

# **User Manual**

# ASMB-310IR/310

Dual 1366 Socket CEB Server Board with 2 PCIe x16 Expansion Slots

Trusted ePlatform Services



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# **Peripheral Compatibility**

Order Information				
Processor P/N	Description	Manufacturer PN		
96MPXE-2.53-8M13T	XEON 2.53G 8M 1366P 4CORE E5540(G)	AT80602000789AA (E5540/ SLBF6) - Quad Core - <b>Embedded</b>		
96MPXE-2.0-4M13T	XEON 2.0G 4M 1366P 4CORE E5504(G)	AT80602000801AA (E5504/ SLBF9) - Quad Core - <b>Embedded</b>		
96MPXE-2.4-12M13T	XEON 2.4G 12M 1366P 4CORE E5620(G)	AT80614005073AB (E5620/ SLBV4)		
96MPXE-2.13-8M13T	XEON 2.13G 8M 1366P 4CORE L5518(G)	AT80602002265AB (L5518/ SLBFW)		
96MPXE-2-8M13T	XEON 2.0G 8M 1366P 2CORE L5508(G)	AT80602002697AC (L5508)		
96MPXE-2.4-12M13T1	XEON 2.4G 12M 1366P 6CORE E5645(G)	AT80614003597AC (E5645/ SLBWZ)		

Memory P/N	Description	Manufacturer PN
96D3-1G1333E-AP	1G DDR3-1333 240PIN ECC 128X8 ELP(G)	78.01GC8.422
96D3-2G1333E-AP	2G DDR3-1333 240PIN ECC 128X8 ELP(G)	78.A1GC8.423
96D3-4G1333E-AP	4G DDR3-1333 240PIN ECC 256X8 HYX(G)	78.B1GDF.AF3
96D3-1G1333ER-AP	1G DDR3-1333 240PIN REG 128X8 ELP(G)	78.01GCC.420
96D3-2G1333ER-AP	2G DDR3-1333 240PIN REG 128X8 ELP(G)	78.A1GCC.421
96D3-4G1333ER-AP1	4G DDR3-1333 240PIN REG 256X8 HYX(G)	78.B1GDM.AF1

SATA HDD P/N	Description	Manufacturer PN
96HD500G-ST-SG7K6	SEAGATE 500G 3.5" SATA 7KRPM 16M(G)	ST3500418AS
96HD1000G-ST-SG7K	SEAGATE 1000G 3.5" SATA 7KRPM 32M(G)	ST31000528AS

SAS HDD P/N	Description	Manufacturer PN
96HD146G-SS-SG15K1	Seagate 3.5" SAS 15K 146G, dual ports	ST3146356SS

# **ASMB-310IR and ASMB-310 Feature Comparison**

	ASMB-310IR	ASMB-310
Chipset	E5520	E5520
SAS	8	n/a
SATA	6	6
PCIe	4 x PCIe x8 (or 2 x PCIe x16), 1 x PCIe x4	4 x PCIe x8 (or 2 x PCIe x16), 2 x PCIe x4
IPMI	IPMI 2.0 + iKVM	n/a
LAN(RJ-45)	3	2
S/W RAID	yes	yes

# **Initial Inspection**

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

- 1 x ASMB-310IR/310 CEB motherboard
- 1 x ASMB-310IR Startup Manual
- 1 x Driver CD (user's manual is included)
- 2 x Serial ATA HDD data cables
- 2 x LGA 1366 2U/4U CPU Cooler
- 2 x mini-SAS to 4 Serial ATA HDD data cable (For ASMB-310IR only)
- 1 x I/O port bracket
- 2 x SATA power cable
- 1 x Warranty card

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ASMB-310IR mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the ASMB-310IR, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

# **Order Information**

Part Number	HDD	Expansion Slot	IPMI
ASMB-310-00A1E	6 SATA	4 x PCIe x8 (or 2 x PCIe x16), 2 x PCIe x4	-
ASMB-310IR-00A1E	6 SATA + 8 SAS/SATA	4 x PCIe x8 (or 2 x PCIe x16), 1 x PCIe x4	Yes

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Overview

# 1.1 Introduction

ASMB-310IR serverboard is the most advanced Intel E5520 board for industrial server applications that require high-performance computing. The serverboard supports Intel Xeon 5500/5600 processors and DDR3 800/1066/1333 MHz memory up to 48GB. ASMB-310IR provides dual PCIe x16 slots which support two high performance graphic cards.

In addition, the ASMB-310IR has dual Gigabit Ethernet LAN ports via a dedicated PCIe x1 bus, which offers bandwidth of up to 500 MB/s, eliminating network bottlenecks. High reliability and outstanding performance make the ASMB-310IR the ideal platform for industrial server/networking applications.

By using the Intel E5520 chipset, the ASMB-310IR offers five PCIe slots; two PCIe x16 slots, two PCIe x8 slots, one PCIe x4 slot and a variety of features such as 6 onboard SATA II interfaces (bandwidth = 300 MB/s) with software for RAID 0, 1, 10 and 5 (Windows only); 11 USB 2.0 connectors. Furthermore, ASMB-310IR is embedded with an LSI SAS controller 1068E, and can support 8 SAS/SATA HDD with software RAID 0, 1, 1E. These powerful I/O capabilities ensure even more reliable data storage capabilities and high-speed I/O peripheral connectivity.

With all these excellent features and outstanding performance, the ASMB-310IR is the ideal platform for today's industrial server applications.



ASMB-310 SKU contains 6 PCIe slots; two PCIe x16 slots, two PCIe x8 slots, and two PCIe x4 slots. ASMB-310 does not have an SAS controller onboard.

# 1.2 Features

### 1.2.1 General

- **PCIe architecture:** The Intel E5520 PCH chipset supports 36 PCIe lanes.
- Intel latest Daul processor platform: ASMB-310IR support two Intel Latest 5500/5600 Quad/Dual core Processor.
- High performance I/O capability: Dual Gigabit LAN via PCIe x1 bus, one PCIe x4 slot, 6 SATAII connectors and 11 USB 2.0 ports and 8 SAS/SATA connectors (ASMB-310IR only)
- Standard CEB form factor with industrial features: ASMB-310IR provides industrial features like long product life, reliable operation under wide temperature range, watchdog timer, etc.
- SAS hard drive support: Embedded LSI 1068E SAS controller which can support eight SAS/SATA HDD with software RAID 0,1,1E.
- IPMI 2.0 support: ASMB-310IR equip Aspeed 2050 BMC chip supports IPMI 2.0 (Intelligent Platform Management Interface 2.0) via dedicated LAN port.
- **KVM over IP:** ASMB-310IR KVM over IP function.

# **1.3 Specifications**

Table 1.1: Specification			
Processor			
CPU	<ul> <li>Dual 1366-pin LGA Sockets Intel® 64-bit Xeon® processor(s)</li> <li>Quad-Core Intel® Xeon® Processor 5500 / 5600 sequence (Nehalem-EP/ Westmere processor)</li> <li>Support TDP 60W/80W/95W CPU</li> </ul>		
Processor Bus	QPI bus speed as 6.4 GT/s		
System Memory			
Memory Capacity	<ul> <li>Xeon processor support DDR3 memory bus</li> <li>Each processor have 3 channels memory bus, each channel have one DIMM socket. 3 x 240-pin DIMM sockets for each processor, total 6 x DIMM sockets</li> <li>Support up to 48 GB memory</li> </ul>		
Memory Type	Support 1333 / 1066 MHz ECC Registered / Unbuffered ECC DDR3 modules		
DIMM Sizes	Each memory socket support 1 GB, 2 GB, 4 GB, 8 GB memory size module.		
Memory Voltage	1.5 V		
Error Detection	<ul> <li>Corrects single-bit errors</li> <li>Detects double-bit errors (using ECC memory)</li> <li>Supports Intel® x4 and x8 Single Device Data Correction (SDDC)</li> </ul>		

<b>On-Board Devices</b>			
Chipsets	<ul> <li>Intel 5520 (Tylersburg 36D) chipset IOH</li> <li>ICH10R chipset</li> <li>Intel 5520 IOH provide 36 lanes PCIe Gen-2 bus, used for PCIe slots.</li> <li>ICH10R provide SATA, USB, Network, motherboard basic I/Os</li> <li>SAS LSI1068E (ASMB-310IR SKU Only) conntected to ICH10R PCI-e Gen1 x4 lanes</li> </ul>		
Network Controllers	<ul> <li>1x Intel 82574L Gigabit Ethernet Controller connected to ICH10R PCIe-Gen-1 Lane</li> <li>1x Intel 82567LM Gigabit PHY connected to ICH10R MAC</li> <li>Above network Supports 10BASE-T, 100BASE-TX, and 1000BASE-T, RJ45 output</li> <li>1x 10/100BASET RTL8201N PHY(Realtek) connected to AST2050 dedicated IPMI/IKVM, if this option is on</li> </ul>		
VGA	ASPEED AST2050 controller with 64 MB VGA memory provides basic 2D VGA function		
Super I/O	Winbond W83627DHG chip provide motherboard keyboard mouse, RS232, and Hardware monitor functions.		
SAS (ASMB-310IR)	LSI SAS1068E is 8 ports SAS 3 Gb/s controller RAID 0, 1, 1E supported		
IKVM/BMC (ASMB-310IR)	ASPEED AST2050 is also as IKVM/BMC controller		

Input / Output			
Serial ATA	6x Serial ATA ports with standard 7-pins SATA connectors. SATA ports come from Intel ICH10R . The SATAs support 3Gb/s / RAID 0, 1, 5, 10 (Windows only)		
SAS (Optional)	8x SAS ports come from LSI1068E SAS controller with standard 7- pins connector like SATA connector.		
LAN	<ul> <li>2x RJ45 LAN ports (10/100/1000BASET LAN)</li> <li>1x RJ45 Dedicated IPMI LAN port(10/100BASET) (For ASMB- 310IR Only), fro IPMI only, there is no regular LAN function</li> </ul>		
USB	<ul> <li>6x USB port to rear connected with RJ45</li> <li>3x USB internal headers (5 ports)</li> </ul>		
VGA	1x VGA Port		
Keyboard / Mouse	PS/2 keyboard and mouse connector in rear site		
Serial Port / Header	<ul> <li>1x internal header(2x5 2.5 mm pitch) for UART port</li> <li>1x external DB9 UART</li> </ul>		

Power Connector	
System Power	1 x 24 pin SSI EPS 12 V power connector (Input 12 V, 5 V, 3.3 V, 5 V stand by)
CPU Power	2 x 8 pin SSI EPS 12 V power connector for CPU & Memory power (12 V)

Expansion Slots	
	2x PCI-E x16 slot (Gen 2) (Slot 1 and 3)
	2x PCI-E x8 slot (Gen 2) (Slot 2 and 4)
	<ul> <li>Slot Location 1: 1 x PCI-E x16 (Gen2 x16 Link) (Auto switch to x8 Link if slot 2 is occupied)</li> </ul>
	<ul> <li>Slot Location 2: 1 x PCI-E x8 (Gen2 x8 Link)</li> </ul>
PCI-Express	<ul> <li>Slot Location 3: 1 x PCI-E x16 (Gen2 x16 Link) (Auto switch to x8 Link if slot 4 is occupied)</li> </ul>
	<ul> <li>Slot Location 4: 1 x PCI-E x8 (Gen2 x8 Link)</li> </ul>
	1x PCI-E in x4 slots (Gen 2) (Slot 5)
	1x PCI-E in x4 slots (Gen 1 x4 lanes) <b>(Removed when SAS onboard)</b> (Slot 6)

System BIOS	
BIOS Type	32 Mb SPI Flash EEPROM with AMI BIOS

PC Health Monitoring			
Voltage	Monitors for CPU Cores, +3.3 V, +5 V, +12 V, +5 V Standby, VBAT		
FAN	Total of five fan headers supporting up to 5 fans		
	Five 4-pin fan headers		
	4 x fans with tachometer status monitoring		
	Thermal Control for 4 x fan connectors		
Temperature	Monitoring for CPU *2 (PECI)		
	<ul> <li>Monitoring for System (SIO)</li> </ul>		

Other Features	Chassis intrusion detection
(Case Open)	Chassis Intrusion header

Operating Environment / Compliance			
RoHS	RoHS Compliant 6/6 Pb Free		
Environmental Spec.		Operating Temperature: 10 to 40° C Non-operating Temperature: -10 to 70° C Operating Relative Humidity: 0% to 90% (non-condensing) Non-operating Relative Humidity: 5 to 95% (non-condensing)	

# **1.4 Board Layout, Jumpers and Connectors**

Connectors on the ASMB-310IR motherboard link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers that are used to configure your system for your application.

The tables below list the function of each of the jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.



Figure 1.1 Board layout



Figure 1.2 Rear I/O

 Table 1.2: Onboard LAN LED Color Definition

 10/100/1000 Mbps LAN Link/Activity LED Scheme

Left	Right	Left LED	Right LED	
10 Mbpa	Link	Off	Green	
ro wops	Active	Off	Blinking green	
100 Mbpa	Link	Amber	Green	
	Active	Amber	Blinking green	
1000 Mbps	Link	Green	Green	
	Active	Green	Blinking green	
No Link		Off	Off	

Table 1.3: Jumpers		
Label	Function	
JP_CMOS1	CMOS Clear	
JP_BMC1	BMC Enable (2-3) or Disable (1-2)	

Table 1.4: Connectors		
Label	Function	
ATX_8P_P0	SSI EPS 12 V auxiliary power connector (for CPU0) and memory	
ATX_8P_P1	SSI EPS 12 V auxiliary power connector (for CPU1) and memory	
ATX_P24	SSI EPS 24-pin main power connector (for system)	
COM2	Serial port: RS-232	
CPU0	Intel LGA1366 CPU0 socket	
CPU1	Intel LGA1366 CPU1 socket	

Table 1.4: Connec	tors		
CPUFAN0	CPU0 fan connector (4-pin)		
CPUFAN1	CPU1 fan connector (4-pin)		
DIMMP0A_1	Channel A DIMM1 of CPU0		
DIMMP0B_1	Channel B DIMM1 of CPU0		
DIMMP0C_1	Channel C DIMM1 of CPU0		
DIMMP1A_1	Channel A DIMM1 of CPU1		
DIMMP1B_1	Channel B DIMM1 of CPU1		
DIMMP1C_1	Channel C DIMM1 of CPU1		
FPPH1	Front panel pin header connector		
HDAUD1	HD audio Interface connector		
IPMB_TB1	IPMB connector (For ASMB-310IR only)		
LANLED1	LAN1/2 LED extension connector		
LPC2	LPC port for debug		
PCIEX16_1	PCIe x16 slot		
PCIEX16_3	PCIe x16 slot		
PCIEX4_5	PCIe x4 slot		
PCIEX4_6	PCIe x4 slot (For ASMB-310IR only)		
PCIEX8_2	PCIe x8 slot		
PCIEX8_4	PCIe x8 slot		
SAS0	SAS0 hard drive connector (For ASMB-310IR only)		
SAS1	SAS1 hard drive connector (For ASMB-310IR only)		
SAS2	SAS2 hard drive connector (For ASMB-310IR only)		
SAS3	SAS3 hard drive connector (For ASMB-310IR only)		
SAS4	SAS4 hard drive connector (For ASMB-310IR only)		
SAS5	SAS5 hard drive connector (For ASMB-310IR only)		
SAS6	SAS6 hard drive connector (For ASMB-310IR only)		
SAS7	SAS7 hard drive connector (For ASMB-310IR only)		
SATA0	Serial ATA0 hard drive connector		
SATA1	Serial ATA1 hard drive connector		
SATA2	Serial ATA2 hard drive connector		
SATA3	Serial ATA3 hard drive connector		
SATA4	Serial ATA4 hard drive connector		
SATA5	Serial ATA5 hard drive connector		
SGPIOA1	GPIO connector for SAS0 ~ SAS3 (For ASMB-310IR only)		
SGPIOB1	GPIO connector for SAS4 ~ SAS7 (For ASMB-310IR only)		
SYSDFAN1	system fan connector (4-pin)		
SYSRFAN1	system fan connector (4-pin)		
SYSUFAN1	system fan connector (4-pin)		
USB10	USB port 10		
USB67	USB port 6, 7		
USB89	USB port 8, 9		

Table 1.5: Onbo	ard LED	
5 V_LED1	Power on LED	
5 V <sub>SB</sub> _LED2	Standby LED	

# 1.5 Block Diagram



# **1.6 System Memory**

ASMB-310IR has six 240-pin memory sockets for DDR3 1066/1333 MHz memory modules with maximum capacity of 48 GB (Maximum 8 GB for each DIMM). ASMB-310IR supports registered DIMMs or unbuffered DIMM with ECC / Non-ECC memory module.

# **1.7 Memory Installation Procedures**

To install DIMMs, first make sure the two handles of the DIMM socket are in the "open" position. i.e. The handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket, and then press the DIMM module right down into the socket, until you hear a click. This is when the two handles have automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

	Sin	gle CP		Dua		Install	ed	
	Inst	alled (	(CPUU)	(CP	00 & 0	PU1)		
Quantity of memory installed	1	2	3	2	3	4	5	6
DIMMP0A-1	V	V	V	V	V	V	V	V
DIMMP0B-1		V	V		V	V	V	V
DIMMP0C-1			V				V	V
DIMMP1A-1				V	V	V	V	V
DIMMP1B-1						V	V	V
DIMMP1C-1								V

# **1.8 Processor Installation**

The ASMB-310IR is designed for dual LGA1366, Intel E5500/E5600 series Xeon processor.



Connections

# 2.1 Introduction

You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed, you may need to partially remove a card to make all the connections.

# 2.2 USB Ports and LAN Ports (USB01/USB23/ USB45/LAN1/LAN2/IPMI\_LAN1)

The USB ports comply with USB specification rev. 2.0. Transmission rates of up to 480 Mbps and fuse protection are supported. The USB interface can be disabled in the system BIOS setup.

The ASMB-310IR & ASMB-310 are equipped with two high-performance 1000 Mbps Ethernet LANs. They are supported by all major network operating systems. The RJ-45 jacks on the rear plate provide convenient 1000Base-T operation.

ASMB-310IR is also equipped with the additional 100 Mbps Ethernet LAN (IPMI\_LAN1 Port) which is shared with IPMI for system management.



IPMI_LAN1	LAN1	LAN2
USB4	USB0	USB2
USB5	USB1	USB3

	0 00 00 00 0□	
U	SB67	





USB10

# 2.3 VGA Connector

The ASMB-310IR includes VGA interface that can drive conventional CRT and LCD displays.



# 2.4 Serial Ports (COM1/COM2)

The ASMB-310IR offers 2 serial ports (One on the rear panel and one onboard).





COM2

# Chapter 2 Connections

# 2.5 PS2 Keyboard and Mouse Connectors (KB1MS)

Two 6-pin mini-DIN connectors (KBMS1) on the rear panel of the motherboard provide PS/2 keyboard and mouse connections.



# 2.6 CPU Fan Connector (CPU FAN0/CPU FAN1)



**CPUFAN0** 

# 2.7 System FAN Connector (SYS DFAN1/UFAN1/ RFAN1)



# 2.8 Front Panel Connector (FPPH1)





# 2.9 SGPIO (SGPIOA1/SGPIOB1)





	SGPIOA1		SGPIOB1	
1	SIOCLKA	1	SIOCLKB	
2	NC	2	NC	
3	SIOENDA	3	SIOENDB	
4	SIOENDA	4	SIOENDB	
5	SIODINA	5	SIODINB	

# 2.10 Front Panel LAN Indicator Connector (LANLED1)





1	LAN1_LED0_ACT	2	LAN2_LED1_ACT
3	VCC3_LAN1LED	4	VCC3_LAN2LED
5	LAN1_LED1_1000M	6	LAN2_LED2_1000
7	LAN1_LED2_100M	8	LAN2_LED0_100
9	VCC3	10	NC

# Chapter 2 Connections

# 2.11 Serial ATA Interface (SATA0 ~ 5)

ASMB-310IR features six high performance serial ATA interface (up to 300 MB/s) which eases cabling to hard drives with thin and long cables.



# 2.12 PCIe x16 Expansion Slot (PCIEX16\_1/ PCIEX16\_3)

The ASMB-310IR provides two PCIe x16 slots.





PCIe x16 can only run x8 link while next PCIe x8 is occupied.

# 2.13 PCIe x4 Expansion Slot (PCIEX4\_5/PCIEX4\_6)

The ASMB-310IR provides One PCIe x4 slot. (ASMB-310 provides two PCIe x4 slots)



This slot only available in ASMB-310 SKU.

# 2.14 PCIe x8 Expansion Slot (PCIEX8\_2/PCIEX8\_4)

The ASMB-310IR provides two PCIe x8 slots.



# 2.15 Series Attached SCSI Interface (SAS0 ~ 7)



# 2.16 Auxiliary Power Connector (ATX\_8P\_PQ/ ATX\_8P\_P1/ATX\_P24)



# 2.17 HD Audio Interface Connector (HDAUD1)





1	+5 V_AUD	2	GND
3	ACZ_SYNC	4	ACZ_BITCLK
5	ACZ_SDOUT	6	ACZ_SDIN0
7	ACZ_SDIN1	8	ACZ_RST#
9	+AC_12V	10	GND
11	GND	12	NC

# 2.18 LPU connector (LPU2)





1	CLK_33M_PORT80_CN	2	LPC_LAD1
3	PLTRST_LPCP80	4	LPC_LAD0
5	LPC_LFRAME	6	+3.3 V
7	LPC_LAD3	8	GND
9	LPC_LAD2	10	NC



AMI BIOS

# 3.1 Introduction

AMIBIOS has been integrated into many motherboards for over a decade. In the past, people often referred to the AMIBIOS setup menu as BIOS, BIOS setup or CMOS setup. With the AMIBIOS Setup program, you can modify BIOS settings and control the special features of your computer. The Setup program uses a number of menus for making changes and turning the special features on or off. This chapter describes the basic navigation of the ASMB-310IR setup screens.

Tain       Advanced       PCIPNP       Boot       Security       Chipset       Exit         System Overview				BIOS SE	TUP UTILITY		
System Overview     Use ENTERI. (TAB) or (SHIFT-TAB) to select a field.       AMIBIOS Version :08.00.16 Build Date:09/23/10 ID :BA01X018     Use I+1 or I-1 to configure system Time.       Processor Intel (R) Xeon (R) CPU Intel (R) Xeon (R) Xeon (R) Xeon (R) Xeon (R	Main	Advanced	PCIPnP	Boot	Security	Chipset	t Exit
AMIBIOS       select a field.         Version :08.00.16       select a field.         Build Date:09/23/10       Use [+] or [-] to configure system Time.         ID :BA01X018       use [+] or [-] to configure system Time.         Processor       Intel (R) Xeon (R) CPU       L5518 @ 2.13GHz         Speed :2133MHz       count :2       *         System Memory       size :2040MB       *         System Time       L02:26:591       *         System Date       IMon 09/27/20101       *         Select Field       F1 General Help         F10 Save and Exit       ESC Exit	System	Overview				Usa 	e (ENTER), (TAB) (SHIFT-TAB) to
Uersion       :08.00.16         Build Date:09/23/10       Use [+] or [-] to configure system Time.         ID       :BA01X018         Processor       Intel (R) Xeon (R) CPU         Intel (R) Xeon (R) CPU       L5518 @ 2.13GHz         Speed       :2133MHz         Count       :2         System Memory       + Select Screen         Size       :2040MB         System Time       [02:26:59]         System Date       IMon 09/27/2010]         P10       Save and Exit         ESC       Exit	AMIBIO	S an an a	2			se	lect a field.
ID     :BA01X018     Get FF Ge	Versio	n :08.00.1 Date:09/23/1	b A			ller	ft] or [-] to
Processor Intel (R) Xeon (R) CPU       L5518 @ 2.13GHz         Speed       :2133MHz         Count       :2         System Memory       + Select Screen         Size       :2040MB         System Tine       [02:26:59]         System Date       IMon 09/27/2010]         P10       Save and Exit         ESC       Exit	ID	:BA01X01	8			CON	nfigure system Time.
Intel (R) Keon (R) CPU       L5518 @ 2.13GHz         Speed       :2133HHz         Count       :2         System Memory       +         Size       :2040MB         System Time       L02:26:591         System Date       IMon 09/27/20101         P10       Save and Exit         ESC       Exit	Proces	sor					
Count :2 System Memory Size :2040MB System Tine IO2:26:591 System Date IMon 09/27/20101 # Select Screen 14 Select Item +- Change Field Tab Select Field Fi General Help F10 Save and Exit ESC Exit	Intel( Sneed	R) Xeon (R) C :2133MHz	PU	L5518	0 2.13GHz		
System Memory       +       Select Screen         Size       :2040MB       14       Select Item         System Time       IO2:26:591       Tab       Select Field         System Date       IMon 09/27/20101       F1       General Help         F10       Save and Exit       ESC       Exit	Count	:2				10	
Size :2040MB System Time IO2:26:591 System Date IMon 09/27/20101 14 Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	System	Memory				÷	Select Screen
System Time [02:26:59] System Date [Mon 09/27/2010] Tab Select Field F1 General Help F10 Save and Exit ESC Exit	Size	:2040MB				t1	Select Item
System Date IMon 09/27/2010] F1 General Help F10 Save and Exit ESC Exit	System	Time		[02:2	6:591	Tal	Select Field
P10 Save and Exit ESC Exit	System	Date		[Mon	09/27/2010]	F1	General Help
un2 69 (C)Commight 1985-2010 American Magatrende Inc.						F10 ES0	9 Save and Exit C Exit
VVZ-05 X0/COPULIGHT 1505 Z0107 HMCLICAH HCGAUCHUS7 INC.		v02.69 (	C) Copyrigh	t 1985-2	010, America	n Megatro	ends, Inc.

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed up CMOS so it retains the Setup information when the power is turned off.

# 3.2 BIOS Setup

### 3.2.1 Main Menu

Press <Del> to enter AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

Main	Advanced	PCIPnP	BIOS SE Boot	IUP UTILITY Security	Chipset	Exit
System	Overv iew				Use or	[ENTER], [TAB] [SHIFT-TAB] to
AMIBIO Version Build 1 ID	S n :08.00.16 Date:09/23/10 :BA01X018				se le Use cont	ect a field. [+] or [-] to figure system Time.
Process Intel ( Speed Count	sor R) Xeon (R) CP :2133MHz :2	U	L5518	@ 2.13GHz		
<b>System</b> Size	Memory :2040MB				+ 11 +-	Select Screen Select Item Change Field
System <mark>System</mark>	Time Date		E02:2 EMon	6:59] 09/27/2010]	Tab F1 F10 ESC	Select Field General Help Save and Exit Exit

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can be. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

### 3.2.1.1 System Time / System Date

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

# 3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the ASMB-310IR setup screen to enter the Advanced BIOS setup screen. You can select any of the items in the left frame of the screen, such as CPU configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Advanc WARNIN	ed Settings G: Setting w	rong value	s in bel	low sections	Conf	igure CPU.
<ul> <li>CPU</li> <li>IDE</li> <li>Supe</li> <li>Hard</li> <li>Inte</li> <li>Cloce</li> </ul>	may cause Configuratio configuratio rIO Configur Ware Health el VT-d Confi ek Gen item	e system to m ation Configurat iguration	i malfund	tion.		
					<pre></pre>	Select Screen Select Item r Go to Sub Screen General Help Save and Exit Exit
	v02.69 (	(C) Copyr igł	rt 1985-2	2010, America	n Megatren	ds, Inc.

### 3.2.2.1 CPU Configuration

Advanced Bi	LOS SETUP UTILITY	
Ratio Status:Unlocked (Min:12, Ratio Actual Value:16	Max:16)	▲ When enable, CPU will conditionally demote C6/C7 request
Ratio CMOS Setting	[16]	to C3 based on uncor
C1E Support	[Enabled]	auto-demote
Server Class	[HPC]	information.
Hardware Prefetcher	[Enabled]	
Adjacent Cache Line Prefetch	[Enabled]	
MPS and ACPI MADT ordering	[Modern ordering]	
Max CPUID Value Limit	[Disabled]	
Intel(R) Virtualization Tech	[Enabled]	
Execute-Disable Bit Capability	[Enabled]	
Intel(R) HT Technology	[Enabled]	← Select Screen
Active Processor Cores	[A11]	↑↓ Select Item
A20M	[Disabled]	+- Change Option
Intel(R) SpeedStep(tm) tech	[Enabled]	F1 General Help
Intel(R) C-STATE tech	[Enabled]	F10 Save and Exit
C State package limit setting	[Auto]	ESC Exit
C1 Auto Demotion	[Enabled]	
C3 Auto Demotion	[Enabled]	<b>T</b>

Configure advanced CPU settings Module Version:01.08	;	Sets the ratio between CPU Core Clock and the FSB
Manufacturer:Intel Intel(R) Xeon(R) CPU Frequency :2.13GHz BCLK Speed :133MHz Cache L1 :256 KB Cache L2 :1024 KB Cache L3 :8192 KB Ratio Status:Unlocked (Min:12,	L5518 @ 2.13GHz Max:16)	Frequency.
Ratio Actual Value:16 Ratio CMOS Setting Hardware Prefetcher Adjacent Cache Line Prefetch MPS and ACPI MADT ordering Max CPULD Value Limit Intel(R) Virtualization Tech Execute-Disable Bit Capability	1161 Enabled1 Enabled1 Modern ordering1 Disabled1 Enabled1 Enabled1	<ul> <li>← Select Screen</li> <li>↑↓ Select Item</li> <li>← Change Option</li> <li>F1 General Help</li> <li>F10 Save and Exit</li> <li>ESC Exit</li> </ul>

### Ration CMOS Setting

Allows you to set the ratio between the CPU Core Clock and the BCLK Frequency.

The valid value ranges vary according to your CPU model.

### Hardware Prefetcher

Hardware Prefetcher is a technique that fetches instructions and/or data from memory into the CPU cache memory well before the CPU needs it, so that it can improve the load-to-use latency. You may choose to enable or disable it.

### Adjacent Cache Line Prefetch

The processor fetches the currently requested cache line, as well as the subsequent cache line. This reduces the cache latency by making the next cache line immediately available if the processor requires it as well.

### MPS and ACPI MADT ordering

MADT refers to Multiple APIC Description Table.

### Max CPUID Value Limit

This item allows you to limit CPUID maximum value.

### Intel® Virtualization Tech

Intel Virtualization Technology (Intel VT) is a set of hardware enhancements to Intel server and client platforms that provide software-based virtualization solutions. Intel VT allows a platform to run multiple operating systems and applications in independent partitions, allowing one computer system to function as multiple virtual systems.

### Execute-Disable Bit Capability

This item allows you to enable or disable the No-Execution page protection technology.

■ Intel® HT Technology

This item allows you to enable or disable Intel Hyper Threading technology.

### A20M

This makes legacy OS compatible with some APs.

### Intel® SpeedStep® tech

When set to disabled, the CPU runs at its default speed, when set to enabled, the CPU speed is controlled by the operating system.

### Intel® TurboMode tech

Turbo mode allows processor cores to run faster than marked frequency for specific conditions.

### Intel® C-STATE tech

This function saves CPU power consumption when in system halt state. When enabled, the CPU speed and voltage will be reduced during system halt state to save power consumption. You may choose to enable or disable it.

### 3.2.2.2 IDE Configuration

IDE Configuration		Options
SATA#1 Configuration Configure SATA#1 as SATA#2 Configuration	[Compatible] [IDE] [Enhanced]	Disabled Compatible Enhanced
<ul> <li>Primary IDE Master</li> <li>Primary IDE Slave</li> <li>Secondary IDE Master</li> <li>Secondary IDE Slave</li> <li>Third IDE Master</li> <li>Fourth IDE Master</li> </ul>	: [Not Detected] : [Not Detected] : [Not Detected] : [Not Detected] : [Not Detected] : [Not Detected] : [Not Detected]	<ul> <li>← Select Screen</li> <li>↑↓ Select Item</li> <li>← Change Option</li> <li>F1 General Help</li> <li>F10 Save and Exit</li> <li>ESC Exit</li> </ul>

### 3.2.2.3 Intel VT-d Setting

(Enabled)	Disabled Enabled
	<ul> <li>← Select Screen</li> <li>↑↓ Select Item</li> <li>← Change Option</li> <li>F1 General Help</li> <li>F10 Save and Exit</li> <li>ESC Exit</li> </ul>
	(Enabled)

### Intel VT-d Configuration

To support Intel chipset virtualization technology for directed I/O.

### 3.2.2.4 Hardware Health Configuration

Hardware Health Configuration	on 🔺	Options
System Temperature CPUO Temperature CPU1 Temperature Case open alarm	:45°C/113°F :53°C/127°F :36°C/96°F Disabled]	Manual Mode Thermal Cruise Mode
SYSUFAN1 Mode Setting SYSUFAN1 TargetTemp Value SYSFAN Tolerance Value CPUFAN0 Mode Setting CPUFAN0 TargetTemp Value CPUFAN0 Tolerance Value	[Thermal Cruise Mod] [055] [03] [Thermal Cruise Mod] [055] [03]	
CPUFAN1 Mode Setting	[Thermal Cruise Mod]	← Select Screen
CPUFAN1 TargetTemp Value	[055]	↑↓ Select Item
SYSDEAN1 Mode Setting	[Thermal Cruise Mod]	F1 General Helm
SYSDFAN1 TargetTemp Value	[055]	F10 Save and Exit
CPUFAN1 Tolerance Value	[03]	ESC Exit
SYSUFAN1 Speed	:6490 RPM	

### Chassis Intrusion

Enable/Disable the Chassis Intrusion monitoring function. When the case is opened, the buzzer beeps.

### 3.2.2.5 Super I/O Configuration

Configure Win627DHG Super IO Chipset		Allows BIOS to Select	
Serial Port1 Address Serial Port2 Address	[3F8/TRQ4] [2F8/TRQ3]	—— Serial Port1 Base Addresses.	
		<ul> <li>Select Screen</li> <li>14 Select Item</li> <li>Change Option</li> <li>F1 General Help</li> <li>F10 Save and Exit</li> </ul>	

### Serial Port1 Address

This option configures serial port 1 base addresses.

### Serial Port2 Address

This option configures serial port 2 base addresses.

### 3.2.2.6 Clock Gen Spectrum Setting

Advanced		
Clock GEN Spectrum	[Disabled]	Options Disabled Enabled
		<ul> <li>← Select Screen</li> <li>↑↓ Select Item</li> <li>← Change Option</li> <li>F1 General Help</li> <li>F10 Save and Exit</li> <li>ESC Exit</li> </ul>
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### 3.2.3 Advanced PCI/PnP Settings

Select the PCI/PnP tab from the ASMB-310IR setup screen to enter the Plug and Play BIOS Setup screen. You can display a Plug and Play BIOS Setup option by highlighting it using the <Arrow> keys. All Plug and Play BIOS Setup options are described in this section. The Plug and Play BIOS Setup screen is shown below.

Advanced PCI/PnP	Settings	SECULITIES	▲ Clea	r NURAM during
WARNING: Setting may caus	wrong values in bel e system to malfunc	ow sections tion.	— Syst	em Boot.
Clear NVRAM Plug & Play O/S	[No] [No]			
IRQ3 IRQ4 IRQ5 IRQ7 IRQ9 IRQ10 IRQ11	lAvai lAvai lAvai lAvai lAvai lAvai lAvai	lable] lable] lable] lable] lable] lable] lable]	+ 1↓ +- F1	Select Screen Select Item Change Option General Halm
DMA Channel 0 DMA Channel 1 DMA Channel 3 DMA Channel 5	lAva i lAva i lAva i lAva i	lable] lable] lable] lable]	F1 F10 ESC	Save and Exit Exit

### 3.2.3.1 Clear NVRAM

Set this value to force the BIOS to clear the Non-Volatile Random Access Memory (NVRAM).The Optimal and Fail-Safe default setting is No.

### 3.2.3.2 Plug & Play O/S

When set to No, BIOS configures all the devices in the system. When set to Yes and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for bootup.

## 3.2.4 Boot Settings

nain Havanced	PCIPnP	Boot	Security	Chipset	Exit
Boot Settings				Confi	gure Settings
▶ Boot Settings Co	mfiguratio	n			g System Boot.
▶ Boot Device Pric ▶ USB Drives	rity				
				← †↓ Enter F1 F10 ESC	Select Screen Select Item Go to Sub Screer General Help Save and Exit Exit

Boot Settings Configuration	Allows BIOS to skip	
Quick Boot Quiet Boot AddOn ROM Display Mode Interrupt 19 Capture Boots Graphic Adapter Priority	(Enabled) (Disabled) (Force BIOS) (Disabled) (PCI-Express VGA)	booting. This will decrease the time needed to boot the system.
		<ul> <li>Select Screen</li> <li>Select Item</li> <li>Change Option</li> <li>F1 General Help</li> <li>F10 Save and Exit</li> <li>ESC Exit</li> </ul>

### Quick Boot

This item allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.

### Quiet Boot

If this option is set to Disabled, the BIOS displays normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.

### AddOn ROM Display Mode

Set display mode for option ROM.

### Interrupt 19 Capture

Some add-on cards' option ROMs need Interrupt 19, this is to enable or disable supporting this kind of add-on cards.

Boots Graphic Adapter Priority

	Boot	
Boot Device Priority 1st Boot Device 2nd Boot Device	[USB:AMI Virtual F1] [Network:IBA GE S1o]	Specifies the boot sequence from the available devices. A device enclosed in parenthesis has been disabled in the corresponding type menu.
		<ul> <li>← Select Screen</li> <li>↑↓ Select Item</li> <li>← Change Option</li> <li>F1 General Help</li> <li>F10 Save and Exit</li> <li>ESC Exit</li> </ul>
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USB Drives		Specifies the boot
1st Drive	USB: USB DISK 2.0]	available devices.
		<ul> <li>Select Screen</li> <li>Select Item</li> <li>Change Option</li> <li>F1 General Help</li> <li>F10 Save and Exit</li> <li>ESC Exit</li> </ul>

## 3.2.5 Security Setting



Select Security Setup from the ASMB-310IR Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection are described in this section. To access the sub menu for the following items, select the item and press <Enter>:

### 3.2.5.1 Change Supervisor / User Password

Provides for either installing or changing the password.

### 3.2.6 Advanced Chipset Settings

THUCK IT IT	Advanced	PCLPnP	Boot	Security	Chipset	Exit
Advanced	l Chipset S	lettings			Confi featu	gure CPU Bridge
WARNING: ▶ CPU Br ▶ North ▶ South	: Setting w may cause ridge Confi Bridge Con Bridge Con	rong value system to guration figuration figuration	s in bel malfunc	ow sections tion.	Teata	1
					¢ †↓ Enter F1 F10 ESC	Select Screen Select Item Go to Sub Scree General Help Save and Exit Exit

### 3.2.6.1 CPU Bridge Chipset Configuration

		Chipset	
CPU Bridge Chipset Configu	uration		
CPU Revision Current QPI Frequency Current Memory Frequency	:D0 :5.866GT :1066 Mhz	<ul> <li>← Select Scree</li> <li>↑↓ Select Item</li> <li>F1 General Hel</li> <li>F10 Save and Ex</li> <li>ESC Exit</li> </ul>	n p it
00.00.0000			

### 3.2.6.2 North Bridge Chipset Configuration

NorthBridge Chipset Configuration		Crystal Beach / DMA
NB Revision Current QPI Frequency	:C2 :5.866GT	configuration.
Crystal Beach / DMA	(Disabled)	
		<ul> <li>← Select Screen</li> <li>↑↓ Select Item</li> <li>↓ Charge Datia</li> </ul>

### PCI-E port assign method [Auto][x8x8x8x8]

Note!

PCI-E port assign method defaults as "Auto". When inserting a riser card into PCI-E x16 Slot 1, and it fails to recognize the add-on card of the riser card, plase change the default setting to x8x8x8x8 manually.

### 3.2.6.3 South Bridge Chipset Configuration

		Chipset	
South Bridge Chipset Configuration		Options	
USB Functions USB 2.0 Controller GBE Controller HDA Controller	[12 USB Ports] [Enabled] [Enabled] [Disabled]	Disabled 2 USB Ports 4 USB Ports 6 USB Ports 8 USB Ports 10 USB Ports 12 USB Ports	
		<ul> <li>Select Screen</li> <li>Select Item</li> <li>Change Option</li> <li>General Help</li> <li>Save and Exit</li> <li>ESC Exit</li> </ul>	
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### HDA Controller

Enables or disables the High Definition audio controller.

### 3.2.7 Exit Option

xit Uptions	Exit system setup
Save Changes and Exit	changes.
Discard Changes and Exit	The second second second
)iscard Changes	F10 key can be used
	for this operation.
Load Uptimal Defaults	
Judu FallSale peldult5	
	+ Select Screen
	14 Select Item
	Enter Go to Sub Screen
	F1 General Help
	F10 Save and Exit
	ESC Exit

### 3.2.7.1 Save Changes and Exit

When you have completed system configuration, select this option to save your changes, exit BIOS setup and reboot the computer so the new system configuration parameters can take effect.

- Select Save Changes and Exit from the Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now?
  - [Ok] [Cancel]
- 2. Select Ok or Cancel.

### 3.2.7.2 Discard Changes and Exit

- Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]
- 2. Select Ok to discard changes and exit.

### 3.2.7.3 Discard Changes

Select Discard Changes from the Exit menu and press <Enter>.

### 3.2.7.4 Load Optimal Defaults

The ASMB-310IR automatically configures all setup items to optimal settings when you select this option. Optimal Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Defaults if your computer is experiencing system configuration problems. Select Load Optimal Defaults from the Exit menu and press <Enter>.

### 3.2.7.5 Load Failsafe Defaults

The ASMB-310IR automatically configures all setup options to failsafe settings when you select this option. Failsafe Defaults are designed for maximum system stability, but not maximum performance. Select Failsafe Defaults if your computer is experiencing system configuration problems.

- Select Save Changes and Exit from the Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now?
   [Ok] [Cancel]
- 2. Select OK to load Failsafe defaults.





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