













Manual

ADVANTECH

AIMB-290

Industrial Mini-ITX Motherboard with Intel® Atom C3000



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User Manual

AIMB-290

Intel® Atom® C3000 processor with DDR4 ECC/non-ECC RAM, VGA, Dual GbE, Dual 10GbE, PCIe x8, DC/ATX Input



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A Message to the Customer

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Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known.

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We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

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In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

Declaration of Conformity

FCC Class B

This device complies with the requirements in part 15 of the FCC rules:

Operation is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.



Caution! There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

CPU Family	Core Stepping	Cores	Power	Freq (GHz)	Cache	Mfg. Tech	нт	VT-x	VT-d	Package Type	Result
Intel ATOM C3958	QS	16	31W	2.00 GHz	16 MB	14 nm	NO	YES	YES	FCBGA1310	PASS
Intel ATOM C3858	QS	12	25 W	2.00 GHz	12 MB	14 nm	NO	YES	YES	FCBGA1310	PASS
Intel ATOM C3758	QS	8	25 W	2.20 GHz	16 MB	14 nm	NO	YES	YES	FCBGA1310	PASS
Intel ATOM C3558	QS	4	16 W	2.20 GHz	8 MB	14 nm	NO	YES	YES	FCBGA1310	PASS

CPU Compatibility

Memory Compatibility

Category	ECC	Speed	Capacity	Vendor	ADVANTECH P/N	Module/Chip_PN
Long-DIMM DDR4	Ν	2400	4GB	Advantech	SQR-UD4N4G2K4HNEAC	H5AN4G8NAFR
Long-DIMM DDR4	Ν	2400	8GB	ADATA	AQD-D4U8GN24-HE	H5AN8G8NAFR
Long-DIMM DDR4	Ν	2400	8GB	Advantech	SQR-UD4N8G2K4HNHAC	H5AN8G8NAFR
Long-DIMM DDR4	Ν	2133	8GB	ADATA	N/A	H5AN4G8NMFR TFC
Long-DIMM DDR4	Ν	2133	16GB	Advantech	AQD-D4U16N21-SE	SEC 543 K4A8G08 5WB BCPB
Long-DIMM DDR4	N	2133	16GB	Transcend	N/A	SEC 546 K4A8G08 5WB BCRC
Long-DIMM DDR4	Ν	2400	16GB	ADATA	AQD-D4U16N24-HE	H5AN8G8NAFR
Long-DIMM DDR4	ECC	2400	8GB	ADATA	AQD-D4U8GE24-HE	H5AN8G8NAFR
Long-DIMM DDR4	ECC	2133	16GB	Advantech	AQD-D4U16E21-SE	SEC 546 K4A8G08 5WB BCPB
Long-DIMM DDR4	ECC	2400	16GB	Advantech	SQR-UD4M-16G2K4SEB	SEC 649 K4A8G08 5WB BCRC
Long-DIMM DDR4	ECC	2400	16GB	Advantech	AQD-D4U16E24-SE	SEC 649 K4A8G08 5WB BCRC
Long-DIMM DDR4	ECC	2400	16GB	ADATA	AQD-D4U16E24-HE	H5AN8G8NAFR
Long-DIMM DDR4	ECC	2400	32GB	Advantech	SQR-RD4M-32G2K4SRB	SEC 637 K4A8G04 5WB BCRC

Ordering Information

P/N	CPU	VGA	GbE LAN	10GbE	сом	SATA	USB3.0/2.0	MiniPCle	ТРМ	PCIEx8	IPMI
AIMB-290G4-S1A1E	C3958	1	2	2	2	6	3/1	1 F/S	(1)	1	Yes
AIMB-290G4-S2A1E	C3758	1	2	2	2	6	3/1	1 F/S	(1)	1	Yes
AIMB-290G2-S3A1E	C3558	1	2	0	2	6	3/3	1 F/S	(1)	0	NA

*() BOM options available on MP version.

Initial Inspection

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

- 1X AIMB-290 Mini-ITX Motherboard
- 4 x SATA HDD cable
- 1 X SATA power cable
- 1 x COM port cable
- 1 x I/O port bracket
- 1 x Startup manual
- 1 x Warranty card
- 1 x CPU cooler

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-290 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the AIMB-290, 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.

Precautions

- 1. Please use either EATXPWR1 or ATX12V1. Do not use both connectors at the same time.
- 2. The temperature of the10GbE LAN IC is high due to its high performance. When you assemble the enclose with AIMB-290, please make sure the system fan can remove heat efficiently from the chassis, or the ustomer can purchase a suitable compatible cooler from Advantech.

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General Information

1.1 Introduction

AIMB-290 is designed with the Intel Atom C3000 series for server applications that require both performance computing and enhanced system/power management capabilities.

The motherboard supports C3958 2.0 GHz / C3758 2.2 GHz/ C3558 2.2 GHz, support ECC/non-ECC DDR4 long DIMM up to 64GB/32GB, per slot up to 32GB/16GB. And connectivity of 2 x serial ports, 3 x USB 3.0, 1/3 x USB 2.0, dual GbE LAN, dual 10GbE LAN, 2 x SATA III ports. AIMB-290 also supports IPMI 2.0 (Intelligent Platform Management Interface).

1.2 Features

- High performance: Use Intel ATOM C3000 processor up to 16 core SOC. Supports ECC DDR4 long DIMM up to 64GB.
- IPMI 2.0: The AIMB-290 supports IPMI 2.0 to manage and control server systems.
- **Fast network:** 2 ports 10GbE LAN to strengthen Internet transmission.
- **EMMC inside:** Supports EMMC 5.1.
- Power design for application: AIMB-290 supports DC 12V 4-pin only or ATX 24-pin input independently.

1.3 Specifications

1.3.1 System

- CPU/Chipset: Intel ATOM C3000 series processor
- BIOS: AMI EFI 128 Mbit SPI BIOS
- SATA hard disk drive interface: 6 on-board SATA connectors with data transmission rates up to 600 MB

1.3.2 Memory

- RAM: 2 slots with 288-pin long-DIMM. Supports dual-channel DDR4 1600/1866/ 2133/2400MHz ECC/Non-ECC SDRAM.
 - 16GB/per DIMM for DDR4 non-ECC/ECC 2400MHz with U-DIMM.
 - 32GB/per DIMM for DDR4 ECC 2400MHz with R-DIMM.

1.3.3 Input/Output

- PCle slot: One PCle x8 expansion slot, 1 x full-size MiniPCle
- Serial port: Two serial ports, one is RS-232/422/485 and one is RS-232. One DB-9 connector located in rear panel is RS-232.
- **Keyboard and PS/2 mouse connector:** One 6-pin mini-DIN connector
- **USB port:** Supports 3 x USB 3.0 ports with transmission rates up to 5Gbps, and 1 or 3 x USB 2.0 ports (sku) with transmission rates up to 480 Mbps.
- **GPIO:** Supports 8-bit GPIO for general purpose control applications.

1.3.4 Graphics

- **Controller:** ASPEED AST2500/2510 BMC controller
- **Display memory:** 4 GB DDR4 on board
- VGA: Supports max. resolution 1920 x 1200 @ 60 Hz

1.3.5 Ethernet LAN

- Interface: 10/100/1000/10G Mbps
- Controller:
 - LAN 1/2: Marvell 88E1512 with RJ45 for 10/100/1GbE
 - LAN 3/4: Intel X557-AT2 with RJ45 for 1G/10GbE (sku)
 - Lan5: IPMI controller, Realtek RTL8201 with RJ45 for IPMI (sku)

1.3.6 Industrial Features

 Watchdog timer: Can generate a system reset. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels)

1.3.7 Mechanical and Environmental Specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, depending on CPU)
- **Storage temperature:** -40 ~ 85° C (-40 ~ 185° F)
- **Humidity:** 5 ~ 95% non-condensing
- Power supply voltage: Only DC 12V with 4-pin connector or +3.3 V, +5 V, +12 V, -12 V, +5VSB with ATX 24-pin connector
- Power consumption: 35W with Intel ATOM C3958 + 1x 32GB RAM + 1x 64GB SSD
- Board size: 170 x 170 mm
- Board weight: 0.356 kg

1.4 Jumpers and Connectors

Connectors on the AIMB-290 motherboard link it to devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

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

Table 1.1: Jumpers						
Label	Function					
JFP1+JFP2	Front Panel Pin Header					
JCMOS1	CMOS Clear Jumper					
PSON1	ATX/AT Mode Selection					
JUSBPWR1	USB Port Power Selection					
JOBS1+JWDT1	Watchdog Timer Output, OBS Beep					

Table 1.2: Connectors					
Label	Function				
DIMMA1, DIMMB1	DDR4 288-pin DIMM Socket				
SOC-BIOS2, BMC-BIOS2	SPI Programming Pin Header				
SATA1~6	SATA Signal Connector				
SATAPWR1	MINIPCIE Connector				
PCIEX8_1	PCI-E x8 Slot				
LANLED1	NETWORK LED Pin Header				
EATXPWR1	ATX Power Supply Connector				
ATX12V1	ATX 12V Power Supply Connector				
GPIO1	General Purpose I/O Pin Header				
USB0506	USB2.0 Pin Header				
COM2	COM Port Pin Header				
KBMS1	PS/2 Keyboard and Mouse Connector				
JFP1+JFP2	Front Panel Pin Header				
CPUFAN1	CPU FAN Power Connector				
SYSFAN1~4	SYSTEM FAN Power Connector				
JFP3	Power LED and Keyboard Lock Pin Header				
JCASE1	Case Open Pin Header				
SYS_LED	System Error LED Connector				
BAT1	Battery Connector				
LPC1	Low Pin Count Header				
SMBUS1	SM Bus Connector				
PMBUS1	Power Supply PM Bus Connector				
SGPIO1, SGPIO2	SGPIO Connector				

1.5 Board layout: Jumper and Connector Locations



Figure 1.1 Jumper and Connector Location



Figure 1.2 I/O Connectors

1.6 AIMB-290 Board Diagram



Figure 1.3 AIMB-290 Block Diagram

1.7 **Safety Precautions**



Warning! Always completely disconnect the power cord from chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.



Caution! Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to electrostatic discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.



Caution! The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.



Caution! There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

1.8 Jumper Settings

This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboards's default settings and your options for each jumper.

1.8.1 How to Set Jumpers

You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" (or turn ON) a jumper, you connect the pins with the clip. To "open" (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.9 System Memory

AIMB-290 has two 288-pin memory sockets for 2133/2400 MHz memory modules with maximum capacity of 32/64 GB.

16GB/per DIMM for DDR4 non-ECC/ECC 2400MHz with U-DIMM, and 32GB/per DIMM for DDR4 ECC 2400MHz with R-DIMM.

1.10 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. Then firmly but gently (avoid pushing down too hard) press the DIMM module well down into the socket, until you hear a click 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.

1.11 Processor

The AIMB-290 is designed for FCBGA1310, Intel ATOM C3000 series processor with 12 lanes sku processor.

AIMB-290 User Manual



Connecting Peripherals

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 or have a packed chassis, you may need to partially remove the card to make all the connections.

2.2 USB Ports (USB0304 / USB0506 / Lan5_USB0102 / JUSBPWR1)

The AIMB-290 provides up to max 6 x USB ports. The USB interface complies with USB Specification Rev 2.0 supporting transmission rates up to 480 Mbps and Rev 3.0 supporting transmission rate up to 5 Gbps and is fuse protected. The USB interface can be disabled in the system BIOS setup.



Table 2.1: USB0102 (Lan5_USB0102)					
Pin	Signal	Pin	Signal		
U1	+5V	U10	+5V		
U2	D1-	U11	D2-		

Table 2.	1: USB0102 (Lan5_USB0′	102)		
U3	D1+	U12	D2+	
U4	GND	U13	GND	
U5	RX1-	U14	RX2-	
U6	RX1+	U15	RX2+	
U7	GND	U16	GND	
U8	TX1-	U17	TX2-	
U9	TX1+	U18	TX2+	

Table 2.2: USB0304				
Pin	Signal	Pin	Signal	
1	+5V	10	+5V	
2	D3-	11	D4-	
3	D3+	12	D4+	
4	GND	13	GND	
5	RX3-			
6	RX3+			
7	GND			
8	TX3-			
9	TX3+			

Table 2.3: USB0506					
Pin	Signal	Pin	Signal		
1	+5V Stand by	2	+5V Stand by		
3	D6-	4	D5-		
5	D6+	6	D5+		
7	GND	8	GND		
9	N.C.				

Table 2.4: JUSBPWR1 for USB0102 / USB0304			
Function	Jumper Setting		
+5V Stand by power (1-2) (Default)			
+V5 main power (2-3)			

Note! * Does'nt support USB0506

Chapter 2

Connecting Peripherals

2.3 LAN Ports (LAN12 / LAN34 / LAN5_USB0102)

The AIMB-290 is equipped with two performance 1000 Mbps and two high-performance 1GbE Ethernet LAN adapters to support by all major network operating systems. The RJ-45 jacks on the rear panel to provides convenient LAN connection.



Table 2.5: Lan12					
Pin	Signal	Pin	Signal		
A-C1	LAN2_MDI_0+	B-C1	LAN1_MDI_0+		
A-C2	LAN2_MDI_0-	B-C2	LAN1_MDI_0-		
A-C3	LAN2_MDI_1+	B-C3	LAN1_MDI_1+		
A-C4	LAN2_MDI_2+	B-C4	LAN1_MDI_2+		
A-C5	LAN2_MDI_2-	B-C5	LAN1_MDI_2-		
A-C6	LAN2_MDI_1-	B-C6	LAN2_MDI_1-		
A-C7	LAN2_MDI_3+	B-C7	LAN2_MDI_3+		
A-C8	LAN2_MDI_3-	B-C8	LAN2_MDI_3-		

Table 2.6: Lan34				
Pin	Signal	Pin	Signal	
A-C1	LAN4_MDI_0+	B-C1	LAN3_MDI_0+	
A-C2	LAN4_MDI_0-	B-C2	LAN3_MDI_0-	
A-C3	LAN4_MDI_1+	B-C3	LAN3_MDI_1+	
A-C4	LAN4_MDI_2+	B-C4	LAN3_MDI_2+	
A-C5	LAN4_MDI_2-	B-C5	LAN3_MDI_2-	
A-C6	LAN4_MDI_1-	B-C6	LAN3_MDI_1-	
A-C7	LAN4_MDI_3+	B-C7	LAN3_MDI_3+	
A-C8	LAN4_MDI_3-	B-C8	LAN3_MDI_3-	

Table 2.7: Lan5 (LAN5_USB0102)					
Pin	Signal	Pin	Signal		
C1	LAN5_MDI_0+	C5	N.C.		
C2	LAN5_MDI_0-	C6	LAN5_MDI_1-		
C3	LAN5_MDI_1+	C7	N.C.		
C4	N.C.	C8	N.C.		

2.4 VGA Port (VGA1)

AIMB-290's VGA Port with max resolution supports to 1920x1080 32/16bpp @ 60Hz





Table 2.8	: VGA1		
Pin	Signal	Pin	Signal
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	N.C.
4	N.C.	12	SDATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	SCLK
8	GND		

2.5 Serial Ports (COMD1 / COM2)

AIMB-290 supports two serial ports, COM1 supports RS-232 function, COM2 supports RS-232/422/485 function by BIOS selection. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network. The IRQ and address ranges for both ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup. Different devices implement the RS-232 standards in different ways. If you have problems with a serial device, be sure to check the pin assignments for the connector.



Table 2.9: COMD1				
Pin	Signal	Pin	Signal	
1	COM1_DCD#	6	COM1_DSR#	
2	COM1_SIN	7	COM1_RTS#	
3	COM1_SOUT	8	COM1_CTS#	

Table 2.9: COMD1				
4	COM1_DTR#	9	COM1_RI#	
5	GND			

Table 2.10: COM2				
Pin	Signal	Pin	Signal	
1	COM2_DCD#	2	COM2_DSR#	
3	COM2_RXD#	4	COM2_RTS#	
5	COM2_TXD#	6	COM2_CTS#	
7	COM2_DTR#	8	COM2_RI#	
9	GND			

2.6 Front Panel Connectors (JFP1+JFP2 / JFP3)

There are several headers for monitoring and controlling the AIMB-290.



Table 2.11: JFP1+JFP2				
Pin	Signal	Pin	Signal	
1	+5V	2	HDD LED+	
3	Power Button+	4	SPK_P2	
5	HDD LED-	6	Power Button-	
7	SPK_P3	8	SMB_DATA	
9	System Reset+	10	SPK_P4	
11	SMB_CLK	12	System Reset-	

* Internal Speaker (Buzzer) (7-10)(Default)

Table 2.12: JFP3				
Pin	Signal	Pin	Signal	
1	PWR LED +	2	NC	
3	PWR LED (GND)	4	Keyboard Lock	
5	GND			

2.6.1 ATX Soft Power Switch (JFP1/PWR_SW)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to (JFP1/ PWR_SW), for convenient power on and off.

2.6.2 Reset (JFP1/RESET)

Many computer cases offer the convenience of a reset button. Connect the wire for the reset button.

2.6.3 HDD LED (JFP1/HDDLED)

You can connect an LED to connector (JFP1/HDDLED) to indicate when the HDD is active.

2.6.4 External speaker (JFP1/SPEAKER)

JFP2/SPEAKER (Buzzer) is a 2-pin connector. AIMB-290 don't has external speaker. It provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7 & 10 as closed.

2.6.5 Power LED and keyboard lock connector (JFP3/PWR_LED & KEY LOCK)

(JFP3/PWR_LED & KEY LOCK) is a 5-pin connector for the power on LED and Key Lock function. Refer to Appendix B for detailed information on the pin assignments.

The Power LED cable should be connected to pin 1-3. The key lock button cable should be connected to pin 4-5. There are 3 modes for the power supply connection. The first is "ATX power mode"; the system turns on/off by a momentary power button. The second is "AT Power Mode"; the system turns on/off via the power supply switch. The third is another "AT Power Mode" which makes use of the front panel power switch. The power LED status is indicated in the following table:

Table 2.13: ATX P	ower Supply LED	Status (No suppor	t for AT power)
Power mode	LED (ATX Power Mode) (On/off by momentary button)	LED (AT power Mode) (On/off by switching power supply)	LED (AT power Mode) (On/off by front panel switch)
PSON1 (on back plane) jumper setting	pins 2-3 closed	pins 1-2 closed	Connect pins 1 & 2 to panel switch via cable
System On	On	On	On
System Off	Off	Off	Off
S5	NA	N/A	N/A

2.7 GPIO / SMBUS / PMBUS (GPIO1 / SMBUS1 / PM BUS1)

2.7.1 **PMBUS**

If power supply can support PMBUS 2.0, you can link this connector to the corresponding connector on power supply to monitor power supply condition. AIMB-290 support basic function, If you want to add more features, please contact with our sale to discuss customized design.



Table 2.14: GPIO1					
Pin	Signal		Pin	Signal	
1	GPIO0		2	GPIO4	
3	GPIO1		4	GPIO5	
5	GPIO2		6	GPIO6	
7	GPIO3		8	GPIO7	
9	+5V Stand by		10	GND	
Table 2.1	Table 2.15: SMBUS1				
Pin	Si	ignal			
1	+{	5V			
2	S	MB_CLK			
3	S	MB_DATA			
4	G	ND			

Table 2.16: PMBUS1		
Pin	Signal	
1	SMB_CLK	

Table 2.16: PMBUS1		
2	SMB_DATA	
3	SMB_ALERT#	
4	GND	
5	+V3.3	

2.8 SPI Programming Pin Header (SOC-BIOS2, BMC-BIOS2) / Battery Holder (BAT1)



Table 2.17: SOC-BIOS2, BMC-BIOS2				
Pin	Signal	Pin	Signal	
1	SPISKT_CS#0	2	+3.3V Stand by	
3	SPISKT_MISO	4	N.C.	
5	N.C.	6	SPISKT_CLK	
7	GND	8	SPISKT_MOSI	

Table 2.18: BAT1				
Pin	Signal	Pin	Signal	
1	VBAT	2	GND	

2.9 Serial ATA (SATA1 / SATA2 / SATA3 / SATA4 / SATA5 / SATA6), Serial ATA Power connectors (SATAPWR1)

AIMB-290 features a high performance Serial ATA III interface (up to 600 MB/s) which eases hard drive cabling with thin, space-saving cables.



Table 2.19: SATA1~ SATA6			
Pin	Signal	Pin	Signal
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		

Table 2.20: SATAPWR1				
Pin	Signal	Pin	Signal	
1	+12V	2	GND	
3	GND	4	+5V	

2.10 Fan Connector (CPUFAN1/SYSFAN1/SYSFAN2/ SYSFAN3/SYSFAN4)

If a fan is used, this connector supports cooling fans of 500 mA (6 W) or less. Supports smart fan function.



Table 2.21: CPUFAN1		
Pin	Signal	
1	GND	
2	+12V	
3	DETECT	
4	PWM IN	

Table 2.22: SYSFAN1/ SYSFAN2/ SYSFAN3/ SYSFAN4

Pin	Signal
1	GND
2	+12V
3	DETECT
4	PWM IN

2.11 PS/2 Keyboard and Mouse Connector (KBMS1)

6-pin mini-DIN connectors (KBMS1) is for supporting the PS/2 keyboard and PS/2 mouse by a cable P/N 1703060191.



Table 2.23: KBMS1		
Pin	Signal	
1	KB CLK	
2	KB DATA	
3	MS CLK	
4	GND	
5	+5V	
6	MS DATA	

2.12 ATX/AT Mode Selection (PSON1)



Table 2.24: PSON1		
Function	Jumper Setting	
AT Mode (1-2)	3 2 1	
ATX Mode (2-3) (Default)	3 2 1	

2.13 System Error LED Connector (SYS_LED) / NETWORK LED Pin Header (LANLED1)



Table 2.25: SYS_LED				
Pin	Signal	Pin	Signal	
1	+3.3V_Stand by	2	ERR_LED#	

Table 2.26: LANLED1				
Pin	Signal	Pin	Signal	
1	LAN1 ACT# LED	2	+3.3V Stand by	
3	LAN2 ACT# LED	4	+3.3V Stand by	

2.14 Case-Open Detect Connector (JCASE1)



Table 2.27: JCASE1		
Pin	Signal	
1	CASEOP#	
2	GND	
2.15 Power Connector (EATXPWR1, ATX12V1)

This connector is for an ATX power supply with EATXPWR1 or DC-12V only with ATX12V1. The plugs from the power supply are designed to fit these connectors in only one direction. Determine the proper orientation and push down firmly until the connectors mate completely.



- 1. Please use either EATXPWR1 or ATX12V1. Do not use both connectors at the same time.
- Please connect the ATX12V1 connector with the PSU ATX 12V 4pin connector.
- 3. For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version).



Table	Table 2.28: EATXPWR1				
Pin	Signal	Pin	Signal		
1	+3.3V	13	+3.3V		
2	+3.3V	14	-12V		
3	GND	15	GND		
4	+5V	16	PSON#		
5	GND	17	GND		
6	+5V	18	GND		
7	GND	19	GND		

Table 2.28: EATXPWR1				
8	POWER_OK	20	NC	
9	+5VSB	21	+5V	
10	+12V	22	+5V	
11	+12V	23	+5V	
12	+3.3V	24	GND	

Table 2.29: ATX12V1				
Pin	Signal	Pin	Signal	
1	GND	2	GND	
3	+12V	4	+12V	

2.16 PCI Express x8 Slot (PCIEX8_1)

AIMB-290 provides a PCIe x8 slot to install add-on cards when their applications require higher graphic performance than the CPU embedded graphics controller can be provided.



Table 2	2.30: PCIEX8_1			
Pin	Signal	Pin	Signal	
B1	+12V	A1	N.C.	
B2	+12V	A2	+12V	
B3	+12V	A3	+12V	
B4	GND	A4	GND	
B5	SMB_CLK	A5	N.C.	
B6	SMB_DATA	A6	N.C.	
B7	GND	A7	N.C.	
B8	+3.3V	A8	N.C.	
B9	N.C.	A9	+3.3V	
B10	+3.3VAUX	A10	+3.3V	
B11	WAKE#	A11	PWRGD	
B12	N.C.	A12	GND	
B13	GND	A13	REFCLK+	
B14	TX7+	A14	REFCLK-	
B15	TX7-	A15	GND	
B16	GND	A16	RX7+	
B17	N.C.	A17	RX7-	
B18	GND	A18	GND	
B19	TX6+	A19	N.C.	
B20	ТХ6-	A20	GND	
B21	GND	A21	RX6+	
B22	GND	A22	RX6-	
B23	TX5+	A23	GND	
B24	TX5-	A24	GND	
B25	GND	A25	RX5+	
B26	GND	A26	RX5-	
B27	TX4+	A27	GND	
B28	TX4-	A28	GND	
B29	GND	A29	RX4+	
B30	N.C.	A30	RX4-	
B31	N.C.	A31	GND	
B32	GND	A32	N.C.	
B33	TX3+	A33	N.C.	
B34	TX3-	A34	GND	
B35	GND	A35	RX3+	
B36	GND	A36	RX3-	
B37	TX2+	A37	GND	
B38	TX2-	A38	GND	
B39	GND	A39	RX2+	
B40	GND	A40	RX2-	
B41	TX1+	A41	GND	
B42	TX1-	A42	GND	
B43	GND	A43	RX1+	
B44	GND	A44	RX1-	
B45	TX0+	Δ45	GND	

Table 2.30: PCIEX8_1				
B46	ТХ0-	A46	GND	
B47	GND	A47	RX0+	
B48	N.C.	A48	RX0-	
B49	GND	A49	GND	

2.17 MINIPCIE / mSATA Connector (MINIPCIE1)





Table 2.31: MINIPCIE1

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3Vaux
3	Reserved	4	GND
5	Reserved	6	+1.5V
7	CLKREQ#	8	Reserved
9	GND	10	Reserved
11	REFCLK-	12	Reserved
13	REFCLK+	14	Reserved
15	GND	16	Reserved
17	Reserved	18	GND
19	Reserved	20	DISABLE#
21	DETECT#	22	RESET#
23	PCIE_RX+	24	+3.3Vaux
25	PCIE_RX-	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TX-	32	SMB_DATA

Table 2.31: MINIPCIE1				
33	PCIE_TX+	34	GND	
35	GND	36	USB_D-	
37	GND	38	USB_D+	
39	+3.3Vaux	40	GND	
41	+3.3Vaux	42	Reserved	
43	V1.2_DETECT#	44	LED_WLAN#	
45	Reserved	46	Reserved	
47	Reserved	48	+1.5V	
49	Reserved	50	GND	
51	MSATA_DETECT#	52	+3.3Vaux	



BIOS Operation

3.1 Introduction

With the AMI BIOS Setup program, you can modify BIOS settings to control the special features of your computer. The Setup program uses a number of menus for making changes. This chapter describes the basic navigation of the AIMB-290 setup screens.

3.2 BIOS Setup

The AIMB-290 Series system has AMI BIOS built in, with a SETUP utility that allows users to configure required settings or to activate certain system features.

The SETUP saves the configuration in the FLASH of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to preserve the FLASH.

When the power is turned on, press the or <Esc> button during the BIOS POST (Power-On Self Test) to access the CMOS SETUP screen.

Control Keys	
$\langle \leftarrow \rangle \langle \rightarrow \rangle$	Select Screen
< \ >< \ >	Select Item
<enter></enter>	Select
<+/->	Change Opt
<f1></f1>	General help
<f2></f2>	Previous Values
<f3></f3>	Optimized Defaults
<f4></f4>	Save & Exit
<esc></esc>	Exit

3.2.1 Main Menu

Press 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.

Aptio Setup Utility Main Advanced IntelRCSetup Se	<mark>– Copyright (C) 2017 American</mark> rver Mgmt Event Logs Securit	Megatrends, Inc. y Boot Save & Exit
BIOS Information BIOS Vendor Core Version Compliancy Project Version Build Date and Time Access Level Project Board Version Power Type	American Megatrends 5.0.1.3 0.31 x64 UEFI 2.6; PI 1.4 AIMB A2900000F60X043 12/28/2017 13:31:14 Administrator AIMB-290 BMC ATX	Set the Date. Use Tab to switch between Date elements. Default Ranges: Year: 2005–2099 Months: 1–12 Days: dependent on month
Memory Information Total Memory Memory Frequency System Date System Time	16384 MB (DDR4) 2133 MHz [Thu 12/28/2017] [12:57:13]	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266.	Copyright (C) 2017 American M	egatrends, Inc.

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. 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.

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

Select the Advanced tab from the AIMB-290 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, 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 screen is shown below. The sub menus are described on the following pages.

Aptio Setup Utility – Copyright (C) 2017 American Main Advanced IntelRCSetup Server Mgmt Event Logs Security	Megatrends, Inc. y Boot Save & Exit
 Trusted Computing ACPI Settings NCT6776 Super IO Configuration H/W Monitor AST2500SEC Super IO Configuration S5 RTC Wake Settings Serial Port Console Redirection Network Stack Configuration CSM Configuration USB Configuration SDIO Configuration 	Trusted Computing Settings
 Intel(R) Ethernet Connection X553 16bE - 00:A0:C9:00:00:00 Intel(R) Ethernet Connection X553 16bE - 34:12:78:56:01:01 Intel(R) Ethernet Connection X553/X557-AT 10GBASE-T - 00:A0:C9:00:00:02 Intel(R) Ethernet Connection X553/X557-AT 10GBASE-T - 34:12:78:56:01:03 	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266. Copyright (C) 2017 American Me	egatrends, Inc.

3.2.2.1 Trusted Computing

Aptio Setup Utility - Advanced	· Copyright (C) 2017 American	Megatrends, Inc.
TPM20 Device Found Vendor: IFX Firmware Version: 5.51 Security Device Support Active PCR banks Available PCR banks SHA-1 PCR Bank SHA256 PCR Bank Pending operation Platform Hierarchy Storage Hierarchy Endorsement Hierarchy TPM2.0 UEFI Spec Version Physical Presence Spec Version TPM 20 InterfaceType	<pre>[Enable] SHA-1,SHA256 SHA-1,SHA256 [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [TCG_2] [1.3] [TIS]</pre>	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1266. C	opyright (C) 2017 American M	egatrends, Inc.

Security Device Support

Enable or Disable BIOS support for security device.

TPM State
 Enable or disable security day

Enable or disable security device.

Pending operation

Schedule an operation for the security device.

Device Select

TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated.

3.2.2.2 ACPI Settings



- Enable ACPI Auto Configuration
 Enable or Disable ACPI Auto Configuration
 Lock Legacy Resources
 - Enable or disable lock of legacy resources.

Chapter 3 BIOS Operation

3.2.2.3 NCT6776 Super IO Configuration

Aptio Setup Utility — Advanced	Copyright (C) 2017 American	Megatrends, Inc.
NCT6776 Super IO Configuration		Set Parameters of Serial Port
Super IO Chip ▶ Serial Port 1 Configuration ▶ Serial Port 2 Configuration ▶ Digital I/O Configuration	NCT6776	
Case Open Warning Wake On Ring Watch Dog Timer	[Disabled] [Disabled] [Disabled]	
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266. Co	pyright (C) 2017 American M	egatrends, Inc.

Serial Port 1 Configuration

Aptio Setup Utility - Advanced	- Copyright (C) 2017 American	Megatrends, Inc.
Serial Port 1 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=3F8h; IRQ=4;	
Change Settings	[Auto]	
		↔: Select Screen ↓: Select Item
		Enter: Select +/-: Change Opt.
		F1: General Heip F2: Previous Values F3: Optimized Defaults
		F4: Save & Exit ESC: Exit
Version 2 19 1266	onuright (P) 2017 American M	egatrends Inc

Aptio Setup Util. Advanced	ity – Copyright (C) 2017 Americ	can Megatrends, Inc.
Serial Port 2 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=2F8h; IRQ=3;	(666)
Change Settings Device Mode	[Auto] [RS232]	
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.120	56. Copyright (C) 2017 American	n Megatrends, Inc.

Serial Port

Enable or disable serial port 1

Change Settings Select an optimal settings for super IO device.

3.2.2.4 H/W Monitor

PC Health Status

Aptio Setup Utilit Advanced	ty – Copyright (C) 2017 Am	erican Megatrends, Inc.
 PC Health Status System temperature CPU temperature SYSFAN1 Speed CPUFAN1 Speed SYSFAN2 Speed SYSFAN3 Speed SYSFAN4 Speed VCORE +12V +5V +5VSB +V1.2_DDR +V3.3 +3VSB VBAT Smart Fan Mode Configuration CPU Warning Temperature ACPI Shutdown Temperature 	: +49°C : +35°C : N/A : 2299 RPM : N/A : N/A : N/A : 1.016 V : +11.968 V : +5.024 V : +5.024 V : +5.024 V : +3.312 V : +3.296 V : +3.296 V : +3.040 V [Disabled] [Disabled]	Smart Fan Mode Select ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2 19 1266	- Conunight (C) 2017 Amer	ican Medatrends Inc

Smart Fan Mode Configuration

Smart Fan Mode Configuration		▲ CPU Fan Mode Select
CPU Fan Mode CPUFAN Temperature 1 CPUFAN DC/PWM 1 CPUFAN Temperature 2	[SMART FAN IV Mode] 30 102 50	
CPUFAN DC/PWM 2 CPUFAN Temperature 3 CPUFAN DC/PWM 3 CPUFAN Temperature 4 CPUFAN DC/PWM 4	153 70 204 90 255	
CPUFAN Critical Temperature CPUFAN Critical Temp Tolerance System Fan Mode	90 1 [SMART FAN IV Mode]	++: Select Screen †↓: Select Item
SYSFAN Temperature 1 SYSFAN DC/PWM 1 SYSFAN Temperature 2 SYSFAN DC/PWM 2	30 0 40 84	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values
SYSFAN TEMperature 3 SYSFAN DC/PWM 3 SYSFAN Temperature 4 SYSFAN DC/PWM 4 SYSFAN DC/PWM 4	50 168 60 255	F3: Uptimized Defaults F4: Save & Exit ESC: Exit
SYSFAN Critical Temperature SYSFAN Critical Temp Tolerance Version 2, 19, 1266	20 1 Fonuright (C) 2017 America	₩ ▼

Smart Fan Mode Configuration CPU Fan Mode CPU Fan Mode Select CPU Fan Mode ISMART FAN IV Mode] O CPUFAN Temperature 1 30 O CPUFAN Temperature 2 50 O CPUFAN DC/PWH 3 102 O CPUFAN Temperature 3 70 O CPUFAN Temperature 4 90 O CPUFAN Critical Temperature CPU Fan Mode H:: Select Screen System Fan Mode System Temperature 1 0 System Temperature 2 40 Enter: Select System Temperature 3 50 So System Temperature 3 50 So System Temperature 3 50 So System Temperature 4 60 So System Temperature 4 60 So System Critical Temperature 90 So System Critical Temperature 90 So Syste	nuvanceu		
CPU Fan Mode[SMART FAN IV Mode]CPUFAN Temperature 130CPUFAN Temperature 250CPUFAN DC/PHM 2153CPUFAN DC/PHM 3204CPUFAN DC/PHM 40CPUFAN Critical Temperature 490CPUFAN Critical Temperature 490CPUFAN Critical Temperature 5CPU Fan ModeSystem Fan ModeManual ModeSystem Fan ModeManual ModeSystem Fan ModeManual ModeSystem Fan ModeManual ModeSystem Fan ModeFan IV ModeSystem Fan Mode0System Temperature 240System Temperature 350System Temperature 460System N C/PHM 3168System Temperature 460System N DC/PHM 4255System N C/PHM 4255System N C/PHM 4255System N Critical Temperature90System N Critical Temperature90	Smart Fan Mode Configuration		CPU Fan Mode Select
System Fan ModeSHART FAN IV Mode++: Select ScreenSYSFAN Temperature 1011: Select ItemSYSFAN DC/PWM 10+/-: Change Opt.SYSFAN Temperature 240F1: General HelpSYSFAN DC/PWM 284F2: Previous ValuesSYSFAN Temperature 350F3: Optimized DefaultsSYSFAN DC/PWM 3168F4: Save & ExitSYSFAN DC/PWM 4255SSSYSFAN DC/PWM 4255SYSFAN Critical Temperature90SYSFAN Critical Temp Tolerance1	CPU Fan Mode CPUFAN Temperature 1 CPUFAN DC/PWM 1 CPUFAN Temperature 2 CPUFAN DC/PWM 2 CPUFAN Temperature 3 CPUFAN DC/PWM 3 CPUFAN Temperature 4 CPUFAN DC/PWM 4 CPUFAN Critical Temperature CPUFAN Critical Temperature	[SMART FAN IV Mode] 30 102 50 153 70 204 90 CPU Fan Mode Thermal Cruise Mode	
	System Fan Mode SYSFAN Temperature 1 SYSFAN DC/PWM 1 SYSFAN Temperature 2 SYSFAN DC/PWM 2 SYSFAN Temperature 3 SYSFAN DC/PWM 3 SYSFAN Temperature 4 SYSFAN DC/PWM 4 SYSFAN Critical Temperature SYSFAN Critical Temperature	SMART FAN IV Mode 0 40 84 50 168 60 255 90 1	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

CPU Fan Mode / System Fan Mode

Select an optimal settings for Fan mode.

3.2.2.5 AST2500SEC Super IO Configuration

Aptio Setup Utility – Advanced	Copyright (C) 2017 American	Megatrends, Inc.
AST2500SEC Super ID Configuration		Set Parameters of Serial Port
Super IO Chip ▶ Serial Port 1 Configuration	AST2500SEC	
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266. Co	pyright (C) 2017 American M	egatrends, Inc.

Aptio Setup U Advanced	tility – Copyright (C) 2017 Am	erican Megatrends, Inc.
Serial Port 1 Configuration		Enable or Disable Serial Port
Serial Port	[Disabled]	(COM)
		++: Select Screen
		Enter: Select
		F1: General Help
		F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
Version 2.19	.1266. Copyright (C) 2017 Amer	ican Megatrends, Inc.

3.2.2.6 S5 RTC Wake Settings

Wake system from S5 [Disabled] Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime, System will wake on the current time + Increase minute(s) **: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit ESC: Exit	Aptio Setu Advanced	up Utility – Copyright (C) 2017 Americ	can Megatrends, Inc.
++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	Wake system from S5	[Disabled]	Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime , System will wake on the current time + Increase minute(s)
			<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Wake system from S5

Enable or disable system wake on alarm event. Select FixedTime, system will wake on the hr:min:sec specified. Select DynamicTime, system will wake on the current time + Increase minute(s)

3.2.2.7 Serial Port Console Redirection

COM1 Console Redirection [Disabled] Console Redirection Settings Serial Comunication via IPMI COM (Disabled) Console Redirection Port Is Disabled Legacy Console Redirection Legacy Console Redirection Settings	Console Redirection Enable or Disable.
Serial Port for Out-of-Band Management/	
<pre>Windows Emergency Management Services (EMS) Console Redirection [Disabled] ▶ Console Redirection Settings</pre>	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>







Console Redirection

This item allows users to enable or disable console redirection.

3.2.2.8 Network Stack Configuration

Advance	Aptio Setup Utility – Copyrig d	ht (C) 2017 American	Megatrends, Inc.
Network Stack	[Disab	led]	Enable/Disable UEFI Network Stack
			<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
	Version 2.19.1266. Copyright	(C) 2017 American M	egatrends, Inc.

Aptio Setup Ut: Advanced	llity – Copyright (C) 2017 Ame	erican Megatrends, Inc.
Network Stack Ipv4 PXE Support Ipv4 HTTP Support Ipv6 PXE Support Ipv6 HTTP Support IP6 Configuration Policy PXE boot wait time Media detect count	[Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Automatic] 0 1	Enable/Disable UEFI Network Stack
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.3	l266. Copyright (C) 2017 Ameri	can Megatrends, Inc.

Network Stack

Enable or Disable UEFI Network Stack

3.2.2.9 CSM Configuration

Aptio Setup Utility Advanced) – Copyright (C) 2017 A	merican Megatrends, Inc.
COM1 Console Redirection Settings Terminal Type Bits per second Data Bits Parity Stop Bits Flow Control VT-UTF8 Combo Key Support Recorder Mode Resolution 100x31 Putty KeyPad	[ANSI] [115200] [8] [None] [1] [None] [Enabled] [Disabled] [Disabled] [V1100]	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Aptio Setup Advanced	o Utility – Copyright (C) 20	17 American Megatrends, Inc.
Out-of-Band Mgmt Port Terminal Type Bits per second Flow Control Data Bits Parity Stop Bits	[CDM1] [VT-UTF8] [115200] [None] 8 None 1	Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.
Version 2.	.19.1266. Copyright (C) 2017	American Megatrends, Inc.

Aptio Setup Utility - Advanced	Copyright (C) 2017 American	Megatrends, Inc.
Compatibility Support Module Config	uration	Enable/Disable CSM Support.
CSM Support	[Enabled]	
CSM16 Module Version	07.81	
GateA20 Active INT19 Trap Response	[Upon Request] [Immediate]	
Boot option filter	[UEFI only]	
Option ROM execution		
Network Storage Video Other PCI devices	[UEFI] [UEFI] [UEFI] [UEFI]	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266. C	opyright (C) 2017 American M	legatrends, Inc.









CSM Support

Enable or disable CSM Support

GateA20 Active

UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE - execute the trap right away; POSTPONED - execute the trap during legacy boot.

Boot option filter

This option controls Legacy/UEFI ROMs priority.

Option ROM execution

- Network [UEFI]
- Storage [UEFI]
- Video [UEFI]
- Other PCI device [UEFI]

Note!

If your HDD or other boot device is installed as Legacy mode, it may



- cause blue screen situation. There are 2 ways to solve this: 1. Re-install your OS as UEFI Mode
- 2. Change all of settings above as " Legacy"
- Boot option filter ->Legacy Only
- Network ->Legacy
- Storage ->Legacy
- Video ->Legacy
- Other PCI devices ->Legacy

3.2.2.10 USB Configuration

Aptio Setup Utility - Advanced	Copyright (C) 2017 American	Megatrends, Inc.
USB Configuration		Enables Legacy USB support.
USB Module Version	19	support if no USB devices are connected. DISABLE option will
USB Controllers: 1 XHCI		keep USB devices available only for EFI applications.
USB Devices: 1 Drive, 2 Keyboards, 2 Mice,	3 Hubs	
Legacy USB Support XHCI Hand-off USB Mass Storage Driver Support Port 60/64 Emulation	[Enabled] [Enabled] [Enabled] [Enabled]	
USB bardware delaws and time-outs:	[[[[]]]]	↔: Select Screen
USB transfer time-out	[20 sec]	Enter: Select
Device reset time-out	[20 sec]	+/-: Change Opt.
Device power-up delay	[Auto]	F1: General Help
		F2: Previous Values
Mass Storage Devices:	Found and	F3: Optimized Defaults
KingstonDataTraveler 3.0PMAP	[Auto]	F4: Save & Exit
		LOC: EXIC
Version 2.1 <u>9.1266.</u> Co	opyright (C) 2017 American M	legatrends, Inc.

Aptio Setup Utili Advanced	ty – Copyright (C) 2017 American	Megatrends, Inc.
USB Configuration		The time-out value for
USB Module Version	19	transfers.
USB Controllers: 1 XHCI USB Devices: 1 Drive, 2 Keyboards, 2 M	ice, 3 Hubs	
Legacy USB Support XHCI Hand-off USB Mass Storage Driver Support Port 60/64 Emulation	USB transfer time-out	t: Select Screen
USB hardware delays and time–ou USB transfer time–out		↓: Select Item nter: Select
Device reset time-out Device power-up delay	[20 sec] [Auto]	+/−: Change Opt. F1: General Help F2: Previous Values
Mass Storage Devices: KingstonDataTraveler 3.0PMAP	[Auto]	F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.126	6. Copyright (C) 2017American M	legatrends, Inc.

Legacy USB Support

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

XHCI Hand-off

This is a workaround for 0Ses without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

- USB Mass Storage Driver Support Enable/disable USB Mass Storage Driver support.
- USB transfer time-out The time-out value for Control, Bulk, and Interrupt transfers.
- Device reset time-out

USB mass storage device start unit command time-out

Device power-up delay

Maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a Root port it is 100ms, for a hub port the delay is taken from Hub descriptor.

3.2.2.11 SDIO Configuration

Aptio Setup U Advanced	tility – Copyright (C) 201	7 American Megatrends, Inc.
SDIO Configuration		Auto Option: Access SD device
SDIO Access Mode		supports it,otherwise in PIO
Mass Storage Devices:		device in DMA mode.PIO Option: Access SD device in PID mode
Sdio Device 1 Details:		
Bus 0 Dev 1c Func 0 MMC - AJNB4R(15.6GB)	SDIO Access Mo Auto ADMA SDMA PIO	de ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19	.1266. Copyright (C) 2017	American Megatrends, Inc.



3.2.2.12 Intel® Ethernet Connection X553 1GbE

Aptio Setup Utility – Copyright (C) 2017 American Main Advanced IntelRCSetup Server Mgmt Event Logs Securit	Megatrends, Inc. y Boot Save & Exit
 Trusted Computing ACPI Settings NCT6776 Super ID Configuration H/W Monitor AST2500SEC Super ID Configuration S5 RTC Wake Settings Serial Port Console Redirection Network Stack Configuration CSM Configuration USB Configuration SDID Configuration Intel(R) Ethernet Connection X553 16bE - 00:A0:C9:00:00:00 Intel(R) Ethernet Connection X553 16bE - 34:12:78:56:01:01 Intel(R) Ethernet Connection X553/X557-AT 106BASE-T - 00:A0:C9:00:00:02 Intel(R) Ethernet Connection X553/X557-AT 106BASE-T - 34:12:78:56:01:03 	Trusted Computing Settings ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1266. Copyright (C) 2017 American M	egatrends, Inc.

NIC Configuration

Click to configure the network device port.

Link Speed

Specifies the port speed used for the selected boot protocol.

Wake On LAN Enable or disable Wake On LAN.

3.2.3 Chipset Configuration Setting

Select the chipset tab from the BIOS setup screen to enter the Chipset Setup screen. Users can select any item in the left frame of the screen, such as PCI express Configuration, to go to the sub menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> keys. All Chipset Setup options are described in this section. The Chipset Setup screens are shown below. The sub menus are described on the following pages.

Aptio Setup Utilit Main Advanced IntelRCSetup S	t <mark>y – Copyright (C) 2017 America</mark> Server Mgmt Event Logs Securi	n Megatrends, Inc. ty Boot Save & Exit
Relax Security Configuration Processor Configuration Server ME Configuration North Bridge Chipset Configurat: South Bridge Chipset Configurat:	[Disabled] Lon	Relaxes the security configuration to be able to use BIOS update tools
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266	b. Copyright (C) 2017 American	Megatrends, Inc.

3.2.3.1 Processor Configuration

Aptio Setup Utili IntelRCSetup	ity – Copyright (C) 2017 Americ	an Megatrends, Inc.
Processor Configuration		▲ Enable/Disable EIST. GV3 and
Processor ID Processor Frequency CPU BCLK Frequency Microcode Revision L1 Cache RAM L2 Cache RAM Processor Version	000506F1 2.000GHz 100MHz 0000001E 56KB 2048KB Intel(R) Atom(TM) CPU C3958 @ 2.00GHz	be available. GV3 must be enabled for Turbo. Auto – Enable for BO CPU stepping, all others disabled, change setting to override.
EIST (GV3) BIOS Request Frequency TM1 TM2 Mode Dynamic Self Refresh PMOP Levels CPU C State Package C State limit Max Core C-State Enhanced Halt State (C1E) Monitor/Mwait L1 Prefetcher L2 Prefetcher ACPI 3.0 T-States	[Enable] [Enable] [Adaptive Throttling] [Disable] [Fast] [Enable] [No Limit] [C6] [Enable] [Enable] [Enable] [Enable] [Enable] [Disable]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.

Aptio Setup Utilit IntelRCSetup	y – Copyright (C) 20:	7 American Megatrends, Inc.
Package C State limit Max Core C-State Enhanced Halt State (C1E) Monitor/Mwait L1 Prefetcher L2 Prefetcher ACPI 3.0 T-States Fast String Machine Check VMX BIST Selection Extended APIC AES-NI	[No Limit] [C6] [Enable] [Enable] [Enable] [Enable] [Enable] [Enable] [Enable] [Enable] [Enable] [Enable]	 Displays and provides option to change the DFX Processor Settings
Lock PACKAGE_RAPL_LIMIT PL1 Time Window PL1 Power Level PL2 Power Level Active Processor Cores Dump Crash Log CPU Flex Ratio Override CPU Core Ratio Ratio Limits > Ratio Limits Configuration > Processor DFX Configuration	[Disable] 45 31 37 0 [Disable] [Disable] 24 [Disable]	<pre>14: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266	. Copyright (C) 2017	American Megatrends, Inc.

3.2.3.2 Server ME Configuration



3.2.3.3 North Bridge Chipset Configuration

ECC Support		
	[Enabled]	Select to enable/disable ECC Support ++: Select Screen 11: Select Item
		+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

ECC Support

Enable or Disable ECC memory support (If the RAM don't support ECC, please don't open the ECC function, or the system will maybe have unexpected error.)

Chapter 3 BIOS Operation

3.2.3.4 South Bridge Chipset Configuration



Aptio Setup Utility – Copyright (C) 2017 American IntelRCSetup	Megatrends, Inc.
▶ SATA Controller 0 ▶ SATA Controller 1	Configuration of SATA Controller
	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266. Copyright (C) 2017 American Me	egatrends, Inc.







SATA Configuration

SATA ports information and settings.

Aptio Setup Utility – Copyright (C) 2017 American IntelRCSetup	Megatrends, Inc.
 USB SS Configuration USB HS Configuration 	USB super speed configuration
	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266. Copyright (C) 2017 American Me	gatrends, Inc.

Aptio Setup Utility – Copyright (C) 2017 American IntelRCSetup	Megatrends, Inc.
▶ Port 0 (USB0102) ▶ Port 1 (USB0102) ▶ Port 2 (USB0304)	Port configuration
	<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266. Copyright (C) 2017 American M	egatrends, Inc.

Aptio Setup Utili IntelRCSetup	ity – Copyright (C) 2017 Ame	erican Megatrends, Inc.
USB SS Physical Connector	[Enabled]	Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

 Port 0 (USB0102) Port 1 (USB0102) Port 2 (USB0304) Port 3 (USB Hub) 	Port configuration
	++: Select Screen
	<pre>fl: Select Scient fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Aptio Setup Uti IntelRCSetup	lity – Copyright (C) 2017 Ame	erican Megatrends, Inc.
USB Physical Connector	[Enabled]	Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1	266. Copyright (C) 2017 Ameri	ican Megatrends, Inc.

Aptio Setup Utility – Copyright (C) 2017 American IntelRCSetup	Megatrends, Inc.
<pre> Port 0 (USB0102) Port 1 (USB0102) Port 2 (USB0304) Port 3 (USB Hub) </pre>	Port configuration (USB Hub for USB0304 & USB0506 & BMC)
	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266. Copyright (C) 2017 American Me	gatrends, Inc.

USB Configuration

USB ports information and settings.

Aptio Setup Utility – Copyright (C) 2017 American IntelRCSetup	Megatrends, Inc.	
Pcie Slot Mini PCI Express	Configuration of PCI Express Root Port ++: Select Screen tl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.19.1266. Copyright (C) 2017 American Me	egatrends, Inc.	
	Aptio Setup Utility – Copyright (C) 2017 America IntelRCSetup	an Megatrends, Inc.
----------------------------	--	---
Link Speed ASPM Support	[Gen3] [L1]	Select upper limit on link operational speed for PCI Express RootPort.
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>



PCIE IP Configuration

PCIE information and settings.

1	Aptio Setup Utility – IntelRCSetup	Copyright (C) 2017 American	Megatrends, Inc.
C-state POPUP		[Enabled]	Enable/Disable C-state POPUP
			<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
	Version 2.19.1266. C	opyright (C) 2017American M	legatrends, Inc.



State After G3

Specify what state to go to when power is re-applied after a power failure (G3 state)

- Lan1 & Lan2 Controller Enable or Disable Lan1 & Lan2 ports.
- Lan3 & Lan4 Controller
 Enable or Disable Lan3 & Lan4 ports.

PCIE Wake

Enable or Disable PCIE to wake the system from S5

3.2.4 Server Mgmt

If your AIMB-290 can support IPMI, you can modify these setting to meet your demand.

Aptio Setup Utility – Main Advanced IntelRCSetup Serve	<mark>Copyright (C) 2017 American</mark> r Mgmt <mark>Event Logs Securit</mark>	Megatrends, Inc. y Boot Save & Exit
BMC Self Test Status BMC Device ID BMC Device Revision BMC Firmware Revision IPMI Version BMC Support > System Event Log > Bmc self test log > BMC network configuration	PASSED 34 1 3.2 2.0 [Enabled]	Enable∕Disable interfaces to communicate with BMC
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266. Co	pyright (C) 2017American M	egatrends, Inc.

BMC Support

Enable or Disable BMC support.

Aptio Setup Utility – Serve	Copyright (C) 2017 American r Mgmt	Megatrends, Inc.
Enabling/Disabling Options SEL Components	[Enabled]	Change this to enable or disable all features of System Event Logging during boot.
Erasing Settings Erase SEL When SEL is Full	[No] [Do Nothing]	
Custom EFI Logging Options Log EFI Status Codes	[Error code]	
NOTE: All values changed here do not until computer is restarted.	take effect	
		++: Select Screen ↑↓: Select Item Enter: Select
		+/-: Change Opt. F1: General Help 52: Brewiews Values
		F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1266. Co	pyright (C) 2017 American M	egatrends, Inc.

SEL Components

Enable or Disable SEL Components to Control via command.

Aptio Setup Utili	ty – Copyright (C) 2017 America Server Mgmt	an Megatrends, Inc.
Enabling/Disabling Options SEL Components	[Enabled]	Disable the logging of EFI Status Codes or log only error onde or only progress code or
Erasing Settings Erase SEL When SEL is Full	[No] [Do Nothing]	both.
Custom EFI Logging Options Log EFI Status Codes	[Error code]	
NOTE: All values changed here d until computer is restart	Disabled Both Error code	
	Progress code	↔: Select Screen 1↓: Select Item Enter: Select
		 +/-: Change Upt. F1: General Help F2: Previous Values F2: Detimized Defaults
		F4: Save & Exit ESC: Exit
Version 2.19.126	6. Copyright (C) 2017 American	Megatrends, Inc.







Aptio Setup Utility – Serve	Copyright (C) 2017 Americar r Mgmt	n Megatrends, Inc.
Log area usage = 00 out of 20 logs		Erase Log Options
Erase Log When log is full	[Yes, On every reset] [Clear Log]	
Log Empty		
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266. Cc	pyright (C) 2017 American M	legatrends, Inc.





***		channel parameters statically
Configure IPV4 support		or dynamically(by BIOS or
***		BMC). Unspecified option will
		not modify any BMC network
Lan channel 1		parameters during BIOS phase 👘
Configuration Address source	[Unspecified]	
Current Configuration Address	DynamicAddressBmcDhcp	
source		
Station IP address	0.0.0.0	
Subnet mask	0.0.0.0	
Station MAC address	00-c0-a8-12-34-56	
Router IP address	0.0.0.0	
Router MAC address	00-00-00-00-00	↔: Select Screen
		↑↓: Select Item
***		Enter: Select
Configure IPV6 support		+/-: Change Opt.
***		F1: General Help
		F2: Previous Values
Lan channel 1		F3: Optimized Defaults
		F4: Save & Exit
IPV6 Support	[Disabled]	ESC: Exit
IPV6 is not supported in BMC (OR) IF	PV6 Support is Disabled.	

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3.2.5 Event Logs

If your AIMB-290 can support IPMI, you can view event log to find out the failure operation. You can set these items to meet the your or environment demand.

Aptio Setup Utility – Copyright (C) 2017 American	n Megatrends, Inc.
Main Advanced IntelRCSetup Server Mgmt <mark>Event Logs</mark> Securi	ty Boot Save & Exit
▶ Change Smbios Event Log Settings	Press <enter> to change the</enter>
▶ View Smbios Event Log	Smbios Event Log configuration.
	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2,19,1266, Convright (C) 2017 American t	Megatrends Inc

Aptio Setup Utility — (Copyright (C) 2017 American Event Logs	Megatrends, Inc.
Enabling/Disabling Options Smbios Event Log	[Enabled]	Change this to enable or disable all features of Smbios Event Logging during boot.
Erasing Settings Erase Event Log When Log is Full	[No] [Do Nothing]	
Smbios Event Log Standard Settings Log System Boot Event MECI METW	[Enabled] 1 60	
Custom Options Log OEM Codes Convert OEM Codes	[Enabled] [Disabled]	→++: Select Screen †↓: Select Item Enter: Select
NOTE: All values changed here do not until computer is restarted.	take effect	+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1266. Co	pyright (C) 2017 American Mu	egatrends, Inc.

Aptio Setup Utilit	y – Copyright (C) 2017 Amer. Event Logs	ican Megatrends, Inc.
Enabling/Disabling Options Smbios Event Log	[Enabled]	Choose options for reactions to a full Smbios Event Log.
Erasing Settings Erase Event Log When Log is Full	<mark>[No]</mark> [Do Nothing]	
Smbios Event Log Standard Settir Log System Boot Event MECI METN	ngs [Enabled] 1 	
Custom Options Log OEM Codes Convert OEM Codes	Do Nothing Erase Immediately	++: Select Screen 14: Select Item Fator: Solect
NOTE: All values changed here do not take effect until computer is restarted.		+/-: Change Opt. F1: General Help F2: Previous Values
		F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1266	6. Copyright (C) 2017 America	an Megatrends, Inc.
Antio Setur Utilit	u - Copupidht (C) 2017 Ameri	icon Magathanda The

Aptio Setup Utility –	Copyright (C) 2017 American Event Logs	Megatrends, Inc.
Enabling/Disabling Options Smbios Event Log	[Enabled]	Choose options for erasing Smbios Event Log. Erasing is done prior to any logging
Erasing Settings Erase Event Log When Log is Full	[No] [Do Nothing]	activation during reset.
Smbios Event Log Standard Settings Log System Boot Event MECI METW Custom Options Log OEM Codes	[Enabled] 1 — Erase Event Log — No Yes, Next reset Yes, Every reset	++: Select Screen
Convert OEM Codes NOTE: All values changed here do not until computer is restarted.	take effect	<pre>\$</pre>
Version 2.19.1266. Co	pyright (C) 2017 American Mu	egatrends, Inc.

	Aptio	Setup Utility -	- Copyright (C) 2017 Americar Event Logs	Megatrends, Inc.
DATE	TIME	ERROR CODE	SEVERITY	DESCRIPTION
12/19/17 12/19/17	13:54:41 13:54:41	Smbios 0x16 Smbios 0x17	N/A N/A	Lug hred Keset
				<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
	Vensi	ion 2.19.1266. C	Copyright (C) 2017American №	legatrends, Inc.

3.2.6 Security

- Aptio Setup Utility Main Advanced IntelRCSetup Serv	• Copyright (C) 2017 American Per Mgmt Event Logs Securit	Megatrends, Inc. y Boot Save & Exit		
Password Description If ONLY the Administrator's passwor then this only limits access to Set only asked for when entering Setup. If ONLY the User's password and must be boot or enter Setup. In Setup the L have Administrator rights. The password length must be in the following range: Minimum length Maximum length Administrator Password User Password	d is set, up and is then this entered to lser will 3 20	Set Administrator Password ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		
Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.				

3.2.7 Boot



- Setup Prompt Timeout [1] Use the <+> and <-> keys to adjust the number of seconds to wait for setup activation key.
- Bootup NumLock State Select the keyboard NumLock state
- Quiet Boot
 Enable/disable quiet boot option

3.2.8 Save & Exit

Aptio Setup Uti. Main Advanced IntelRCSetup	l <mark>ity – Copyrig</mark> Server Mgmt	ht (C) 2017 Event Logs	American M Security	egatrends, Inc. Boot Save & Exit
Save Options Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Changes Discard Changes Default Options Restore Defaults Save as User Defaults Restore User Defaults Boot Override UEFI: Built-in EFI Shell			E t t -→↑ f F F F F F E	<pre>xit system setup after saving he changes.</pre>
Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.				

Save Changes and Exit

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer to take effect all system configuration parameters.

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

Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

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

Save Changes and Reset

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer to take effect all system configuration parameters.

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

Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration.

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

Restore Defaults

The BIOS automatically configures all setup items to optimal settings when users select this option. Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Defaults if the user's computer is experiencing system configuration problems. Select Restore Defaults from the Exit menu and press <Enter>.

Save as User Default Save the all current settings as a user default.

Restore User Default

Restore all settings to user default values.



Software Introduction & Service

4.1 Introduction

The mission of Advantech Server Software Services is to "Enhance quality of life with Advantech platforms and Microsoft® Windows® server technology" We enable Windows® server software products on Advantech platforms to more effectively support the server computing community. Customers are freed from the hassle of dealing with multiple vendors (hardware suppliers, system integrators, OS distributors) for projects. Our goal is to make Windows® Server solutions easily and widely available to the embedded computing community.

4.2 Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. Provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security and offers add-on value for Advantech platforms. It plays the role of catalyst between developer and solution, and makes Advantech embedded platforms easier and simpler to adopt and operate with customer applications.

4.2.1 Software API

4.2.1.1 Control

GPIO



SMBus



General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off the device. Our API also provides Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus is the System Management Bus defined by Intel Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

4.2.1.2 Monitor

Watchdog



Hardware Monitor



A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own. A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

4.2.2 Software Utility



The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up current BIOS by copying it from the flash chip to a file on the customers' disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

Monitoring



Monitoring is a utility for customers to monitor system health, like voltage, CPU and system temperature and fan speed. These items are important to a device, if critical errors occur and are not solved immediately, permanent damage may be caused.



Chipset Software Installation Utility

5.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for AIMB-290 are located on Advantech website. (http://support.advantech.com/Support/.) Updates are provided via Service Packs from Microsoft*.

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user manual before performing the installation.

5.2 Introduction

The Intel[®] Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

5.3 Windows Server 2016 Driver Setup

1. When enter the website of Advantech, then search product AIMB-290. There is "Chipset" driver inside.



www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

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