i>	Set this value if the floppy disk drive attached to the corresponding channel is a 360 KB 5 1/4" floppy disk drive.
<i>1.2MB 5 1/4"</i>	Set this value if the floppy disk drive attached to the corresponding channel is an 1.2 MB 5 1/4" floppy disk drive.
<i>720KB 3 1/2"</i>	Set this value if the floppy disk drive attached to the corresponding channel is a 720 KB 3 1/2" floppy disk drive.
<i>1.44MB 3 1/2"</i>	Set this value if the floppy disk drive attached to the corresponding channel is an 1.44 MB 3 1/2" floppy disk drive. <b>This is the default setting for Floppy Drive A.</b>
<i>2.88 MB 3 1/2"</i>	Set this value if the floppy disk drive attached to the corresponding channel is a 2.88 MB 3 1/2" floppy disk drive.

### 11.3.4. Super IO Configuration

This field can be used to select the Super I/O settings.



#### 11.3.4.1. Onboard Floppy Controller

This function enables or disables the floppy drive controller.

Possible settings are: *Disabled* and **Enabled**.

<i>Disabled</i>	If a supplementary floppy disk controller is used or the system is not equipped with a floppy disk drive.
<b>Enabled</b>	The floppy disk controller of the board is used.

#### 11.3.4.2. Floppy Drive Swap

Available settings are: **Disabled** and *Enabled*.

#### 11.3.4.3. Serial Port 1 & 2 Address

These fields allow you to select the onboard serial ports and their addresses.

Available settings are:

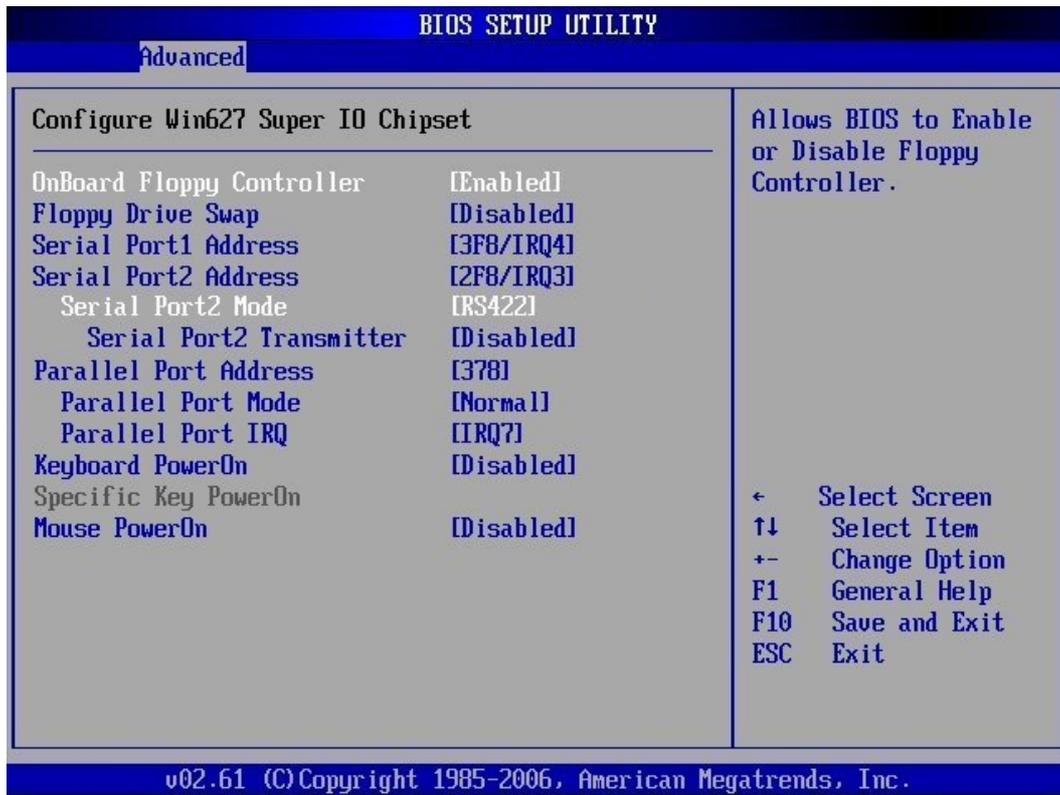
	Default	Available settings (without default setting)
Serial Port 1 Address	<b>3F8/IRQ4</b>	3E8/IRQ4 / 2E8/IRQ3 / Disabled
Serial Port 2 Address	<b>2F8/IRQ3</b>	3E8/IRQ4 / 2E8/IRQ3 / Disabled

#### 11.3.4.4. Serial Port2 Mode

This field allows you to select the line mode for serial communication.

Available settings are: **Normal (RS232)**, **RS422** and **RS485**.

If the [Serial Port2 Mode] is set to **RS422** is available a supplementary option: [Serial Port2 Transmitter].



If Serial Port2 Mode is set to <b>RS422</b>	Available settings
Serial Port2 Transmitter	<i>Enabled</i> and <b><i>Disabled</i></b>

#### 11.3.4.5. Parallel Port Address

This field selects the I/O address used to access the parallel interface.

The possible values are: *Disabled*, **378**, **278**, **3BC**.



The use of address space **3BC** may be restricted for some modes because it doesn't allow for 8 consecutive addresses.

**11.3.4.6. Parallel Port Mode**

This field is used to specify whether the parallel port is to be used as a bi-directional input/output port or just as an output port. *ECP* and *EPP* transfer modes allow faster transfer rates of 2 and 2.4 Mbytes/s. These modes will only work with peripheral devices which support them. In addition, the field *Parallel Port Address* must be set to 378 or 278 when using one of these two modes.

<b>Normal</b>	The port functions as an output port only.
<i>Bi-Directional</i>	Data can be transferred in both directions across the port.
<i>EPP</i>	Fast transfer mode (up to 2 Mbytes/s), can output and receive data. The mode requires a peripheral device which supports the EPP (Enhanced Parallel Port) transfer mode.
<i>ECP</i>	Fast transfer mode (up to 2.4 Mbytes/s), can output and receive data. The mode requires a peripheral device which supports the ECP (Enhanced Capability Port) transfer mode.
<i>ECP &amp; EPP</i>	Fast transfer mode (up to 2.4 Mbytes/s), can output and receive data. The mode requires a peripheral device which supports both EPP (Enhanced Parallel Port) and ECP (Enhanced Capability Port) transfer mode.

**11.3.4.7. Parallel Port IRQ**

This field selects the interrupt used for the parallel interface.

It is possible to choose between: **IRQ7** and *IRQ5*.

<b>IRQ7</b>	This setting allows the parallel port to use the interrupt IRQ7.
<i>IRQ5</i>	This setting allows the parallel port to use the interrupt IRQ5.

**11.3.4.8. Keyboard PowerOn**

This option allows you to wake-up your system using the keyboard.

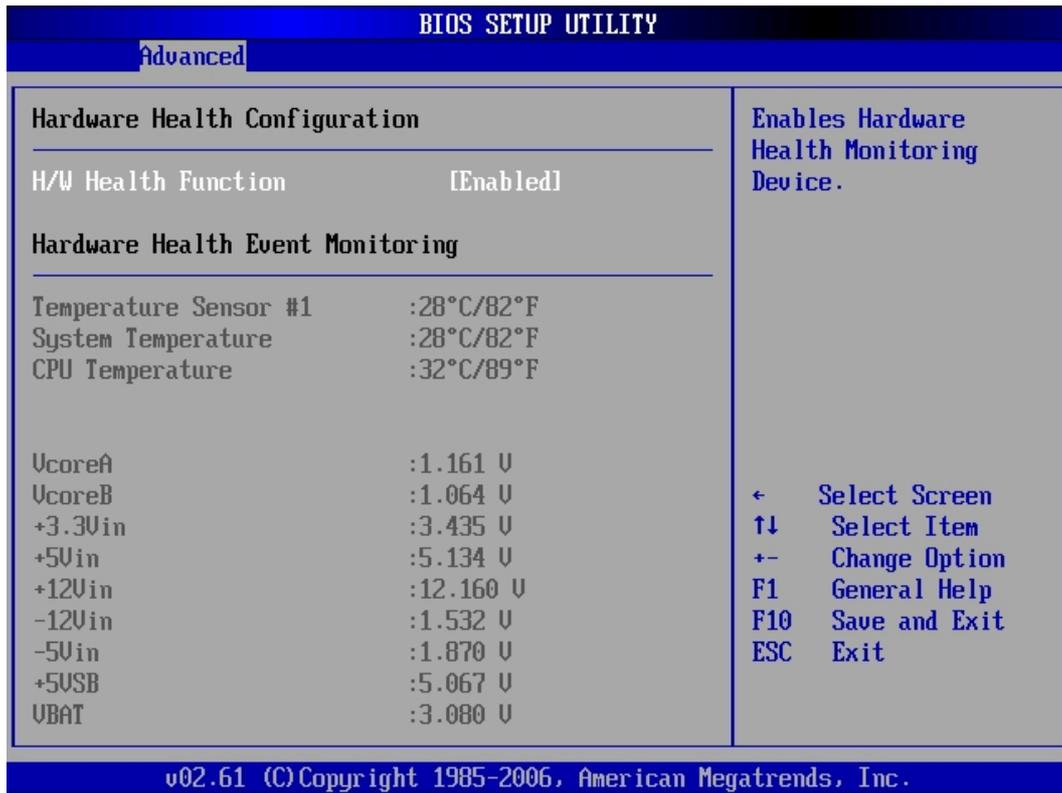
Available settings are: **Disabled**, *Specific Key*, and *Any Key*.

**11.3.4.9. Mouse PowerOn**

This option allows you to wake-up your system using the mouse.

Available settings are: **Disabled**, *Left Button*, and *Right Button*.

### 11.3.5. Hardware Health Configuration



#### 11.3.5.1. H/W Health Function

This option allows you to enable or disable the Hardware Health Event Monitoring.

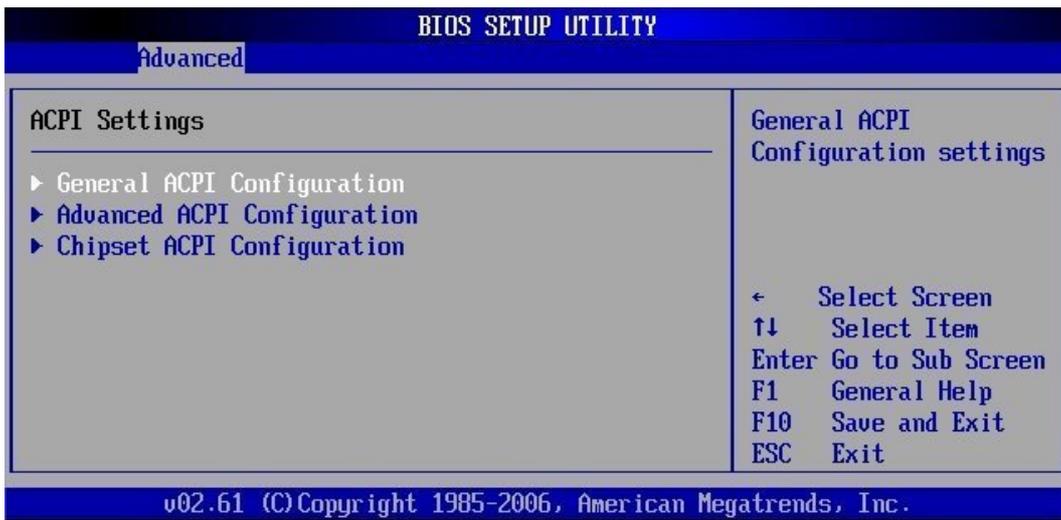
Available settings are: **Enabled** and *Disabled*.

#### 11.3.5.2. Hardware Health Event Monitoring

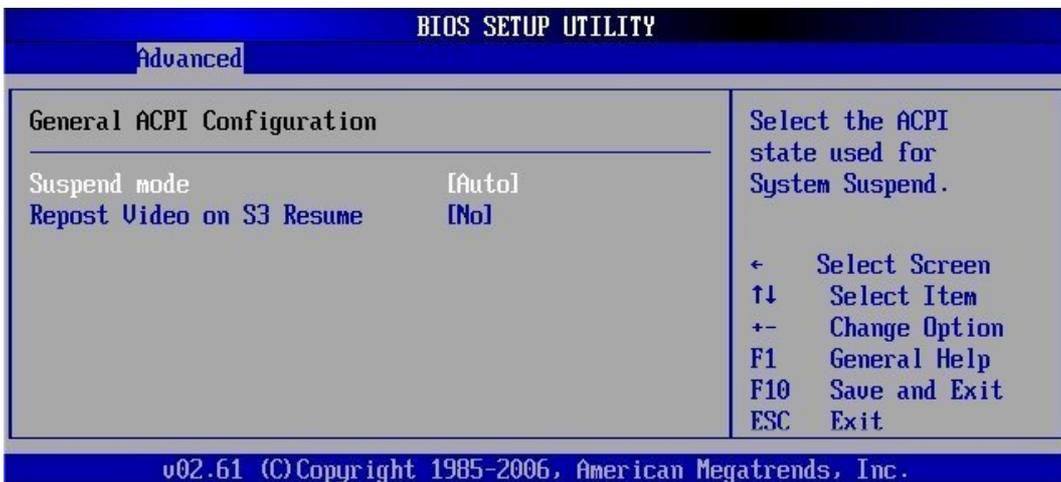
These fields allow you to observe the parameters of the hardware monitoring function feature of the system. The values are read-only values for the monitoring of the system and show the PC health status.

### 11.3.6. ACPI Configuration

ACPI Configuration settings allow you to select the Advanced Power Management (APM) options.



#### ➤ General ACPI Configuration



#### 11.3.6.1. Suspend Mode

This option allows you to select the ACPI state used for System Suspend.

It is possible to choose between: **Auto**, **S1 (POS)** and **S3 (STR)**.

**S1 (POS) Power On Suspend:** The system appears off. The CPU is stopped. RAM is refreshed. The system is running in a low power mode.

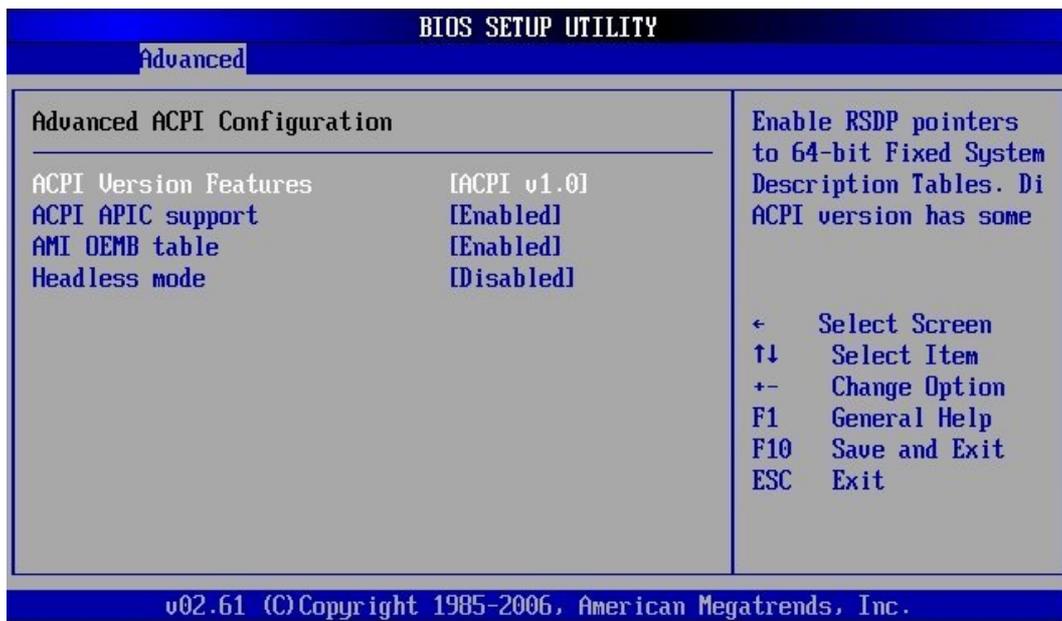
**S3 (STR): Suspend to RAM:** The system appears off. The CPU has no power. RAM is refreshed. The system is running in a lower power mode than S1.

#### 11.3.6.2. Repost Video on S3 Resume

This option allows you to determine whether you invoke a VGA BIOS POST on S3/STR resume.

Available settings: Yes and **No**.

### ➤ Advanced ACPI Configuration



#### 11.3.6.3. ACPI Versions Features

This option allows you to set the corresponding ACPI version. It is possible to choose between: **ACPI v1.0**, **ACPI v2.0** and **ACPI v3.0**.

#### 11.3.6.4. ACPI APIC support

This option determines whether or not to include the ACPI APIC table pointer to the RSDT pointer list. It is possible to choose between: **Enabled** and **Disabled**.

<b>Enabled</b>	This setting will initiate ACPI APIC support.
<b>Disabled</b>	This setting disables ACPI APIC support.

#### 11.3.6.5. AMI OEMB table

This option allows you to include the OEMB table pointer to R(X)SDT pointer list.

It is possible to choose between: **Enabled** and **Disabled**.

<b>Enabled</b>	This setting enables adding an OEMB table.
<b>Disabled</b>	This setting disables adding an OEMB table.



OEMB table is used to pass POST data to the AML code during ACPI O/S operation. It is required for proper functionality.

#### 11.3.6.6. Headless mode

This option is used to update the ACPI FACP table to indicate headless operations.

It is possible to choose between: **Enabled** and **Disabled**.

<b>Enabled</b>	This option enables updating the ACPI FACP table to indicate headless operation.
<b>Disabled</b>	This option disables updating the ACPI FACP table to indicate headless operation.

**11.3.6.7. AMI OEMB table**

This option allows you to include the OEMB table pointer to R(X)SDT pointer list.  
It is possible to choose between: **Enabled** and **Disabled**.

<b>Enabled</b>	This setting enables adding an OEMB table.
<b>Disabled</b>	This setting disables adding an OEMB table.



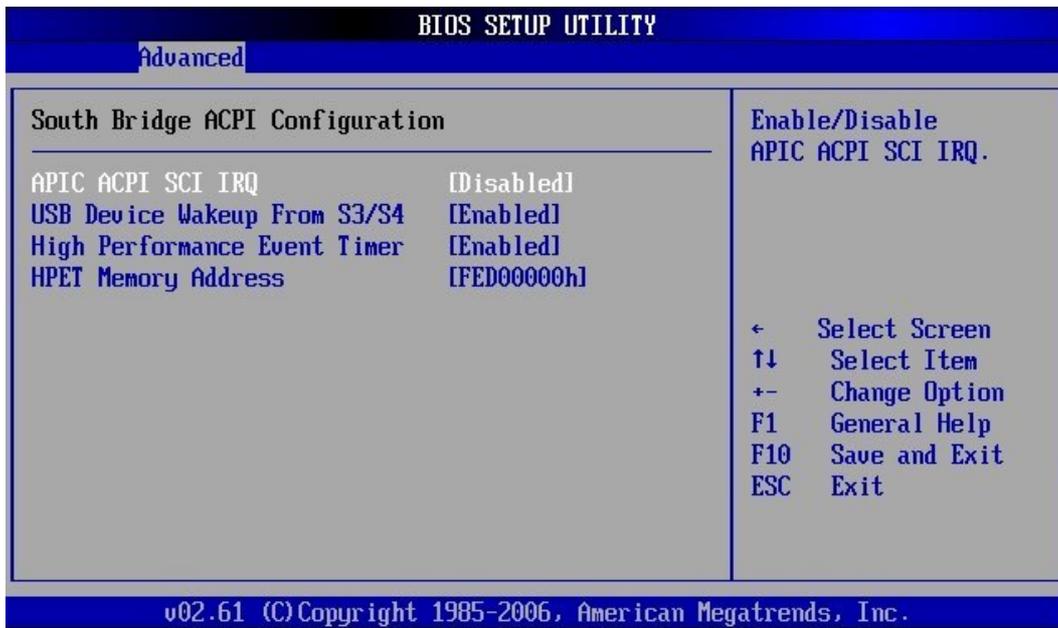
OEMB table is used to pass POST data to the AML code during ACPI O/S operation. It is required for proper functionality.

**11.3.6.8. Headless mode**

This option is used to update the ACPI FACP table to indicate headless operations.  
It is possible to choose between: **Enabled** and **Disabled**.

<b>Enabled</b>	This option enables updating the ACPI FACP table to indicate headless operation.
<b>Disabled</b>	This option disables updating the ACPI FACP table to indicate headless operation.

➤ **Chipset ACPI Configuration (South Bridge)**

**11.3.6.9. APIC ACPI SCI IRQ**

This option allows you to enable or disable the APIC ACPI IRQ function.  
Available settings: **Enabled** and **Disabled**.

**11.3.6.10. USB Device Wakeup From S3/S4**

This option allows you to enable or disable the wakeup function from the S3/S4 state.  
Available settings: **Enabled** and **Disabled**.

**11.3.6.11. High Performance Event Timer**

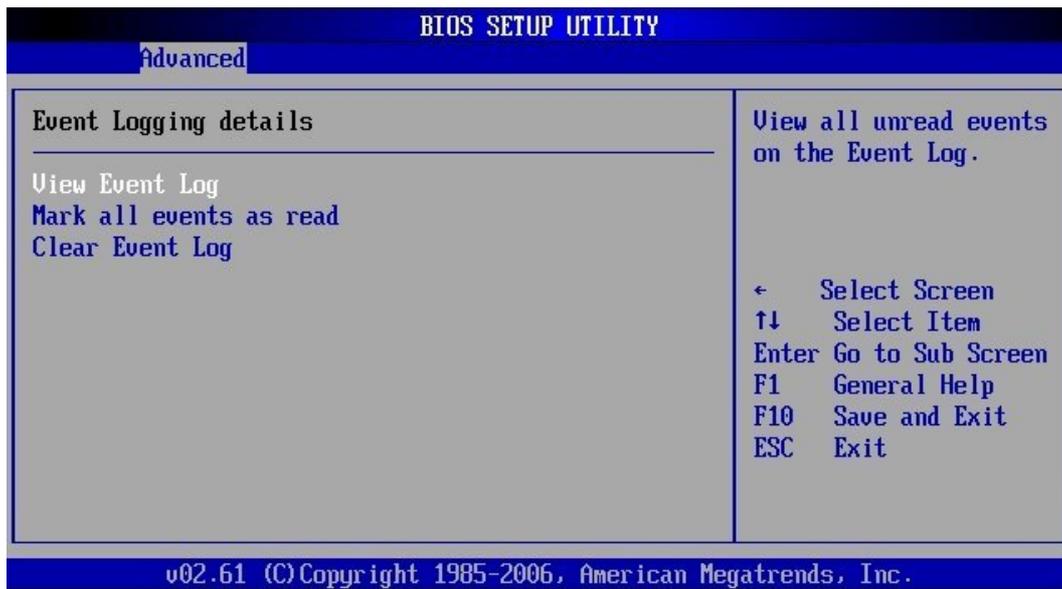
This option allows you to enable or disable the HPET (High Performance Event Timer).  
Available settings: **Enabled** and **Disabled**.

**11.3.6.12. HPET Memory Address**

This option is available only if the [High Performance Event Timer] is set to "**Enabled**".  
Available settings: **FED00000h** / **FED01000h** / **FED02000h** and **FED03000h**.

### 11.3.7. Event Log Configuration (Event Logging details)

AMI BIOS logs certain events to be event log, which can be configured using these options.



#### 11.3.7.1. View Event Log

This selection allows you to view the event log.

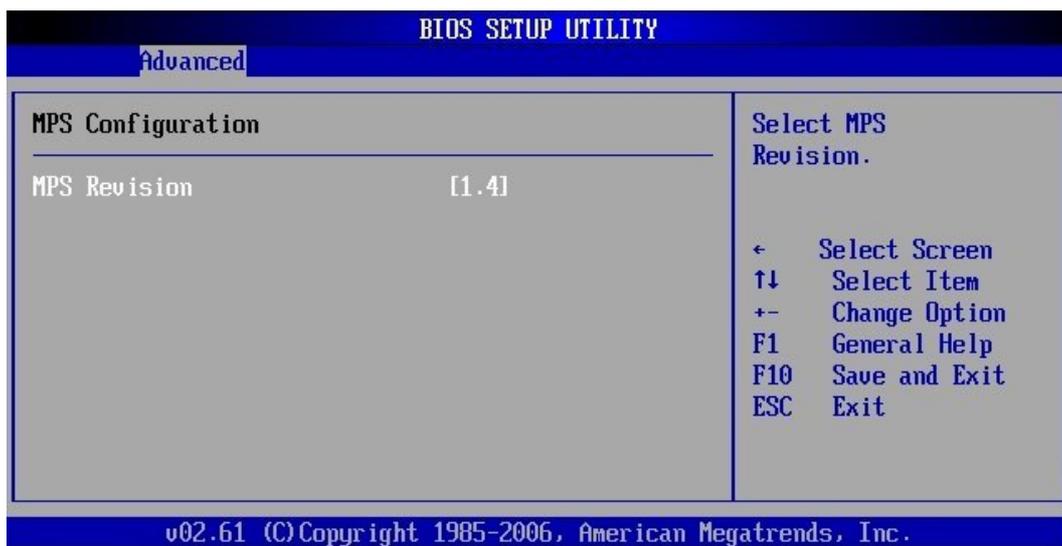
#### 11.3.7.2. Mark all events as read

This selection allows you to set the events as already read.

#### 11.3.7.3. Clear Event Log

This selection allows you to clear all events in the event log.

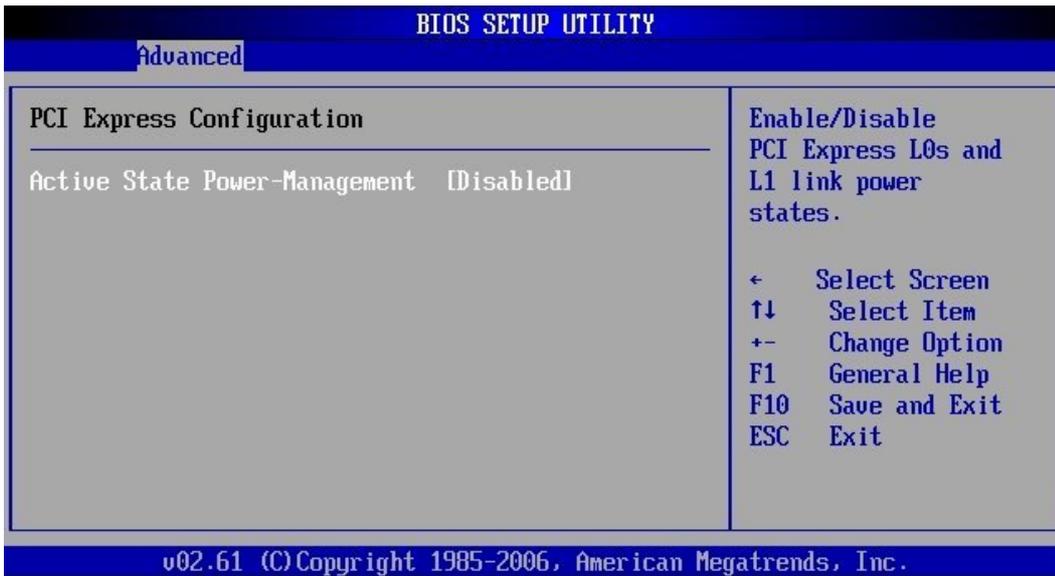
### 11.3.8. MPS Configuration



This field allows you to select which MPS (Multi-Processor Specification) version is used. You have to select the MPS version supported by your operating system.

Available settings are: **1.4** and **1.1**.

### 11.3.9. PCI Express Configuration

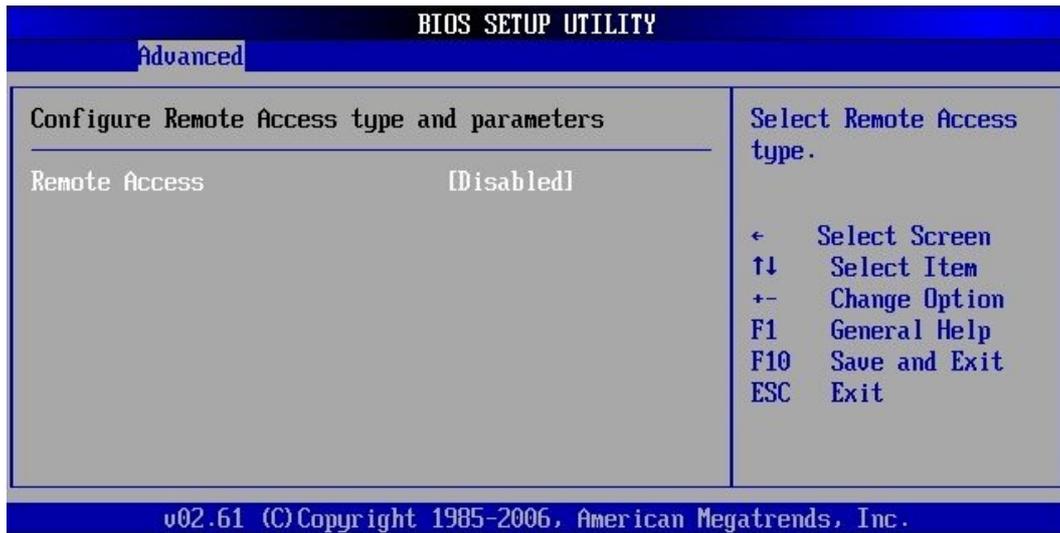


#### 11.3.9.1. Active State Power Management

This option allows you to enable or disable the L0s and L1 link power states.

Available settings are: *Enabled* and ***Disabled***.

### 11.3.10. Remote Access Configuration (Configure Remote Access type and parameters)

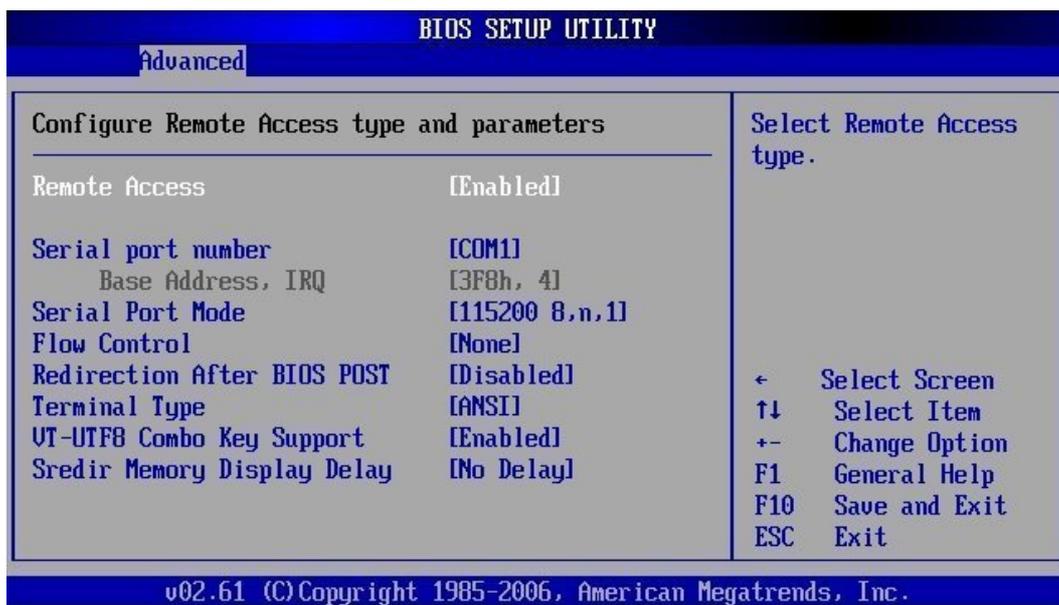


#### 11.3.10.1. Remote Access

This option allows you to enable or disable the console redirection features.

Available settings are: *Enabled* and ***Disabled***.

If this option is set to "*Enabled*" are available following options:



#### 11.3.10.2. Serial port number

This option allows you to select the serial port for console redirection.

The available settings are: ***COM1*** and *COM2*.

#### 11.3.10.3. Serial Port Mode

This option allows you to select the serial port features (Speed, Data Bits, Parity, StopBits) for a proper data transfer with the client system.

The available settings are: **115200 8,n,1** / 57600 8,n, 1 / 38400 8,n,1 / 19200 8,n,1 / 09600 8,n,1.

**11.3.10.4. Flow Control**

Flow Control lets computers (host and client) tell each other when they can accept more data for transmission and when to wait. This handshaking prevents data from being lost because one computer was busy.

The available settings are: **None**, *Hardware* and *Software*.

**11.3.10.5. Redirection After BIOS POST**

This option allows you to select when the console redirection will be used.

<i>Always</i>	Redirection is always active. (Some OSs may not work if this setting is chosen).
<i>Boot Loader</i>	Redirection is active during POST and during Boot Loader.
<b>Disabled</b>	Turns off the redirection after POST.

**11.3.10.6. Terminal Type**

This option allows you to select the target terminal type.

The available settings (industry standard terminal protocol) are:

**ANSI**, *VT 100* and *VT-UTF8*.

**11.3.10.7. VT-VTF8 Combo Key Support**

This option allows you to enable or disable the VT-UTF8 Combo Key Support for ANSI/VT 100 terminals.

It is possible to choose between: **Enabled** and *Disabled*.



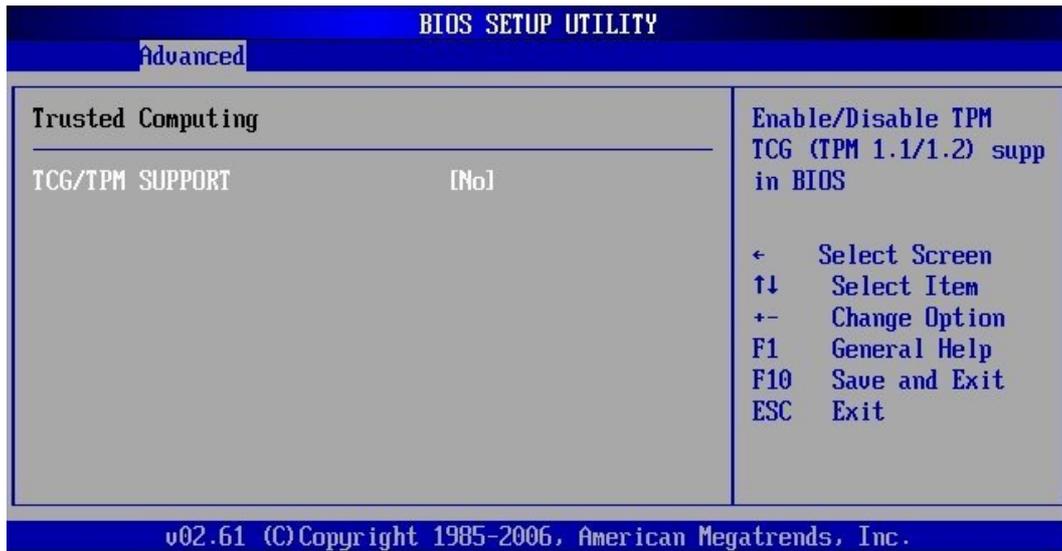
Client and target systems must have the same settings for a working communication.

**11.3.10.8. Sredir Memory Display Delay**

This option allows you to pause for the memory display during redirection for the set value.

Available settings are: **No Delay**, *Delay 1 Sec*, *Delay 2 Sec* and *Delay 4 Sec*.

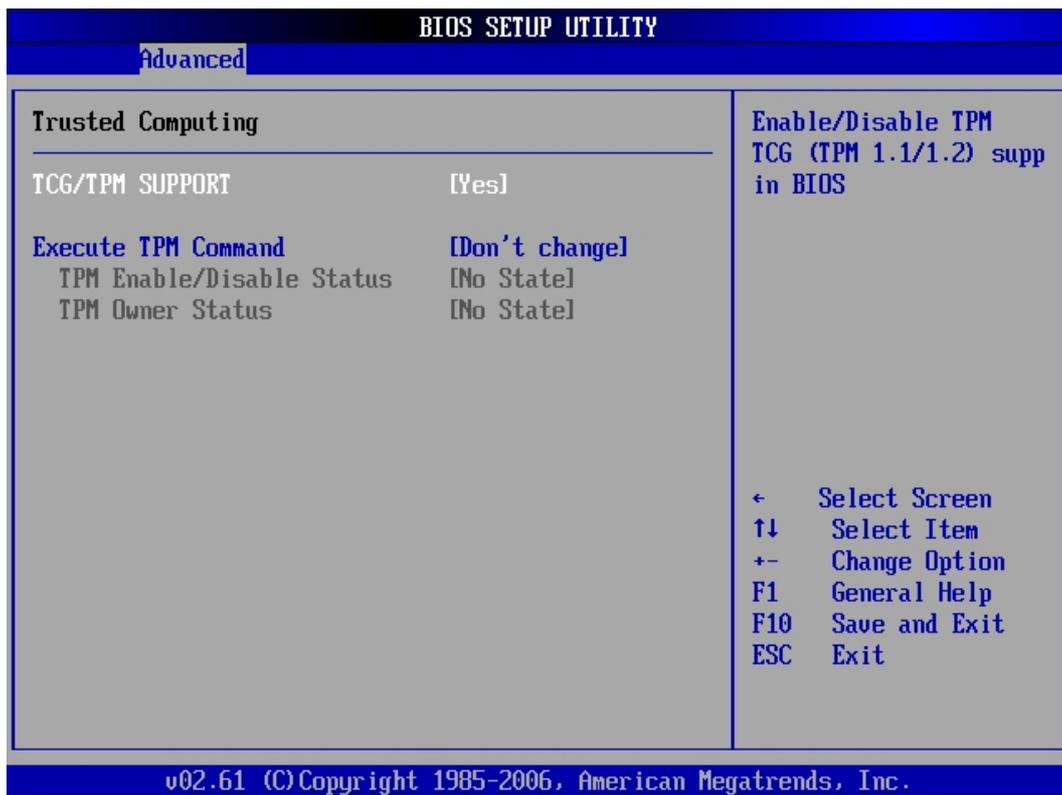
### 11.3.11. Trusted Computing



This option allows you to enable or disable the TPM TCG (TPM 1.1/1.2) support in BIOS.

Available settings are: Yes and **No**.

If this option is set to "Yes" is available following options: [Execute TPM Command].



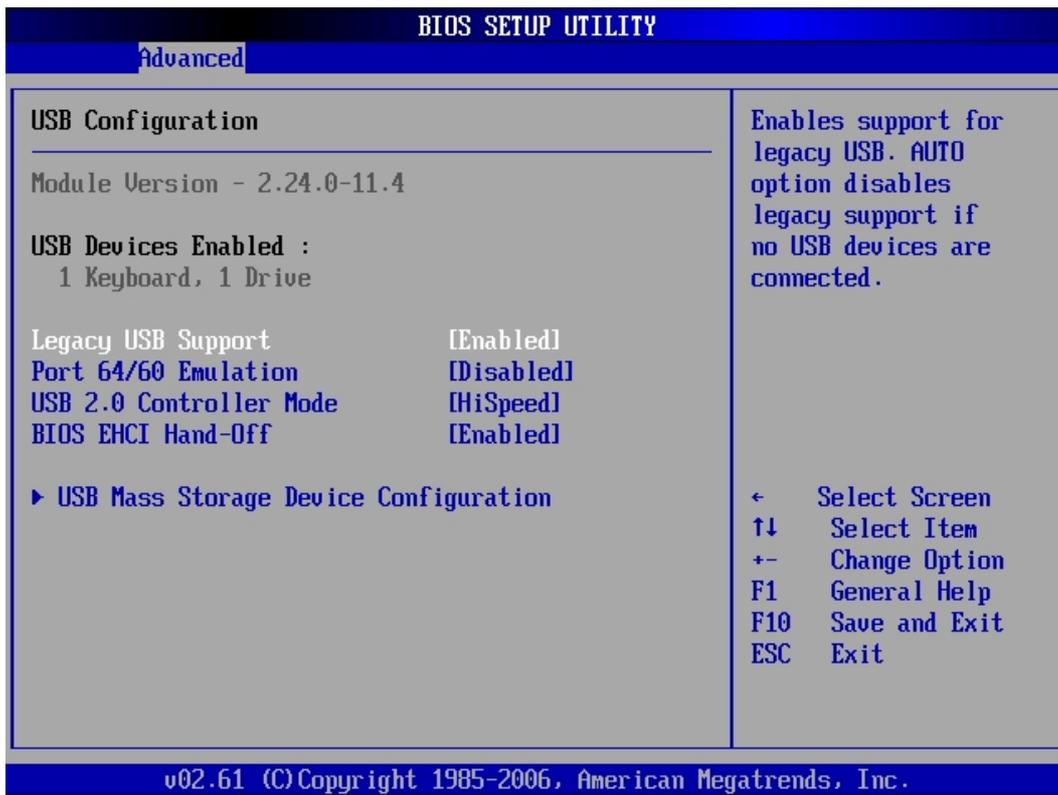
#### 11.3.11.1. Execute TPM Command

This option allows you to enable (activate), to disable (deactivate) the initialization of the TPM (Trusted Platform Module).

Available settings are: **Don't change**, *Disabled* and *Enabled*.

### 11.3.12. USB Configuration

This field allows you to select options for USB configuration.



#### 11.3.12.1. Legacy USB Support

This function enables or disables support for legacy USB. Enabling legacy USB support allows using USB devices under DOS and other non-Plug & Play operating systems.

Possible settings are: **Enabled**, **Disabled** and **Auto**.

If "Auto" is set, the system is searching for USB devices. Whether no device is detected, the BIOS disable this option in background.

#### 11.3.12.2. Port 64/60 Emulation

The [Port 64/60 Emulation] option is available only if the option [Legacy USB Support] is set to **Enabled** or **Auto**.

Possible settings are: **Enabled** and **Disabled**.

#### 11.3.12.3. USB 2.0 Controller Mode

The [USB 2.0 Controller Mode] option is available only if the option [Legacy USB Support] is set to **Enabled** or **Auto**.

This option allows you to set the data signaling rate for the USB 2.0 controller.

Possible settings are: **FullSpeed** and **HiSpeed**.

<b>HiSpeed</b>	This setting allows data signaling rate of 480 Mbps.
<b>FullSpeed</b>	This setting allows data signaling rate of 12 Mbps.

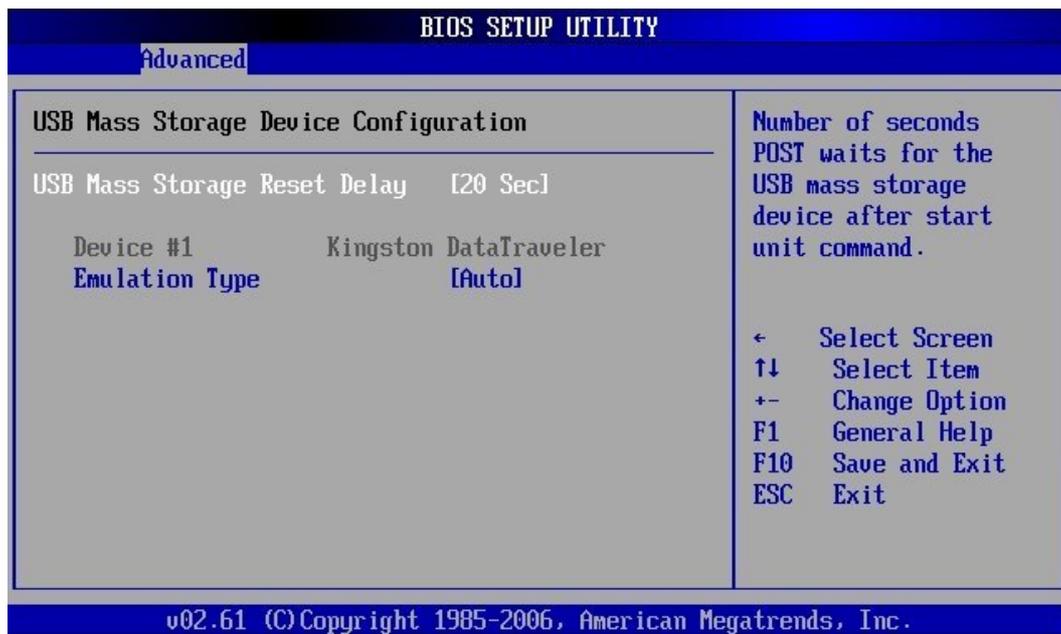
#### 11.3.12.4. BIOS EHCI Hand-Off

The [BIOS EHCI Hand-Off] option is available only if the [Legacy USB Support] is set to **Enabled** or **Auto**.

This option allows you to enable support for operating systems without "EHCI Hand-Off" features.

Possible settings are: **Enabled** and **Disabled**.

### ➤ USB Mass Storage Device Configuration



#### 11.3.12.5. USB Mass Storage Reset Delay

This option specifies amount of time the BIOS USB code should wait after issuing a reset to the USB mass storage devices (only needed for slow starting devices).

It is possible to choose between: *10 Sec*, ***20 Sec***, *30 Sec*, and *40 Sec*.

#### 11.3.12.6. Emulation Type

This option specifies the type of emulation provided by the BIOS for the device.

It is possible to choose between: ***Auto***, *Hard Disk*, *CD-ROM*, *Floppy* and *Forced FDD*.

<b><i>Auto</i></b>	When this option is selected, the BIOS detect the current formatted media.
<i>Hard Disk</i>	This option allows the device to be emulated as hard disk.
<i>CD-ROM</i>	This option allows the device to be emulated as a CD-ROM (if the block size of the media is greater than 512 bytes).
<i>Floppy</i>	This option allows the device to be emulated as floppy drive.
<i>Forced FDD</i>	This option allows a hard disk image to be connected as a floppy image.

## 11.4. PCIPnP

The "PCI PnP Configuration" section of the BIOS controls the settings for the onboard PCI slots.



### 11.4.1.1. Clear NVRAM

This Option allows you to clear the NVRAM during the system boot.

The available settings are: **No** and Yes.

### 11.4.1.2. Plug & Play O/S

This field determines the Plug&Play function. Plug&Play means that added components are automatically recognized and installed if they support automatic recognition.

The available settings are: **No** and Yes.

<b>No</b>	The system BIOS assumes the recognition of the components and assigns the resources (e.g. DOS, WIN3.1).
Yes	The operating system assumes part of the Plug&Play functions. This setting should only be selected if the operating system supports Plug&Play (e. g. Windows 95 or higher) (e.g. Windows 2000, XP, Modem, LINUX).

#### 11.4.1.3. PCI Latency Timer

This choice specifies, how long (PCI clock) a PCI card can still use the PCI Bus as master, if another PCI card requests the access to the PCI Bus.

The available settings are: 32, **64**, 96, 128, 160, 192, 224 and 248.

#### 11.4.1.4. Allocate IRQ to PCI VGA

This option allows or restricts the system to allocate an IRQ to a VGA adapter card that uses the PCI Bus.

The available settings are: **Yes** and *No*.

<b>Yes</b>	Assigns an IRQ to PCI VGA card if the card requests an IRQ.
<i>No</i>	Does not assign an IRQ to a PCI VGA card even if the card requests an IRQ.

#### 11.4.1.5. Palette Snooping

This option allows the compliance of older higher resolution video cards to the VGA standard. As presently all video boards are compliant to this standard, this option must stay **Disabled**. This default setting should not be changed unless the VGA card manufacturer requires Palette Snooping to be “*Enabled*”.

The available settings are: *Enabled* and **Disabled**.

#### 11.4.1.6. PCI IDE BusMaster

If this option is „Enabled“, the BIOS uses busmastering for reading/writing to IDE drives.

The available settings are: **Enabled** and *Disabled*.

#### 11.4.1.7. OffBoard PCI/ISA IDE Card

This option is to be used if an offboard PCI/ISA IDE controller adapter card is installed in the system. The settings of this option allow you to specify the PCI expansion slot on the motherboard where the offboard PCI/ISA controller is installed.

The available settings are: *PCI Slot1*, *PCI Slot2*, *PCI Slot3*, *PCI Slot4*, *PCI Slot5*, *PCI Slot6*, and **Auto**.

#### 11.4.1.8. IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, IRQ14, IRQ15

These options allow you to configure the IRQ Resources.

Available settings are: **Available** and *Reserved*.

<b>Available</b>	This setting allows the specified IRQ to be used by PCI/PnP device.
<i>Reserved</i>	This setting allows the specified IRQ to be used by a legacy ISA device.

#### 11.4.1.9. DMA Channel 0, DMA Channel 1, DMA Channel 3, DMA Channel 5, DMA Channel 6, DMA Channel 7

These options allow you to configure the DMA channels.

Available settings are: **Available** and *Reserved*.

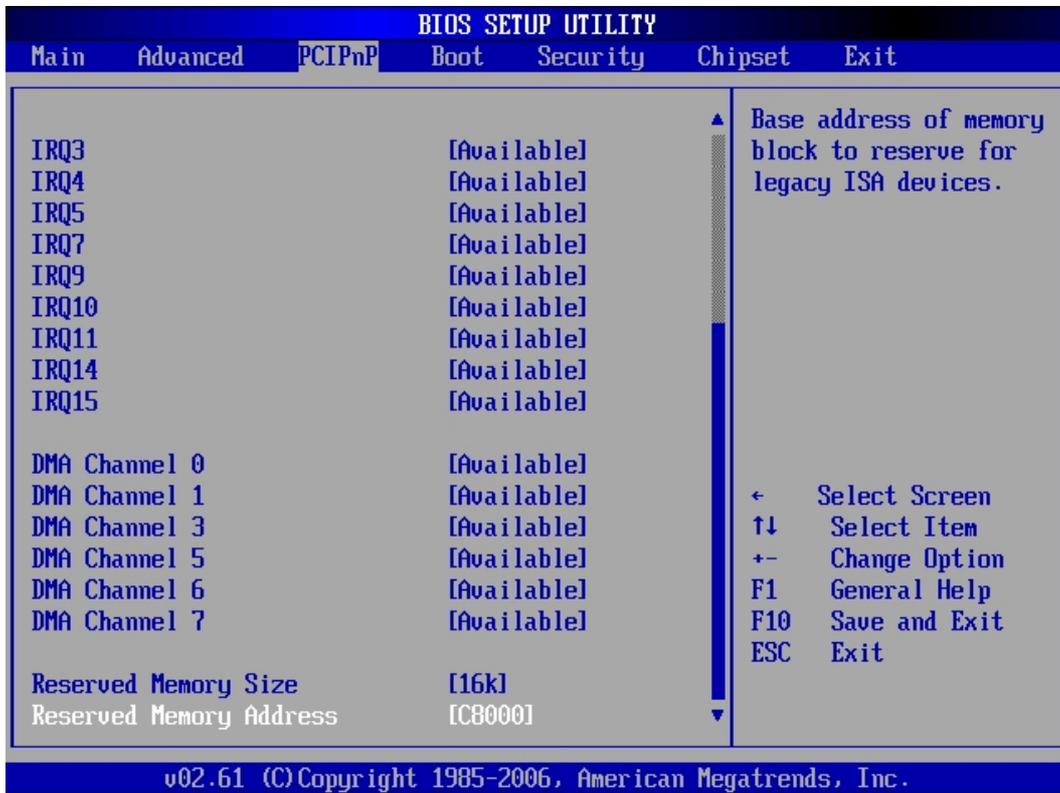
<b>Available</b>	This setting allows the specified DMA channel to be used by PCI/PnP device.
<i>Reserved</i>	This setting allows the specified DMA channel to be used by a legacy ISA device.

#### 11.4.1.10. Reserved Memory Size

This option allows you to specify the memory size for the ISA extension cards (only to be used if the ISA-Bridge is equipped on the backplane).

Available settings are: *16k*, *32k*, *64k* and ***Disabled***.

If this option is enabled to *16k*, *32k* or *64k* a supplementary option is available: "Reserved Memory Address".



#### 11.4.1.11. Reserved Memory Address

This option allows you to specify the memory size for the ISA extension cards in the reserved memory address.

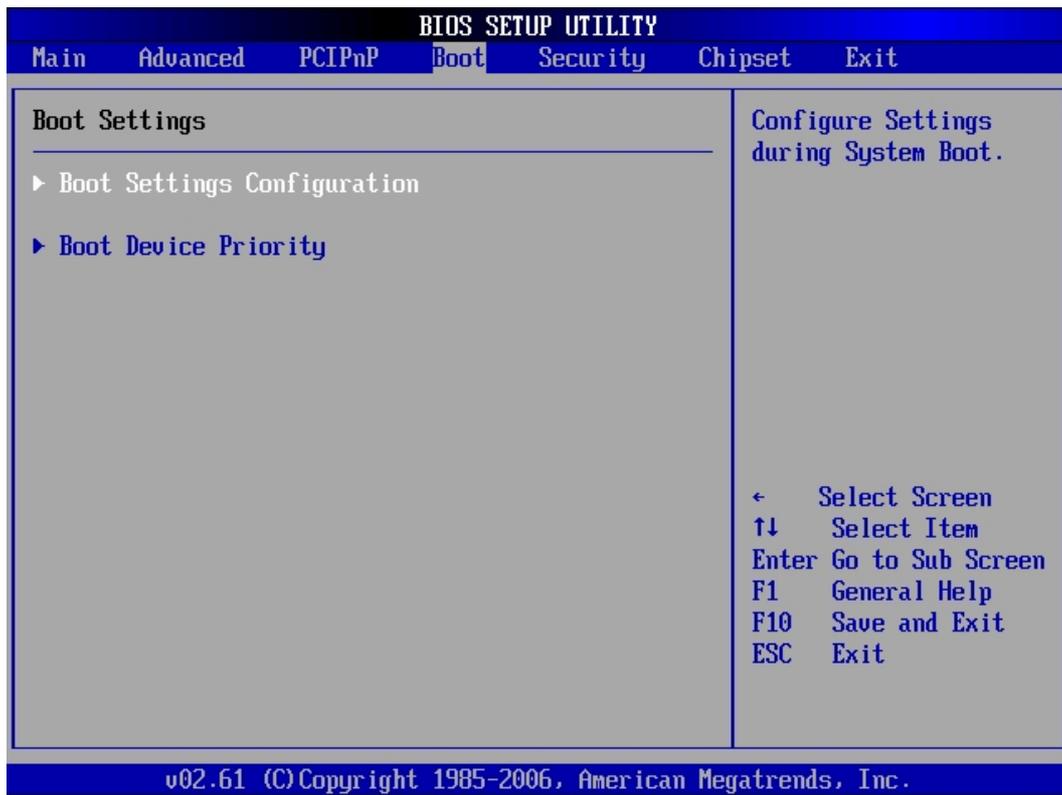
Available settings are: C0000, C4000, **C8000**, CC000, D0000, D4000, D8000 and DC000.



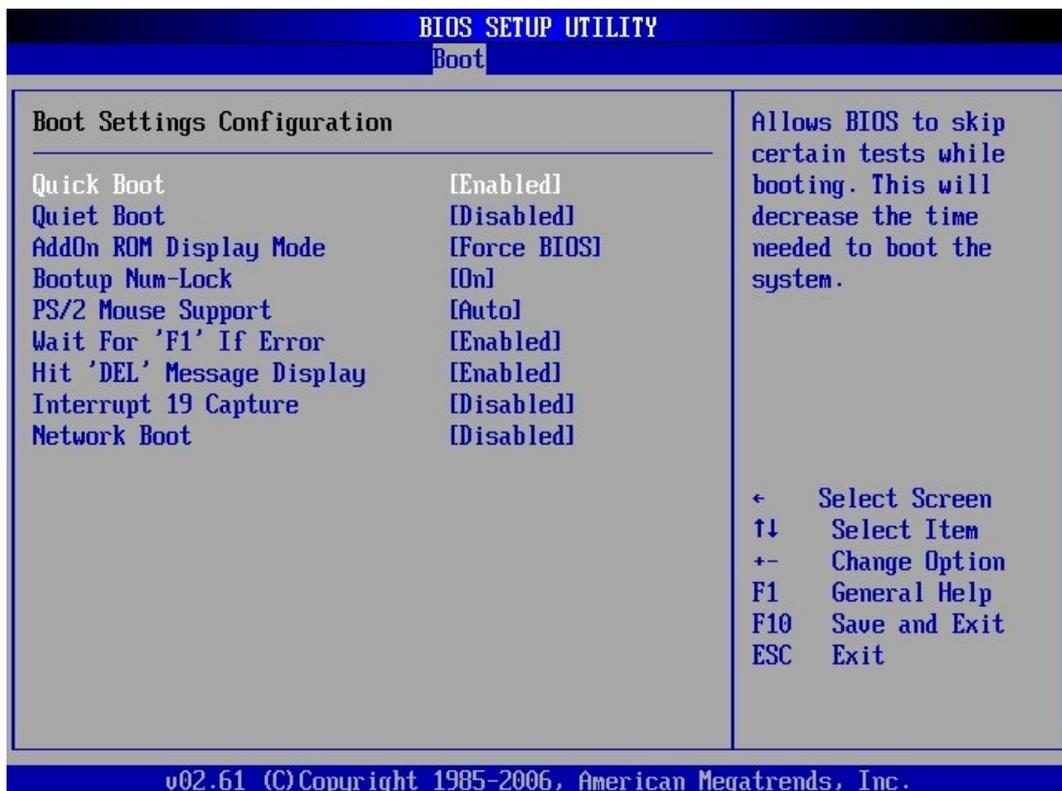
For a proper ISA card installation, set the same values of the BIOS options "Reserved Memory Size" and "Reserved Memory Address" like on the OS level and/or driver level (depending on the installed ISA card).

## 11.5. Boot

In the Boot menu you define the sequence in which the system BIOS searches the drives for system files to start the operating system.



### ➤ Boot Settings Configuration



**11.5.1.1. Quick Boot**

This option allows or restricts the BIOS to perform all POST tests.

It is possible to choose between: **Enabled** and **Disabled**.

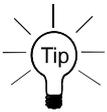
<b>Enabled</b>	This setting allows the BIOS to skip certain POST tests to boot faster.
<b>Disabled</b>	This setting allows the BIOS to perform all POST tests.

**11.5.1.2. Quiet Boot**

This option allows you to modify the boot up screen settings between POST messages or OEM logo.

It is possible to choose between: **Enabled** and **Disabled**.

<b>Enabled</b>	This setting allows the computer system to display the OEM logo instead of POST messages.
<b>Disabled</b>	This setting allows the computer system to display the POST messages.



If this option is **Enabled** the installed AMI-Logo (or a customized Company-Logo, if ordered) will be displayed during POST.

**11.5.1.3. AddOn ROM Display Mode**

This option can be used to display add-on ROM (read-only memory) messages (e.g. the SCSI BIOS or VGA BIOS).

It is possible to choose between: **Force BIOS** and **Keep Current**.

<b>Keep Current</b>	A third party BIOS messages are not displayed during system boot.
<b>Force BIOS</b>	This setting allows the computer system to force a third party BIOS to display its messages during system boot.

**11.5.1.4. Bootup Num-Lock**

Set this value to allow the Number Lock setting to be modified during boot up.

It is possible to choose between: **On** and **Off**.

<b>On</b>	Set this value to allow the Number Lock on the keyboard to be enabled automatically when the computer system is boot up. This allows the immediate use of 10-keys numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard will be lit. This is the default setting.
<b>Off</b>	This option does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard will light up when the Number Lock is engaged.

**11.5.1.5. PS/2 Mouse Support**

This option allows you to activate or to restrict the PS/2 mouse support.

It is possible to choose between: **Auto**, **Enabled** and **Disabled**.

<b>Enabled</b>	Set this value to force the system to reserve an IRQ for PS/2 devices.
<b>Disabled</b>	This option will prevent the PS/2 mouse port from using system resources and will prevent the port from being active. Use this setting if you want to install an external serial mouse.
<b>Auto</b>	Set this value to allow the BIOS to auto-detect a PS/2 mouse and to reserve the resources for it.

### 11.5.1.6. Wait For 'F1' If Error

This option specifies if errors detected during the boot time, determine the interruption of the boot procedure.

It is possible to choose between: **Enabled** and *Disabled*.

<b>Enabled</b>	The boot procedure is stopped, whenever the BIOS detect an error. The system waits for a user input.
<i>Disabled</i>	The boot procedure will be not halted for any error that may be detected.

### 11.5.1.7. Hit 'DEL' Message Display

This option allows you to modify the setting for "Hit 'DEL' Message Display".

It is possible to choose between: **Enabled** and *Disabled*.

<b>Enabled</b>	This setting allows the system to display: Hit Del to enter Setup during memory initialization. If "Quiet Boot" option is enabled, the Hit 'DEL' message will not be displayed.
<i>Disabled</i>	This setting prevents the system to display: Hit Del to enter Setup during memory initialization. If "Quiet Boot" option is enabled, the Hit 'DEL' message will not be displayed.

### 11.5.1.8. Interrupt 19 Capture

Set this value to allow option ROMs such as network controllers to trap BIOS interrupt 19.

It is possible to choose between: *Enabled* and **Disabled**.

<i>Enabled</i>	The BIOS allows option ROMs to trap interrupt 19.
<b>Disabled</b>	The BIOS prevents option ROMs from trapping interrupt 19.

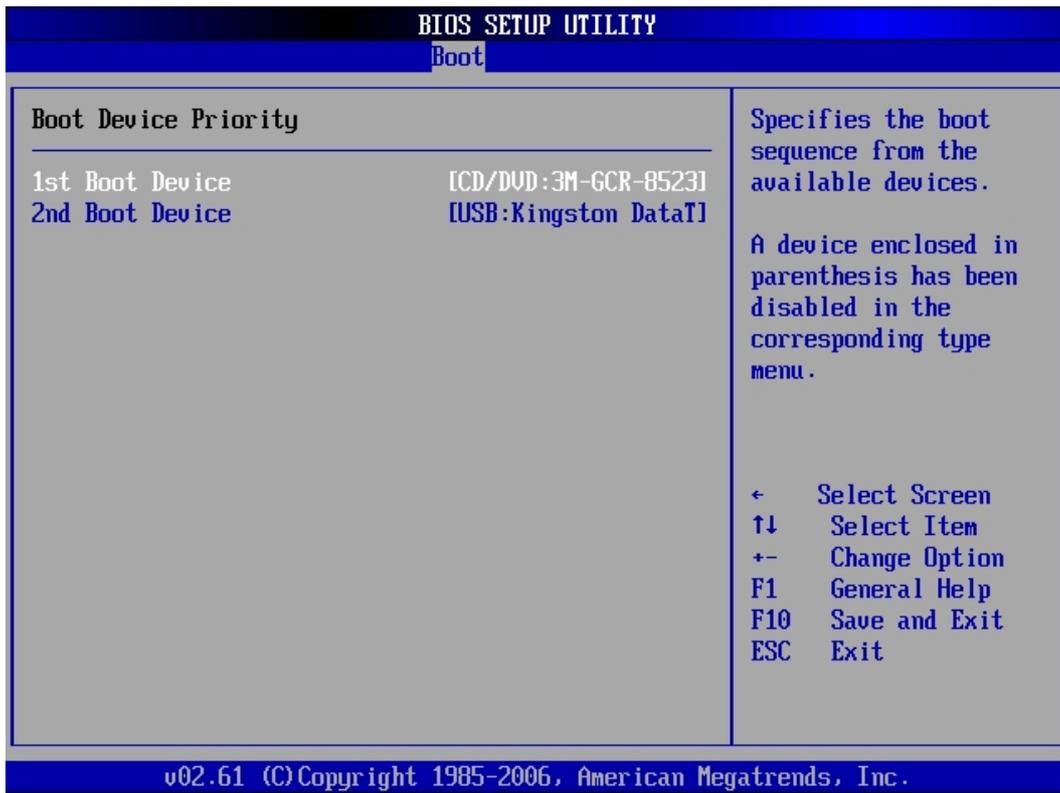
### 11.5.1.9. Network Boot

This option allows you to disable the network boot function or to select the corresponding Ethernet Controller for Network Boot.

It is possible to choose between: **Disabled**, 1. *Ethernet Port*, 2. *Ethernet Port* and 3. *Ethernet Port*.

➤ **Boot Device Priority**

In the *Boot Device Priority* menu you define the sequence in which the system BIOS searches the drives for system files to start the operating system.



List of devices available for use as boot devices: (the possible selection is depending on the system configuration).

**11.5.1.10. 1<sup>st</sup> / 2<sup>nd</sup>, / 3<sup>rd</sup>, .... / n<sup>th</sup> Boot Device**

Available settings: *[USB: Kingston DataT]*; *[CD/DVD:3M-GCR-8523]* and *Disabled*.

Boot Devices (examples)	Description
<i>[USB: Kingston DataT]</i>	USB Device (not supplied)
<i>[CD/DVD:3M-GCR-8523]</i>	<b>3M</b> (third <b>M</b> aster) (not supplied)

## 11.6. Security

PCI-960 supports Supervisor and User password.



Valid password (Supervisor and User) can be a 1 to 6 alphanumeric characters combination.

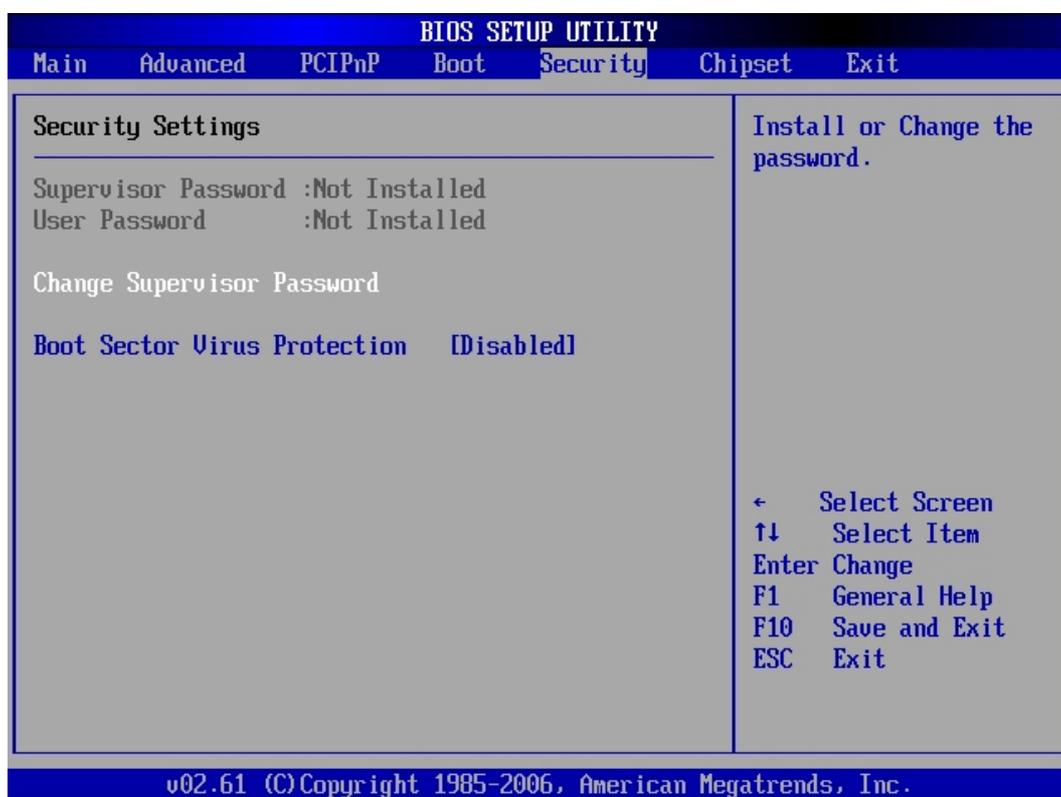
If you are using both passwords the Supervisor password must be set first.

Keep a record of the new password when the password is changed. If you forget the password, you must erase the system configuration information in NVRAM.

The system can be configured so that all users must enter a password every time the system boots or when BIOS Setup is executed, using either or either the Supervisor password or User password.

The Supervisor and User passwords activate two different levels of password security.

If you select password support, you are prompted for a one to six character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and reconfigure.



### 11.6.1. Supervisor Password

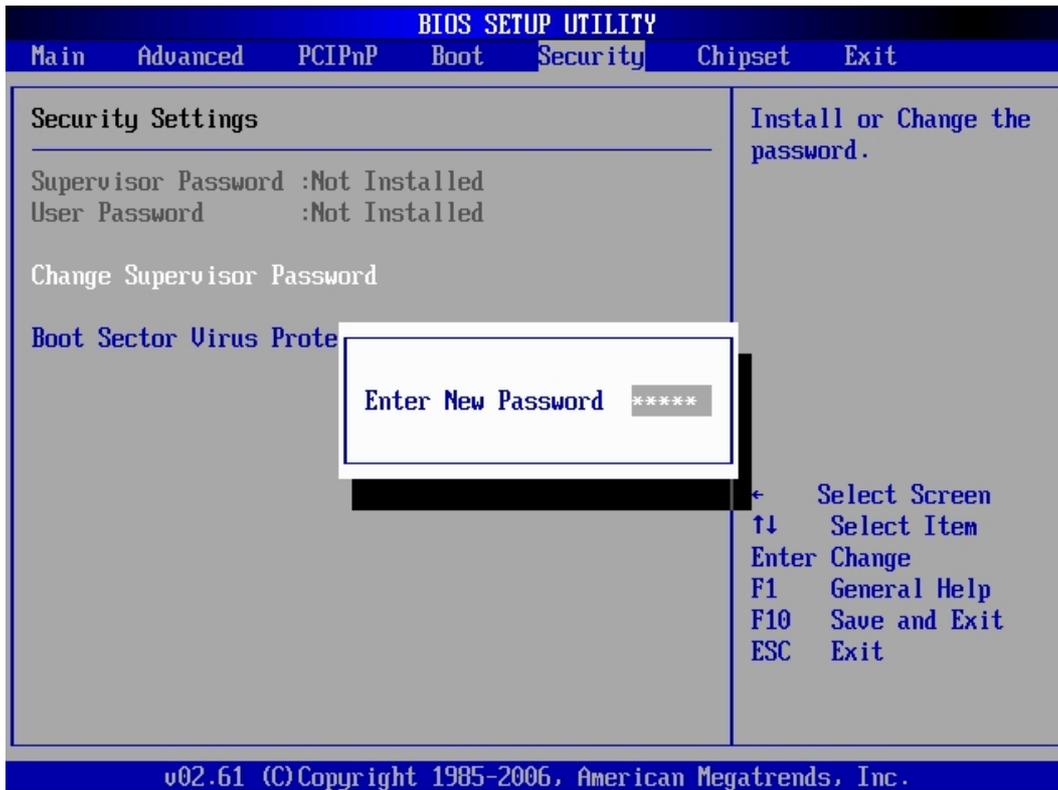
This field indicates whether a supervisor password has been set.

If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

### 11.6.2. User Password

This field indicates whether a user password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

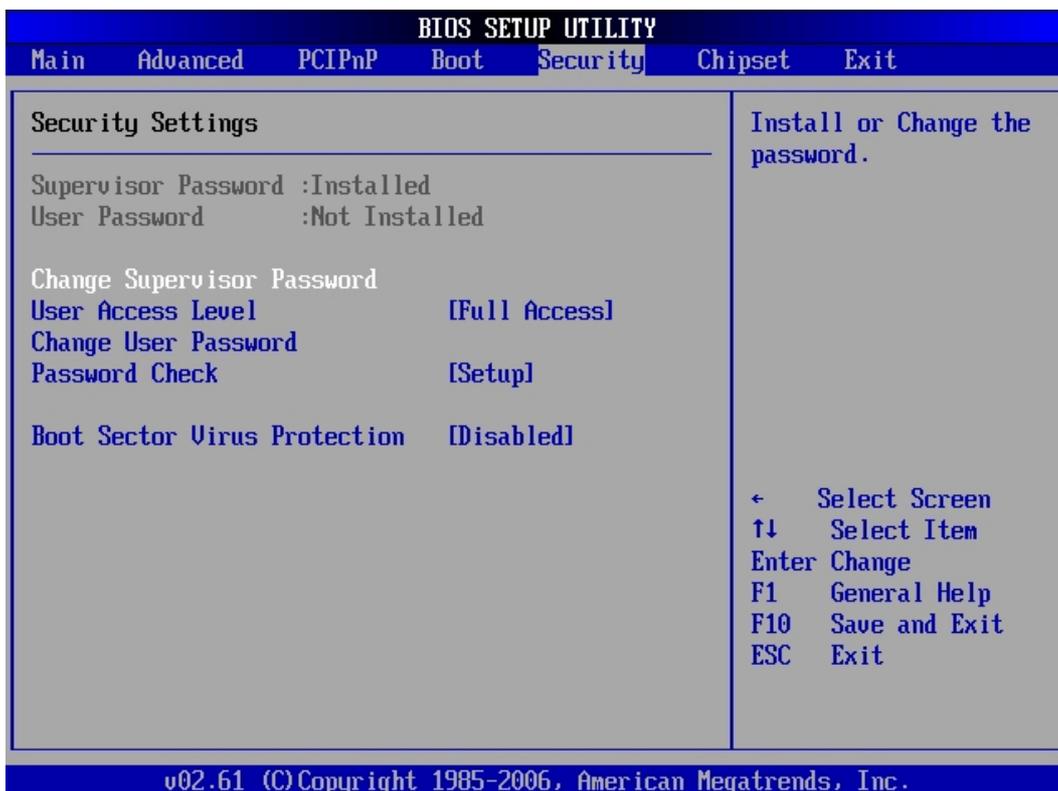
## 11.6.2.1. Change Supervisor Password



Select this option and press <Enter> to access the sub menu.

You can use the sub menu to change the supervisor password. Select the "Change Supervisor Password" option from the Security Setup menu and press <Enter>.

"Enter New Password:" input field appears. Valid password can be a 1 to 6 alphanumeric characters combination. Type the password and press <Enter>. The screen does not display the characters entered. "Confirm New Password:" input field appears. Retype the password as prompted and press <Enter>. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM.



If a Supervisor Password is installed two options are available:

“**User Access Level**” with following settings: *Full Access*, *Limited*, *View Only*, and *No Access*.

“**Password Check**” with following settings: *Setup* and *Always*.

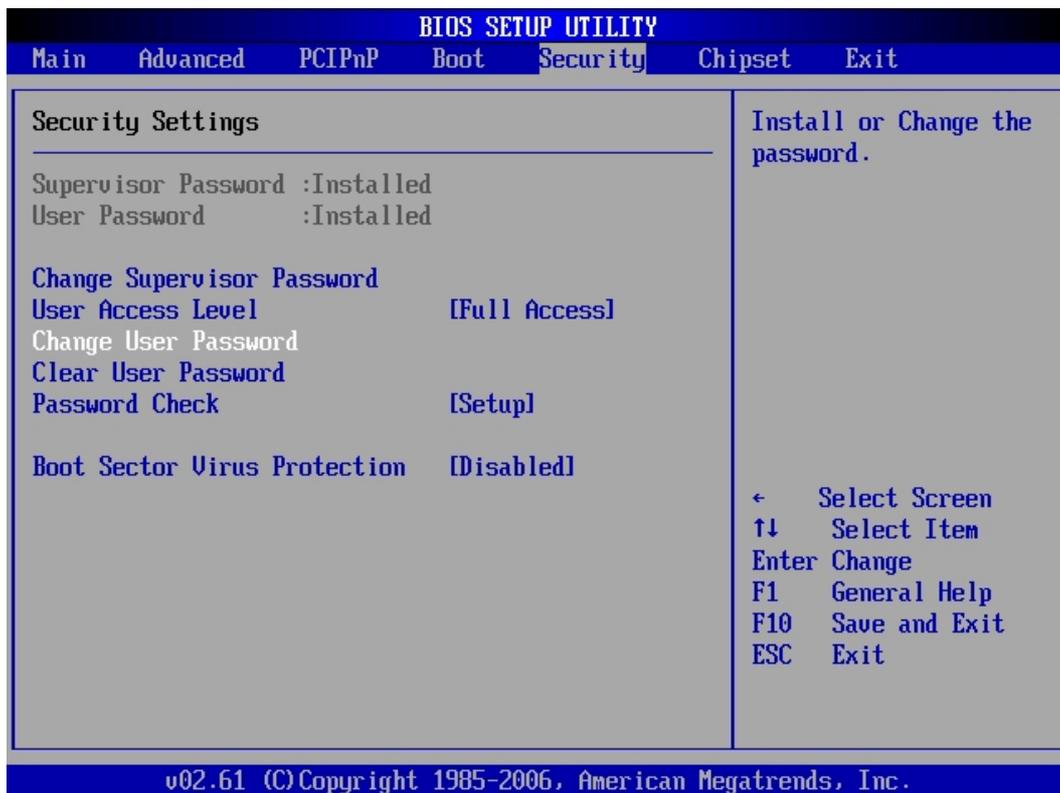
#### 11.6.2.2. Change User Password

Select this option and press <Enter> to access the sub menu.

You can use the sub menu to change the user password. Select Change User Password from the Security Setup menu and press <Enter>.

“Enter New Password:” input field appears. Valid password can be a 1 to 6 alphanumeric characters combination. Type the password and press <Enter>. The screen does not display the characters entered. “Confirm New Password:” input field appears. Retype the password as prompted and press <Enter>. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM.

If a User Password is installed are available the “**Clear User Password**” option:

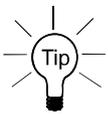


### 11.6.3. Boot Sector Virus Protection

With this field you can protect the boot sector against virus.

It is possible to choose between: *Enabled* and ***Disabled***.

<i>Enabled</i>	<p>The boot sector cannot be changed. A virus that attacks the boot sector cannot infect the system.</p> <p>Select "<i>Enabled</i>" to enable boot sector protection. The system displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. If "<i>Enabled</i>", the following appears when a write is attempted to the boot sector. You may have to type <b>N</b> several times to prevent the boot sector write.</p> <p>Boot Sector Write!</p> <p>Possible VIRUS: Continue (Y/N)? _</p> <p>The following appears after any attempt to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard disk drive Service:</p> <p>Format!!!</p> <p>Possible VIRUS: Continue (Y/N)? _</p>
<b><i>Disabled</i></b>	<p>The boot sector could be changed. The protection is disabled.</p>

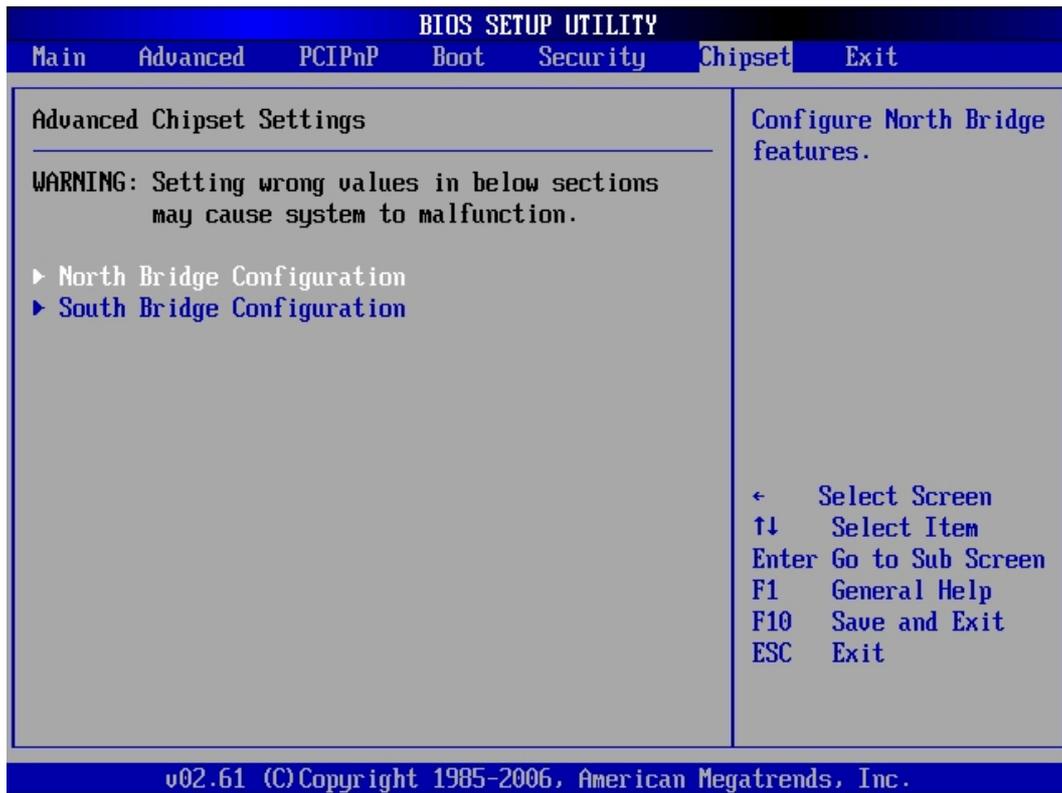


Before installing an operating system you have to change this selection to "*Disabled*". During installation the first sector is written by the operating system. After the installation you can enable the boot virus protection by set "*Enabled*".

Boot Sector Virus is not very common today. Set this do not replace the anti-virus software.

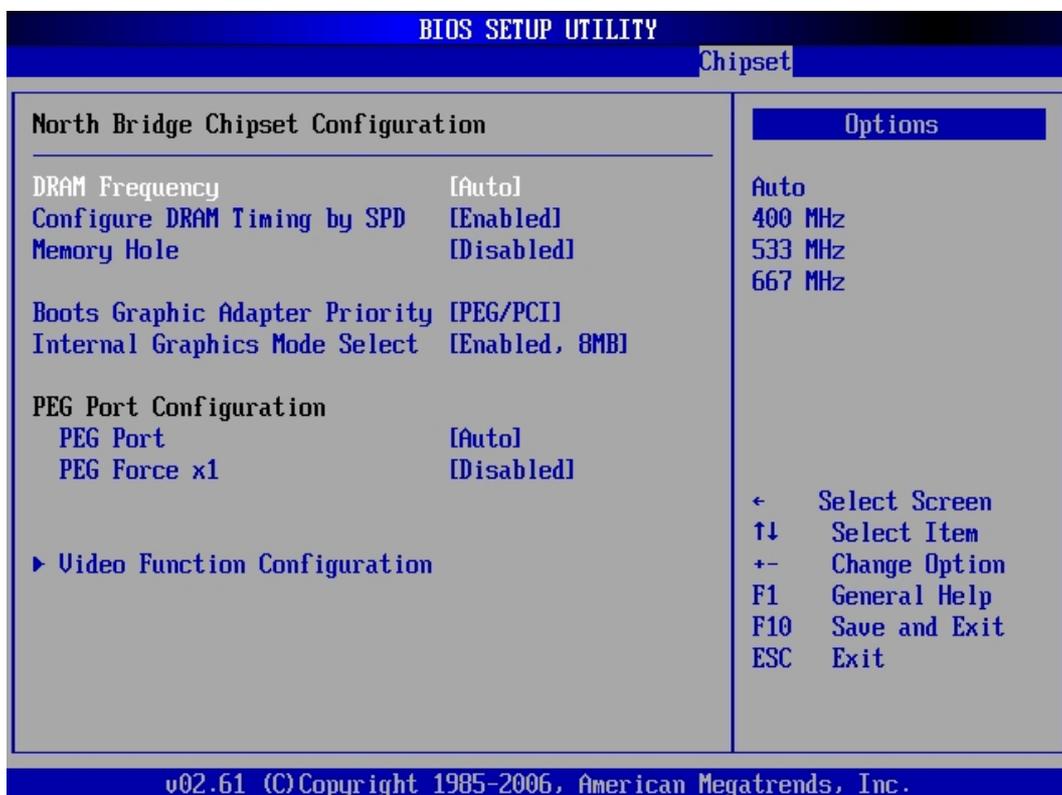
## 11.7. Chipset

All "Chipset" BIOS Setup options are described in this section. The "Chipset" BIOS Setup screen is shown below.



### 11.7.1. North Bridge Chipset Configuration

You can use this field to select options for the NorthBridge chipset configuration.



**11.7.1.1. DRAM Frequency**

The available settings are:

The available settings are: **Auto**, 400 MHz, 533MHz and 667 MHz.

**11.7.1.2. Configure DRAM Timing by SPD**

The available settings are: **Enabled** and *Disabled*.

**11.7.1.3. Memory Hole**

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space 15MB-16MB.

The available settings are: 15MB-16MB and **Disabled**.

**11.7.1.4. Boot Graphics Adapter Priority**

These settings allow you to select the graphics controller used as primary boot device.

The available settings are: *IGD*, *PCI/IGD*, *PCI/PEG*, *PEG/IGD* and **PEG/PCI**.

**IGD**: Integrated Graphics Display

**PEG**: PCI Express Graphics

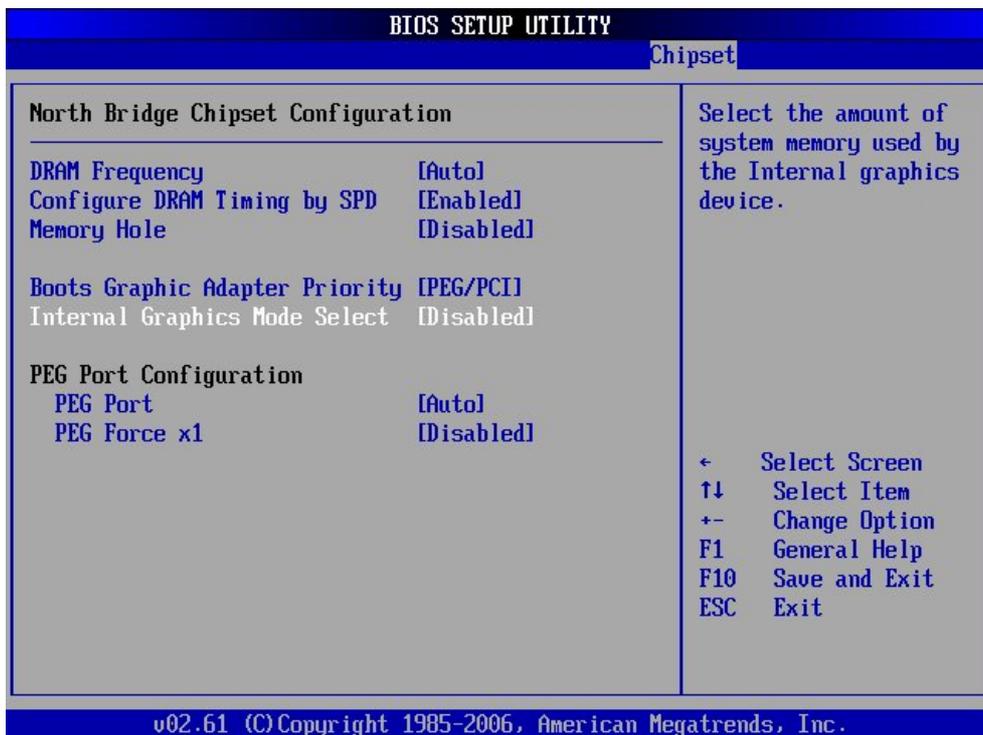
**PCI**: PCI Device

**11.7.1.5. Internal Graphics Mode Select**

This option allows you to select the amount of system memory used by the internal graphics device.

Available settings are: *Enabled*, 1MB, / **Enabled, 8MB**, / *Disabled*.

If the [Internal Graphics Mode Select] option is set to "disabled" the submenu [Video Function Configuration] is not available (refer to the picture below).

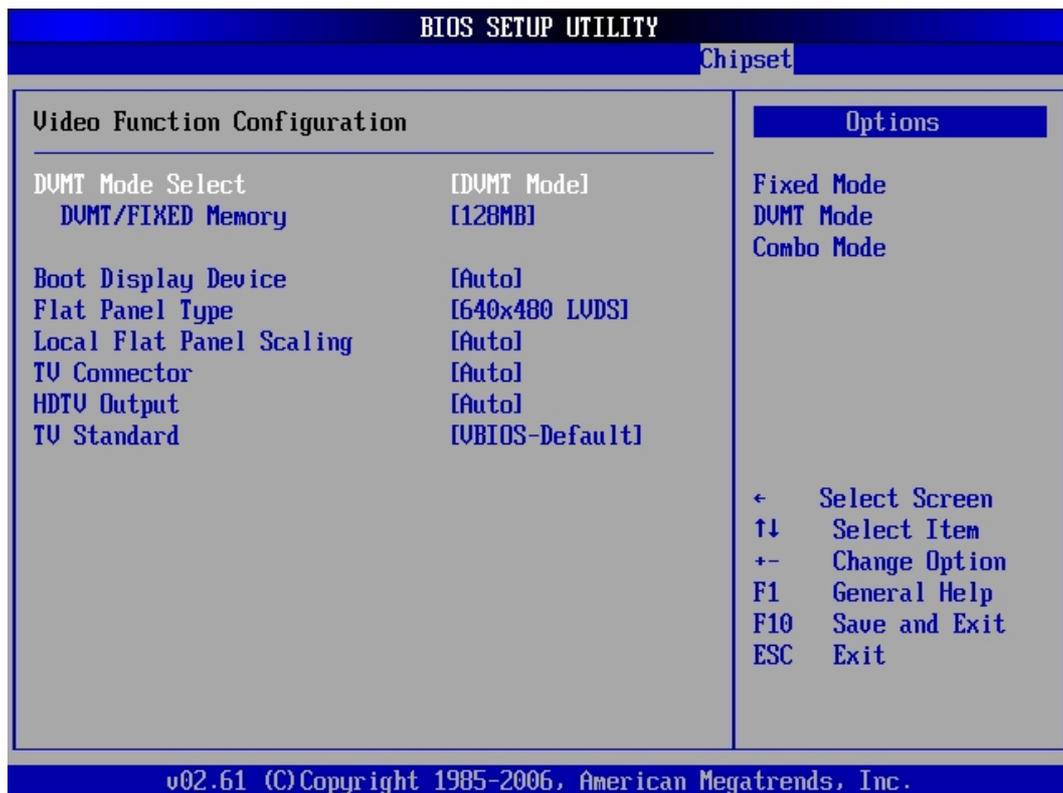
**11.7.1.6. PEG Port Configuration****11.7.1.7. PEG Port**

Available settings are: *Disabled* and **Auto**.

**11.7.1.8. PEG Force x1**

Available settings are: *Enabled* and **Disabled**.

## ➤ Video Function Configuration



### 11.7.1.9. DVMT Mode Select

This option allows you to select the DVMT operating mode.

Available settings are: *Fixed Mode*, **DVMT Mode** and *Combo Mode*.

### 11.7.1.10. DVMT/Fixed Memory

Available settings are: *Maximum DVTM*, *64MB* and **128MB**.



The option [DVMT/Fixed Memory] is not accessible when the option [DVMT Mode Select] is set to **Combo Mode**.

### 11.7.1.11. Boot Display Device

This option allows you to select the boot display device.

Available settings are: **Auto**, *CRT on Port 0*, *LFP on Port 2*, *LFP on Port 3*, *DFP on Port 2*, *DFP on Port 3*, *TV on Port 2*, *TV on Port 3*, *CRT-Port 0 & CRT-Port 2*, *CRT-Port 0 & CRT-Port 3*, *CRT-Port 0 & LFP-Port 2*, *CRT-Port 0 & LFP-Port 3*, *CRT-Port 0 & DFP-Port 2*, *CRT-Port 0 & DFP-Port 3* and *DFP-Port 2 & DFP-Port 3*.

### 11.7.1.12. Flat Panel Type

This option allows you to select the flat panel type.

Available settings are: **640 x 480 LVDS**, *800 x 600 LVDS*, *1024 x 768 LVDS*, *1280 x 1024 LVDS*, *1400 x 1050 LVDS* and *1400 x 1050 LVDS*.

### 11.7.1.13. Local Flat Panel Scaling

This option allows you select the setting for flat panel scaling.

Available settings are: **Auto**, *Force Scaling* and *Disabled*.

#### 11.7.1.14. TV Connector

This option allows you to select the used TV output connector.

Available settings are: **Auto**, *Composite*, *Component*, *Composite & RGB*, *S-Video*, *SCART Composite*, *Scart Compos. & RGB*, *Scart Compos & s-Vdo* and *SMPTE253 Compon. RGB*.

#### 11.7.1.15. HDTV Output

This option allows you to select the used HDTV output connector.

Available settings are: **Auto**, *480i60*, *480p60*, *576i50*, *576p50*, *720p60*, *1080i50*, *1080i60*, *1080p24*, *1080p25*, *1080p30*, *1080p50* and *1080p60*.

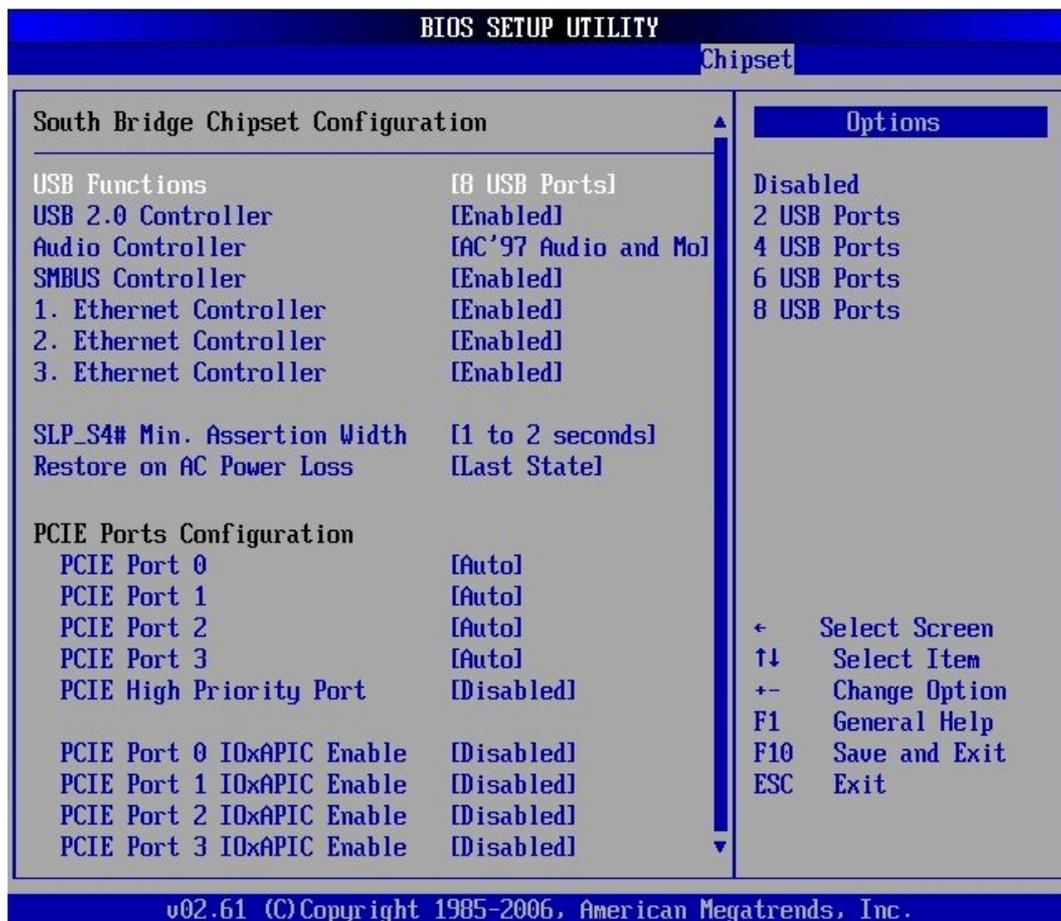
#### 11.7.1.16. TV Standard

This option allows you to select the TV standard used as output.

Available settings are: **VBIOS-Default**, *NTSC*, *PAL*, *SECAM*, *SMPET240M*, *ITU-R television*, *SMPET295M*, *SMPET296M*, *EIA-770.2*, and *EIA770.3*.

## 11.7.2. South Bridge Chipset Configuration

You can use this field to select options for the SouthBridge chipset configuration.



### 11.7.2.1. USB Function

This option allows you to enable or disable the host controllers.

Possible settings are: *Disabled*, *2 USB Ports*, *4 USB Ports*, *6 USB Ports* and ***8 USB Ports***.

### 11.7.2.2. USB 2.0 Controller

This option allows you to enable or disable the EHCI USB controller function.

Possible settings are: ***Enabled*** and *Disabled*.

If this option "USB 2.0 Controller" is set to "*Disabled*", the option "USB 2.0 Controller Mode" (Advanced/USB Configuration) is not available.

### 11.7.2.3. Audio Controller

This option allows you to enable or disable the onboard audio.

The available settings are: ***AC'97 Audio and Modem***, *AC'97 Audio only*, *AC'97 Modem only* and *Disabled*.

If a MiniPCI Modem is used please contact our Support Department!

### 11.7.2.4. SMBUS Controller

This option allows you to enable or to disable the SMBUS controller.

Possible settings are: ***Enabled*** and *Disabled*.

#### 11.7.2.5. 1. / 2. / 3. Ethernet Controller

These options allow you to enable or to disable the corresponding Ethernet controller.  
Possible settings are: **Enabled** and *Disabled*.

#### 11.7.2.6. SLP\_S4# Min Assertion Width

The available settings are: **1 to 2 seconds**, *2 to 3 seconds*,  
*3 to 4 seconds* and *4 to 5 seconds*.

#### 11.7.2.7. Restore on AC Power Loss

This option allows you to specify the state the system should return to when power is restored after AC power loss.  
The available settings are: *Power Off*, *Power On* and **Last State**.

#### 11.7.2.8. PCIE Ports Configuration

##### 11.7.2.9. PCIE Port 0 / PCIE Port 1 / PCIE Port 2 / PCIE Port 3

Possible settings are: **Auto**, *Enabled* and *Disabled*.

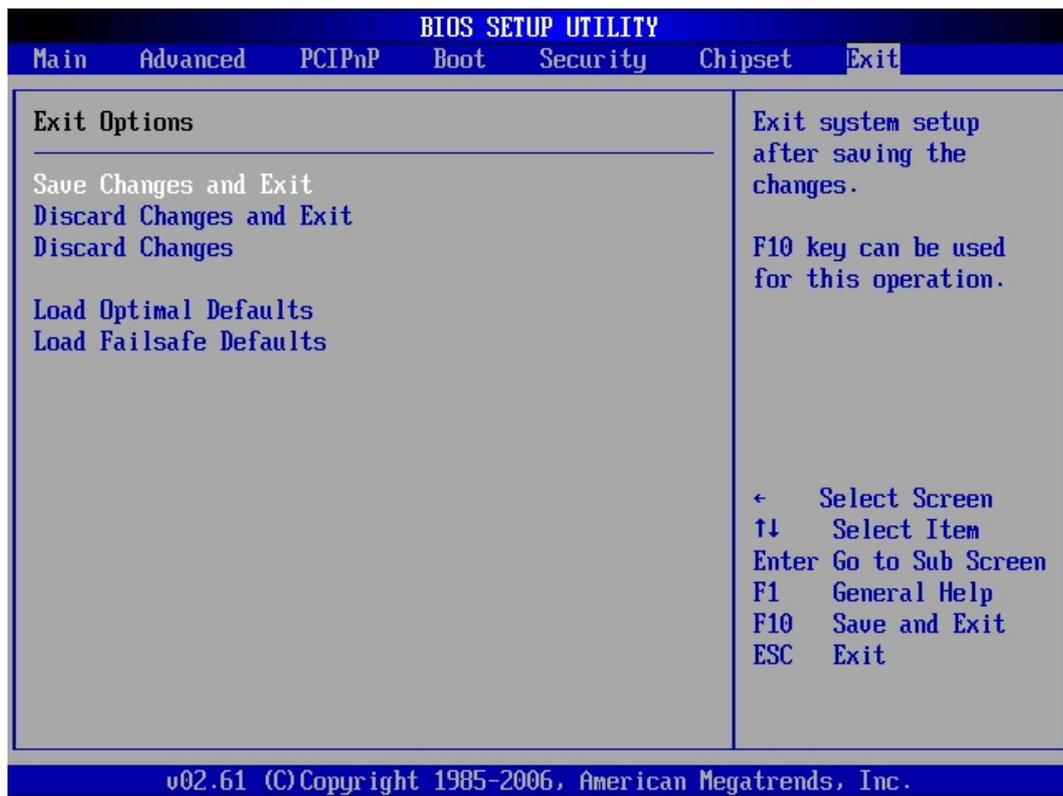
##### 11.7.2.10. PCIE High Priority Port

Available settings are: **Disabled**, *Port 0*, *Port 1*, *Port 2*, *Port 3*, *2. Ethernet Port* and *1. Ethernet Port*.

##### 11.7.2.11. PCIE Port 0 IOxAPIC Enable / PCIE Port 1 IOxAPIC Enable / PCIE Port 2 IOxAPIC Enable / PCIE Port 3 IOxAPIC Enable /

Available settings are: **Disabled** and *Enabled*.

## 11.8. Exit



### 11.8.1. Save Changes and Exit

This field saves the settings you have made and exits BIOS Setup.

### 11.8.2. Discard Changes and Exit

This field exits BIOS Setup without saving the new settings.

### 11.8.3. Discard Changes

This field resets all values to those that were active when the computer was turned on without exiting BIOS Setup.

### 11.8.4. Load Optimal Defaults

This option allows you to load the default values of your system configuration. These default settings (manufacturing settings) are optimal and enable all high performance features.

### 11.8.5. Load Failsafe Defaults

By this option the system can reload all default settings, which are permanently stored in the BIOS-ROM.

These settings are not the optimized default settings (manufacturing defaults) for your system, but can be used, if after changes, the system does not run reliably. The Fail-Safe settings are designed for maximum stability, but not maximum performance.

## 12. Technical Data

PCI-960 Board	Main Specifications
<b>Processor (Mobile)</b>	Intel® Core™ 2 Duo and Intel® Core™ Solo (Mobile), Socket 478 For CPU frequency, please refer to the actually data sheet on the web page: <a href="http://www.kontron.com">www.kontron.com</a>
<b>Board Type</b>	PICMG 1.3 standard, full size
<b>Memory Socket</b>	2x 240-pin DDR2 DIMMs
<b>Memory</b>	Up to 4GB of 400MHz, 533MHz or 667 MHz DDR2 SDRAM (dual channel), unbuffered, non-ECC; Memory Type: 256 MB, 512MB, 1GB
<b>Cache</b>	2 MB Level 2, 4 MB Level 2
<b>Chipset</b>	Intel® 945GM with integrated Graphic Controller "Intel® Gen 3.5" Intel® ICH7R Chipset with Intel® Matrix Storage Technology for SATA RAID 0, 1, 5, 10 configuration
<b>Gigabit Ethernet Controllers</b>	2x Realtek RTL8111B LAN-Controller 1x Realtek RTL8110S LAN Controller
<b>ISA Interface</b>	PCI to ISA Bridge ITE8888G
<b>LPC Super I/O</b>	Winbond W83627HF
<b>BIOS</b>	AMI BIOS PnP; ACPI 3.0; 1MB (8Mbits) Flash BIOS ROM
<b>Watchdog</b>	Time-out occurs after 255 seconds/minutes
<b>Operating Systems</b>	Information about the applicable operating systems refer to the web page: <a href="http://www.kontron.com">www.kontron.com</a> or: <a href="mailto:support@kontron.com">support@kontron.com</a>
<b>Interfaces Support via PICMG 1.3 Edge Connector</b>	1x PCI 32 bit @ 33MHz 1x PCIe x16 4x PCIe x1 or 1x PCIe x4 4x USB (2.0) 1x LAN (10/100/1000 Mbps) 2x SATA II, 3Gbps
<b>External Connectors (on the slot bracket)</b>	1x VGA 2x LAN (10/100/1000 Mbps) 2x USB (2.0)
<b>Onboard Jumpers</b>	1x Power Button Configuration 2x Configuration COM2 with Termination Resistors 1x CompactFlash Configuration 1x Disable CMOS Backup Restore Function 1x RTC Reset (Clear CMOS)
<b>Onboard Connectors</b>	2x SATA II, 3Gbps 1x IDE0 1x CompactFlash Connector (IDE0, shared) 1x Floppy 1x MiniPCI 2x Serial Port 1x COM1 (RS232) 1x COM2 (RS232) configurable RS422, RS485 1x Parallel LPT 1x USB (2.0) (USB4+USB5) 1x TV-Out (rear side mounted) 1x LVDS (JILI) 1x Audio (Line-In, Line-Out, Mic-In) 1x CD-In 1x SPDIF-In&-Out (supports coax. and optical fibre via additional Multimedia Bracket) 1x Multifunctional Connector with support for: 1x Keyboard and 1x Mouse 1x Power LED 1x Reset Button 1x Speaker 1x HDD/CF Activity LED

The table is continued on the next page.

<b>Onboard Connectors</b>	1x Hardware Monitor supports monitoring of: 2x Fan-Speed (1xCPU and 1x system) Power Button Chassis Intruder 3x SMBus user defined GPIO[0-7] 3x 12V Fan Power 1x 12V ATX Power 1x Additional Power Button 1x Suspend-LED 1x Keyboard&Mouse 1x Keyboard Lock 1x LPC-Bus (reserved) 1x Lithium Battery Socket 1x External Battery Connector
<b>Power Supply</b>	Lithium battery 3.0 V for RTC, Type: CR2032 External 12V ATX: [option: via on-board or backplane] Power via backplane and PICMG 1.3 edge connector: +3.3 VSB, +5.0 VSB, +12.0 V, +5.0 V, +3.3 V

## 12.1. Electrical Specifications

Board Version	Type of the external PSU	Inputs via	
PCI-960	ATX PSU	Backplane and PICMG 1.3 edge connector	+3.3 VSB, +5 VSB, +3.3 V, +5.0 V, +12.0 V
		On-board 12 V ATX power connector: J32	+12V

## 12.2. Mechanical Specifications

<b>Dimensions</b>	338.58 x 126.39 x 22.7 mm (13,33" x 4.98" x 0.89"); height without CPU heat sink
<b>Weight</b>	0.455 kg (1.003 lbs.) (without CPU fan)

## 12.3. Environmental Specifications

<b>Operating Temperature</b>	0 °C to 60 °C (32 °F to 140 °F)
<b>Storage/Transport Temperature</b>	-40 °C to +70 °C (-40 °F to 158 °F)
<b>Relative Humidity</b>	5 % to 95 % (non-condensing)

## 12.4. CE Directives

CE Directives	
Electrical Safety	General Product Safety Directive (GPSD) 2001/95/EC Low Voltage Directive (LVD) 2006/95/EC
Electro Magnetic Compatibility (EMC)	EMC Directive 2004/108/EC

## 13. Technical Support

For technical support, please contact our Technical Support department.

German headquarter Hotline:

TEL: (+49) 8165-77 112

FAX: (+49) 8165-77 110

E-mail: [support@kontron.com](mailto:support@kontron.com)

Make sure you have the following on hand when you call:

- the unit part id number (P/No #),
- and the serial number (S/No #) of the unit (provide the serial number found on the label, placed on the rear side of the board).

Be ready to explain the nature of your problem to the service technician.

If you have any questions about Kontron Embedded Computers or our products and services, you may reach us at the aforementioned numbers, or at: [www.kontron.com](http://www.kontron.com) or by writing to:

Kontron Embedded Computers GmbH

Oskar-von-Miller-Str. 1

85386 Eching

Germany

### 13.1. Returning Defective Merchandise

Before returning any merchandise please:

1. Contact our Service and request an RMA number (Return Material Authorization) by:  
Fax: (+49) 8165-77 412  
E-mail: [service@kontron.com](mailto:service@kontron.com)
2. Make sure to receive an RMA number from Kontron Embedded Computers-Service before returning any merchandise. Clearly write or mark this number on the outside of the package you are returning.
3. Describe the device failure behavior as precisely as possible.
4. When returning goods, include the name and telephone number of a person whom we can contact for further explanations if necessary. Where applicable, always include all duty papers and invoice(s) associated with the item(s) in question.
5. When returning a unit:
  - Ensure that the unit is properly packed in the original box,
  - include a copy of the RMA form.