

PER13D

Embedded System
User's Manual



Safety information

Electrical safety

To prevent electrical shock, unplug the power cable from the power outlet before relocating the system.

When adding or removing devices to the system, ensure that the power cables for the device have been disconnected before connecting the signal cables. If possible, disconnect all power cables from the existing system before adding a device.

Before connecting or removing signal cables from the mainboard, ensure that all power cables are unplugged.

Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.

Make sure that the power supply is set to the correct voltage in your area.

If you are not sure about the voltage of the electrical outlet that you are using, contact your local power company.

If the power supply is broken, do not fix it by yourself. Contact a qualified service technician or your local distributor.

Operation safety

Carefully read all the manuals that came with the mainboard, before installing it and adding devices.

Before using the product, make sure that all cables are properly connected and that the power cables are not damaged. If you find any damage, contact your dealer immediately.

To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets, and circuitry.

Avoid dust, humidity, and extreme temperatures. Do not place the product in wet areas.

Place the product on a stable surface.

If you encounter any technical problems with the product, please contact your local distributor

Statement

All rights reserved. No part of this publication may be reproduced in any form or by any means without prior written permission from the publisher.

All trademarks are the property of the owners.

All product specifications are subject to change without prior notification.

Revision History

Revision	Date (dd.mm.yyyy)	Changes
Version 1.0	09,11,2011	Initial release
Version 1.1	07,05,2012	Chassis color changed
Version 1.2	18,05,2012	LVDS connector pin define

Table of Contents

Safety information	1
<i>Electrical safety</i>	<i>1</i>
<i>Operation safety.....</i>	<i>1</i>
Statement.....	2
Revision History	2
Chapter 1	5
1.1 PER13D Introduction.....	5
1.2 PER13D System Specifications.....	6
1.3 PER13D Dimensions.....	7
1.4 PER13D Rear I/O Panel.....	8
1.5 PER13D Packing List	9
Chapter 2	10
Hardware Installation.....	10
2.1 Installing System Memory	10
2.2 Installing Mini PCIe device	12
2.3 Installing Driver	12
2.4 Hard Disk Drive Installation	13
2.5 GPIO (Cash Drawer) Installation.....	14
Chapter 3 I/O Pin Definition and Jumpers Setting	15
3.1 External I/O Connectors Pin Definitions.....	15
DC_IN (DC Adapter 12V in)	15
+12V_OUT (12V OUT)	15
USB 2.0 Port.....	15
COM1, 6: D-Sub 9 Pin Connector	15
COM2 (RS-232/422/485 Port A DB-9 Connector).....	16
COM3, 5: RJ-45 Connector.....	16
VGA1 & VGA2: D-Sub 15 Pin Connector	16
LAN1 & LAN2 (LAN connector RJ45)	17
LPT Port: D-Sub 25 Connector	17
KB_MS1 (PS/2 Connector)	17
DIO (Cash Drawer)	18
RJ11 Port.....	18
AUDIO_JACK (Audio Line Out)	18
3.2 Jumper Setting.....	18
DC_OUT (12V for external/internal use)	18
CPU_FAN (CPU FAN)	18
SYS_FAN (System FAN)	18
KB_MS2 (PS/2 Keyboard and PS/2 Mouse)	19
LVDS_PWR1 (LVDS 3V/5V selection)	19
INV_BRIG1 (Inverter with Box-header).....	19
LVDS 18-bit Connector.....	19
JRS1, JRS2, JRS3, JRS4, JRS5 (Only COM2 is available for RS232, RS422 or RS485 selections) ...	20
JCOM1, JCOM2, JCOM3, JCOM5, JCOM6 (for Pin 9 output 5V,12V or RI).....	20
COM1, COM3, COM5, COM6 (Serial Port with Box-header)	20
COM4 (Serial Port with 1.27mm pin-header)	21
JFRONT (Front Panel Connector with Box-header).....	21

F_USB1, F_USB2, F_USB3 (USB Pin-header).....	21
USB_PWR1, USB_PWR2, USB_PWR3 (Jumper for Stand-by, 5V or VCC 5V selections)	21
F_AUDIO (Front Audio Box-header)	22
VGA2 (VGA Connector with Box-header)	22
CLR_COMS1 (Clear CMOS Pin-header)	22
SATAPW_1, SATAPW_2 (SATA HDD Power 5V & 12V)	22
LCDPWR_CON (LCD Power ON/OFF)	23
BKLTEN_CON (Back light Inverter Enable/Disable).....	23
3.3 Onboard Connector Pin Assignment	24
Mini PCIE Socket	24
DDR3_1 DDR3 Memory DIMM Slot	25
SATA1, SATA2 connector (Serial ATA 2.0).....	25
SATA3 connector (Serial ATA 2.0).....	25
Chapter 4 AMI BIOS UTILITY	26
4.1 About BIOS Setup	26
4.2 Configuring the BIOS	26
4.3 Default Configuration	27
4.4 Entering Setup	27
4.5 BIOS Setup Utility	28
Main Menu	28
Advanced Menu.....	29
Boot Menu	35
Security Menu.....	37
Chipset Menu.....	39
Exit Setting	41
Appendix	44
Troubleshooting	44

Chapter 1

1.1 PER13D Introduction

PER13D, with Intel® Atom™ D525 1.8GHz and great heat dissipation ability for any harsh environment, is specially designed for self-service application. Its stylish mechanical design with feature of easy maintenance and abundant I/O access.

System: Intel® Atom™ D525 & ICH8M chipset.

Housing: PER13D is made with strong metal housing suitable.

Extensibility: Low profile design with abundant I/O access, PER13D is ideal for connecting a variety of system devices:

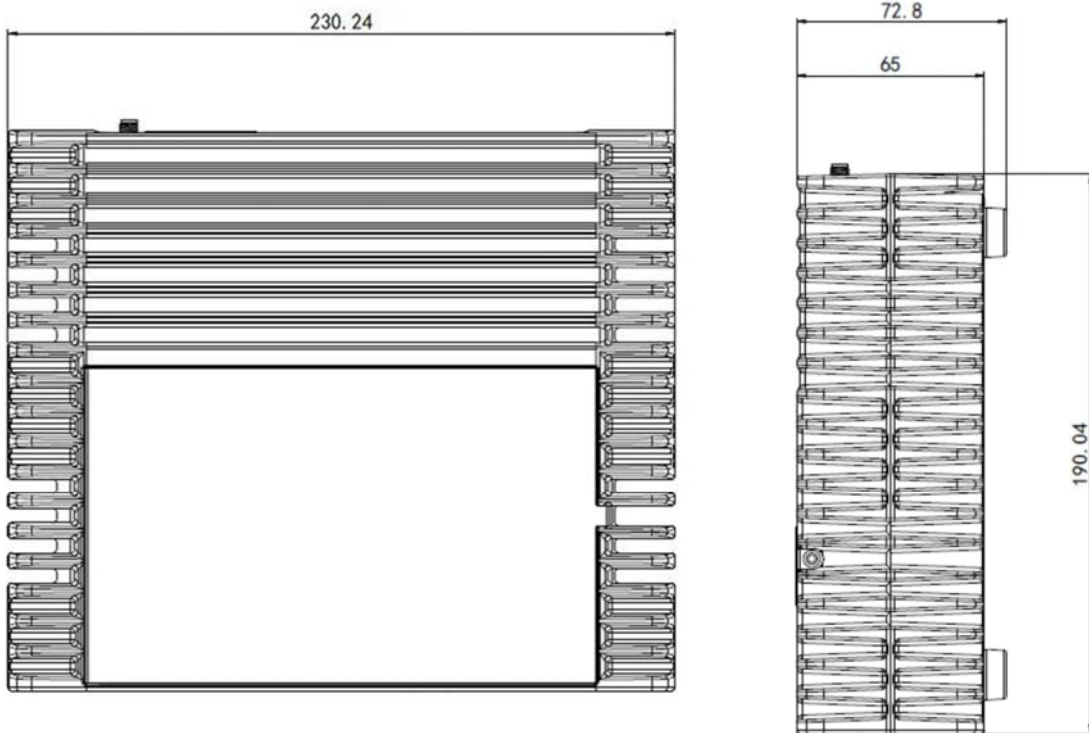
- +12V DC out supported — For Display
- Abundant I/O allowed the box for different kinds of peripherals or devices



1.2 PER13D System Specifications

System	
Processor	Intel® Atom™ D525 1.8GHz (Dual Core, L2 cache 1MB)
Chipset	Intel® ICH8M
Memory	1 x 204 pin SO-DIMM DDR3 800MHz up to 2GB
BIOS	AMI® BIOS
Expansion Slot	1 x Mini PCIe
Display	Intel® GMA3150 18-bit single channel LVDS display
LAN	Dual Realtek RTL8111E GbE LAN, 1000/100/10 Mbps
Audio	Realtek ALC269
Storage	1 x 2.5" SATA Storage (HDD/SSD)
Front I/O	
USB Port	1 x USB 2.0
ATX Power Switch	Yes
LED indicator	HDD access/ LAN access
Rear I/O	
Serial	3 x COM ports (DB-9 male) with 5/12v DC output 2 x COM port (RJ-45) for 12V Customer display
Printer	1 x Parallel port (DB-25 female)
USB Port	4 x USB 2.0
GPIO (Cash Drawer)	1 x 12V (RJ11)
Keyboard/Mouse	1 x PS/2
LAN	2 x RJ45 10/100/1000 Base-T
Audio	1 x Line-out 1 x Mic-in
VGA	2 x DB-15 female
Wireless LAN	Optional for wireless 802.11 b/g/n Mini PCIe module
DC jack	+12V DC in & Out
Mechanical & Environment	
Power Requirement	+12V DC in
Power supply	DC Output: 12V, 7.5A AC Input: 100-240V, 2A-1A, 50-60Hz
Dimension	230.24mm x 190.04mm x 65mm
Construction	Aluminum housing with metal cover
Operating Temp.	0°C ~ 50°C (32°F ~ 122°F)
Storage Temp.	-10°C ~ 55°C (14°F ~ 131°F)
Relative Humidity	10% ~ 90% (non-condensing)
O/S Support	Windows XP & Windows 7 Posready 2009 & Posready 7 Linux (Per Request)
EMI/Safety	CE, FCC, CCC
Accessories	Universal mount kit (option)
Color	Blue

1.3 PER13D Dimensions



1.4 PER13D Rear I/O Panel



I/O Port	Connector Type	Description
Power In	AC Power Connector	AC power in connector
12V Out	12V DC-out connector	This DC-out port can sustain the power of the monitor or any other devices which need 12V DC power input.
VGA	D-Sub 15 Pin Connector	The VGA port is used for connecting LCD or CRT monitors
LAN	LAN RJ45 Connector	The LAN port is applied to hook the terminal to a local area network.
USB Port	USB Type A	Standard USB connector for external device
LPT Port	D-Sub 25 Connector	The parallel port LPT1 can be used to connect parallel devices, such as a printer.
K/B / Mouse	PS/2 Keyboard Connector	The port is for connecting an external keyboard or mouse.
DIO (Cash Drawer)	RJ11 Connector	DIO (Cash Drawer) Connector, 12V supported
COM1, COM2, COM6	D-Sub 9 Pin Connector	The serial ports can be used to connect serial devices.
COM3, COM5	RJ-45 Connector	The serial ports can be used to connect serial devices
Line-Out	Earphone connector	This port is used for audio-out
Mic in	Microphone connector	This port is used for Microphone
Wireless Antenna	Antenna Connector	This port is for Wireless Antenna

1.5 PER13D Packing List

The following items are standard with PER13D:

- 90W Power Adapter
- AC Power Cord x 1
- Wireless (Optional)

Chapter 2 Hardware Installation

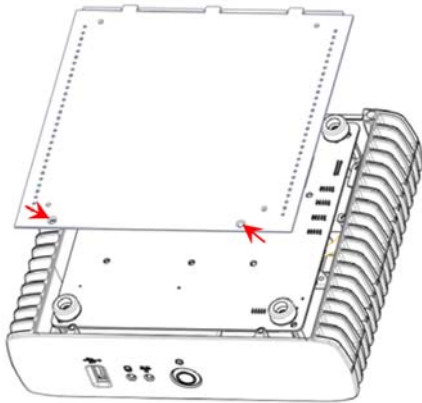
2.1 Installing System Memory

The PER13D supports DDR3 800 SO-DIMM with a maximum memory capacity of 2GB

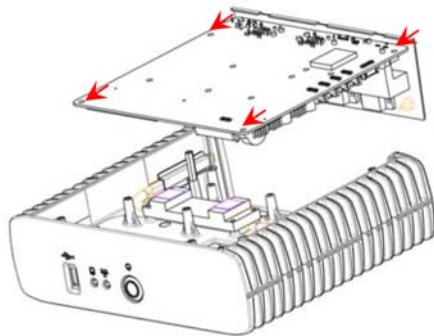


Disconnect all power supplies to the board before installing a memory module to prevent damage to the board and memory module.

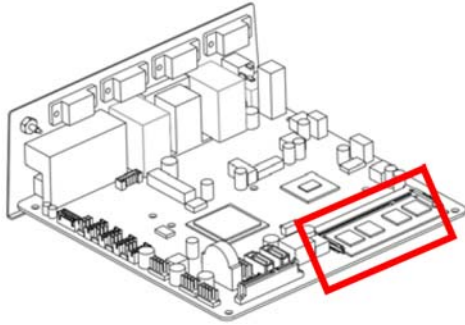
1. Remove two screws on the back cover and take off it



2. Remove four screws on the M/B and pull it up



3. Access to RAM and restore the unit

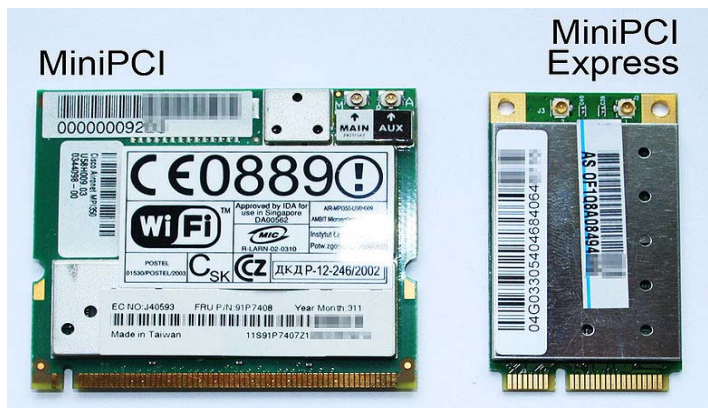


To install a memory module:

1. Locate the memory module slots on the mainboard.
2. Push the socket retaining clips outward to unlock the slots.
3. Align the memory module notch with the slot key on the socket.
4. Insert the module into the desired slot until the retaining clips lock.



2.2 Installing Mini PCIe device



2.3 Installing Driver

The PER13D drivers for Windows XP 32-bit are located in the following directories on the Driver CD or can be downloaded from the Perfectron website (<http://www.perfectron.com>):

Follow the instructions below to install the required PER13D drivers:
Install the Windows operating system before installing any drivers. Most standard I/O device drivers are installed during Windows installation.

Install the chipset driver by running the program:
X:\PER13D Driver\INF\setup.exe. Follow the provided instructions and reboot the computer when instructed.

Install the display driver and utilities by running the program:
X:\PER13D Driver\VGA\WIN2KXP_32\setup.exe. Follow the provided instructions and reboot the computer when instructed.

Install the LAN driver by running the program:
X:\PER13D Driver\LAN\Windows\2000_XP_2003 Server\PRO2KXP.exe. Follow the provided instructions and reboot the computer as required.

Install the Audio driver by running the program:
X:\PER13D Driver\Audio\32bit\2K_XP\setup.exe. Follow the provided instructions and reboot the computer as required.

Chipset X:\PER13D Driver\INF
Display X:\PER13D Driver\VGA\WIN2KXP_32
LAN X:\PER13D driver\LAN\Windows\2000_XP_2003 Server
Audio X:\PER13D Driver\Audio\32bit\2K_XP

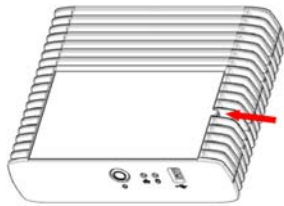
2.4 Hard Disk Drive Installation

PER13D (2.5" HDD or other storage disassembly process)

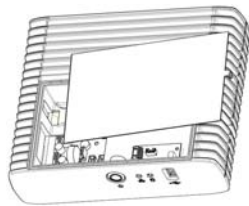


Do not remove the cover until you have verified that no power is supplied to the system. Power must be switched off and the power cord must be unplugged. Every time you service the system, you should be aware of this.

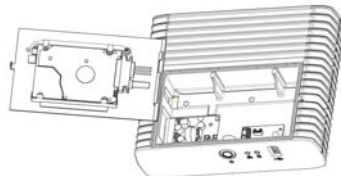
1. Turn off power and remove power cable from main unit.
2. Unlock the screw and open the HDD door.



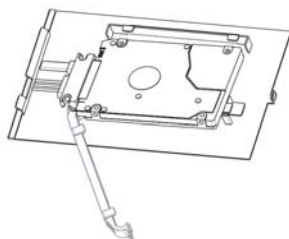
3. Take off the cover and beware of the cables.



4. Take off the SATA cable.



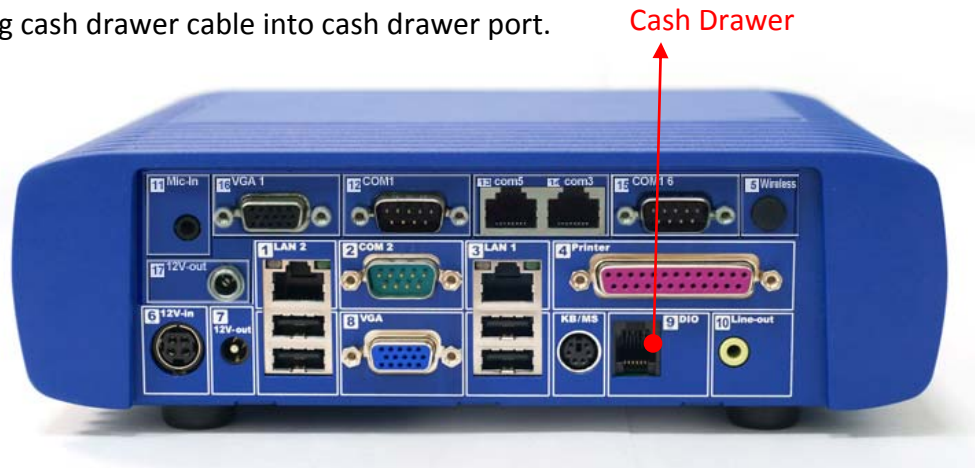
5. Open the special structure of fixing the HDD.
6. Change the HDD and lock back to the tray.
7. Put it back to main unit and fix with the screw.



2.5 GPIO (Cash Drawer) Installation

Before connecting the GPIO (cash drawer) to the **PER13D**, please make sure the drive voltage and cable pin assignment of the device (cash drawer) matches the definition of GPIO (cash drawer) port of **PER13D**. Please refer to the jumper setting and pin definition for more information.

Plug cash drawer cable into cash drawer port.



Note: If the cash drawer cannot be detected by the system, please refer to [troubleshooting](#).

Up to two cash drawers may be driven from this port. Driving voltage of the solenoid is +12V DC. I/O port 284 is used for drawer operation. A test program is supplied, for Linux and Windows, source code of which is available on request by software developers.


Value	Description
0x284	Output address.
0x284 read 8bit	Bit 2 => 0: low 1: high
0x200	Sleep 200ms
0x01	Open cashdrawer1 value.
0x02	Open cashdrawer2 value.
0x04	Close cash-drawer value.
0x04	Cash-drawer status mask.

Chapter 3 I/O Pin Definition and Jumpers Setting

3.1 External I/O Connectors Pin Definitions

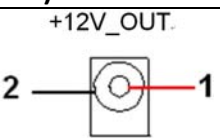
DC_IN (DC Adapter 12V in)

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



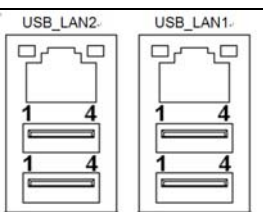
+12V_OUT (12V OUT)

Pin	Definition
1	12V
2	GND



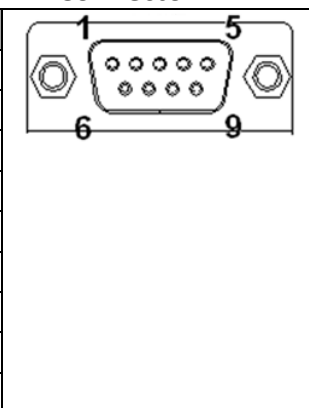
USB 2.0 Port

Pin	Definition
1	USB 5V
2	D-
3	D+
4	GND



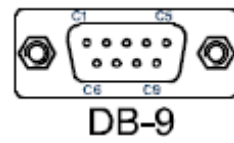
COM1, 6: D-Sub 9 Pin Connector

Pin	Definition
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI/ 5V /12V



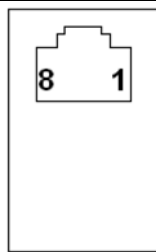
COM2 (RS-232/422/485 Port A DB-9 Connector)

Pin	RS-232	RS-422	Half Duplex RS-485
1	DCD	TX-	DATA-
2	RXD	RX+	NA
3	TXD	TX+	DATA+
4	DTR	RX-	NA
5	GND	GND	GND
6	DSR	NA	NA
7	RTS	NA	NA
8	CTS	NA	NA
9	+5V/+12V/RI	+5V/+12V/NA	+5V/+12V/NA



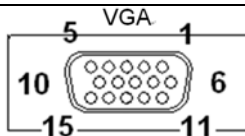
COM3, 5: RJ-45 Connector

Pin	Definition
1	RI/ 5V /12V
2	CTS & RTS
3	GND
4	RTS & GND
5	DTR
6	DSR
7	TXD
8	RXD



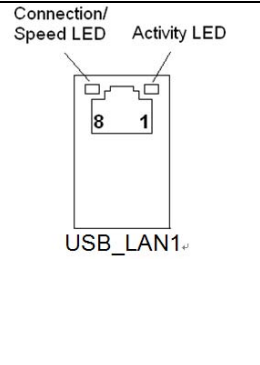
VGA1 & VGA2: D-Sub 15 Pin Connector

Pin	Definition
1	RED
2	GREEN
3	BLUE
4	NC
5	GND
6	GND
7	GND
8	GND
9	VCC 5V
10	GND
11	NC
12	DDC Data
13	H-SYNC
14	V-SYNC
15	DDC Clock



LAN1 & LAN2 (LAN connector RJ45)

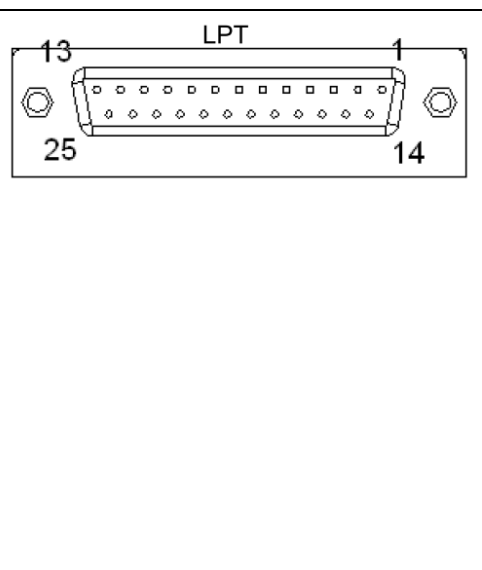
Pin	Definition
1	Data 0+
2	Data 0-
3	Data 1+
4	Data 1-
5	Data 2+
6	Data 2-
7	Data 3+
8	Data 3-



Connection/Speed LED:	
State	Description
Orange	Speed:1 Gbps
Green	Speed:1 00 Mbps
Activity LED:	
State	Description
On	Transmitting
Off	Not Transmitting

LPT Port: D-Sub 25 Connector

Pin	Definition	Pin	Definition
1	STB-	14	AFD-
2	PD0	15	ERR-
3	PD1	16	INIT-
4	PD2	17	SLIN-
5	PD3	18	GND
6	PD4	19	GND
7	PD5	20	GND
8	PD6	21	GND
9	PD7	22	GND
10	ACK-	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT		



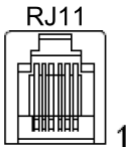
KB_MS1 (PS/2 Connector)

Pin	Definition
1	Keyboard Data
2	Mouse Data
3	GND
4	Mouse Clock
5	5V
6	Keyboard Clock




DIO (Cash Drawer) RJ11 Port

Pin	Definition
1	GND
2	GPIO-0
3	CASH Drawer Switch
4	12V
5	GPIO-1
6	GND

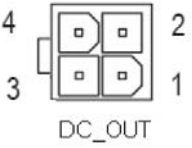

AUDIO_JACK (Audio Line Out)

Pin	Definition
1	GND
2	Line Out (L)
3	AUDIO_JD
4	-ACZ_DET
5	Line Out (R)

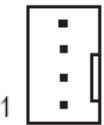

3.2 Jumper Setting**DC_OUT (12V for external/internal use)**

This connector is reserved for future use


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


CPU_FAN (CPU FAN)

Pin	Definition
1	GND
2	+12V/RPM control
3	RPM detect
4	RPM control

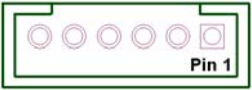

SYS_FAN (System FAN)

Pin	Definition
1	GND
2	+12V/RPM control
3	RPM detect



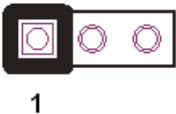
KB_MS2 (PS/2 Keyboard and PS/2 Mouse)

Pin	Definition
1	GND
2	KDAT
3	F_KDAT
4	KCLK
5	F_KCLK
6	5V




LVDS_PWR1 (LVDS 3V/5V selection)

Pin	Definition
1	3.3V
2	DC input
3	5V
Default: 1-2	



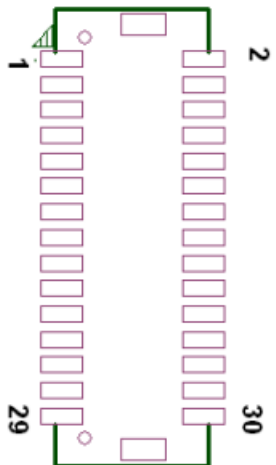
INV_BRIG1 (Inverter with Box-header)

Pin	Definition
1	12V DC out
2	12V DC out
3	GND
4	Backlight Controller
5	Backlight Enable



LVDS 18-bit Connector

Pin	Definition	Pin	Definition
1	GND	16	GND
2	NC	17	Data1-
3	EDID Data	18	GND
4	GND	19	GND
5	EDID Clock	20	Backlight 5V/12V Option
6	NC	21	LVDS Clock-
7	GND	22	Backlight 5V/12V Option
8	NC	23	LVDS Clock+
9	Data0+	24	Backlight 5V/12V Option
10	NC	25	GND
11	Data0-	26	GND
12	Backlight Enable	27	Data2-
13	GND	28	LVDS Power 3.3V
14	Backlight Controller	29	Data2+
15	Data1+	30	LVDS Power 3.3V



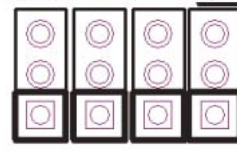
JRS1, JRS2, JRS3, JRS4, JRS5 (Only COM2 is available for RS232, RS422 or RS485 selections)

JRS1: Default 1-2	
Pin	Definition
1	RS232
2	UART RXD
3	RS422
4	UART RXD
5	RS485
6	UART RXD

JRS2: Default 2-3 short	
Pin	Definition
1	RS485 D-
2	COM2 Pin 1
3	RS232 DCD

JRS3: Default 2-3short	
Pin	Definition
1	RS485 D+
2	COM2 Pin 2
3	RS232 RXD

JRS2, JRS3, JRS4, JRS5



JRS4: Default 2-3	
Pin	Definition
1	RS422 D-
2	COM2 Pin 4
3	RS232 DTR

JRS5: Default 2-3	
Pin	Definition
1	RS422 D+
2	COM2 Pin 3
3	RS232 TXD

JCOM1, JCOM2, JCOM3, JCOM5, JCOM6 (for Pin 9 output 5V,12V or RI)

Pin	Definition
1-2 Short	5V
3-4 Short	RI
5-6 Short	12V
Default 3-4 Short	

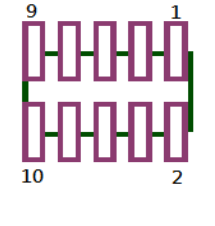
***PS: JCOM4 is always set as 5-6 short for VFD display use.

COM1, COM3, COM5, COM6 (Serial Port with Box-header)

Pin	Definition	Pin	Definition
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI/+5V/+12V
9	GND	10	RI/+5V/+12V

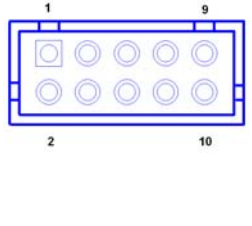
COM4 (Serial Port with 1.27mm pin-header)

Pin	Definition	Pin	Definition
1	DSR	2	DCD
3	RTS	4	RXD
5	CTS	6	TXD
7	RI/+5V/+12V	8	DTR
9	RI/+5V/+12V	10	GND



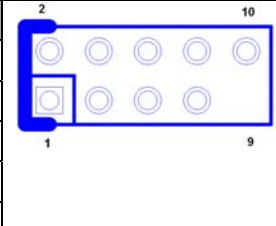
JFRONT (Front Panel Connector with Box-header)

Pin	Definition	Pin	Definition
1	Stand-by LED	2	Power LED
3	Power Switch#	4	GND
5	LAN Action LED	6	Stand-by 5V
7	HDD LED#	8	VCC 5V
9	System Reset#	10	GND



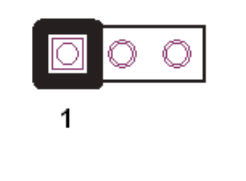
F_USB1, F_USB2, F_USB3 (USB Pin-header)

Pin	Definition	Pin	Definition
1	USB Power 5V	2	USB Power 5V
3	USB Dx-	4	USB Dy-
5	USB Dx+	6	USB Dy+
7	GND	8	GND
9	NC	10	NC



USB_PWR1, USB_PWR2, USB_PWR3 (Jumper for Stand-by, 5V or VCC 5V selections)

Pin	Definition
1	VCC 5V
2	USB DC IN
3	Stand-by 5V
Default 1-2 short	



F_AUDIO (Front Audio Box-header)

Pin	Definition	Pin	Definition
1	Amplifier Out_R+	2	MIC_L
3	Amplifier Out_R-	4	MIC_R
5	GND	6	Line In_R
7	Amplifier Out_L+	8	Line In_L
9	Amplifier Out_L-	10	Line In_JD
11	GND	12	MIC_JD

VGA2 (VGA Connector with Box-header)

Pin	Definition	Pin	Definition
1	V-SYNC	2	H-SYNC
3	GND	4	GND
5	RED	6	GND
7	GREEN	8	DDC Clock
9	BULE	10	DDC Data

CLR_COMS1 (Clear CMOS Pin-header)

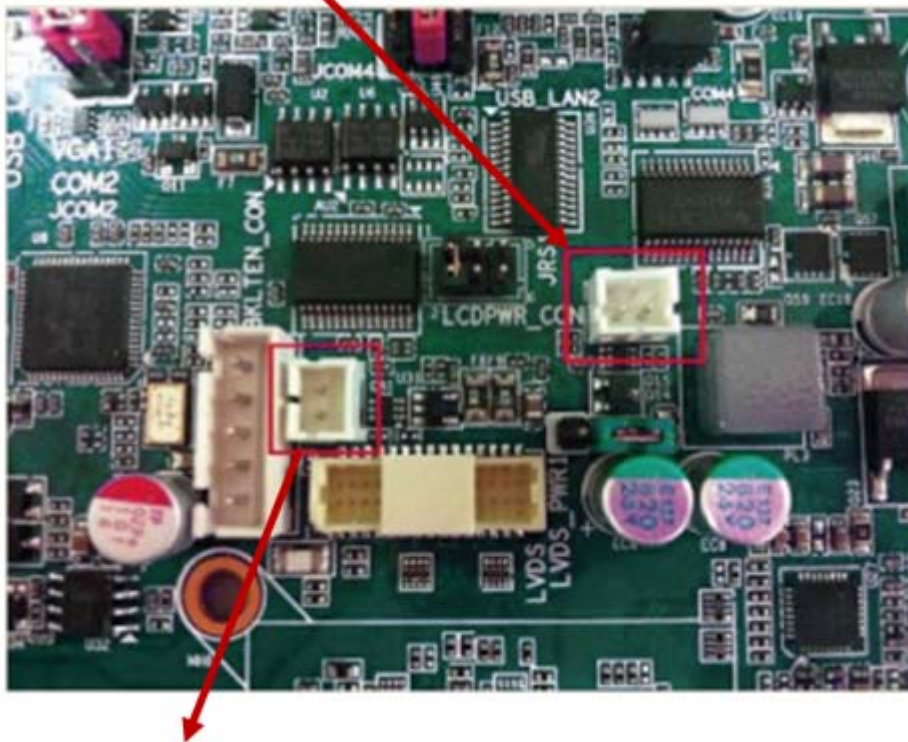
Pin	Definition
1	GND
2	Battery 3V
3	Battery 3V
Default 2-3 short	

SATAPW_1, SATAPW_2 (SATA HDD Power 5V & 12V)

Pin	Definition
1	+12V
2	GND
3	GND
4	5V

LCDPWR_CON (LCD Power ON/OFF)

ON	Short 1-2	
OFF	Open 1-2	
Default 1-2 Open		



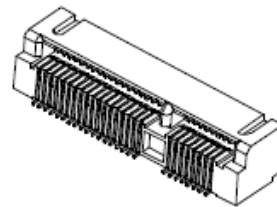
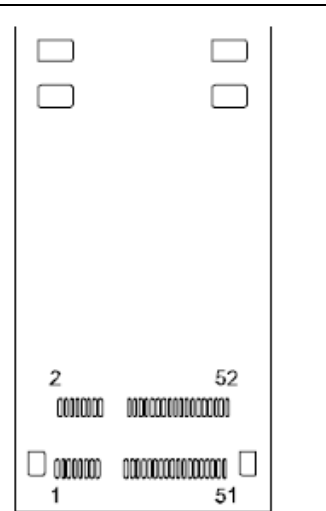
BKLTEN_CON (Back light Inverter Enable/Disable)

Enable	Short 1-2
Disable	Open 1-2
Default 1-2 Open	

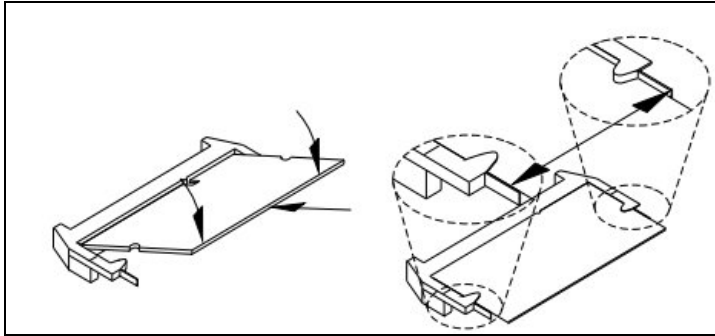
3.3 Onboard Connector Pin Assignment

Mini PCIE Socket

Signal Name	Pin	Pin	Signal Name
PCIE_WAKE#	1	2	*+3.3VSB
NC	3	4	GND
NC	5	6	+1.5V
NC	7	8	UIM_PWR
GND	9	10	UIM_DATA
CLK100_MPCIE1#/2#	11	12	UIM_CLK
CLK100_MPCIE1/2	13	14	UIM_RESET
GND	15	16	UIM_VPP
NC	17	18	GND
NC	19	20	MPCIE1/2_EN
GND	21	22	RST_PCIE#
PCIE_RX2-/3-	23	24	+3.3VSB
PCIE_RX2+/3+	25	26	GND
GND	27	28	+1.5V
GND	29	30	SB_SMB_CLK
PCIE_TX2-/3-	31	32	SB_SMB_DAT
PCIE_TX2+/3+	33	34	GND
GND	35	36	USBN
GND	37	38	USBP
+3.3VSB	39	40	GND
+3.3VSB	41	42	LED_WLAN#
GND	43	44	LED_WLAN#
NC	45	46	LED_WLAN#
NC	47	48	+1.5v
NC	49	50	GND
NC	51	52	*+3.3VSB

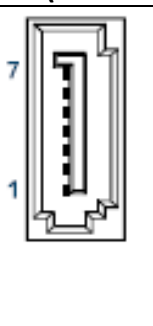


DDR3_1 DDR3 Memory DIMM Slot



SATAI1, SATA2 connector (Serial ATA 2.0)

Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



SATA3 connector (Serial ATA 2.0)

Pin	Definition	Description
1	V33	3.3V Power
2	V33	3.3V Power
3	V33	3.3V Power, pre-charge, 2 nd Mate
4	Ground	1 st Mate
5	Ground	2 nd Mate
6	Ground	3 rd Mate
7	V5	5V Power, pre-charge, 2 nd mate
8	V5	5V Power
9	V5	5V Power
10	Ground	2 nd Mate
11	Reserved	-
12	Ground	1 st Mate
13	V12	12V Power, Pre-charge, 2 nd mate
14	V12	12V Power
15	V12	12V Power



Chapter 4 AMI BIOS UTILITY

This chapter describes how to use the BIOS setup program for PER13C. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the Perfectron Web site at www.perfectron.com

4.1 About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu-driven utility for changing the system configuration to suit individual needs. A ROM-based configuration utility displays the system's configuration status and provides you with a tool to set system parameters.

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

The pull down menus allows you to configure items such as:

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

The settings in the setup program affect how the computer performs. It is important to understand all the setup options and to make settings appropriate with the way you use the computer.

4.2 Configuring the BIOS

This program should be executed under the following conditions:

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

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

4.3 Default Configuration

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

4.4 Entering Setup

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

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

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

TO ENTER SETUP BEFORE BOOT

PRESS <CTRL-ALT-ESC>

Press the key to enter Setup:

Legends

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

Scroll Bar

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

Submenu

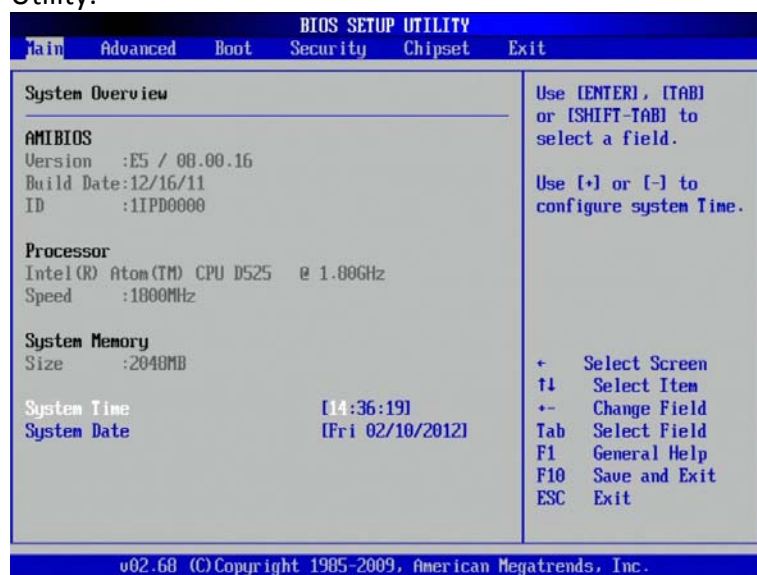
When “▶” appears on the left of a particular field, this indicates a submenu that contains additional options is available for that field. To display the submenu, move the highlight to that field and press <Enter>.

4.5 BIOS Setup Utility

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

Main Menu

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



AMI BIOS: Displays the detected BIOS information.

Processor: Displays the detected processor information.

System Memory: Displays the detected system memory information.

System Time: The time format is <hour>, <minute>, <second>. The time is based on 24-hour military-time. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

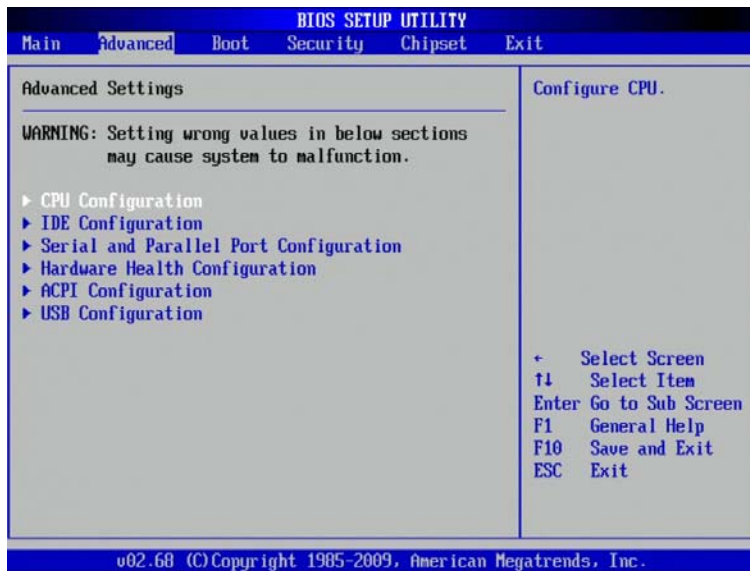
System Date: The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

Advanced Menu

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

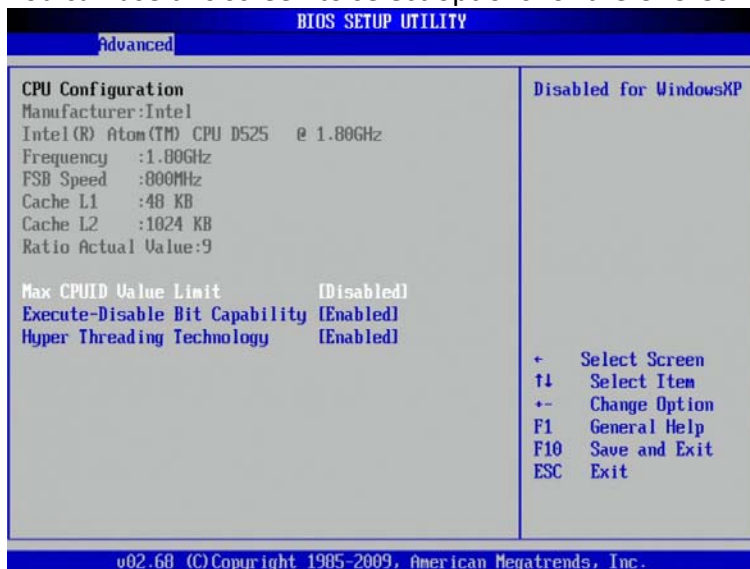


Setting incorrect field values may cause the system to malfunction.



CPU Configuration

You can use this screen to select options for the CPU Configuration Settings.



CPU Configuration

Displays the detected CPU information.

Max CPUID Value Limit

This item allows you to limit CPUID maximum value. It is recommended to keep this feature disabled if you are running p4 HT on an OS capable of running it.

Execute-Disable Bit Capability

Execute Disable Bit (EDB) is an Intel hardware-based security feature that can help reduce system exposure to viruses and malicious code. EDB allows the processor to classify areas in memory where application code can or cannot execute. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage and worm propagation. To use EDB you must have a PC or server with a processor with EDB capability and a supporting operating system. EDB-enabled processors by Intel are indicated by a "J" after the CPU model number. Execute Disable Bit is abbreviated as EDB (by Intel) or XDB. The default setting is [Enabled].

Hyper-Threading Technology

Intel® Hyper-Threading Technology (Intel® HT Technology) is available on laptop, desktop, server, and workstation systems. Look for systems with the Intel® HT Technology logo, which your system vendor has verified utilizing Intel® HT Technology.

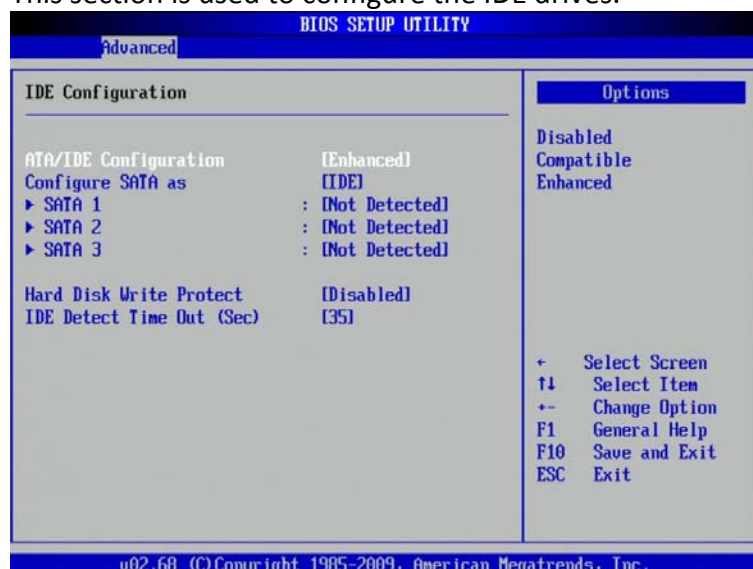
Intel® HT Technology requires a computer system with:

- A processor that supports Intel® HT Technology
- Intel® HT Technology enabled chipset
- Intel® HT Technology enabled system BIOS
- Intel® HT Technology enabled/optimized operating system

Performance will vary depending on the specific hardware and software you use. See your system manufacturer for details on specific system configurations and performance. The default setting is [Enabled].

IDE Configuration

This section is used to configure the IDE drives.



ATA/IDE Configuration

There is a setting in BIOS called "ATA/IDE Configuration", which has three options - Disabled, Compatible and Enhanced. If you choose "Enhanced", you also get a choice for "Enhanced mode support on" and then three choices: S-ATA, P-ATA and S-ATA+P-ATA.

Configure SATA As

SATA hard drives can run in three different modes: IDE, RAID or AHCI. IDE is the old interface standard for hard disks and optical drives is compatible with a variety of platforms, including Windows XP, Windows Vista and Windows 7. AHCI includes features not accessible from IDE mode but is compatible with only Windows Vista and Windows 7. RAID mode allows a user to configure multiple disks for advanced performance or backup security

SATA 1/SATA 2/SATA 3

This BIOS setting could help you and double check what kind of SATA devices was installed on PER13C.

Hard disk Write Protect

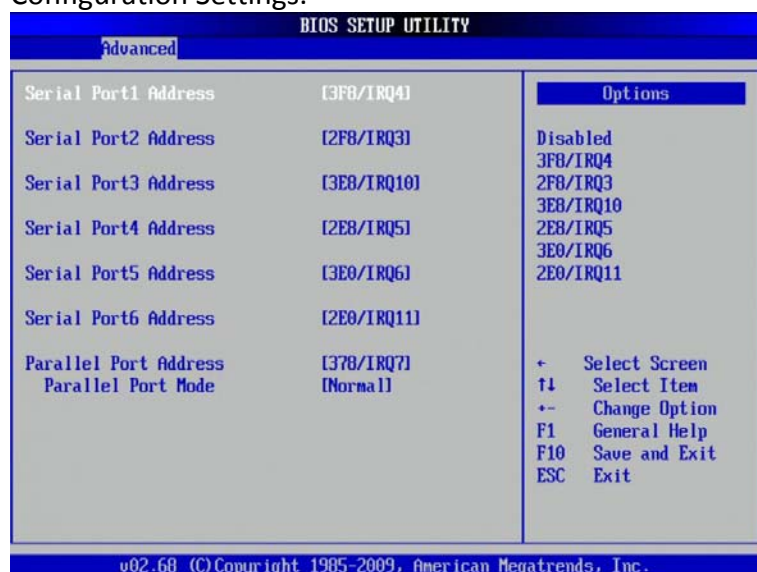
Enabling write protection on the hard drive will not allow any more writing to be performed. Navigate through the BIOS and find the write protect option. A write-protected disk will not allow a user to create, modify or delete files on the drive.

IDE-Detected Time-out (Sec)

BIOS feature comes in. It allows you to force the BIOS to delay the initialization of IDE devices for up to 35 seconds

Serial and Parallel Port Configuration

You can use this screen to select options for the Serial and Parallel Port Configuration Settings.



The default values are:

Serial Port1 Address: 3F8/IRQ4
 Serial Port2 Address: 2F8/IRQ3
 Serial Port3 Address: 3E8/IRQ10
 Serial Port4 Address: 2E8/IRQ5
 Serial Port5 Address: 3E0/IRQ6
 Serial Port6 Address: 2E0/IRQ11

Parallel Port Address and Port mode

The Parallel Port is the most commonly used port for interfacing home made projects. This port will allow the input of up to 9 bits or the output of 12 bits at any one given time, thus requiring minimal external circuitry to implement many simpler tasks. The port is composed of 4 control lines, 5 status lines and 8 data lines. It's found commonly on the back of your PC as a D-Type 25 Pin female connector. There may also be a D-Type 25 pin male connector. This will be a serial RS-232 port and thus, is a totally incompatible port.

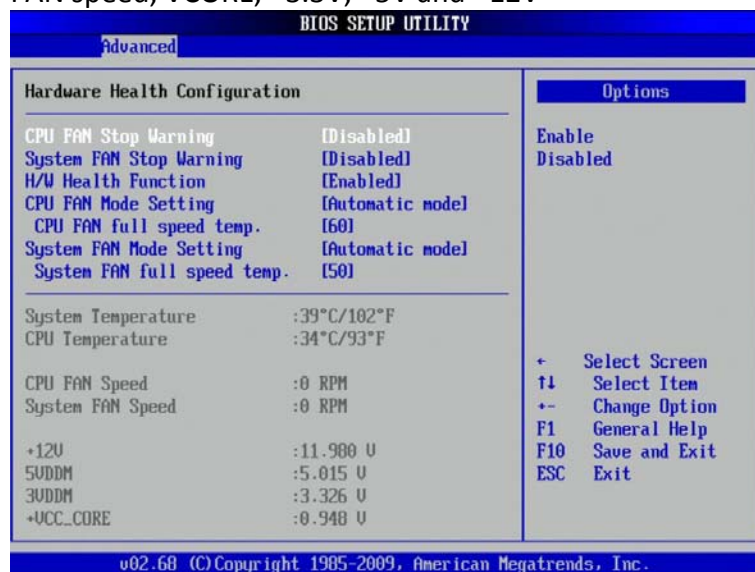
For more information on Serial RS-232 Ports See
<http://www.beyondlogic.org/serial/serial.htm>

Newer Parallel Port are standardized under the IEEE 1284 standard first released in 1994. This standard defines 5 modes of operation which are as follows:

- 1: Compatibility Mode.
- 2: Nibble Mode. (Protocol not Described in this Document)
- 3: Byte Mode. (Protocol not Described in this Document)
- 4: EPP Mode (Enhanced Parallel Port).
- 5: ECP Mode (Extended Capabilities Mode).

Hardware Health Configuration

The Hardware Health Configuration setting displays the system hardware details such as CPU Warning Temperature, CPU Temperature, System Temperature, CPU FAN speed, VCORE, +3.3V, +5V and +12V



CPU FAN/System FAN Stop Warning

You can "Enable" or "Disable" the CPU fan warning on startup from within your computer's BIOS (Basic Input/Output System) settings. You can setup the computer to give you a warning if your CPU fan is not working, or not working properly, before it fully starts up. This means that you can avoid starting up your computer and letting the CPU overheat and get damaged.

The CPU fan warning may also display if you are using a nonstandard CPU fan, which can cause your computer to detect the settings as abnormal or not detected them at all. If you find that this is the case, you may wish to disable the CPU fan warning

H/W Health Function

Select Hardware Health Configure from the CMOS Setup Utility menu and press Enter to display the settings. This will enable or disable Hardware Health Monitoring

CPU FAN/System FAN Mode Setting

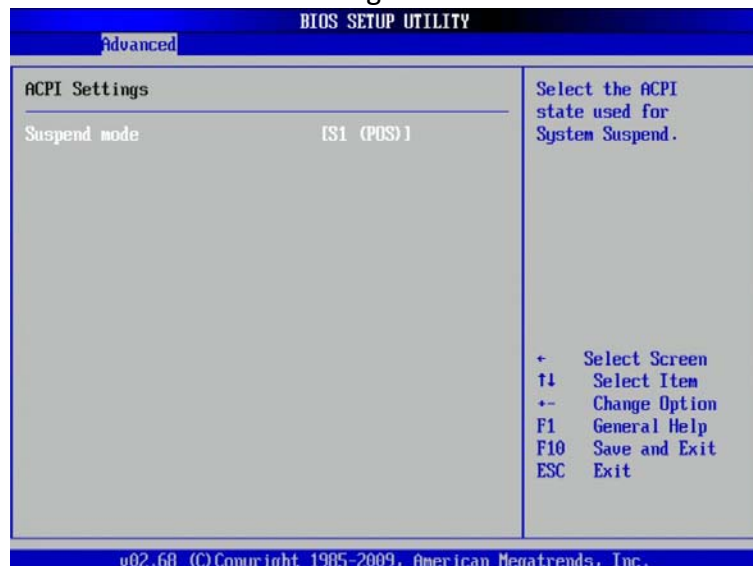
This function allows change of the fan mode configuration

CPU FAN/System FAN Full Speed temp.

The fan speed control program recommended here is well-engineered and should work with 95% of fans on 95% of systems, if not better. The great benefit is that fan speeds are automatically varied according to temperature.

ACPI Configuration

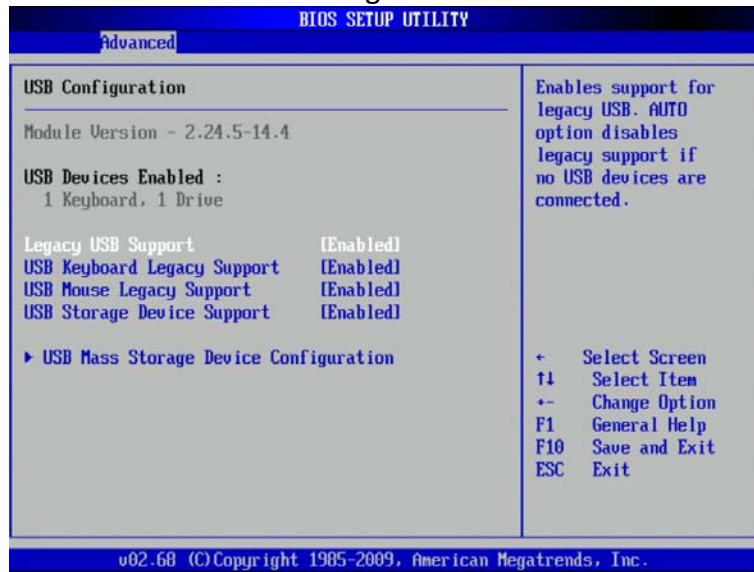
This section is used to configure the ACPI function.

**Suspend Mode**

This field is used to select the type of Suspend mode. S1 (POS) Enables the Power On Suspend function.

USB Configuration

This section is used to configure USB devices.



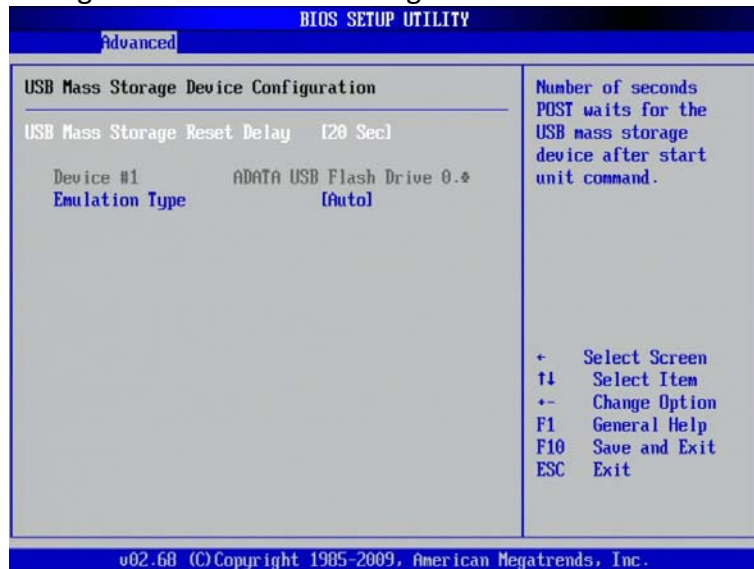
USB Configuration: Displays the detected USB devices.

Legacy USB Support

- Enable Enables Legacy USB.
- Auto Disables support for Legacy when no USB devices are connected.
- Disable Keeps USB devices available only for EFI applications.

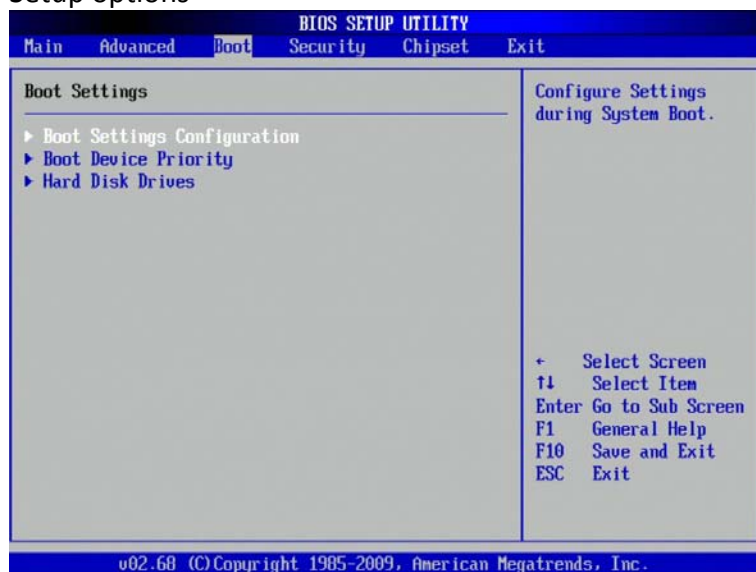
USB Mass Storage Device Configuration

Configures the USB mass storage class devices



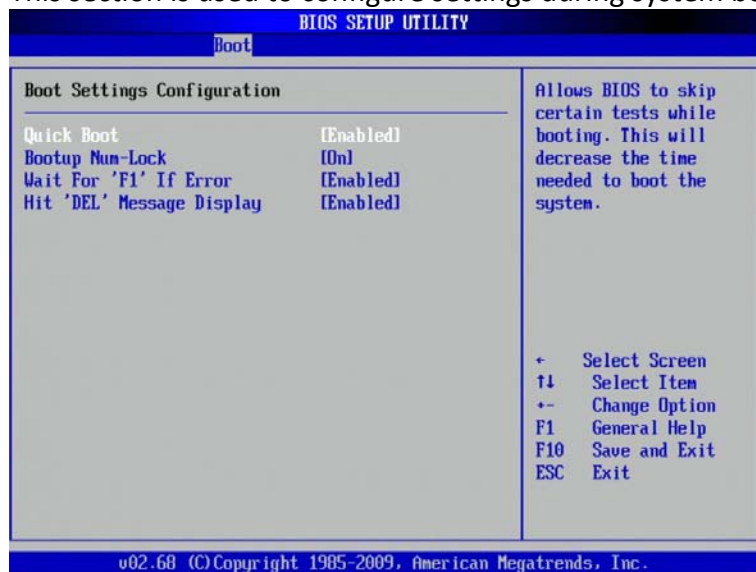
Boot Menu

Select the Boot tab from the setup screen to enter the Boot Setup screen. You can display a Boot Setup option by highlighting it using the <Arrow> keys. All Boot BIOS Setup options



Boot Settings Configuration

This section is used to configure settings during system boot.



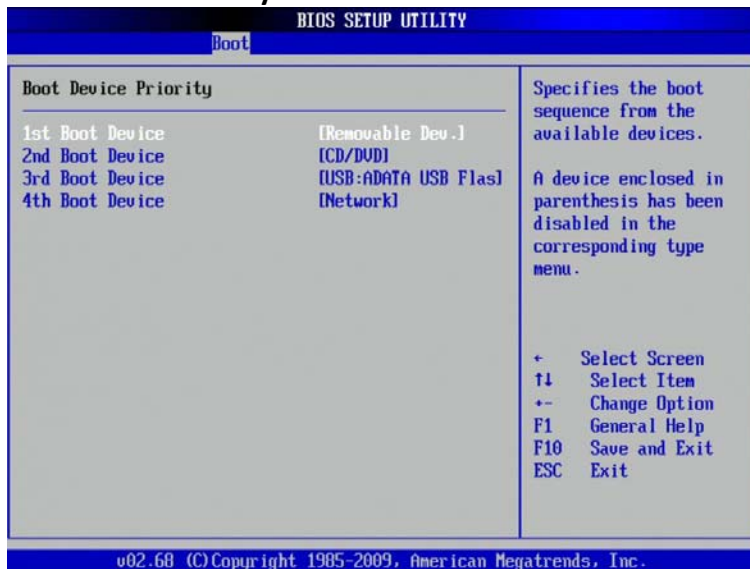
Quick Boot: This allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system. The default setting is [Enabled].

Bootup Num-Lock: This setting, when enabled, automatically turns on your NumLock key when the system is booted. Most systems default this to enabled.

Wait For 'F1' If Error: If this option is disabled, your computer will continue to boot, even if an error is found; otherwise, you'll have to press F1 before the system will boot. Such errors include a missing keyboard, a missing video adapter, and an unexpected quantity of installed memory. The default setting is [Enabled].

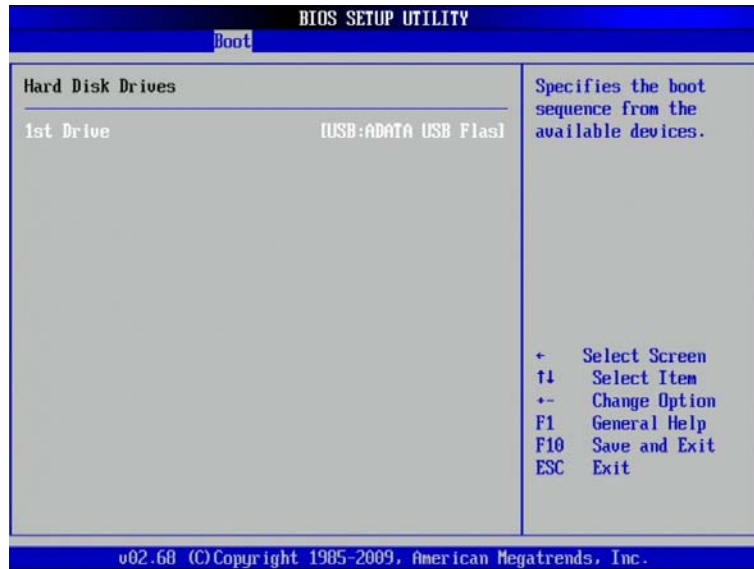
Hit 'DEL' Message Display: This BIOS feature allows you to control the display of the Hit "DEL" to enter Setup message during memory initialization. When enabled, the Hit "DEL" to enter setup message will appear during memory initialization. The default setting is [Enabled].

Boot Device Priority



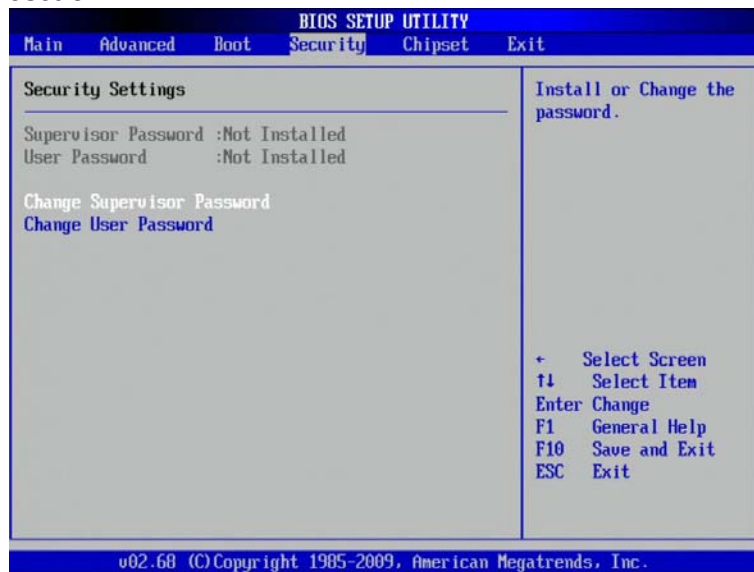
Change this boot order. Plug the flash drive in, boot the computer and enter the BIOS setup utility. Normally, this means holding down the DEL or F2 key just as the computer powers up and begins the boot process. If you read the initial startup screen on your PC carefully, it will tell you exactly what you must do to access and alter your BIOS settings. For the second variant, use the "Boot" menu to select the USB flash drive. It will show up under one of the following headings: "Hard Disk Drive", "Removable Device" or "Removable Storage Device". Next, select the USB flash drive as "1st Drive" in the first position, then hit the Esc key. That device should appear in the menu named "Boot Device Priority" which might also show up as "Boot Sequence". Inside that menu, designate the USB flash drive as the "1st Boot Device", hit the Esc key and save all changes in the "Exit" menu by selecting "Exit and Save Changes".

Hard Disk Drives

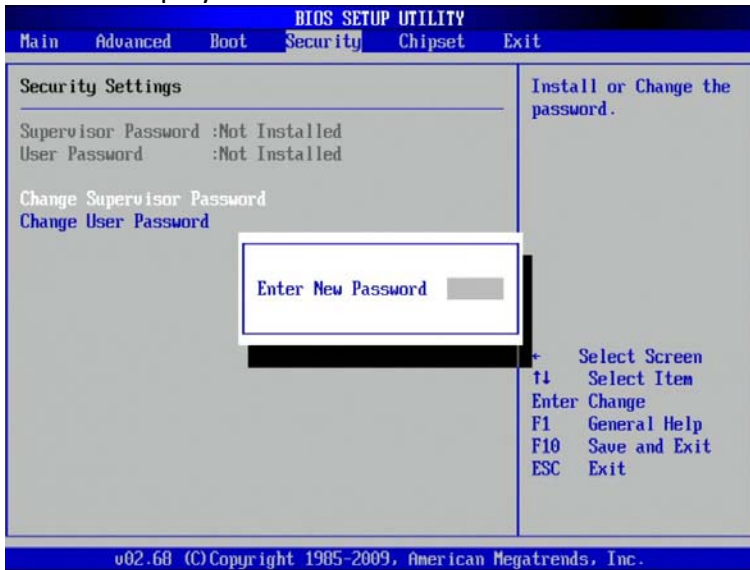


Security Menu

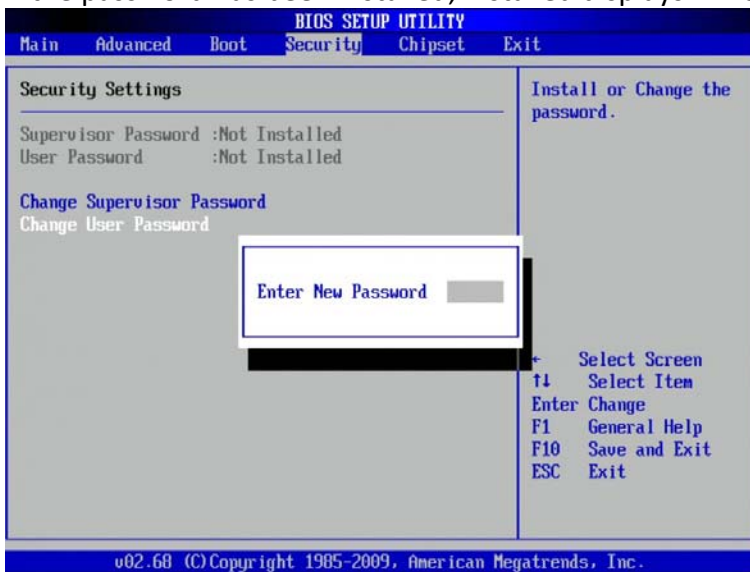
Select Security Setup from the Setup main BIOS setup menu. All Security Setup options such as password protection and virus protection are described in this section.



Change Supervisor Password: This item indicates whether a supervisor password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.



Change User Password: This item indicates whether a user password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.



Chipset Menu

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



Note: The North Bridge Configuration setup screen varies depending on the supported North Bridge chipset.

North Bridge Chipset Configuration

This section is used to configure the north bridge features



DVMT Mode Select

It is recommended that you set this BIOS feature to DVMT Mode for maximum performance. Setting it to DVMT Mode ensures that system memory is dynamically

DVMT/Fixed Memory

This is where the DVMT/FIXED Memory BIOS feature comes in. It allows you this setting works well in systems with lots of memory (768MB or more)

Boot Display Device

PER13C supports VGA+LVDS

Flat Panel Type

You could setup the Flat Panel Type on this BIOS setting. This setting allows you to setup the resolution for onboard 18-bit LVDS connector

South Bridge Chipset Configuration

This section is used to configure the south bridge features.

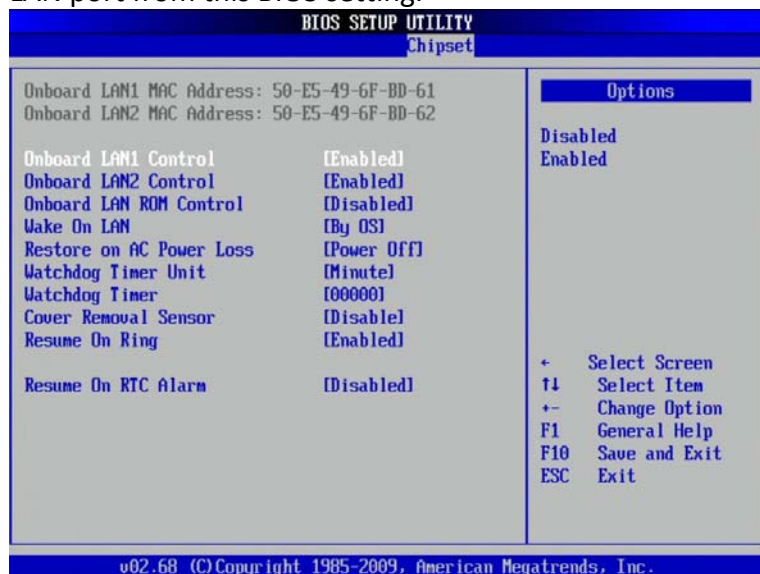


USB Controller: this field is used to enable or disable the Enhanced Host Controller Interface.

Audio Controller: Enables or disables the onboard audio

Onboard LAN1/LAN2 Control

PER13C supports Dual LAN port onboard. You could Disabled/Enabled the onboard LAN port from this BIOS setting.



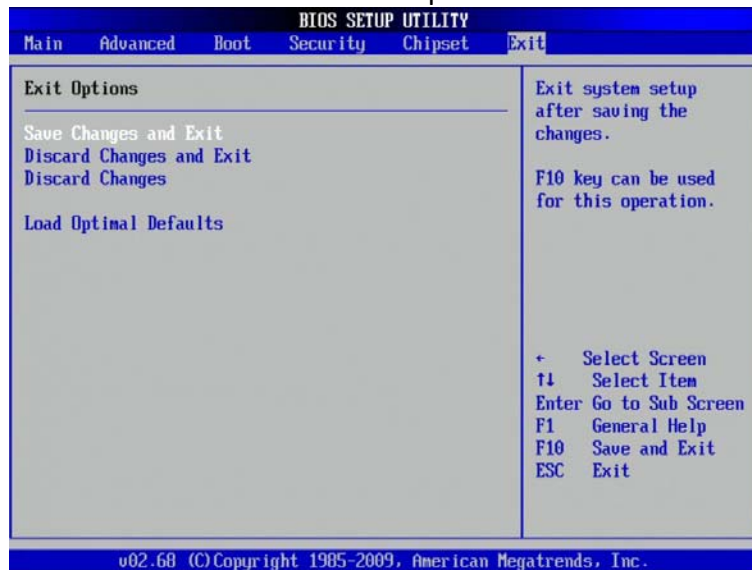
Restore on AC Power Loss

Restore the computer to power up when power is lost. You can set this by entering the computers BIOS setup and configure this setting in the Power Management Settings menu.



Exit Setting

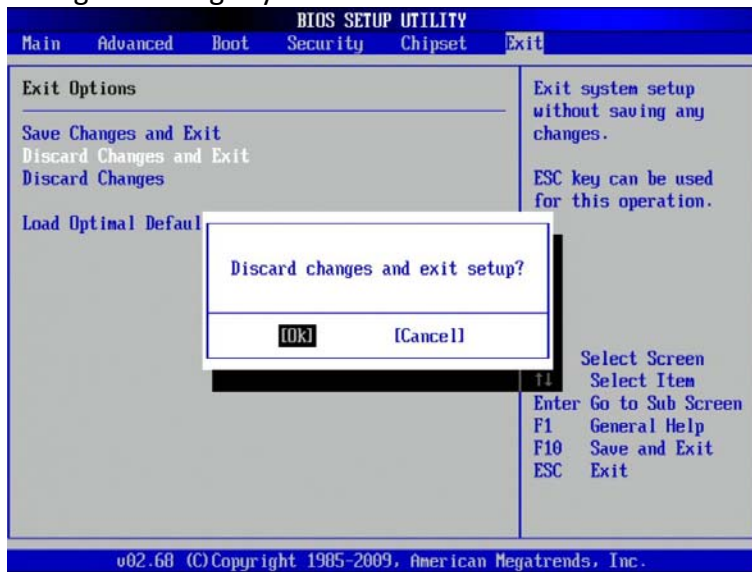
Select the Exit tab from the setup screen to enter the Exit BIOS Setup screen.



Save Changes and Exit: This option allows you to determine whether or not to accept the modifications and save all changes into the CMOS memory before exit.



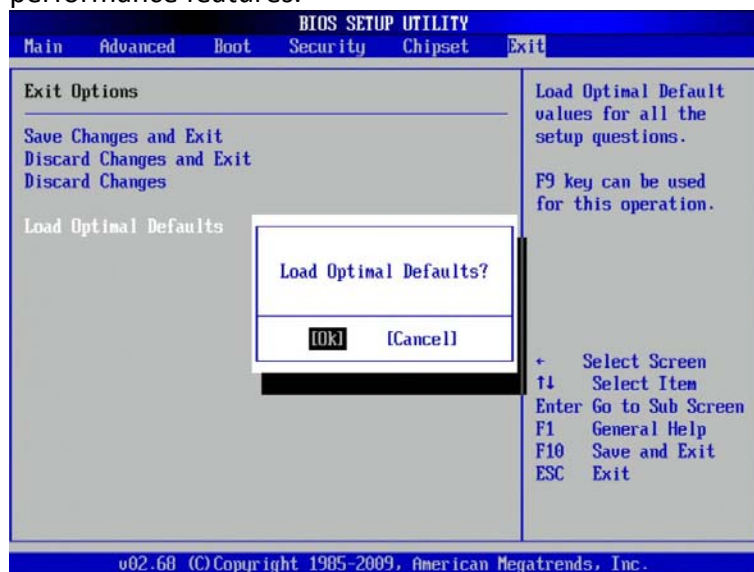
Discard Changes and Exit: This option allows you to exit the Setup utility without saving the changes you have made in this session.



Discard Changes: This option allows you to discard all the changes that you have made in this session.



Load Optimal Defaults: This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.



Appendix

Troubleshooting



Please note that the following troubleshooting guide is designed for people with strong computer hardware knowledge such as System Administrators and Engineers.

Display Shows “No Signal” Before Loading into Windows OS

- A) Check if the VGA cable is getting loose while loading the system.
- B) If the monitor is not connected to the VGA port before power on the system, the Windows OS may automatically choose LVDS to be the primary display. As a result, the monitor (VGA-connected device) will then be defined as the 2nd display and “No Signal” will show on the screen. To switch the monitor back to the primary display, please connect a keyboard to the system and press Ctrl + Alt + F1 simultaneously.

Cannot Detect HDD

- A) SATA cable is not connected properly to main board or it could be defective.
- B) HDD power cable is not connected properly to the main board or it could be defective.
- C) Check CMOS setup, set SATA HDD to Auto Detect.
- D) On-board IDE port could be defective.

PS/2 Keyboard Is Not Functioning Normally

- A) Make sure the keyboard is properly connected to the PS/2 keyboard port before the system is powered up. If the keyboard is connected after Windows2000 has been booted, the keyboard will not work.
- B) Check that the LED on the keyboard goes on then off after power on. If yes, the keyboard is getting power correctly.
- C) The main board or I/O board could be defective.

LAN Is Not Functioning Properly

- A) Check if the LAN driver is installed properly.
- B) Check if there are any IRQ conflicts.
- C) Check if the RJ45 cable is properly connected.
- D) The on-board LAN chip could be defective.

COM Ports Are Not Functioning Properly

- A) Check if the I/O ports are enabled in the CMOS setup.
- B) Check if there are any IRQ conflicts.
- C) The main board or I/O board could be defective.

Cash Drawer Port Is Not Functioning Properly

- A) Make sure the pin assignment matches between the cash drawer and the RJ11 cash drawer port.
- B) The main board or I/O board could be defective.

USB Device Is Not Functioning Properly

- A) Ensure that the USB controller is “enabled” in the CMOS setup.
- B) Ensure that the USB Legacy is “enabled” in the CMOS setup. (Windows 2000 · Window XP Professional)
- C) Ensure that the USB Legacy is “Disabled” in the CMOS setup. (Embedded OS: Windows XP Embedded, Window CE. NET, Linux RedHat 9)