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# EmQ-v900

Q<sub>SEVEN</sub>™ CPU Module

## User's Manual

Version 1.0

CE



2012.09

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## Contents

<b>Chapter 1 - Introduction</b> .....	<b>1</b>
1.1 Copyright Notice.....	2
1.2 Declaration of Conformity .....	2
1.3 About This User's Manual .....	4
1.4 Warning .....	4
1.5 Replacing the Lithium Battery.....	4
1.6 Technical Support .....	4
1.7 Warranty .....	5
1.8 Packing List .....	6
1.10 Specifications .....	7
1.11 Board Dimensions .....	8
<b>Chapter 2 - Installation</b> .....	<b>9</b>
2.1 Block Diagram .....	10
2.2 Connector Pin Assignments .....	11
2.3 The Installation Paths of CD Driver .....	13
<b>Chapter 3 - BIOS</b> .....	<b>15</b>
3.1 BIOS Main Setup.....	16
3.2 Advanced Settings .....	18
3.2.1 CPU Configuration.....	19
3.2.2 IDE Configuration .....	20
3.2.3 SuperIO Configuration .....	23
3.2.4 Hardware Health Configuration .....	25
3.2.5 MPS Configuration.....	26
3.2.6 PCI Express Configuration .....	27
3.2.7 USB Configuration.....	29
3.3 Boot Settings .....	30
3.3.1 Boot Setting Configuration .....	31
3.4 Security Settings .....	34
3.5 Advanced Chipset Settings .....	35
3.5.1 NorthBridge VIA VX900 Configuration.....	36
3.5.2 SouthBridge VIA VX900 Configuration .....	44
3.6 Exit Setting.....	46

<b>Appendix .....</b>	<b>49</b>
<b>Appendix A: I/O Port Address Map .....</b>	<b>50</b>
<b>Appendix B: BIOS Memory Map.....</b>	<b>52</b>
<b>Appendix C: Interrupt Request Lines (IRQ) .....</b>	<b>53</b>



# Chapter 1

# Introduction

## 1.1 Copyright Notice

All Rights Reserved.

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

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

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

## 1.2 Declaration of Conformity

### CE

The CE symbol on your product indicates that it is in compliance with the directives of the Union European (EU). A Certificate of Compliance is available by contacting Technical Support.

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from ARBOR. Please contact your local supplier for ordering information.

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

### Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### FCC Class A

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

**NOTE:**

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

**RoHS**

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

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

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

**SVHC / REACH**

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

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

### **1.3 About This User's Manual**

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

### **1.4 Warning**

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

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

### **1.5 Replacing the Lithium Battery**

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

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

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

### **1.6 Technical Support**

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

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

E-mail:[info@arbor.com.tw](mailto:info@arbor.com.tw)



## 1.7 Warranty

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

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

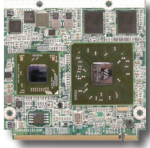
Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited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

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

## 1.8 Packing List

### Packing List

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



1 x EmQ-v900 Q<sub>SEVEN</sub>™ CPU Module



1 x Driver CD



1 x Quick Installation Guide

### Ordering Information

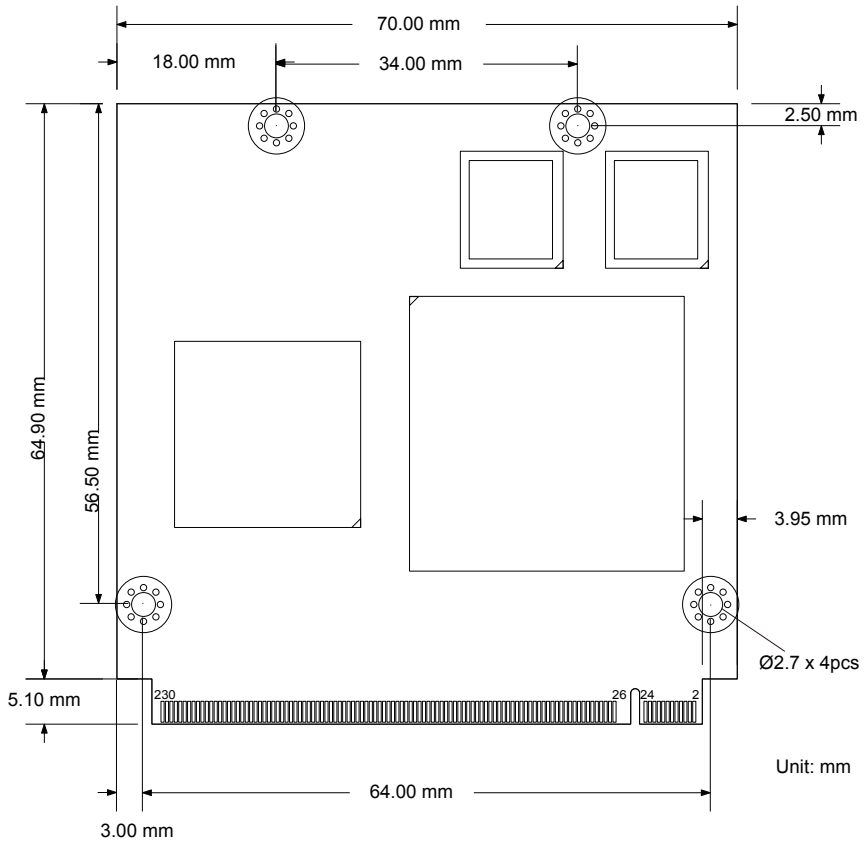
EmQ-v900	VIA Nano™ U3500 1.0GHz Q <sub>SEVEN</sub> ™ CPU module
HS-V900-F1	Heat Spreader for EmQ-v900
HS-V900-C1	Cooler for EmQ-v900
PBQ-3000	Q <sub>SEVEN</sub> ™ EPIC carrier board
CBK-06-3000-00	Cable Kit 1 x USB cable 1 x USB2 cable 2 x COM port cables 1 x SATA cable 1 x SATA power cable

## 1.10 Specifications

### Specifications

Form Factor	Q <sub>SEVEN</sub> CPU Module
CPU	Soldered onboard VIA Nano™ U3500 at 1.0GHz processor
Chipset	VIA VX900
System Memory	Soldered onboard 1GB DDR3 SDRAM
VGA/ LCD Controller	Integrated Chrome9 DX9 controller
Ethernet controller	1 x Realtek 8111 PCIe Gigabit Ethernet
BIOS	AMI PnP Flash BIOS
Serial ATA	2 x Serial ATA ports w/ 300MB/s HDD transfer rate RAID 0, 1 supported
Universal Serial Bus	8 x USB 2.0 host ports, port1 may be configurable as USB 2.0 client port
Graphics Interface	LCD: Single Channel 24-bit LVDS DisplayPort or TMDS (Alternative)
Expansion Interface	2 x Gen. 2 PCIe x1 lanes LPC interface
Operation Temp.	-20°C ~ 70°C (-4°F ~ 158°F)
Watchdog Timer	1~ 255 levels Reset
Dimension (L x W)	70 x 70 mm (2.76" x 2.76")

### 1.11 Board Dimensions

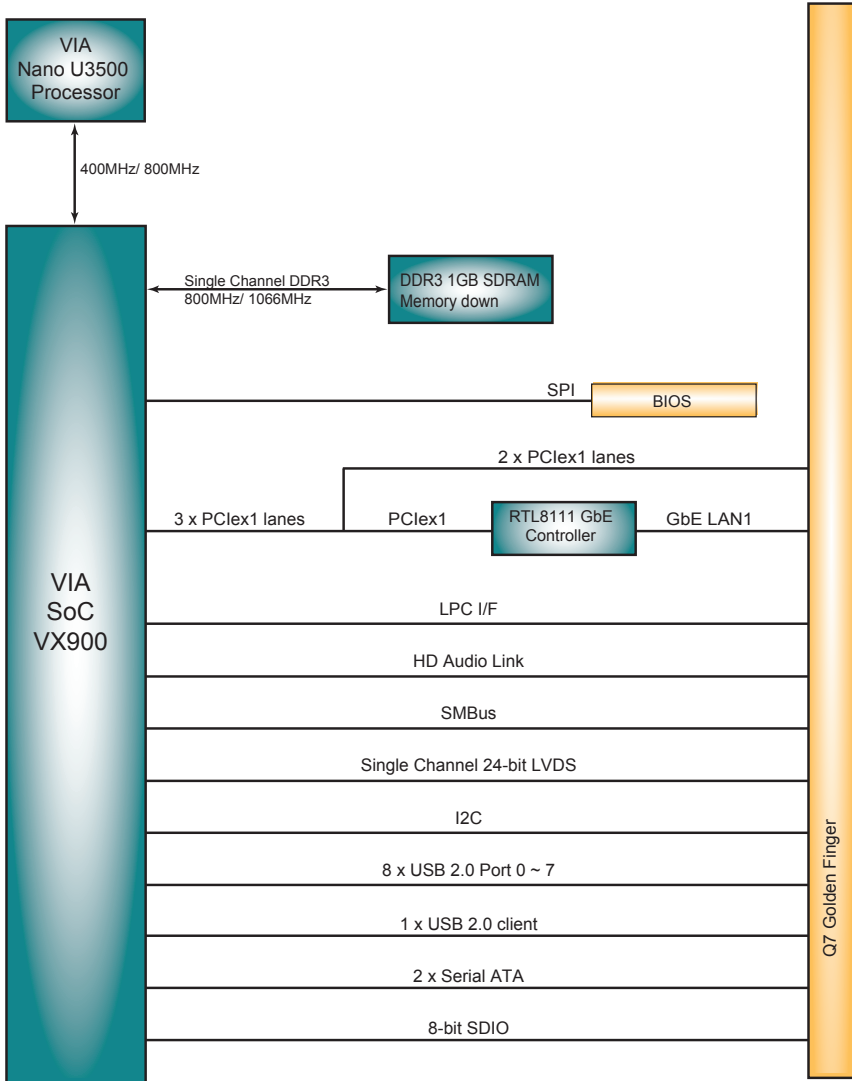




**Chapter 2**

**Installation**

## 2.1 Block Diagram



## 2.2 Connector Pin Assignments

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	65	HDA_SDI	66	I2C_CLK
3	GBE_MDI3-	4	GBE_MDI2-	67	HDA_SDO	68	I2C_DAT
5	GBE_MDI3+	6	GBE_MDI2+	69	THRMR#	70	WDTRIG#
7	GBE_LINK100#	8	GBE_LINK1000#	71	THRMRTRIP#	72	WDOOUT (N/C)
9	GBE_MDI1-	10	GBE_MDI0-	73	GND	74	GND
11	GBE_MDI1+	12	GBE_MDI0+	75	USB_P7-	76	USB_P6-
13	GBE_LINK#	14	GBE_ACT#	77	USB_P7+	78	USB_P6+
15	GBE_CTREF	16	SUS_S5#	79	USB_6_7_OC#	80	USB_4_5_OC#
17	WAKE#	18	SUS_S3#	81	USB_P5-	82	USB_P4-
19	SUS_STAT#	20	PWRBTN#	83	USB_P5+	84	USB_P4+
21	SLP_BTN# (N/C)	22	LID_BTN#	85	USB_2_3_OC#	86	USB_0_1_OC#
23	GND	24	GND	87	USB_P3-	88	USB_P2-
	KEY		KEY	89	USB_P3+	90	USB_P2+
25	GND	26	PWGIN	91	USB_HOST_PRES#	92	USB_HC_SEL (N/C)
27	BATLOW#	28	RSTBTN#	93	USB_P1-	94	USB_P0-
29	SATA0_TX+	30	SATA1_TX+	95	USB_P1+	96	USB_P0+
31	SATA0_TX-	32	SATA1_TX-	97	GND	98	GND
33	SATA_ACT#	34	GND	99	LVDS_A0+	100	LVDS_B0+ (N/C)
35	SATA0_RX+	36	SATA1_RX+	101	LVDS_A0-	102	LVDS_B0- (N/C)
37	SATA0_RX-	38	SATA1_RX-	103	LVDS_A1+	104	LVDS_B1+ (N/C)
39	GND	40	GND	105	LVDS_A1-	106	LVDS_B1- (N/C)
41	BIOS_DISABLE#	42	SDIO_CLK#	107	LVDS_A2+	108	LVDS_B2+ (N/C)
43	SDIO_CD#	44	SDIO_LED (N/C)	109	LVDS_A2-	110	LVDS_B2- (N/C)
45	SDIO_CMD	46	SDIO_WP	111	LVDS_PPEN	112	LVDS_BPEN
47	SDIO_PWR#	48	SDIO_DAT1	113	LVDS_A3+	114	LVDS_B3+ (N/C)
49	SDIO_DAT0	50	SDIO_DAT3	115	LVDS_A3-	116	LVDS_B3- (N/C)
51	SDIO_DAT2	52	SDIO_DAT5	117	GND	118	GND
53	SDIO_DAT4	54	SDIO_DAT7	119	LVDS_A_CLK+	120	LVDS_B_CLK+ (N/C)
55	SDIO_DAT6	56	RSVD	121	LVDS_A_CLK-	122	LVDS_B_CLK- (N/C)
57	GND	58	GND	123	LVDS_BLT_CTRL	124	RSVD
59	HDA_SYNC	60	SMB_CLK	125	LVDS_DID_DAT	126	LVDS_BLC_DAT (N/C)
61	HDA_RST#	62	SMB_DAT	127	LVDS_DID_CLK	128	LVDS_BLC_CLK (N/C)
63	HDA_BITCLK	64	SMB_ALERT# (N/C)	129	RSVD	130	RSVD

## Installation

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
131	DP1TX3+	132	SDVO_INT+ (N/C)	197	GND	198	GND
133	DP1TX3-	134	SDVO_INT- (N/C)	199	RSVD	200	RSVD
135	GND	136	GND	201	RSVD	202	RSVD
137	DP1TX1+	138	DP1_AUX+	203	RSVD	204	MFG_NC4
139	DP1TX1-	140	DP1_AUX-	205	VCC_5V_SB	206	VCC_5V_SB
141	GND	142	GND	207	MFG_NC0 (N/C)	208	MFG_NC2 (N/C)
143	DP1TX2+	144	SDVO_TVCLKIN+ (N/C)	209	MFG_NC1 (N/C)	210	MFG_NC3 (N/C)
145	DP1TX2-	146	SDVO_TVCLKIN- (N/C)	211	VCC	212	VCC
147	GND	148	GND	213	VCC	214	VCC
149	DP1TX0+	150	SDVO_CTRL_DAT (N/C)	215	VCC	216	VCC
151	DP1TX0-	152	SDVO_CTRL_CLK (N/C)	217	VCC	218	VCC
153	HDMLI_HPD# (N/C)	154	DP_HPD#	219	VCC	220	VCC
155	PCIE_CLK_REF+	156	PCIE_WAKE#	221	VCC	222	VCC
157	PCIE_CLK_REF-	158	PCIE_RST#	223	VCC	224	VCC
159	GND	160	GND	225	VCC	226	VCC
161	PCIE3_TX+ (N/C)	162	PCIE3_RX+ (N/C)	227	VCC	228	VCC
163	PCIE3_TX- (N/C)	164	PCIE3_RX- (N/C)	229	VCC	230	VCC
165	GND	166	GND				
167	PCIE2_TX+ (N/C)	168	PCIE2_RX+ (N/C)				
169	PCIE2_TX- (N/C)	170	PCIE2_RX- (N/C)				
171	EXCD0_PERST#	172	EXCD1_PERST#				
173	PCIE1_TX+	174	PCIE1_RX+				
175	PCIE1_TX-	176	PCIE1_RX-				
177	EXCD0_CPPE# (N/C)	178	EXCD1_CPPE# (N/C)				
179	PCIE0_TX+	180	PCIE0_RX+				
181	PCIE0_TX-	182	PCIE0_RX-				
183	GND	184	GND				
185	LPC_AD0	186	LPC_AD1				
187	LPC_AD2	188	LPC_AD3				
189	LPC_CLK	190	LPC_FRAME#				
191	SERIRQ	192	LPC_LDRQ#				
193	VCC_RTC	194	SPKR				
195	FAN_TACHOIN (N/C)	196	FAN_PWMOUT (N/C)				



## 2.3 The Installation Paths of CD Driver

### Windows 2000 & XP

Driver	Path
CHIPSET	\EmQ-V900\CHIPSET\VIA_INF_V3.20A
LAN	\EmQ-V900\ETHERNET\XP
VGA	\EmQ-V900\GRAPHICS\WinXP
USB	\EmQ-V900\Others\VIA_USB_TransmitX_Windows_Software_Package_V2.00a
Card Reader	\EmQ-V900\Others\VIA_MSP_CardReader_WindowsSoftwarePackage_V3.70A

### Windows 7

Driver	Path
CHIPSET	\EmQ-V900\CHIPSET\VIA_INF_V3.20A
LAN	\EmQ-V900\ETHERNET\Win7
VGA	\EmQ-V900\GRAPHICS\Win7
USB	\EmQ-V900\Others\VIA_USB_TransmitX_Windows_Software_Package_V2.00a
Card Reader	\EmQ-V900\Others\VIA_MSP_CardReader_WindowsSoftwarePackage_V3.70A

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# Chapter 3

# BIOS

### 3.1 BIOS Main Setup

The AMI BIOS provides a setup utility program for specifying the system configurations and settings. The BIOS RAM of the system stores the setup utility and configurations.

When you turn on the computer, the AMI BIOS is immediately activated. To enter the BIOS SETUP UTILILTY, press “Delete” once the power is turned on.

When the computer is shut down, the battery on the motherboard supplies the power for BIOS RAM.

The **Main Setup** screen lists the following information

#### System Overview

**BIOS Version:** displays the current version information of the BIOS

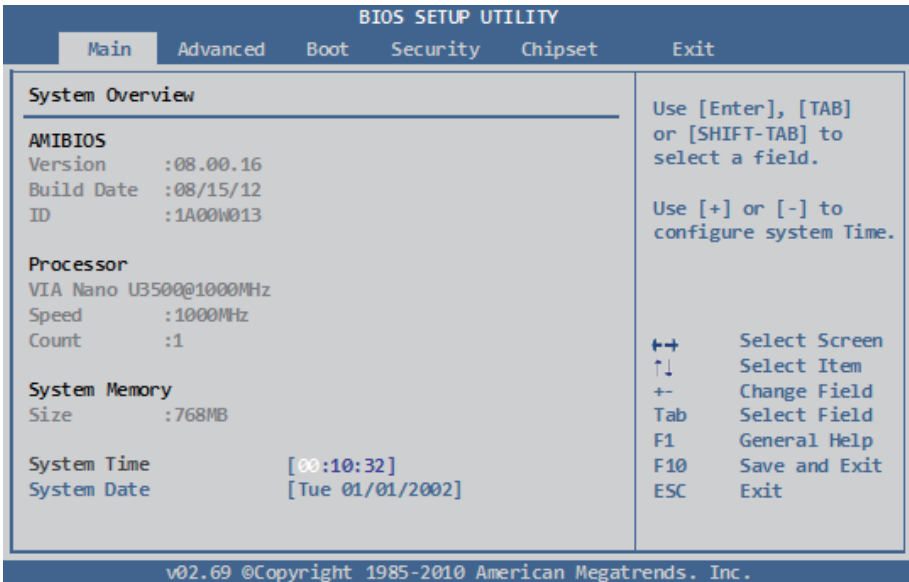
**Build Date:** the date that the BIOS version was made/updated

**Processor** (auto-detected if installed)

**Speed:** displays the processor speed

**System Memory** (auto-detected if installed)

**Size:** lists the memory size information



## System Time

Set the system time.

The time format is:       **Hour** : 00 to 23  
                                   **Minute** : 00 to 59  
                                   **Second** : 00 to 59

## System Date

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

The date format is:       **Day** : Sun to Sat  
                                   **Month** : 1 to 12  
                                   **Date** : 1 to 31  
                                   **Year** : 1999 to 2099

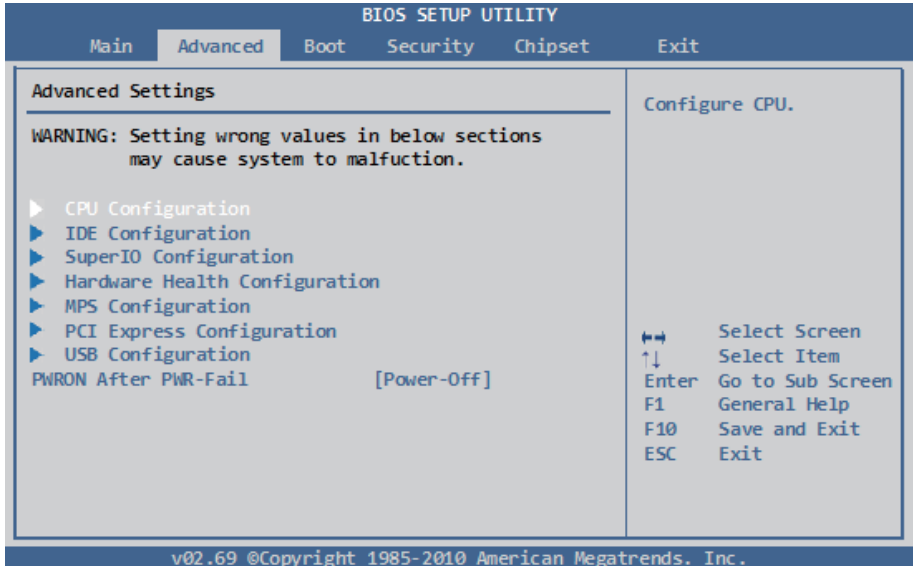
## Key Commands

BIOS Setup Utility is mainly a key-based navigation interface. Please refer to the following key command instructions for navigation process.

← →	Move to highlight a particular configuration screen from the top menu bar / Move to highlight items on the screen
↓ ↑	Move to highlight previous/next item
<b>Enter</b>	Select and access a setup item/field
<b>Esc</b>	On the Main Menu – Quit the setup and not save changes into CMOS (a message screen will display and ask you to select "OK" or "Cancel" for exiting and discarding changes. Use "←" and "→" to select and press "Enter" to confirm) On the Sub Menu – Exit current page and return to main menu
<b>Page Up / +</b>	Increase the numeric value on a selected setup item / make change
<b>Page Down / -</b>	Decrease the numeric value on a selected setup item / make change
<b>F1</b>	Activate "General Help" screen
<b>F10</b>	Save the changes that have been made in the setup and exit. (a message screen will display and ask you to select "OK" or "Cancel" for exiting and saving changes. Use "←" and "→" to select and press "Enter" to confirm)

### 3.2 Advanced Settings

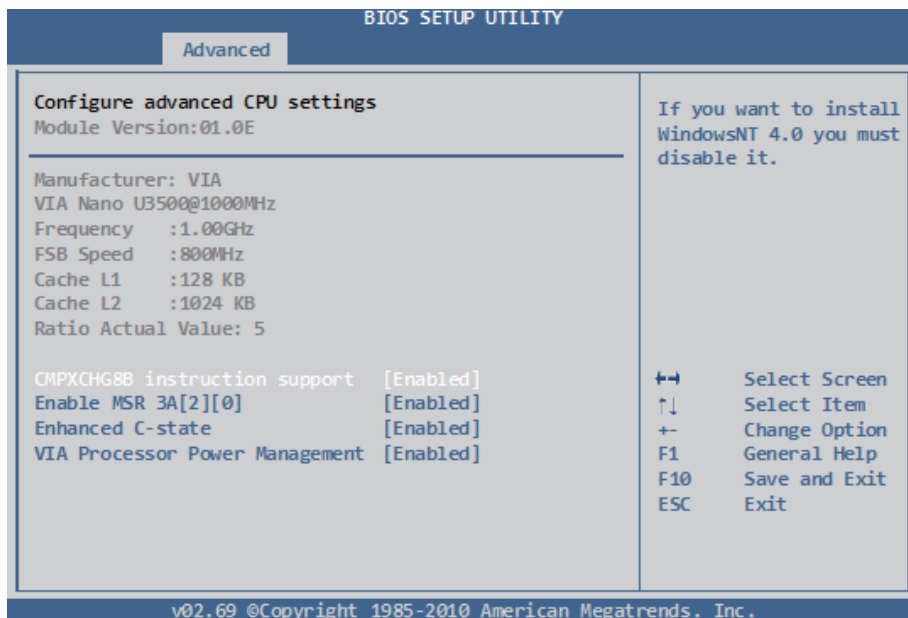
The “Advanced” screen provides the setting options to configure CPU, IDE, y SuperIO, Hardware Health, MPS, PCI Express and USB. You can use “←” and “→” keys to select “Advanced” and use the “↓” and “↑” to select a setup item.



**Note:** Please pay attention to the “WARNING” part at the left frame before you decide to configure any setting of an item.

### 3.2.1 CPU Configuration

The CPU Configuration setup screen varies depending on the installed processor.



#### CMPXCHG8B instruction support

If you want to install WindowsNT 4.0, you must disable it.

#### Enable MSR 3A [2][0]

Enable or disable MSR 3A [2][0].

#### Enhanced C-state

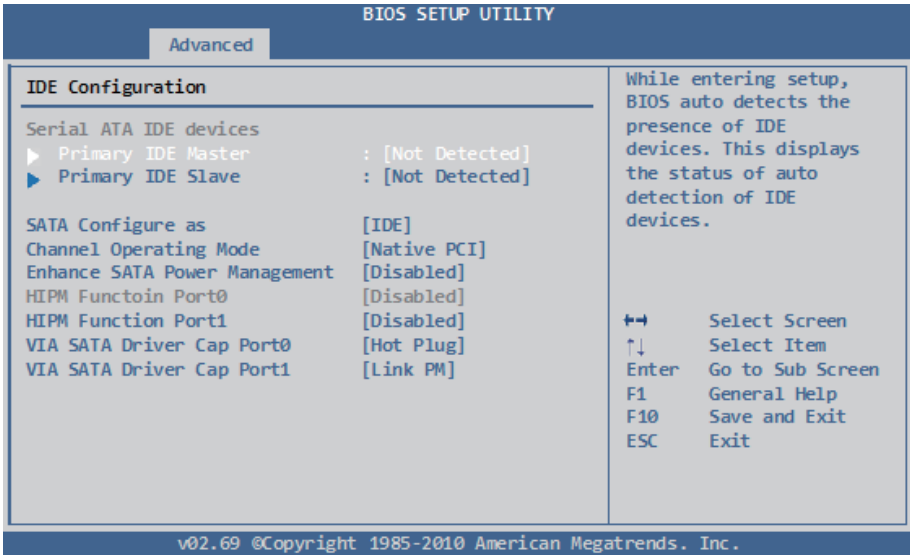
This item allows you to control the enhanced C-state feature.  
The choice: Enabled (Default), Disabled

#### VIA Processor Power Management

This item is for VIA processor power management. Use this item to change the processor performance state on ACPI OS.

### 3.2.2 IDE Configuration

Select the “IDE Configuration” to configure the IDE settings. When an item is selected, there is a status description appearing at the right. You can use “Page Up/+” and “Page Down/-” keys to change the value of a selected item.



#### SATA Configure as

The choice: IDE, RAID

#### Channel Operating Mode

The choice: Compatibility, Native PCI

#### Enhance SATA Power Management

The choice: Disabled, Enabled

#### HIPM Function Port0/1

Control SATA HIPM function.  
The choice: Disabled, Enabled

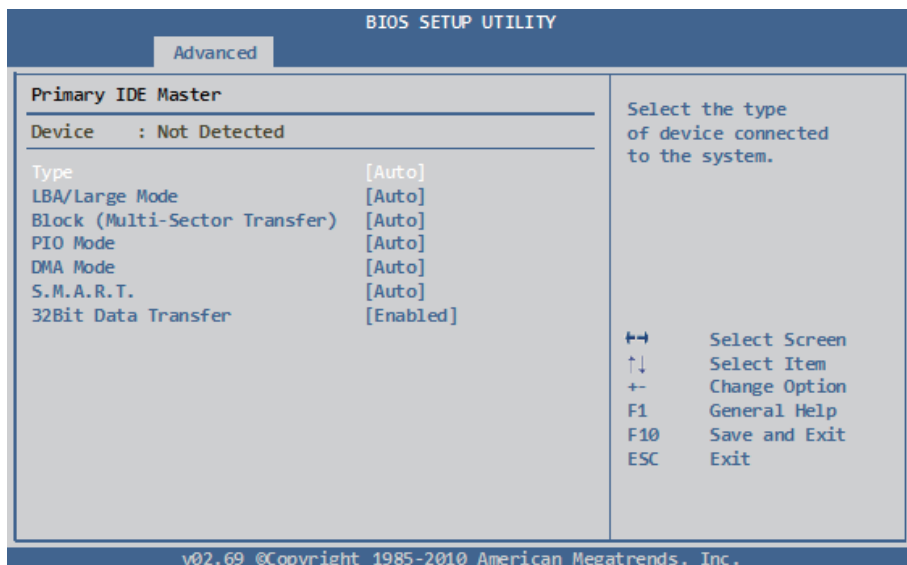
#### VIA SATA Driver Cap Port0/1

The choice: Hot Plug, Link PM



## Primary IDE Master

Select one of the IDE devices to configure it. Press <Enter> to access its the sub menu.



### Type

The type of devices.

The choice: Not Installed, Auto, CD/DVD, ARMD

### LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. The maximum is 137 GB.

Option	Description
Disabled	Disables LBA Mode.
Auto	Enables LBA Mode if the device supports it and the device is not already formatted with LBA Mode disabled.

## Block (Multi-Sector Transfer)

Option	Description
Disabled	The data transfer from and to the device occurs one sector at a time.
Auto	The data transfer from and to the device occurs multiple sectors at a time if the device supports it.

## PIO Mode

Sets the IDE PIO (Programmable I/O) timing options.

The choice: Auto, 0~4

## DMA

Configures the DMA options. “SWDMA<sub>n</sub>” indicates SingleWordDMA<sub>n</sub>; “MWDMA<sub>n</sub>” refers to MultiWordDMA<sub>n</sub> and “UDMA<sub>n</sub>” means UltraDMA<sub>n</sub>.

The choice: Auto, SWDMA0~2, MWDMA0~2, UDMA0~6

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

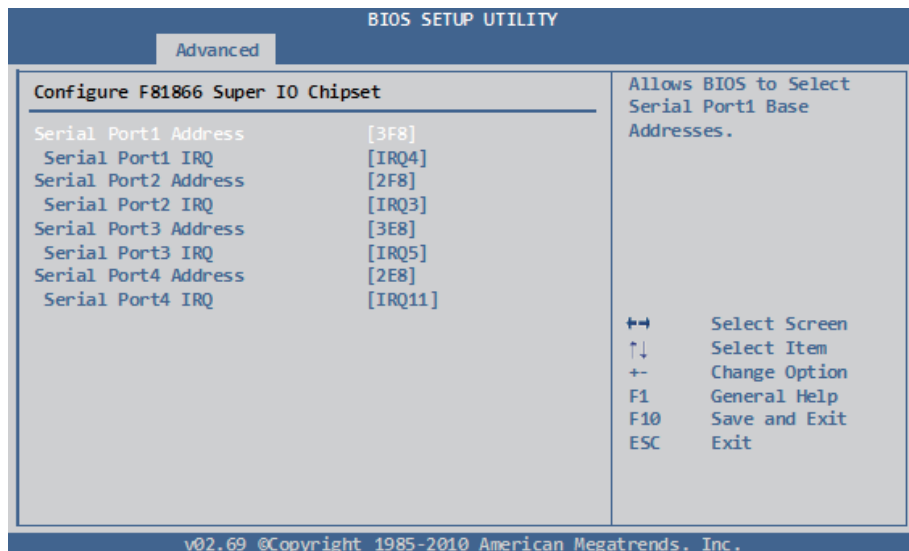
Sets “Auto”, “Enable” or “Disable” for Self-Monitoring Analysis and Reporting Technology (S.M.A.R.T.) to predict impending drive failure.

## 32Bit Data Transfer

The choice: Disabled, Enabled

### 3.2.3 SuperIO Configuration

Use “SuperIO Configuration” to specify address and modes for Serial Port.



### **Serial Port1 Address/IRQ**

Select an address and corresponding interrupt for Serial Port 1.  
Options: 3F8/IRQ4 (Default) ; 3E8/IRQ4 ; 2E8/IRQ3 ; Disabled

### **Serial Port2 Address/IRQ**

Select an address and corresponding interrupt for Serial Port 2.  
Options: 2F8/IRQ3 (Default) ; 3E8/IRQ4 ; 2E8/IRQ3 ; Disabled

### **Serial Port3 Address**

This item allows you to select the address of Serial Port3.  
The choice: 3E8 (Default) / 2E8 / 2F0 / 2E0

### **Serial Port3 IRQ**

This item allows you to select IRQ of Serial Port3.  
The choice: IRQ5 / IRQ3 / IRQ4 / IRQ7 / IRQ9 / IRQ10 / IRQ11 / IRQ12

### **Serial Port4 Address**

This item allows you to select the address of Serial Port4.  
The choice: 2E8 (Default) / 3E8 / 2F0 / 2E0

### **Serial Port4 IRQ**

This item allows you to select IRQ of Serial Port3.  
The choice: IRQ5 / IRQ3 / IRQ4 / IRQ7 / IRQ9 / IRQ10 / IRQ11 / IRQ12

### 3.2.4 Hardware Health Configuration

BIOS SETUP UTILITY	
Advanced	
<b>Hardware Health Configuration</b>	
H/W Health Function	[Enabled]
CPU Temperature	:57°C/ 134°F
Vcore	:1.520 V
+5V	:4.878 V
+12V	:10.560 V
+1.5V	:2.208 V
Enables Hardware Health Monitoring Device.	
←→ Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit	
v02.69 ©Copyright 1985-2010 American Megatrends, Inc.	

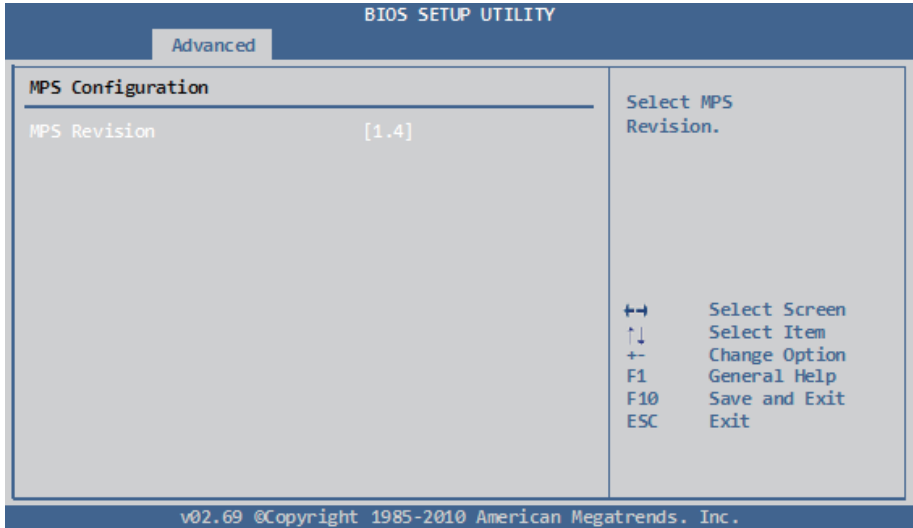
#### CPU Temperature

Displays the currently monitored CPU temperature.

#### Vcore, +5V, +12V, +1.5V

Shows you the voltage level of the Vcore, +5V, +12V and +1.5V.

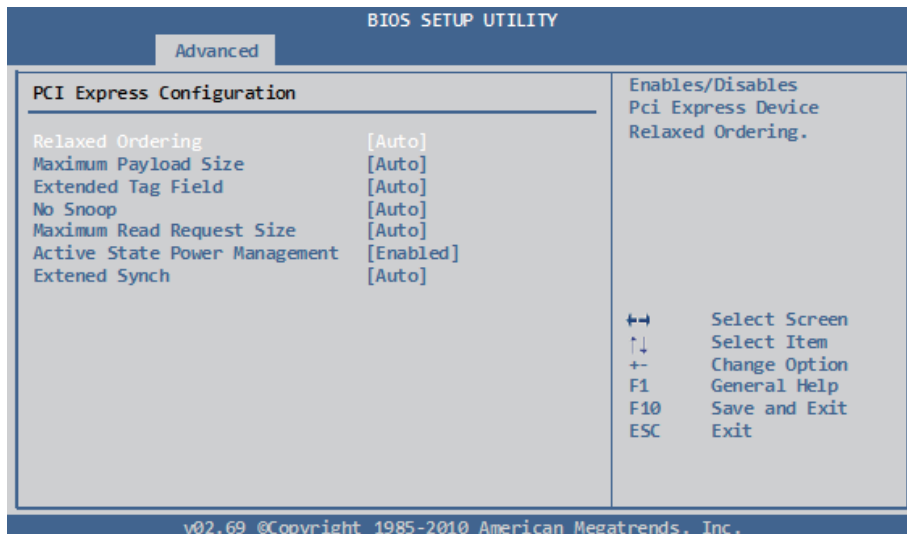
### 3.2.5 MPS Configuration



#### MPS Revision

Select the operating system that is Multi-Processors Version Control for OS.  
The choice: 1.4, 1.1

## 3.2.6 PCI Express Configuration



### Relaxed Ordering

Enable/Disable PCI Express Device Relaxed Ordering.

### Maximum Payload Size

Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.

The choice: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes, MAX SUPPORTED

### Extended Tag Field

Enable/Disable PCI Express Device Extended Tag Field.

### No Snoop

Enable/Disable PCI Express Device No Snoop.

### **Maximum Read Request Size**

Set Maximum Read Request Size of PCI Express Device or allow System BIOS to select the value.

The choice: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes, MAX SUPPORTED

### **Active State Power Management**

Enable/Disable PCI Express ASPM (Device Active State Power Management).

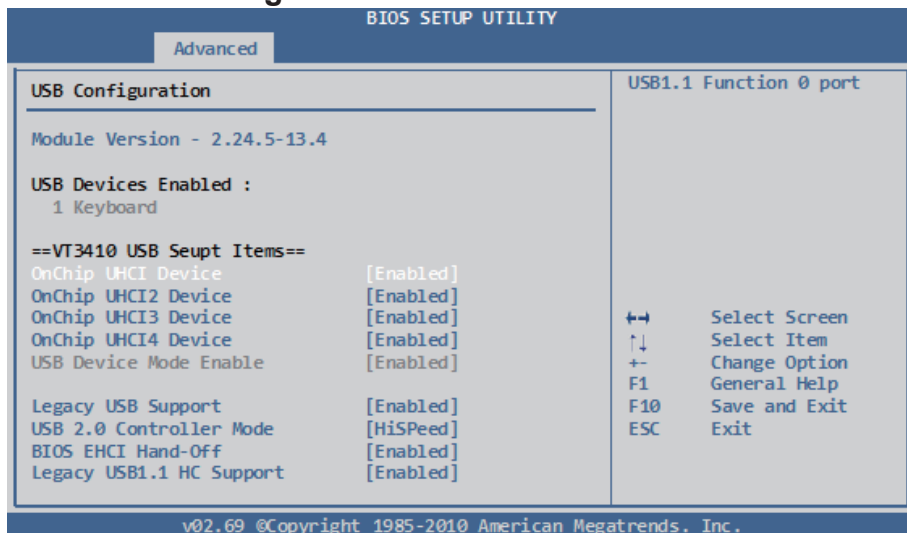
### **Extended Synch**

If Enabled, the option allows generation of extended synchronization patterns.

The choice: Auto, Enabled, Disabled.



## 3.2.7 USB Configuration



### OnChip UHCI Device

The OnChip UHCI Device feature enables support for USB 1.1 devices. UHCI corresponds with the USB\_1 stack. UCHI2 corresponds with the USB\_2 stack. UCHI3 corresponds with the USB\_3 pin header block. UCHI4 corresponds with the USB\_4 pin header block.

### OnChip EHCI Device

The OnChip EHCI Device feature enables support for USB 2.0 devices on USB\_1, USB\_2, USB\_3, and USB\_4.

### Legacy USB Support

Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.

### USB 2.0 Controller Mode

Configures the USB 2.0 controller in High Speed (480Mbps) or Full Speed (12Mbps).

### BIOS EHCI Hand-Off

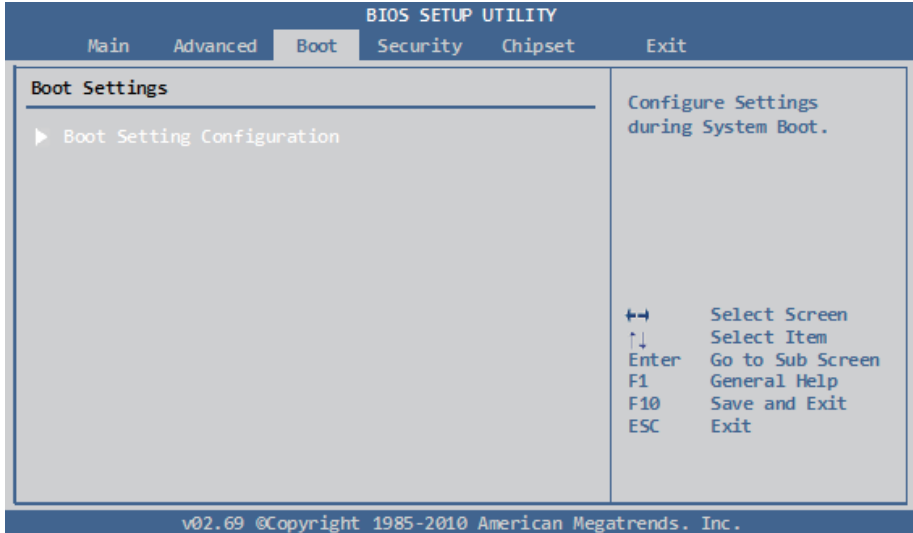
This option allows you to enable/disable EHCI Hand Off if your computer operating system does not support it. EHCI is the abbreviation for Enhanced Host Controller Interface which is necessary for high speed USB operation.

### Legacy USB1.1 HC Support

Enable to support USB1.1 HC.

### 3.3 Boot Settings

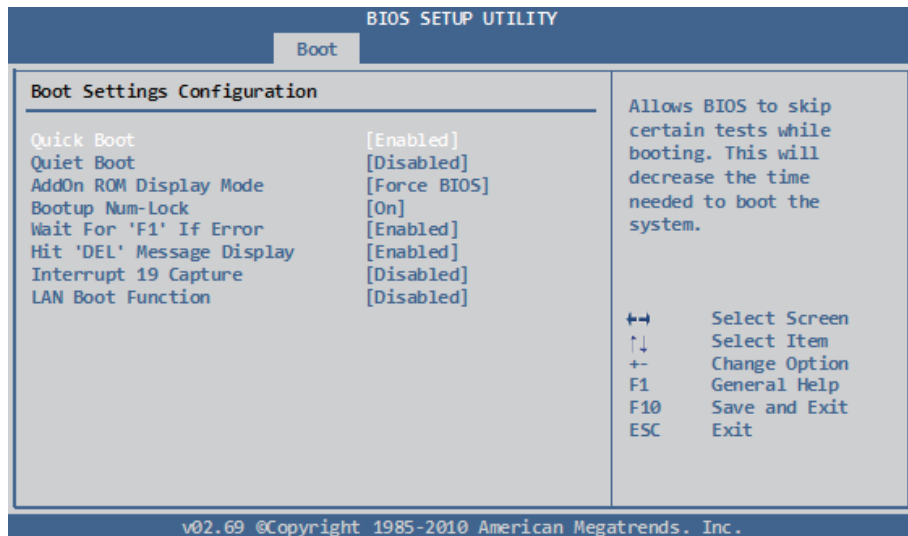
The “Boot” screen provides the access to configure the settings for system boot.



#### Boot Setting Configuration

Enter the sub menu for boot setting.

### 3.3.1 Boot Setting Configuration



#### Quick Boot

Set the value to “Enabled” to allow the BIOS to skip some Power On Self Tests (POST) while booting to decrease the time needed to boot the system. When you set the value to “Disabled” the BIOS will perform all the POST items.

#### Quiet Boot

Display normal POST messages when it's selected as “Disabled.” When it is set as “Enabled,” OEM messages will be displayed instead of POST messages. The default is “Disabled.”

### AddOn ROM Display Mode

Set this option to display add-on ROM (read-only memory) messages. The Optimal and Fail-Safe default setting is Force BIOS. An example of this is a SCSI BIOS or VGA BIOS.

Option	Description
Force BIOS (Default)	Set this value to allow the computer system to force a third party BIOS to display during system boot.
Keep Current	Set this value to allow the computer system to display the ezPORT information during system boot.

### Bootup Num-Lock

Set this value to allow the Number Lock setting to be modified during boot up. The Optimal and Fail-Safe default setting is On.

Option	Description
Off	This option does not enable the keyboard Number Lock automatically. To use the 10-key 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.
On (Default)	Set this value to allow the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard will be lit.

### Wait For “F1” If Error

Set this value to allow the “Wait for ‘<F1>’ Error” setting to be modified. The Optimal and Fail-Safe default setting is Enabled

Option	Description
Disabled	This prevents the ezPORT to wait on an error for user intervention. This setting should be used if there is a known reason for a BIOS error to appear. An example would be a system administrator must remote boot the system. The computer system does not have a keyboard currently attached. If this setting is set, the system will continue to boot up into the operating system. If <F1> is enabled, the system will wait until the BIOS setup is entered.

---

Enabled (Default)	Set this value to allow the system BIOS to wait for any error. If an error is detected, pressing <F1> will enter Setup and BIOS setting can be adjusted to fix the problem. This normally happens when upgrading the hardware and not setting the BIOS to recognize it.
----------------------	---

### Hit “DEL” Message Display

Set this value to allow the “Hit ‘DEL’ to enter Setup Message Display” to be modified. The Optimal and Fail-Safe default setting is Enabled.

Option	Description
Disabled	This prevents the ezPORT to display “Hit DEL to enter Setup” during memory initialization. If Quiet Boot is enabled, the Hit "DEL" message will not display.
Enabled (Default)	This allows the ezPORT to display “Hit DEL to enter Setup” during memory initialization.

### Interrupt 19 Capture

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

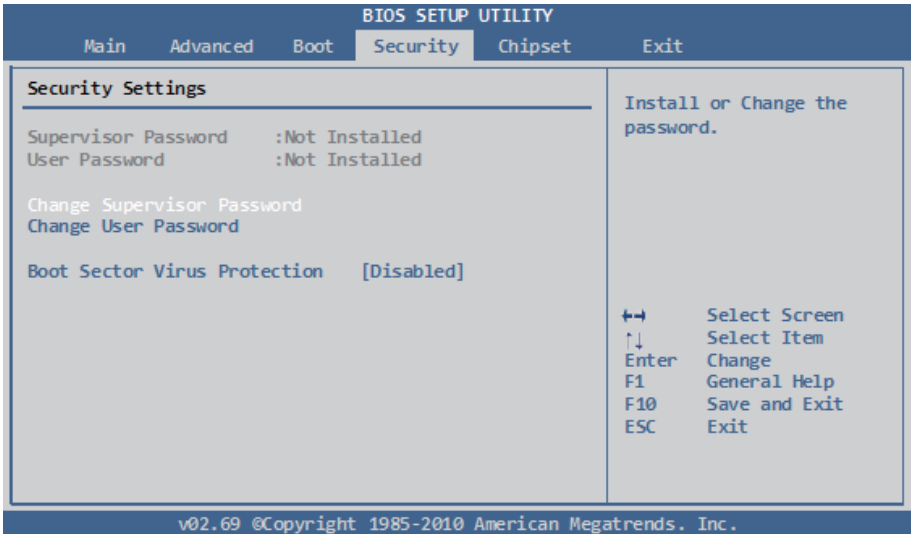
Option	Description
Disabled (Default)	The BIOS prevents option ROMs from trapping interrupt 19.
Enabled	The BIOS allows option ROMs to trapping interrupt 19.

### LAN Boot Function

Set this option to LAN add-on Boot ROM function.

### 3.4 Security Settings

The “Security Settings” screen allows you to set password.



#### Change Supervisor Password

The default is “Not Installed”, but you can change the Supervisor Password and then it will appear “Installed”. Please always remember your password or else you will have to reset the whole system.

#### Change User Password

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

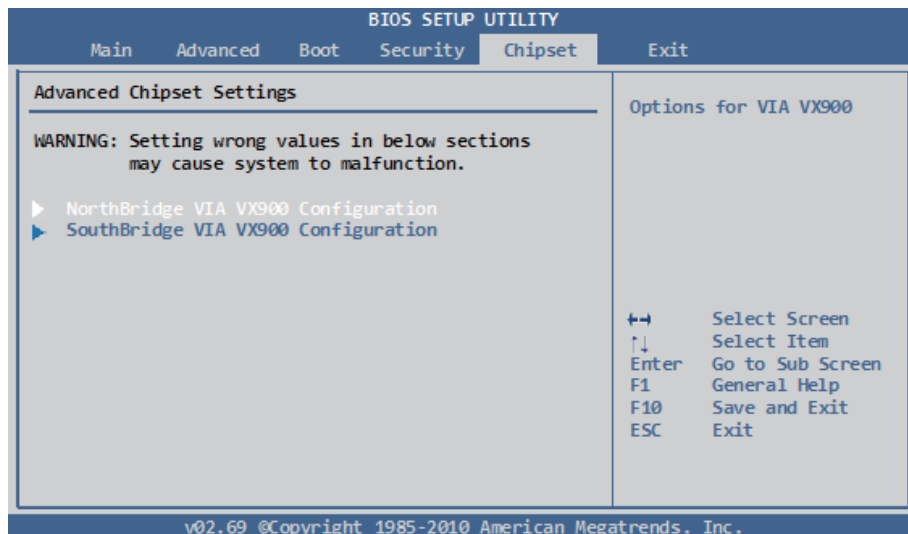
#### Boot Sector Virus Protection

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

The choice: Disabled (Default), Enabled

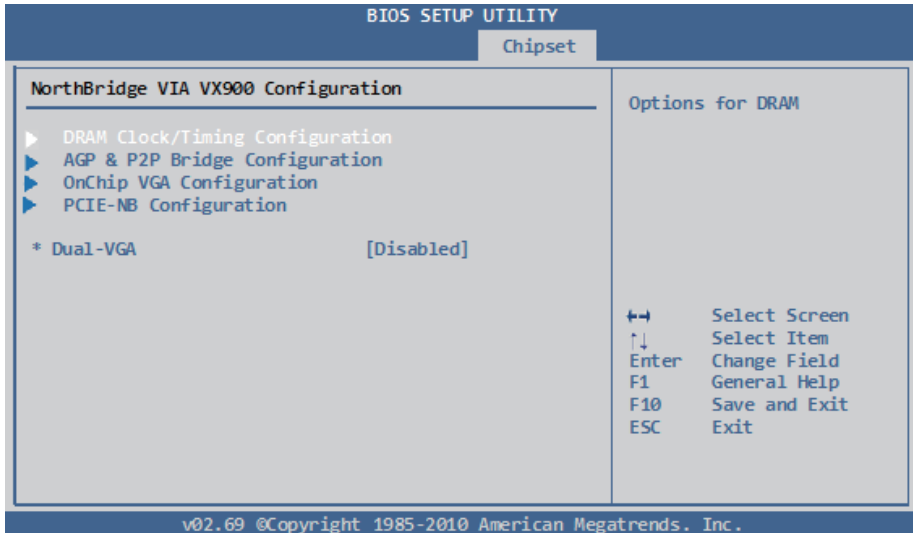
### 3.5 Advanced Chipset Settings

Select “Chipset” to access to “NorthBridge VIA VX900 Configuration” and “SouthBridge VIA VX900 Configuration”. You can enter the sub menu of the two configuration options.



**Note:** Please pay attention to the “WARNING” part at the left frame before you decide to configure any setting of an item.

### 3.5.1 NorthBridge VIA VX900 Configuration



#### Dual-VGA

The Dual VGA feature enables the user to output display to two display devices. A driver must be installed in the OS in order for this function to operate.

The choice: Disabled, Enabled



## DRAM Clock/Timing Configuration

BIOS SETUP UTILITY		Chipset
<b>DRAM Frequency/Timing Configuration</b>		Options for DRAM
DRAM Clock	[Auto]	
Bank Interleave		
Output Impedance Control		
DDR2 Memory Chip ODT [DDR2/DDR3]	[Auto]	
DDR3 Dynamic ODT	[Auto]	
BA0 SEL	[A13]	
BA1 SEL	[A14]	
BA2 SEL	[A15]	
VR Interleave Address Bit 0	[A17]	
VR Interleave Address Bit 1	[A16]	
Virtual Rank Interleave	[Auto]	
BA Scramble	[Enabled]	
RDRDY	[Default]	
Conversion Circuit	[Auto]	
DRAM 32-bit data width	[Enabled]	
DramInitMethod	[Force_SW]	←→ Select Screen
Dram Self Refresh	[Enabled]	↑↓ Select Item
Dynamic CKE	[Enabled]	+− Change Option
Memory Remap Control		F1 General Help
VGA Share Memory(Frame Buffer)	[256MB]	F10 Save and Exit
Internal VGA DVO Support	[Disabled]	ESC Exit
CPU Direct Access Frame Buffer	[Enabled]	
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### DRAM Clock

The DRAM Clock option enables the user to determine how the BIOS handles the memory clock frequency. The memory clock can either be dynamic or static. This feature has three options.

Option	Description
Auto	The Auto option enables the BIOS to select a compatible clock frequency for the installed memory.
400 MHz	The 400 MHz option forces the BIOS to be fixed at 800 MHz for DDR3 memory modules.
533 MHz	The 533 MHz option forces the BIOS to be fixed at 1066 MHz for DDR3 memory modules.

### Bank Interleave

The choice: SPD, Non-Page, 2-Way, 4-Way, 8-Way

### Output Impedance Control

The choice: Normal, Weak

### **DDR2 Memory Chip ODT [DDR2/DDR]**

The choice: Auto, Disabled, 75 ohm/60 ohm, 150 ohm/120 ohm, 50 ohm/40 ohm, NA/20 ohm, NA/30 ohm

### **DDR3 Dynamic ODT**

The choice: Auto, Disabled, RZQ/4, RZQ/2

### **BA0 SEL**

The choice: A11, A13, A15, A17, A19

### **BA1 SEL**

The choice: A12, A14, A16, A18, A20

### **BA2 SEL**

The choice: A14, A15, A18, A19

### **VR Interleave Address Bit 0**

The choice: A15, A17, A19, A21

### **VR Interleave Address Bit 1**

The choice: A14, A16, A18, A20

### **Virtual Rank Interleave**

The choice: Auto, Disabled

### **BA Scramble**

The choice: Enabled, Disabled

### **RDRDY**

The choice: Slowest, Default

### **Conversion Circuit**

The choice: Auto, Async

### **DRAM 32-Bit data width**

The choice: Disabled, Enabled

### **DramInitMethod**

The choice: Auto, Force\_SW

### **Dram Self Refresh**

The choice: Disabled, Enabled

### **Dynamic CKE**

The choice: Disabled, Enabled

---

## **Memory Remap Control**

The choice: Disabled, Enabled

## **VGA Share Memory(Frame Buffer)**

The VGA Share Memory feature enables the user to choose the amount of the system memory to reserve for use by the integrated graphics controller.

The choice: 8MB, 16MB, 32MB, 64MB, 128MB, 256MB, 512MB

## **Internal VGA DVO Support**

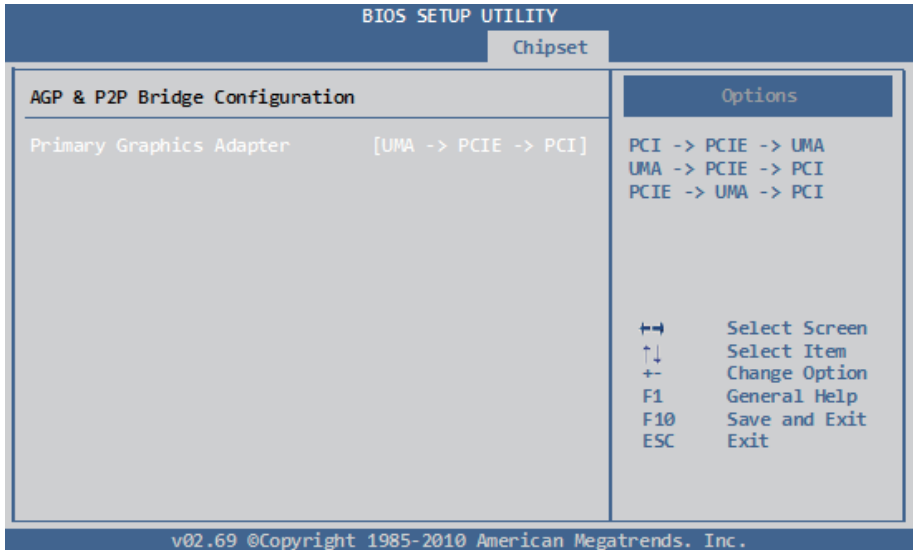
The choice: Disabled, DVO×8 Support, DVO×16 Support

## **CPU Direct Access Frame Buffer**

The choice: Disabled, Enabled

## AGP & P2P Bridge Configuration

The AGP & P2P Bridge Configuration screen has one feature for establishing the order the BIOS takes when seeking a graphics adapter.

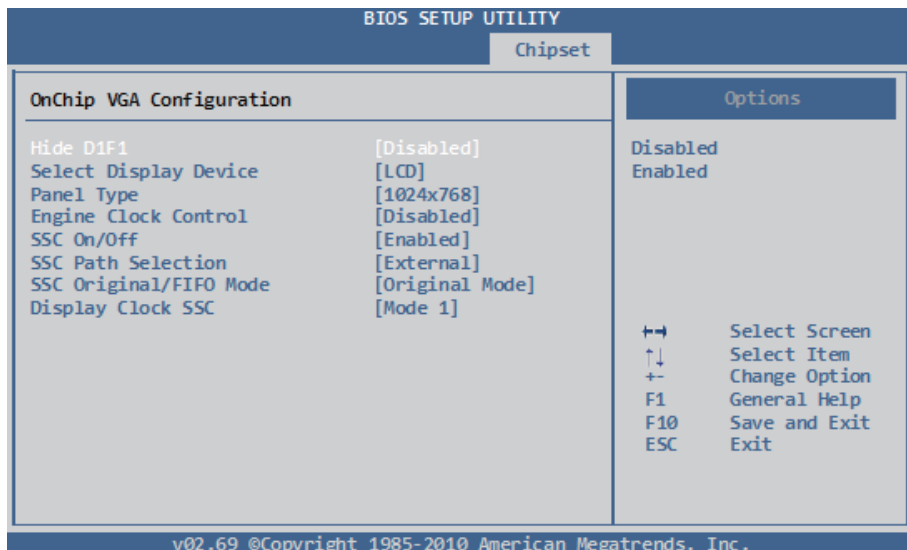


### Primary Graphics Adapter

The Primary Graphics Adapter option enables the user to change the order in which the BIOS seeks for a graphics adapter. There are three paths that can be chosen.

The choice: PCI → PCIE → UMA, UMA → PCIE → PCI, PCIE → UMA → PCI

## OnChip VGA Configuration



### Hide D1F1

The choice: Disabled, Enabled

### Select Display Device Control

When set as "Manual", user can set between "Select Display Device 1" or "Select Display Device 2".

The choice: Auto, Manual

## **Panel Type**

The Panel Type feature enables the user to specify the resolution of the display being used with the system. The panel types are predefined in the VGA VBIOS.

Panel resolution: 640x480, 800x600, 1024x768, 1280x768, 1280x800, 800x480, 1024x600, 1366x768

## **Engine Clock Control**

The choice: Disabled, Enabled

## **SSC On/Off**

The choice: Disabled, Enabled

## **SSC Path Selection**

The choice: Internal, External

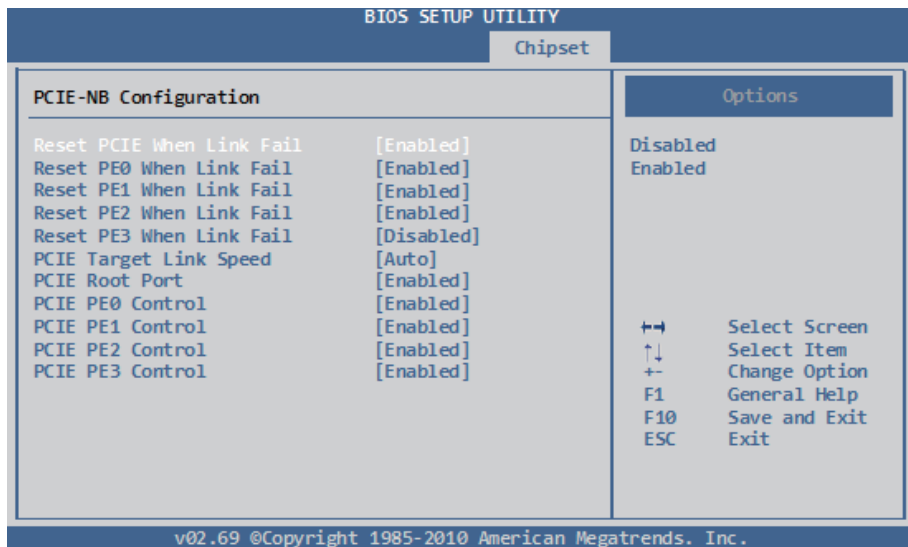
## **SSC Original/FIFO Mode**

The choice: Original Mode, FIFO Mode

## **Display Clock SSC**

The choice: Mode 0~3

## PCIE-NB Configuration



### Reset PCIE When Link Fail

The choice: Disabled, Enabled

### Reset PE0~3 When Link Fail

The choice: Disabled, Enabled

### PCIE Target Link Speed

The choice: Auto, Force Gen1

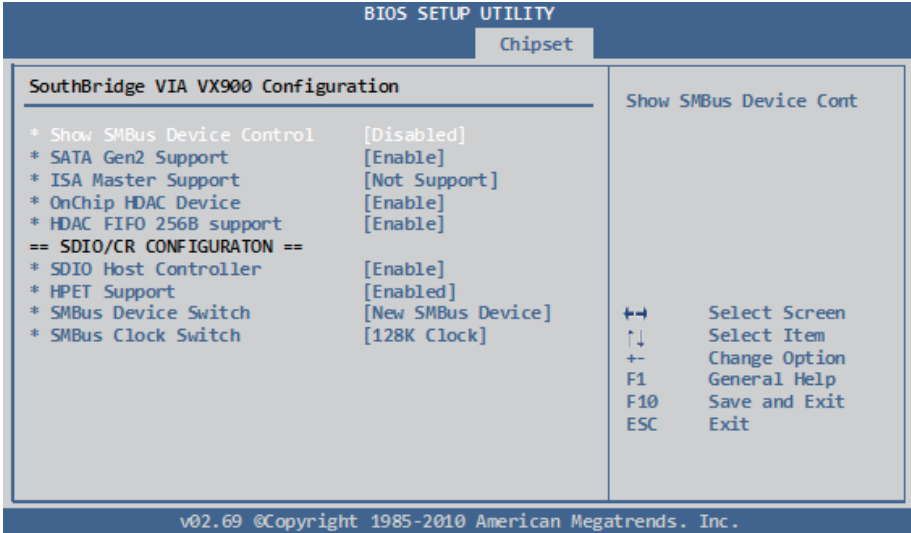
### PCIE Root Port

The choice: Disabled, Enabled

### PCIE PE0~3 Control

The choice: Disabled, Enabled

### 3.5.2 SouthBridge VIA VX900 Configuration



#### Show SMBus Device Control

The choice: Enabled, Disabled

#### SATA Gen2 Support

The SATA Gen2 Support feature allows BIOS to determine whether SATA 3Gb/s or 1.5Gb/s specifications are followed.

The choice: Enabled, Disabled

#### ISA Master Support

The choice: Support, Not Support

#### OnChip HDAC Device

The OnChip HDAC Device feature enables the BIOS to control the high definition audio codec in the chipset.

The choice: Enable, Disable



**HDAC FIFO 256B support**

The choice: Enable, Disable

**SDIO/CR CONFIGURATION****SDIO Host Controller**

The choice: Enable, Disable

**HPET Support**

The HPET Support feature enables the BIOS to determine if the high precision event timer in the chipset is on or off.

The choice: Enabled (default), Disabled

**SMBus Device Switch**

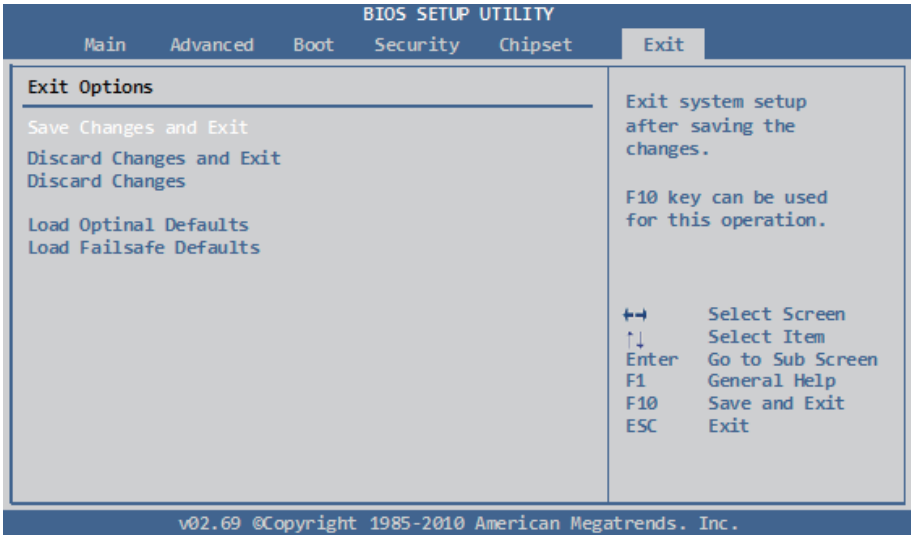
This feature enables support for the new chipset definition of the SMBus interface. There are two options: New SMBus Device and Old SMBus Device. If the OS cannot support the new SMBus definition, then change the setting to "Old SMBus Device".

**SMBus Clock Switch**

The choice: 32K RTC Clock, 32K Clock, 128K Clock

### 3.6 Exit Setting

Select “Exit” to set exit options, save changes or load default values.



#### Save Changes and Exit

When you press “Enter” on this option, a message described as the one below will appear:

“Save configuration changes and exit setup?”

Pressing <OK> stores the configuration changes made in BIOS in CMOS menu - a special section of memory that stays on after you turn your system off, and then exit. The next time you boot your system up, the new configured system values will take place.

**Note:** You can also press <F10> to enable this operation.

#### Discard Changes and Exit

Exit system setup without saving any changes. You can also press <ESC> to activate this function.

---

## Load Optimal Defaults

When you press <Enter> on this option, a message dialog box will appear asking for your confirmation:

Load Optimal Defaults?  
[OK] [Cancel]

Press [OK] to load the BIOS Optimal Default values for all the setup options.

You can also press <F9> key to enable this operation.

## Load Optimal Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message:

Load Optimal Defaults?  
[OK] [Cancel]

Pressing [OK] loads the BIOS Optimal Default values for all the setup questions.

<F9> key can be used for this operation.

## Load Failsafe Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message:

Load Failsafe Defaults?  
[OK] [Cancel]

Pressing [OK] loads the BIOS Failsafe Default values for all the setup questions.

<F8> key can be used for this operation.

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# Appendix

## Appendix A: I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device.

The following table lists the I/O port addresses used.

Address	Device Description
0x00000000-0x00000CF7	PCI bus
0x00000000-0x00000CF7	Direct memory access controller
0x00000D00-0x0000FFFF	PCI bus
0x000003B0-0x000003BB	VIA Chrome9 HD IGP
0x000003C0-0x000003DF	VIA Chrome9 HD IGP
0x0000D000-0x0000DFFF	VIA MSP PCI Express Root Port
0x0000D800-0x0000D8FF	Realtek PCIe GBE Family Controller
0x0000E000-0x0000EFFF	VIA MSP PCI Express Root Port
0x0000E800-0x0000E8FF	Realtek PCIe GBE Family Controller #2
0x0000CC00-0x0000CC07	SDA Standard Compliant SD Host Controller
0x0000C880-0x0000C887	VIA MSP Card Reader Host Controller
0x0000C800-0x0000C807	StorX IDE Controller - 9001
0x0000C480-0x0000C483	StorX IDE Controller - 9001
0x0000C400-0x0000C407	StorX IDE Controller - 9001
0x0000C080-0x0000C083	StorX IDE Controller - 9001
0x0000C000-0x0000C00F	StorX IDE Controller - 9001
0x0000BC00-0x0000BC1F	VIA Rev 5 or later USB Universal Host Controller
0x0000B880-0x0000B89F	VIA Rev 5 or later USB Universal Host Controller
0x0000B800-0x0000B81F	VIA Rev 5 or later USB Universal Host Controller
0x0000B480-0x0000B49F	VIA Rev 5 or later USB Universal Host Controller
0x00000A79-0x00000A79	ISAPNP Read Data Port
0x00000279-0x00000279	ISAPNP Read Data Port
0x00000274-0x00000277	ISAPNP Read Data Port

0x00000020-0x00000021	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x00000081-0x00000083	Direct memory access controller
0x00000087-0x00000087	Direct memory access controller
0x00000089-0x0000008B	Direct memory access controller
0x0000008F-0x0000008F	Direct memory access controller
0x000000C0-0x000000DF	Direct memory access controller
0x00000040-0x00000043	System timer
0x00000070-0x00000071	System CMOS/real time clock
0x00000061-0x00000061	System speaker
0x000000F0-0x000000FF	Numeric data processor
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003E8-0x000003EF	Communications Port (COM3)
0x000002E8-0x000002EF	Communications Port (COM4)
0x00000A60-0x00000A6F	Motherboard resources
0x00000010-0x0000001F	Motherboard resources
0x00000022-0x0000003F	Motherboard resources
0x00000044-0x0000005F	Motherboard resources
0x00000062-0x00000063	Motherboard resources
0x00000065-0x0000006F	Motherboard resources
0x00000072-0x0000007F	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000084-0x00000086	Motherboard resources
0x00000088-0x00000088	Motherboard resources
0x0000008C-0x0000008E	Motherboard resources
0x00000090-0x0000009F	Motherboard resources
0x000000A2-0x000000BF	Motherboard resources
0x000000E0-0x000000EF	Motherboard resources
0x000004D0-0x000004D1	Motherboard resources
0x00000800-0x0000087F	Motherboard resources

0x00000400-0x0000041F	Motherboard resources
0x00000060-0x00000060	Motherboard resources
0x00000064-0x00000064	Motherboard resources

## Appendix B: BIOS Memory Map

Address	Device Description
0xA0000-0xBFFFF	PCI bus
0xA0000-0xBFFFF	VIA Chrome9 HD IGP
0xD0000-0xDFFFF	PCI bus
0x30000000-0xDFFFFFFF	PCI bus
0xF0000000-0xFEBFFFFFF	PCI bus
0xFC000000-0xFCFFFFFF	VIA Chrome9 HD IGP
0xFD000000-0xFDFFFFFF	VIA Chrome9 HD IGP
0xD0000000-0xDFFFFFFF	VIA Chrome9 HD IGP
0xFE9EC000-0xFE9EFFFF	Microsoft UAA Bus Driver for High Definition Audio
0xFEAA0000-0xFEAFFFFF	VIA MSP PCI Express Root Port
0xFBE00000-0xFBEFFFFF	VIA MSP PCI Express Root Port
0xFEADF000-0xFEADFFFF	Realtek PCIe GBE Family Controller
0xFBEF0000-0xFBEFFFFF	Realtek PCIe GBE Family Controller
0xFEB00000-0xFEBFFFFF	VIA MSP PCI Express Root Port
0xFBF00000-0xFBFFFFFF	VIA MSP PCI Express Root Port
0xFEBDF000-0xFEBDFFFF	Realtek PCIe GBE Family Controller #2
0xFBFF0000-0xFBFFFFFF	Realtek PCIe GBE Family Controller #2
0xFE9EBC00-0xFE9EB-CFF	SDA Standard Compliant SD Host Controller
0xFE9EB000-0xFE9EB7FF	VIA MSP Card Reader Host Controller
0xFE9EB800-0xFE9EB8FF	VIA USB Enhanced Host Controller
0xFED01000-0xFED013FF	Motherboard resources
0xFED02000-0xFED02FFF	Motherboard resources



0xFED03000-0xFED03FFF	Motherboard resources
0xFED05000-0xFED05FFF	Motherboard resources
0xFFFF00000-0xFFFFFFFF	Motherboard resources
0xFECC0000-0xFEC-C0FFF	Motherboard resources
0xFED00000-0xFED003FF	High Precision Event Timer, HPET
0xFEC00000-0xFEC00FFF	Motherboard resources
0xFEC00000-0xFEC00FFF	System board
0xFEE00000-0xFEE00FFF	Motherboard resources
0xFE9E4000-0xFE9E7FFF	Microsoft UAA Bus Driver for High Definition Audio
0xE0000000-0xEFFFFFFF	System board
0xE0000000-0xEFFFFFFF	Motherboard resources
0x0000-0x9FFFF	System board
0xC0000-0xCFFFF	System board
0xE0000-0xFFFFF	System board
0x100000-0x2FFFFFFF	System board

## Appendix C: Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 9	Microsoft ACPI-Compliant System
IRQ 40	VIA Chrome9 HD IGP
IRQ 41	Microsoft UAA Bus Driver for High Definition Audio
IRQ 27	VIA MSP PCI Express Root Port
IRQ 31	VIA MSP PCI Express Root Port
IRQ 28	Realtek PCIe GBE Family Controller
IRQ 35	VIA MSP PCI Express Root Port
IRQ 32	Realtek PCIe GBE Family Controller #2
IRQ 39	VIA MSP PCI Express Root Port

## Appendix

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IRQ 22	SDA Standard Compliant SD Host Controller
IRQ 22	VIA Rev 5 or later USB Universal Host Controller
IRQ 23	VIA MSP Card Reader Host Controller
IRQ 23	VIA Rev 5 or later USB Universal Host Controller
IRQ 23	VIA USB Enhanced Host Controller
IRQ 21	StorX IDE Controller - 9001
IRQ 21	VIA Rev 5 or later USB Universal Host Controller
IRQ 20	VIA Rev 5 or later USB Universal Host Controller
IRQ 13	Numeric data processor
IRQ 4	Communications Port (COM1)
IRQ 3	Communications Port (COM2)
IRQ 10	Communications Port (COM3)
IRQ 10	Communications Port (COM4)
IRQ 0	High Precision Event Timer, HPET
IRQ 8	High Precision Event Timer, HPET
IRQ 17	Microsoft UAA Bus Driver for High Definition Audio