



灵江工控

LBOX-270

用户手册

Ling-Jiang Inc.

User Manual

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Disclaimer

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Ling-jiang Inc. makes no representation or warranty regarding the content of this manual. Information in this manual had been carefully checked for accuracy; however, no guarantee is given as to the correctness of the contents. For continuing product improvement, Ling-Jiang Inc. reserves the right to revise the manual or make changes to the specifications of this product at any time without notice and obligation to any person or entity regarding such change. The information contained in this manual is provided for general use by customers.

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

1. This device may not cause harmful interference.
2. This device must withstand any background interference including those that may cause undesired operation.

Safety Information

Read the following precautions before setting up a Ling-jiang Product.

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, 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 your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect 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 temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

CAUTION

Incorrectly replacing the battery may damage this computer. Replace only with the same or its equivalent as recommended by Ling-Jiang Inc. Dispose used battery according to the manufacturer's instructions.

1 Function Introduction



■ 1.1 Model Specifications

CPU	• Intel Atom N280 1.66GHz Processor with 533MHz FSB
Chipset	• Intel 945GSE + ICH7M
Memory	• 1 x DDRII-533 SO-DIMM Up to 2GB
Display	• Integrated Intel GMA-950 GFx Core in 945GSE MCH
ATA	• 1 x Serial ATA port with 150MB/s HDD transfer rate
LAN Chipset	• 1 x RTL8111C Gigabit Ethernet
Watchdog	• 1 ~ 255 level reset

Serial Port	• Support 3 x RS-232 ports and 1 x RS232/422/485
USB Port	• 4 x USB 2.0 ports
LAN	• 1 x RJ45 ports for GbE
Video Port	• 1 x VGA Output
GPIO Port	• NC
Audio	• Mic-in/Line-out
Expansion Bus	• 1 x MPCIE slot

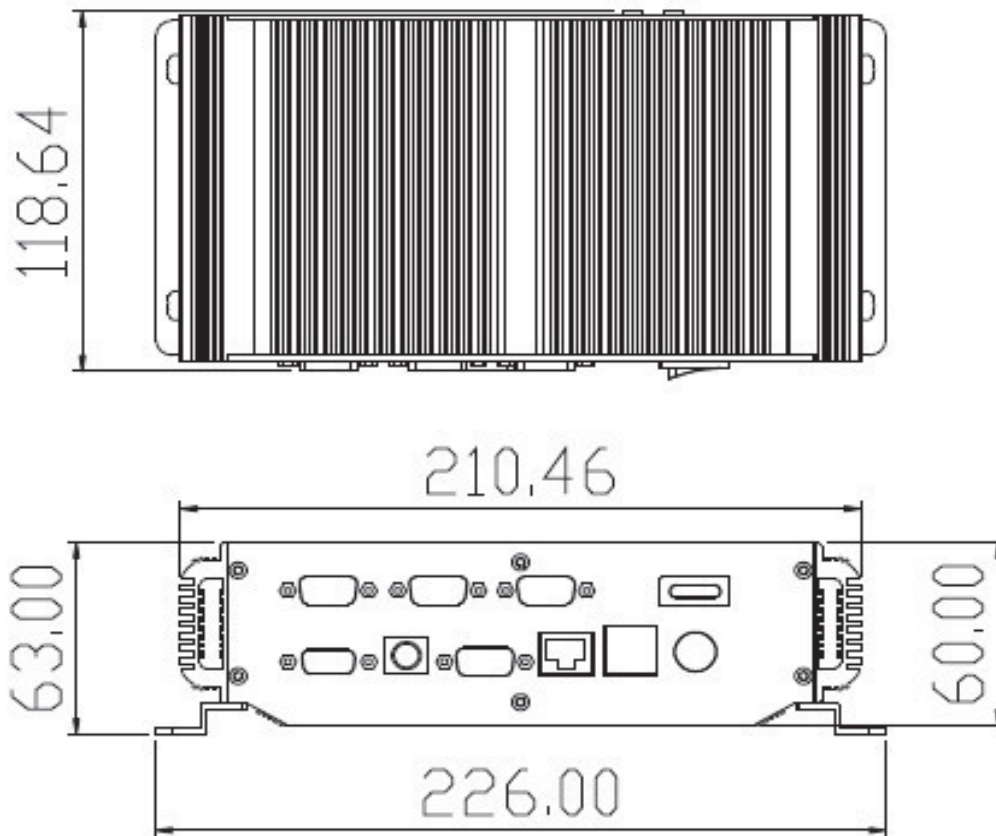
Storage	• 1 x 2.5" drive bay for SATA Type Hard Disk Drive / SSD
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Qualification	• CE, FCC,ROHS
---------------	----------------

- Operating Temp. • -35 ~ -65°C, ambient w/ air
 - Storage Temp. • -20 ~ 70°C
 - Relative Humidity • 10 ~ 95% @ 40°C (non-condensing)
 - Vibration • MIL-STD-810F, Method 514.5, Procedure 1, Category 4
 - Shock & Crash • Operating 20G (11ms), Non-Operating 60G with HDD
• Operating 40G (11ms), Non-Operating 80G with SSD
• Crash 100G (11ms)
 - Power Input • DC 12V Input
-
- Construction • Aluminum alloy
 - Mounting • Supports both of wall-mount/VESA-mount
 - Weight • 2Kg (barebone)
 - Dimensions • 230x 115 x 60mm
-

■ 1.2 LBOX-270 Illustration

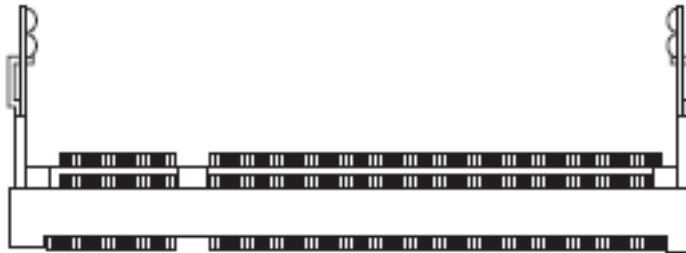
☞ Mainboard



■ 1.3 Memory Module Installation

The LBOX-N270 provide one 200pins SODIMM slot for DDR2 533MHz SDRAM memory modules and supports memory sizes up to 2GB.

These DIMM slots are inteded for memory modules.



DDR2 SO-DIMM Slot
200-pin, 1.8V

Installing Memory Module

1. Locate the DIMM1 SO-DIMM slot. Align the notch on the DIMM with the key on the slot and insert the DIMM into the slot at 45-degree angle.
2. Push the DIMM gently forwards until the slot levers click and lock the DIMM in place. Follow the same procedures to install the second DIMM if necessary.
3. To uninstall the DIMM, flip the slot levers outwards and the DIMM will be released instantly.

Important

You can barely see the golden finger if the DIMM is properly inserted in the DIMM slot.

■ 1.5 RJ-45 LAN Connector LEDs



👉 USB Port

The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

👉 LAN

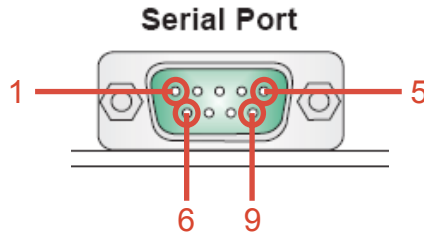
The standard RJ-45 LAN jack is for connection to the local Area Network (LAN). You can connect a network cable to it.



		Left LED	Right LED
		Active LED	100M/1000 Speed LED
LED Color		Yellow	Green/Orange
10M Cable Plug-in	No Transmission	OFF	OFF
	Transition	Yellow (Blinking)	OFF
100M Cable Plug-in	No Transmission	OFF	Green (Lighting)
	Transition	Yellow (Blinking)	Green (Lighting)
1000M Cable Plug-in	No Transmission	OFF	Orange (Lighting)
	Transition	Yellow (Blinking)	Orange (Lighting)
In S3/S4/S5 standby State		Green (Lighting)	OFF

Serial Port

The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.



RS232 Function

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	VCC_COM1	Voltage output, voltage select setting by J1

RS485 Function

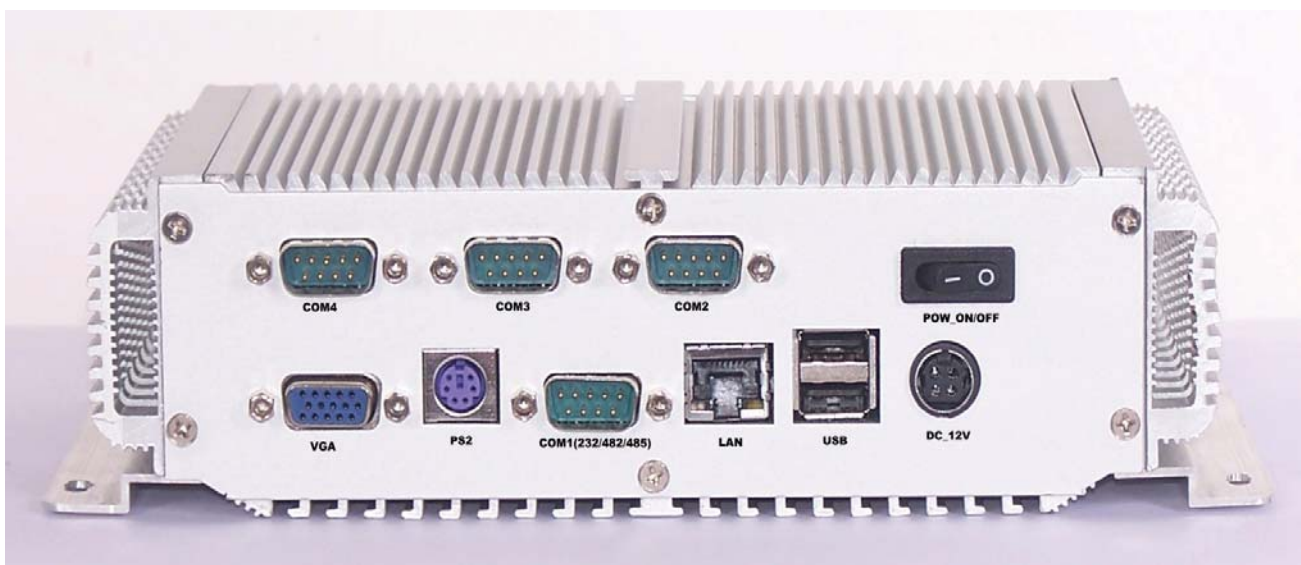
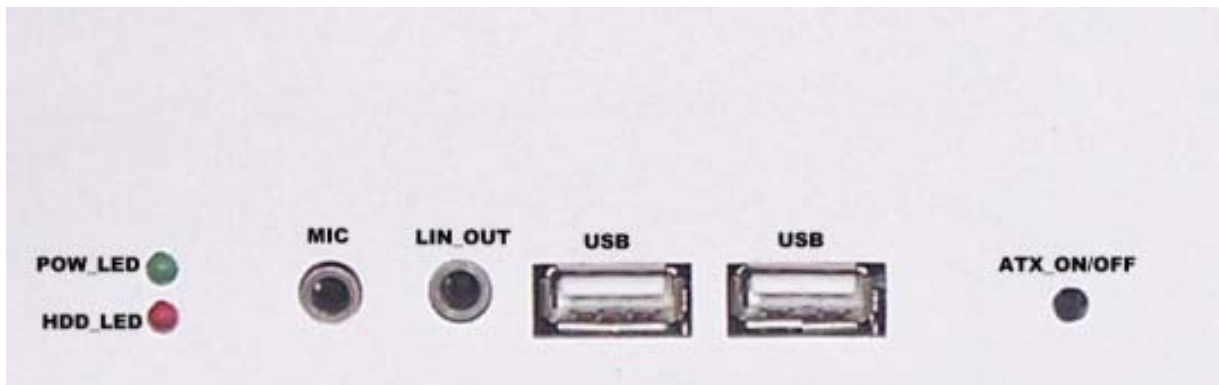
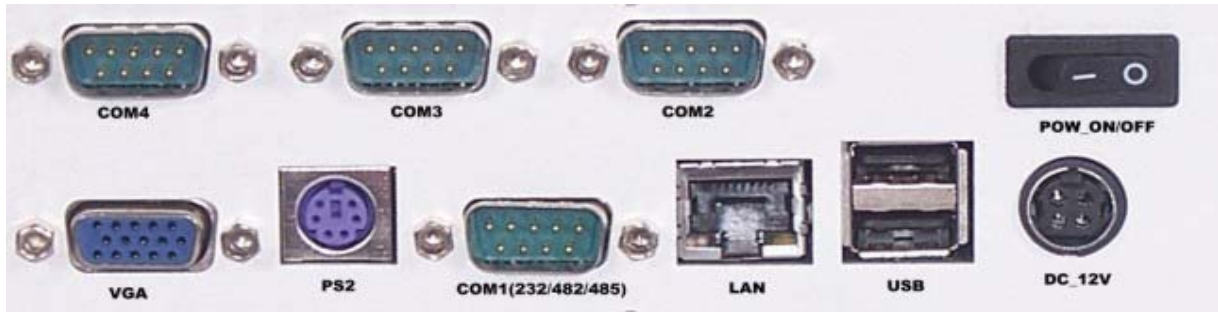
PIN	DESCRIPTION
1	485-, RS-485 transmission line, negative
3	485+, RS-485 transmission line, positive

RS422 Function

PIN	DESCRIPTION
1	422TXD-, RS-422 transmission line, negative
2	422RXD+, RS-422 receiving line line, positive
3	422TXD+, RS-422 transmission line, positive
4	422RXD-, RS-422 receiving line, negative

2 System Installation

2.1 System Introduction



3 BIOS

■ 3.1 Entering The BIOS

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press (DEL) key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

- The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.
- Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format.

LBOX-N270 Mainboard V1.0

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX

2nd - 5th digit refers to the model number.

6th digit refers to the chipset as I = Intel, N = NVIDIA, A = AMD and V = VIA.

7th - 8th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS was released.

073109 refers to the date this BIOS was released.

Control Keys

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press (DEL) key to enter Setup.

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General Help
<F9>	Load Optimized Defaults
<F8>	Load Fail-Safe Defaults
<F10>	Save all the CMOS changes and exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

3.2 Main

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
System Date			[Mon 01/21/2008]			
System Time			[10:18:15]			Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
> Primary IDE Master			:[Not Detected]			Use [+] or [-] to configure system Time.
> Primary IDE Slave			:[Not Detected]			
> Secondary IDE Master			:[Not Detected]			
> System Information						<> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
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System Time

This setting allows you to set the system time. The time format is <Hour> <Minute> <Second>.

System Date

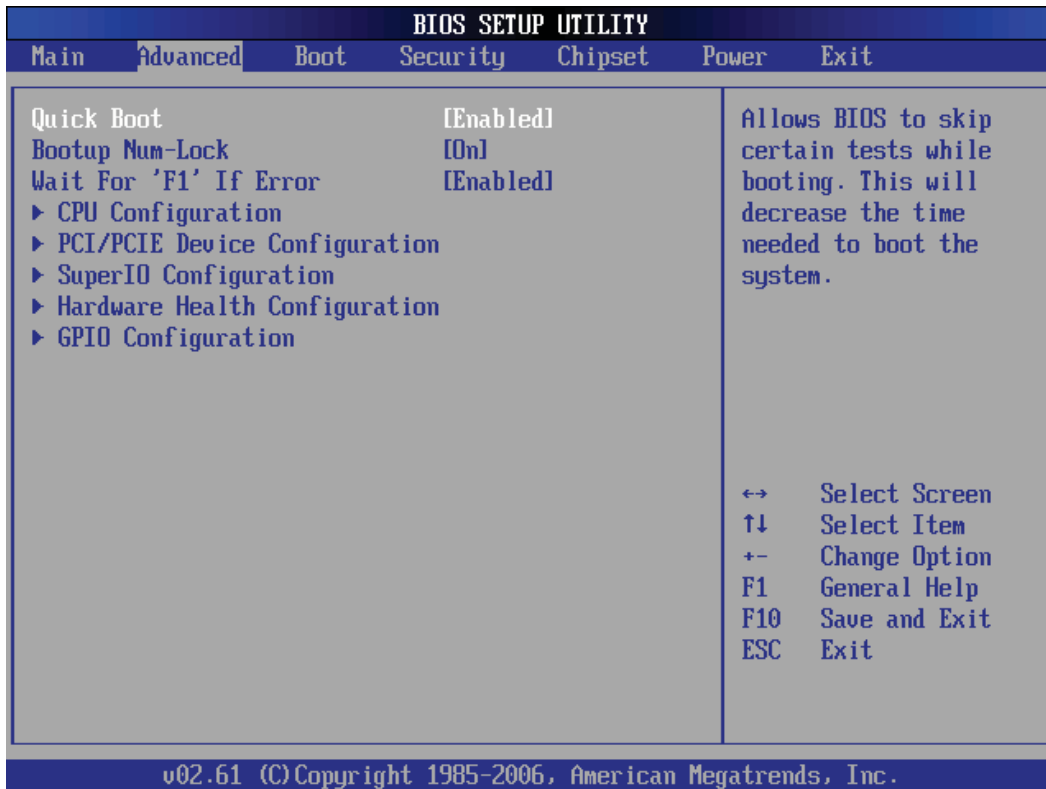
This setting allows you to set the system Date. The time format is <Day> <Month> <Date> <Year>.

Primary IDE Master/Slave, SATA 1/2

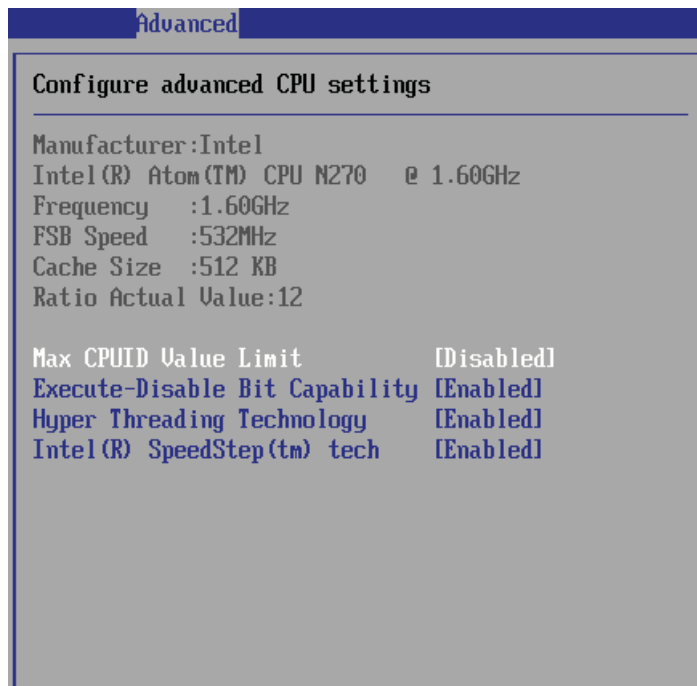
[Type]	Press PgUp/<+> or PgDn/<-> to select [Manual], [None] or [Auto] type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use [Manual] to define your own drive type manually.
[LBA/Large Mode]	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors.
[Block (Multi-Sector Transfer)]	Any selection except Disabled determines the number of sectors transferred per block.
[PIO Mode]	Indicates the type of PIO (Programmed Input/Output)
[DMA Mode]	Indicates the type of Ultra DMA
[S.M.A.R.T.]	This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.
[32 Bit Data Transfer]	Enables 32-bit communication between CPU and IDE controller



■ 3.3 Advanced



☞ CPU Configuration



» **Max CPUID Value Limit**

The Max CPUID Value Limit BIOS feature allows you to circumvent problems with older operating systems that do not support the Intel Pentium 4 processor with Hyper-Threading Technology. When enabled, the processor will limit the maximum CPUID input value to 03h when queried, even if the processor supports a higher CPUID input value. When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

» **Execute Disable Bit Capability**

Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation.

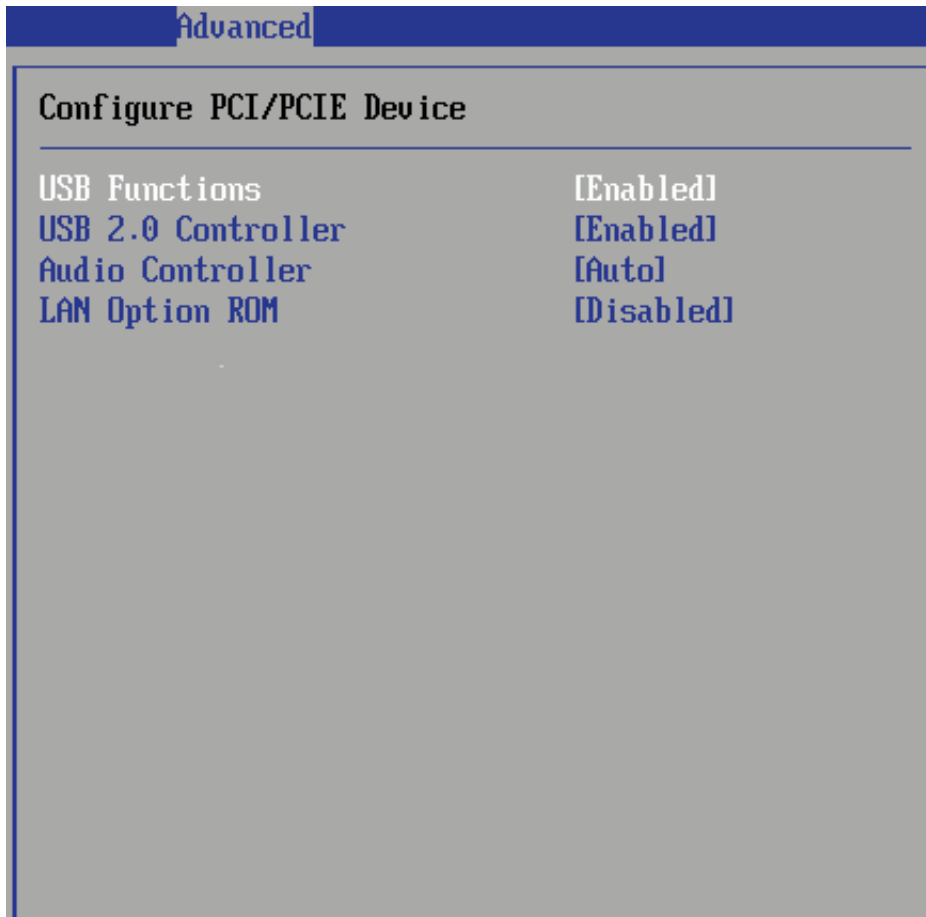
» **Hyper Threading Technology**

The processor uses Hyper Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. Please disable this item if your operating system doesn't support HT Function, or unreliability and instability may occur.

» **Intel(R) SpeedStep(tm) Tech**

EIST (Enhanced Intel SpeedStep Technology) allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production..

☞ PCI/ PCIE Device Configuration



» USB Functions

This setting specifies the operation mode of the onboard USB controller.

» USB 2.0 Controller

This setting enables/disables the onboard USB controller.

» Audio Controller

This setting enables / disable the onboard USB controller.

» LAN Option ROM

The items enable or disable the initiation of the onboard LAN Boot ROMs during bootup. Selecting [Disabled] will speed up the boot process.



Super IO Configuration

BIOS SETUP UTILITY	
Advanced	
Onboard I/O Configuration	Allow BIOS to Select Serial Port1 Base Address.
COM1 Address [3F8]	
COM1 IRQ [4]	
COM1 Function Type [RS232]	
COM1 Pin9 Voltage [Normal]	
COM2 Address [2F8]	
COM2 IRQ [4]	
COM2 Pin9 Voltage [Normal]	
COM3 Address [3E8]	
COM3 IRQ [11]	
COM3 Mode [Normal]	
COM3 Pin9 Voltage [Normal]	
COM4 Address [2E8]	
COM4 IRQ [11]	
COM4 Mode [Normal]	
COM4 Pin9 Voltage [Normal]	
<> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	
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COM1 Address

Options: Disabled, 3F8, 3E8, 2E8

COM1 IRQ

Options: 3, 4, 10, 11

COM1 Function Type

Options: RS232, RS422, RS485

COM1 Pin9 Voltage

Options: Normal, 5V, 12V

COM2 Address

Options: Disabled, 2F8, 3E8, 2E8

COM 2 IRQ

Options: 3, 4, 10, 11

COM2 Pin9 Voltage

Options: Normal, 5V, 12V

COM3 Address

Options: Disabled, 3F8, 2F8, 3E8, 2E8, 2F0, 2E0

COM3 IRQ

Options: 3, 4, 10, 11

COM3 Mode

Options: Normal, IrDA, ASK IR, Smart Card Reader

COM3 Pin9 Voltage

Options: Normal, 5V, 12V

COM4 Address

☞ Hardware Health Configuration

These items display the current status of all monitored hardware devices/components such as voltages, temperatures and all fans' speeds.

Advanced	
Hardware Health Configuration	
CPU Temperature	:43°C/109°F
CPU Core	:1.184 V
Vcc5	:4.972 V
+12.0V	:11.520 V

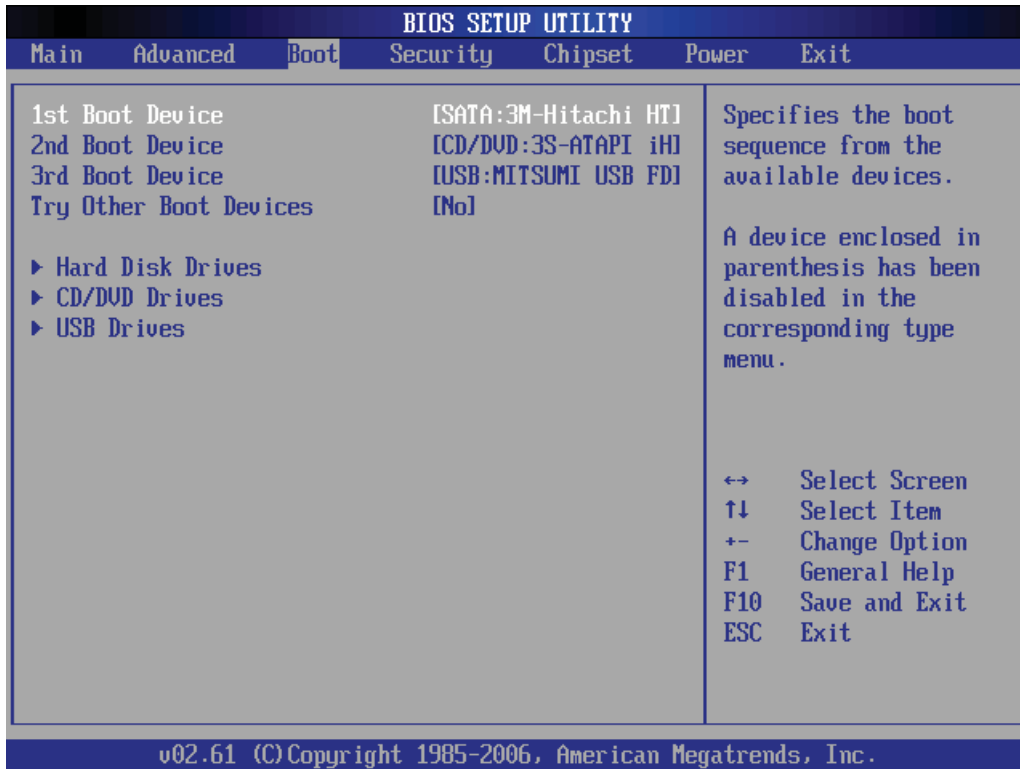
☞ GPIO Configuration

Advanced	
Configure Special GPIO	
GP60 Data	[Low]
GP61 Data	[Low]
GP62 Data	[Low]
GP63 Data	[Low]
GP64 Data	[Low]
GP65 Data	[Low]
GP66 Data	[Low]
GP67 Data	[Low]

» GP 60/ 61/ 62/ 63/ 64/ 65/ 66/ 67 Data

These settings configure special GPIO data.

■ 3.4 Boot



» 1st/2nd/3rd Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

» Try Other Boot Devices

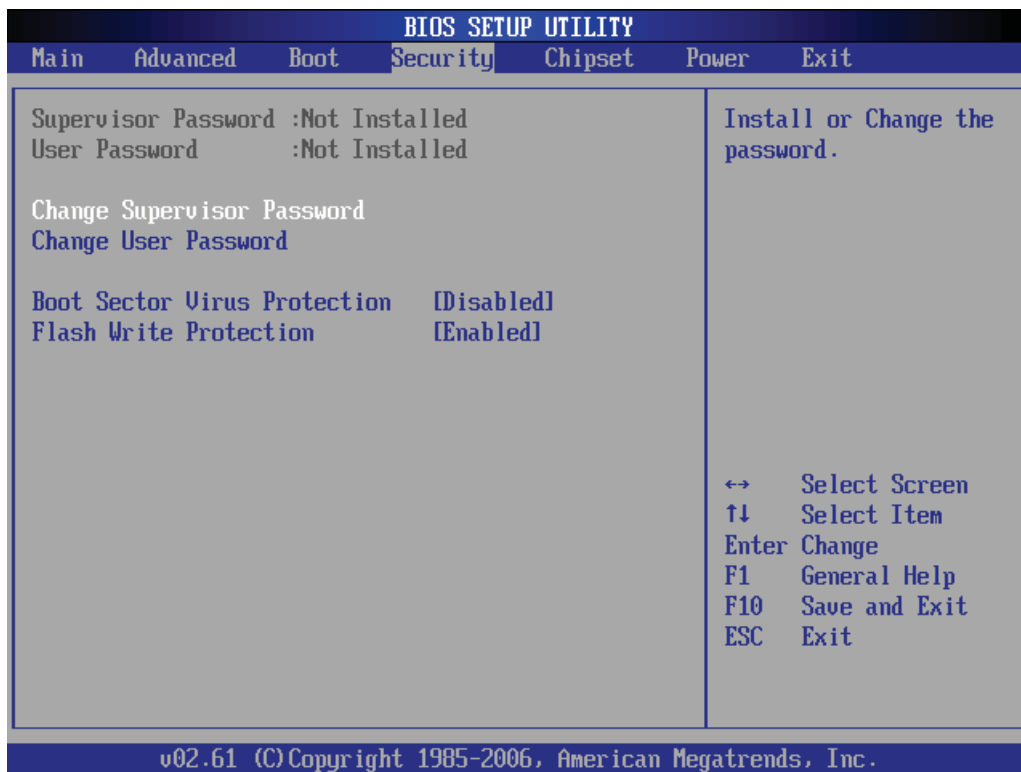
Setting the option to [Enabled] allows the system to try to boot from other device if the system fail to boot from the 1st/2nd/3rd boot device.

» Hard Disk Drives, CD/DVD Drives, USB Drives

These settings allow you to set the boot sequence of the specified devices.



■ 3.5 Security



» Supervisor Password / Change Supervisor Password

Supervisor Password controls access to the BIOS Setup utility. These settings allow you to set or change the supervisor password.

» User Password / Change User Password

User Password controls access to the system at boot. These settings allow you to set or change the user password.

» Boot Sector Virus Protection

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you will need to disable this Flash Protection function.

■ 3.6 Chipset

BIOS SETUP UTILITY	
Chipset	
<p>Video Function Configuration</p> <p>DVMT Mode Select [DVMT Mode] DVMT/FIXED Memory [128M]</p> <p>Boot Display Device [Auto] Flat Panel Type [800x600 18Bit 1C] Local Flat Panel Scaling [Auto] Panel BackLight Voltage [0.0]</p>	<p>Options</p> <p>Fixed Mode DVMT Mode Combo Mode</p> <p><> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit</p>
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.	

» Internal Graphics Mode Select

The field specifies the size of system memory allocated for video memory.

» DVMT Mode Select

Intel's Dynamic Video Memory Technology (DVMT) allows the system to dynamically allocate memory resources according to the demands of the system at any point in time. The key idea in DVMT is to improve the efficiency of the memory allocated to either system or graphics processor.

DVMT/FIXED Memory

When set to DVMT/FIXED Mode, the graphics driver will allocate a fixed amount of memory as dedicated graphics memory, as well as allow more system memory to be dynamically allocated between the graphics processor and the operating system.

» Boot Display Device

Use the field to select the type of device you want to use as the display(s) of the system.

» Force LVDS Inactive

This setting determines whether to force the LVDS inactive or not.

■ 3.7 Power

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
Power Management Setting					Select the ACPI state used for System Suspend	
ACPI Function				[Enabled]		
Suspend mode				[S1 (POS)]		
Repost Video on S3 Resume				[No]	<> Select Screen	
Suspend Time Out				[Disabled]	↑↓ Select Item	
Restore on AC Power Loss				[Last State]	+- Change Field	
Resume By USB Device				[Disabled]	Tab Select Field	
Resume On PME#				[Disabled]	F1 General Help	
Resume On RTC Alarm				[Disabled]	F10 Save and Exit	
					ESC Exit	
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Enable/ Disable ACPI support for Operating System.

ENABLE: If OS supports ACPI, DISABLE: IF OS Does not support ACPI.

Suspend mode

Options: S1 (POS), S3 (STR)

Repost Video on S3 Resume

Determines whether to invoke VGA BIOS post on S3/STR resume.

Options: No, Yes

Suspend Time Out

Options: Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min, 50 Min, 60 Min

Restore on AC Power Loss

Options: Power OFF, Power ON, Last State

Resume By USB Device

Options: Disabled, Enabled

Resume On PME#

Options: Disabled, Enabled

Resume On RTC Alarm

Options: Disabled, Enabled



» **USB Device Wakeup From S3/S4**

This setting allows the activity of the USB device to wake up the system from the S3/S4 sleep state.

» **Resume On LAN**

This field specifies whether the system will be awakened from power saving modes when activity or input signal of onboard LAN is detected..

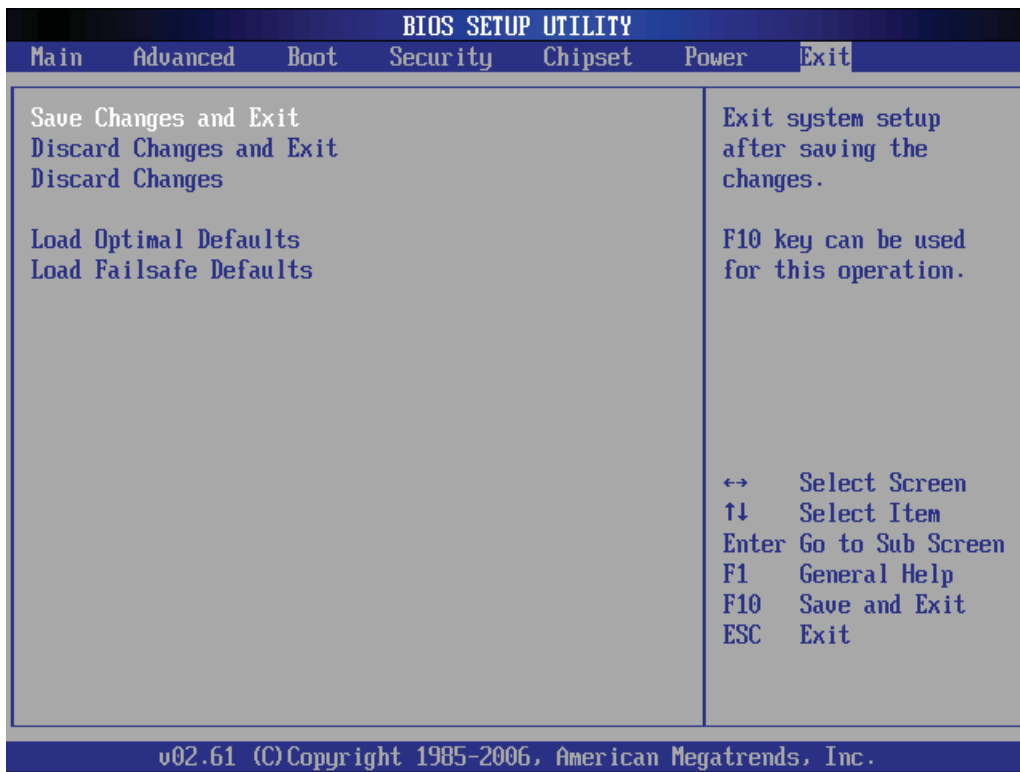
» **Resume On PME#**

When setting to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PME (Power management Event):

» **Resume On RTC Alarm**

When [Enable], you can set the date and time at which the RTC (Real-Time Clock) alarm awakens the system from suspend mode.

■ 3.8 Exit



» Save Changes and Exit

Save changes to CMOS and exit the Setup Utility.

» Discard Changes and EXit

Abandon all changes and exit the Setup Utility.

» Discard Changes

Abandon all changes and continue with the Setup Utility.

» Load Optimal Defaults

Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

» Load Failsafe Defaults

Use this menu to load the default values set by the BIOS vendor for stable system performance.

4 System Resources

■ 4.1 Watch Dog Timer Setting

I/O Address	Used For	Comment
00h – 0Fh C0h – DFh	8237DMA Controller	
20h, 21h	8259A PIC	
2Eh, 2Fh	SuperIO Access Port	
A0h, A1h	8259A PIC	
40h – 43h (XT/AT) 44h – 47h (PS/2)	8254PIT	
60h – 64h	KeyBoard Controller	
90h – 96h	PS/2 P OS	
F0h – FFh	Math Co-Processor, X87 Unit	
170h – 177h	Secondary IDE	
1F0h – 1F7h	Primary IDE	
200h – 22Fh	GAME I/O	
220h – 22Fh	Sound Blaster / AD Lib	
279h, A79h	Plug and Play Configuration Register	
A15h, A16h	HW Monitor Access Port	
2E8h – 2EFh	COM4	
2F8h – 2FFh	COM2	
378h – 37Ah	Parallel Printer Port	
3B0h – 3BFh	MDA / MGA	
3C0h – 3CFh	EGA / VGA	
3D4h – 3D9h	CGA/CRT Register, Controller and Palette Register	
3F0h – 3F7h	Floppy Diskette	
3F6h, 3F7h	Enhanced IDE	
3E8h – 3EFh	COM3	
3F8h – 3FFh	COM1	
0CF8h	PCI Configuration Register/address	
0CFCh	PCI Configuration Register/data	



■ 5.1 Packing List

1. LBOX-270 System
2. Power adapter
3. Mounting bracket
4. 1 GB DDRII SO-DIMM Memory (Optional)
5. 2 GB DDRII SO-DIMM Memory (Optional)
6. 2.5" 160GB Hard Disk Drive (Optional)
8. 16GB MLC Type SSD (Optional)
9. 802.11 b/g/n WiFi Kit (Optional)

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