

User Manual

AIMB-503

Intel® Core[™] i7/i5/i3 LGA1150 MicroATX with CRT/DP/DVI/ LVDS, 10 COM, 4 USB 3.0, 7 USB 2.0, Dual LAN



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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	sSpec.	Power	Mfg. Tech	нт	L2 cache	L3 cache	Package Type	Advantech PN
Intel® Haswell I7-4770S	QE73	65W	22nm	NA	NA	8MB	LGA1150	96MPI7-3.1-8M10T
Intel® Haswell I5-4570TE	Q2'13	35W	22nm	NA	NA	4MB	LGA1150	96MPI5-2.7-4M10T
Intel® Haswell E3-1275	QE6A	84W	22nm	NA	NA	8MB	LGA1150	96MPXE-3.5-8M10T
Intel® Pentium® Processor G3320TE	Q3'13	35W	22nm	NA	NA	3MB	LGA1150	NA
Intel® Pentium® Processor G3420T	Q3'13	35W	22nm	NA	NA	3MB	LGA1150	NA
Intel® Core™ i3-4330 Processor (4M Cache, 3.50 GHz)	Q2'13	65W	22nm	NA	NA	ЗМВ	LGA1150	96MPI3-3.5-4M10T
Intel® Core™ i5-4570S Processor (6M Cache, up to 3.60 GHz)	QE75	65W	22nm	NA	NA	6MB	LGA1150	96MPI5-2.9-6M10T
Intel® Core™ i7-4770TE Processor (8M Cache, up to 3.30 GHz)	Q2'13	45W	22nm	NA	NA	8MB	LGA1150	96MPI7-2.3-8M10T

CPU Compatibility

Memory Compatibility

Brand	Size	Speed	Туре	ECC	Vendor PN	Memory	Advantech PN
Transcend	1GB	DDR3 1066	DDR3	N	TS128MLK64V1U	SEC K4B1G0846G-BCH9	96D3-1G1066NN-TR
Transcend	2GB	DDR3 1066	DDR3	Ν	TS256MLK64V1U	SEC K4B1G0846G-BCH9	96D3-2G1066NN-TR
Apacer	1GB	DDR3 1066	DDR3	Ν	78.01GC3.420	ELPIDA J1108BDBG-DJ-F (128x8)	96D3-1G1066NN-AP
Apacer	2GB	DDR3 1066	DDR3	Ν	78.A1GC3.421	ELPIDA J1108BDBG-DJ-F (128x8)	96D3-2G1066NN-AP
Apacer	4GB	DDR3 1066	DDR3	Ν	78.B1GDJ.AF1	HYNIX H5TQ2G83BFR-H9C	NA
Transcend	1GB	DDR3 1333	DDR3	Ν	TS128MLK64V3U	ELPIDA EDJ1108BFBG-DJ-F	96D3-1G1333NN-TR
Transcend	2GB	DDR3 1333	DDR3	Ν	TS256MLK64V3U	SEC K4B1G0846G-BCH9	96D3-2G1333NN-TR4
Transcend	4GB	DDR3 1333	DDR3	N	TS512MLK64V3N	HYNIX H5TQ2G83CFR H9C 256x8	96D34G1333NN-TR
Annon	100	000 4000	0002	NI	78.01GC6.AF0	H5TQ1G83DFR-H9C	
Apacer	IGB	DDR3 1333	DDR3	IN		H5TQ1G83TFR-H9C	96D3?1G1333NN-AP1
Apacer	2GB	DDR3 1333	DDR3	N	78.A1GDE.4200C	ELPIDA J2108BCSE-DJ-F	96D3?2G1333NN-AP2
Apacer	2GB	DDR3 1333	DDR3	N	78.A1GDE.AF00C	Hynix H5TQ2G838FR(256x8)	96D3?2G1333NN-AP1
Apacer	4GB	DDR3 1333	DDR3	N	78.B1GDE.AF1	HYNIX H5TQ2G83BFR-H9C	96D3?4G1333NN-AP
Apacer	4GB	DDR3 1333	DDR3	Ν	78.B1GDE.AF1	HYNIX H5TQ2G83BFR H9C 256x8	96D3?4G1333NN-AP
Apacer	8GB	DDR3 1333	DDR3	Ν	78.C1GEP.4210C	ELPIDA J4208BASE-DJ-F 512x8	78.C1GEP.4210C
Kingston	2GB	DDR3 1333	DDR3	Ν	KVR1333D3S8N9/2G	ELPIDA J2108BCSE-DJ-F(128x8)	NA
Kingston	4GB	DDR3 1333	DDR3	N	KVR1333D3N9/4G	KINGSTON D2568JENCPGD9U(512x64)	NA
ATP	2GB	DDR3 1600	DDR3	N	XQ16A8N2GS-9-AV	SEC K4B2G0846D (256x8)	NA
ATP	2GB	DDR3 1600	DDR3	N	XQ16A8N2GM-9-AV	MICRON 2HM77 D9PFJ (256x8)	NA
ATP	4GB	DDR3 1600	DDR3	N	XQ16B8N4GS?9-AV	SEC K4B2G0846D (256x8)	NA
ATP	8GB	DDR3 1600	DDR3	Ν	XQ16B8N8GS?9-AV	SEC K4B4G0846B (512x8)	NA
Apacer	8GB	DDR3 1600	DDR3	Ν	78.C1GET.ATF0C	Micron 2FD27 D9PCP (512x8)	NA
DSL	2GB	DDR3 1600	DDR3	N	D3US56081XH12AA	SEC 113 HCK0 K4B2G0846C 256x8	NA
DSL	4GB	DDR3 1600	DDR3	N	D3US56082XH12AA	SEC 113 HCK0 K4B2G0846C 256x8	NA
Transcend	2GB	DDR3 1600	DDR3	Ν	TS256MLK64V6N	MICRON IRM72 D9PFJ	NA
Transcend	4GB	DDR3 1600	DDR3	Ν	TS512MLK64V6N	MICRON IUM22 D9PFJ	NA
Transcend	4GB	DDR3 1600	DDR3	Ν	TS512MLK64V6N	MICRON 2EM77 D9PFJ 256x8	NA
Transcend	8GB	DDR3 1600	DDR3	Ν	TS1GLK64V6H	micron IZD27 D9PBC 512x8	NA

Ordering Information

Part Number	PCH	Memory	VGA	DVI	LVDS	USB 3.0/2.0	COM	SIM Card Holder	LAN	PCIe x 16	PCIe x 4	PCIe x 1	PCI slot	AMP
AIMB-503F-00A1E	B85	Non ECC	1	1	1	4/7	10	Yes	2	1	1	1	-	1
AIMB-503G2-00A1E	B85/H81	Non ECC	1	1	(1) Optional	2/7	10	Yes	2	1	-	2	1	(1)
AIMB-503L-00A1E	H81	Non ECC	1	1	-	2/7	2	-	1	1	-	2	-	(1)
to DOM selface available or MD sector														

*() BOM options available on MP version.

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For outof-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

- 1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
- 2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
- 3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
- 4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
- 5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

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

- AIMB-503 Intel LGA1150 Core i7/i5/i3 Micro ATX Motherboard
- SATA HDD cable x 2
- I/O port bracket x 1
- Startup manual x 1
- Driver CD x 1
- Warranty card x 1
- COM port cable kit x 3

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-503 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-503, 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.

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General Information

1.1 Introduction

AIMB-503 is designed with the Intel B85/H81 for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports Intel Core i7-4770S 3.1 GHz/Core i5-4570S 2.9 GHz/Core i7-4770TE 2.3 GHz/Core i5-4570TE 2.7 GHz/Core i3-4330 3.5 GHz/ Pentium G3320TE 2.3 GHz processor up to 8 MB L3 cache and DDR3 1333/1600 up to 16 GB. It has rich I/O connectivity of 10 serial ports, 4 USB 3.0, 7 USB 2.0, dual GbE LAN and 3 SATA III/II ports.

1.2 Features

- Rich I/O connectivity: Dual GbE LAN via PCIe x 1 bus, 1 x PCI 32- bit/33 MHz PCI slots, 4 USB 3.0, 7 USB 2.0, 10 serial ports, 1 PCIe x 16, 1 PCIe x 4, and 1 PCIe x 1.
- Standard Micro ATX form factor with industrial feature: The AIMB-503 is a full featured Micro ATX motherboard with balanced expandability and performance.
- Wide selection of storage devices: SATA HDD, customers benefit from the flexibility of using the most suitable storage device for larger capacity.
- **Optimized integrated graphic solution:** With Intel® Flexible Display Interface, it supports versatile display options and 32-bit 3D graphics engine.

1.3 Specifications

1.3.1 System

- **CPU:** Intel Core 4th i7/i5/i3/Pentium
- BIOS: AMI EFI 64 Mbit SPI BIOS
- System chipset: Intel® B85/H81
- SATA hard disk drive interface: Three on-board SATA connectors with data transmission rate up to 600/300 MB

1.3.2 Memory

- RAM: Up to 16 GB in 2 slots 240-pin DIMM sockets. Supports dual-channel DDR3 1333/1600 MHz SDRAM.
 - Supports non-ECC unbuffered DIMMs and do not support any memory configuration that mixes non-ECC with ECC unbuffered DIMMs.

Note!

A 32-bit OS may not fully detected 16 GB of RAM when 16 GB is installed.



1.3.3 Input/Output

- PCIe slot: 1 PCIe x16 expansion slot, PCIe x4 expansion slot and 1 PCIe x1 expansion slot.
- PCI Bus: 1 PCI slot, 32-bit/33 MHz PCI 2.2 compliant
- **Parallel port:** Configured to LPT1 or disabled. LPT1 supports EPP/SPP/ECP.
- Serial port: Ten serial ports, two RS-232/422/485 with hardware auto-flow control and eight RS-232.
- Keyboard and PS/2 mouse connector: Two 6-pin mini-DIN connectors are located on the mounting bracket for easy connection to PS/2 keyboard and mouse.
- USB port: Supports up to 4 USB 3.0, 7 USB 2.0 ports with transmission rates up to 5G/480 Mbps.
- GPIO: AIMB-503 supports 8-bit GPIO from super I/O for general purpose control application.

1.3.4 Graphics

- **Controller:** Intel® HD Graphics
- Display memory: 1 GB maximum shared memory with 2GB and above system memory installed
- DVI: Supports DVI up to resolution 1920 x 1200 @ 60Hz refresh rate
- CRT1: Supports VGA up to resolution 1920 x 1200 @ 60Hz refresh rate
- DP: Up to 3840 x 2160 resolution
- **LVDS:** Supports dual channel 48 bit and up to 1920 x 1200

1.3.5 Ethernet LAN

- Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 bus which provides 500 MB/s data transmission rate
- Controller: LAN 1: Realtek 8111E-VL; LAN 2: Realtek 8111E-VL

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: +3.3 V, +5 V, +12 V, -12 V, 5 Vsb

Power consumption:

-Intel® Core[™] i7-4770S CPU @ 3.10GHz + DDR3 8G X2 1600 + SATA H.D.D, +5V @ 1.41A, +3.3V @ 1.14A, +12V @ 4.8A, 5Vsb @ 0.42A, -12V@ 0.13A Measure the maximum current value which system under maximum load (CPU: Top speed, RAM: Full loading)

- Board size: 244 mm x 244 mm (9.6" x 9.6")
- Board weight: 0.5 kg

1.4 Jumpers and Connectors

Connectors on the AIMB-503 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					
CMOS1	Clear CMOS (Default 1-2)					
JLVDS1	LVDS panel power setting					
PSON1	AT mode (1-2); ATX mode (2-3)					
JIR1+JWDT1+JOBS1	CIR interface, Watchdog Timer Output and OBS Beep					
JSETCOM3/ JSETCOM7	COM3 & COM7 RS-232/422/485 jumper setting					
JSETCOM1_V1, JSETCOM2_V1	RI#(1-2)/5V(3-4)/12V(5-6) Select					
JCASE1	Case open sensor					

Table 1.2: Connectors						
Label	Function					
VGA1	VGA1 connector					
DVI1	DVI connector					
INV1	Inverter power output					
LVDS1	LVDS connector					
LANLED1	LAN LED					
LAN1_USB45; LAN2_USB12	LAN & USB connector					
FPAUD1	Front audio header					
AMP1	Adjust audio volume					
AUDIO1	Line out /Mic in connector					
SATA1/2/3	SATA1/2/3/4 on board connector					
USB3/67/89/1011	USB on board connector					
SPI_CN1	SPI connector					
LPC1	LPC connector for debug					
LPT1	Print port					
COM2	Serial port 2 on board connector					
COM3456/COM78910	Serial port 3/4/5/6/7/8/9/10 on board connector					
KBMS2	KB, MS header					
CPU FAN1	CPU fan connector					
SYS FAN1/SYS FAN2	FAN1/2 System fan connector					
GPIO1	GPIO connector					
VOLT1	VOLT connector					
JFP3	Front panel connector					
JIR1+JWDT1+JOBS1	CIR interface, Watchdog Timer Output and OBS Beep					
SMBUS1	SMBUS header					

Table 1.2: Connectors

JFP1+JFP2

Power LED and Keyboard Lock Pin Header, Power Switch/HDD LED/SMBUS/Speaker Pin Header

1.5 Board layout: Jumper and Connector Locations



Figure 1.1 Jumper and Connector Location



Figure 1.2 I/O Connectors

1.6 AIMB-503 Board Diagram



AIMB-503F-00A1E (B85)





AIMB-503G2-00A1E (H81)

Figure 1.4 AIMB-503G2 Block Diagram

AIMB-503L-00A1E (H81)



Figure 1.5 AIMB-503L 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.

1.8.2 CMOS Clear (CMOS1)

The AIMB-503 motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set CMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

r Setting	
O ○ 1-2 closed	
2-3 closed	
\bigcirc	• 2-3 closed

* Default

1.8.3 JLVDS1: LCD Power 3.3 V/5 V/ 12 V Selector

Table 1.4: JLVDS1: LCD Power 3.3 V/5 V/ 12 V Selector		
Closed Pins	Result	
JLVDS1		
2-4	Jumper for 5V LVDS panel	
4-6	Jumper for 3.3V LVDS panel*	
3-4	Jumper for 12V LVDS panel	

*Default

Table 1.5: JLVDS1: LCD Power 3.3 V/5 V/ 12 V Selector			
Function	Jumper Setting		
Jumper position for 5V	1 0 2 0 0 6		
	JLVDS1(2-4)		
Jumper position for 3.3V (Default)	1 0 2 0 0 5 0 0 6		
	JLVDS1(4-6)		
Jumper position for 12V	1 0 2 0 0 5 0 0 6		
	JLVDS1(3-4)		

1.8.4 PSON1: ATX, AT Mode Selector

Table 1.6: PSON1: A	TX, AT Mode Selector	
Function	Jumper Setting	
1-2	AT Mode	
2-3*	ATX Mode	

*Default



1.8.5 JIR1+JWDT1+JOBS1: CIR interface, Watchdog Timer Output and OBS Beep

Table 1.7: JWDT1+JOBS1: Wat Option	chdog Timer Output and OBS Alarm
Function	Jumper Setting
Watchdog Timer Output (4-6) (Default) OBS BEEP(8-9)(Default)	2 10 00000 1 9 (4 and 6) + (8 and 9)
Watchdog Timer Disable (2-4) OBS BEEP(8-9)(Default)	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$



12345

*: Default

1.8.6 COM3/COM7 RS232/422/485 mode selector (JSETCOM3 & JSETCOM7)

Users can use JSETCOM3 & JSETCOM7 to select among RS232/422/485 mode for COM3 & COM7. The default setting is RS232.

Table 1.8: COM3 8	& COM7	RS 232/422/485	mode selector	(JSETCOM3 &
JSETCOM7)				

Function	Jumper Setting	
*RS232	(5-6) + (7-9) + (8-10) + (13-15) + (14-16) closed	
RS422	(3-4) + (9-11) + (10-12) + (15-17) + (16-18) closed	
RS-485	(1-2) + (9-11) + (10-12) + (15-17) + (16-18) closed	
*: Default		

1	RS	23	2	F	RS	42:	2	R	S	185	5
-	0	0	~	-	0	0	2	-	0	0	2
•	0	0	-	•	0	0	4	•	0	0	4
5	0	0	9	5	0	0	0	ŝ	0	0	0
~	0	0	æ	-	0	0	80	2	0	0	
6	0	0	2		0	0	2		0	0	\$
÷	0	0	5	Ŧ	0	$ \circ $	12	Ŧ	0	0	5
13	0	0	4	3	0	0	1	13	0	0	\$
15	0	0	\$	\$	0	0	\$	\$	0	0	ę
÷	0	0	-	4	0	0	-	4	0	0	2

1.8.7 JSETCOM1_V1, JSETCOM2_V1: Power setting for COM1 & COM2

Table 1.9: JSETCOM1_V1, JS COM2	ETCOM2_V1: Power setting for COM1 &
Function	Jumper Setting
Jumper position for RI# (Default)	1 0 2 0 0 0 5 0 0 6 1 and 2
Jumper position for 5V	1 0 2 5 0 0 6 3 and 4
Jumper position for 12V	1 0 2 0 0 6 5 0 0 6 5 and 6

1.8.8 JCASE1: Case Open Sensor

The AIMB-503 motherboard contains a jumper that provides a chassis open sensor. The buzzer on the motherboard beeps when the case is opened.

1.9 System Memory

AIMB-503 has two 240-pin memory sockets for 1333/1600 MHz memory modules with maximum capacity of 16GB (Maximum 8GB for each DIMM). AIMB-503 supports only non-ECC DDR3 memory modules.

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 Installation

The AIMB-503 is designed for LGA1150, Intel Core i7/Core i5/Core i3 processor.



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 (LAN1_USB45/LAN2_USB12/USB3/ USB67/USB89/USB1011)

The AIMB-503 provides up to 11 USB ports. The USB interface complies with USB Specification Rev 2.0 supporting transmission rates up to 5G/480 Mbps. The USB interface can be disabled in the system BIOS setup.

The AIMB-503 is equipped with two high-performance 1000 Mbps Ethernet LAN adapters, both of which are supported by all major network operating systems. The RJ-45 jacks on the rear panel provides convenient LAN connection.



Table 2.1: LAN	Table 2.1: LAN LED Indicator		
LAN Mode	LAN Indicator		
	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)	
LAN1 indicator	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)	
	LED2 (Left)	1000 Mbps (On)	
	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)	
LAN2 indicator	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)	
	LED2 (Left)	1000 Mbps (On)	

2.3 USB Power Switch

AIMB-503 allows users to set USB power between +5VSB and +5V. When the jumper is set as 2-3, do not tick "Allow this device to bring the computer out of standby" under device manager (as below figure 2.1) if users do not request to have the board wake up from S3 via USB device keyboard or mouse.



Figure 2.1 HID-compliant Mouse Properties

DUALPWR3/DUALPWR2	USB/PS2 KBMS Power setting
Setting	Function
1-2	USB/PS2 KBMS power from MOS
2-3	USB/PS2 KBMS power from +5V

DUALPWR2- Jumper for on board USB DUALPWR3- Jumper for rear side USB & PS/2 KBMS



When USB power is switched to +5V, it can't be connected with power KVM.

2.4 VGA1/ DVI-D DP1 Connector



AIMB-503 includes VGA,DVI and DP interfaces that can drive conventional VGA,DVI and DP displays. VGA is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for VGA,DVI and DP connectors are detailed in Appendix B.

2.5 Serial Ports (COM1~COM10)



AIMB-503 supports ten serial ports. COM1. COM2. COM4-6. COM8-10 supports RS-232. COM3 & COM7 supports RS-232/422/485 (supports RS-485 auto flow control). JSETCOM3 & JSETCOM7 is used to select the RS-232/422/485 mode for COM3 & COM7. COM1 & COM2 is with selectable 5V/12V power.

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.

2.6 PS/2 Keyboard and Mouse Connector (KBMS1)/ External PS/2 Keyboard and Mouse Connector (KBMS2)



Two 6-pin mini-DIN connectors (KBMS1) on the motherboard provide connection to a PS/2 keyboard and a PS/2 mouse, respectively. KBMS2 is for supporting the 2nd PS/2 keyboard and PS/2 mouse by a cable P/N 1700018699.

2.7 CPU Fan Connector (CPU_FAN1)



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

2.8 System FAN Connector (SYSFAN1/2)



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

2.9 Power Switch/HDD LED/SMBUS/Speaker, Power LED and Keyboard Lock Pin Header (JFP1,JFP2)

There are several headers for monitoring and controlling the AIMB-503.







JFP2	Front panel connector
Pin	Pin Name
1	SIO_SUSLED
2	NC
3	GND
4	#KEYLOCK
5	GND

2.10 Line Out, Mic In Connector (AUDIO1)





2.11 SMBUS Header (SMBUS1)

AIMB-503 provides SMBUS connector for customer connection to SMBUS protocol embedded device. It can be configured to I2C by customer's request.



2.12 Serial ATA Interface (SATA1 ~ SATA3)



AIMB-503 features a high performance Serial ATA interface (up to 600/300 MB/s) which eases hard drive cabling with thin, space-saving cables.

2.13 Adjust Audio Volume connector (AMP1)





AMP1	Adjust audio volume	
Pin	Pin Name	
1	AMP_L_OUT_C	
2	AMP_L_OUT	
3	GND	
4	AMP_R_OUT	
5	AMP_R_OUT_C	

AMP1 connects to the alarm board on the chassis. These alarm boards give warnings if a power supply or fan fails, or if the chassis overheats.

Chapter 2 Connecting Peripherals

2.14 PCI express x16 slot



AIMB-503 provides a PCIe x16 slot for users to install add-on cards when their applications require higher graphic performance than the CPU embedded graphics controller can provide.

2.15 Front Headphone Connector (FPAUD1)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 (optional) audio standard. Connect this connector with the front panel audio I/O module cable.





FPAUD1	Front audio header
Pin	Pin Name
1	MIC2_L
2	GND
3	MIC2_R
4	F_AUDIO_DET#
5	LIN2_R
6	MIC2_JD
7	SENSE_B
8	NC
9	LIN2_L
10	LIN2_JD

Note!

For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to take advantage of the motherboard's high definition audio capability.

2.16 ATX Power Connector (EATXPWR1, ATX12V1)

This connector is for an ATX Micro-Fit power supply. 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.



- Note!
 1. Please connect the ATX12V1 connector with the PSU ATX 12V 4-pin connector.
 2. For a fully configured system, we recommend that you use a power
 - 2. 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) and provides a minimum power of 180 W.

2.17 SPI Flash connector(SPI_CN1)

The SPI flash card pin header may be used to flash the BIOS if the AIMB-503 cannot power on.





SPI_CN1	SPI connector
Pin	Pin Name
1	SPI_POWER
2	GND
3	SPI_CS#
4	SPI_CLK
5	SPI_MISO
6	SPI_MOSI
7	NC
8	SPI_HOLD#
2.18 LCD Inverter Connector (INV1)





INVI	Inverter Power Output
Pin	Pin Name
1	+12V
2	GND
3	ENABKL
4	VBR
5	+5V

2.19 LVDS Connector (LVDS1)





2.20 General Purpose I/O Connector (GPIO1)





GPIO1	GPIO connector
Pin	Pin Name
1	SIO_SPIO0
2	SIO_SPIO1
3	SIO_SPIO2
4	SIO_SPIO3
5	SIO_SPIO4
6	SIO_SPIO5
7	SIO_SPIO6
8	SIO_SPIO7
9	VCC_GPIO
10	GND

2.21 LPC Connector for Debug (LPC1)



	LPC1	
1		2
3		4
5	L. 51	6
7	[••]	8
-		10
9	2.5	10
11		12
13	[••]	14
		01
	PH(F)_7	x2V_2.00mm



BIOS Operation

3.1 Introduction

AMI BIOS has been integrated into many motherboards, and has been very popular for over a decade. People sometimes refer to the AMI BIOS setup menu as BIOS, BIOS setup or CMOS setup.

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-503 setup screens.

3.2 BIOS Setup

The AIMB-503 Series system has AMI BIOS built in, with a CMOS SETUP utility that allows users to configure required settings or to activate certain system features.

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

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

Control Keys	
< ↑ >< ↓ >< ← >< → >	Move to select item
<enter></enter>	Select Item
<esc></esc>	Main Menu - Quit and not save changes into CMOS Sub Menu - Exit current page and return to Main Menu
<page +="" up=""></page>	Increase the numeric value or make changes
<page -="" down=""></page>	Decrease the numeric value or make changes
<f1></f1>	General help, for Setup Sub Menu
<f2></f2>	Item Help
<f5></f5>	Load Previous Values
<f7></f7>	Load Setup Defaults
<f10></f10>	Save all CMOS changes

3.3 Main BIOS Setup

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 Chipset Boot Se	– Copyright (C) 2012 America ecurity Save & Exit	n Megatrends, Inc.
BIOS Information BIOS Vendor Core Version Compliancy Project Version Build Date and Time Project Board Version Power Type	American Megatrends 4.6.5.4 0.35 x64 UEFI 2.3.1; PI 1.2 AIMB A503F00BF60X010 03/14/2014 09:57:45 AIMB-503F-00A1E ATX	Set the Date. Use Tab to switch between Date elements.
Memory Information Memory Frequency Total Memory	1333 Mhz 2048 MB (DDR3)	
System Date System Time	[Wed 03/19/2014] [17:47:09]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt.
Access Level	Administrator	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Wergion 2 15 1296 Comunicati (C) 2012 American Mediatrends 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.

3.3.1 Advanced BIOS Features

Select the Advanced tab from the AIMB-503 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 screen is shown below. The sub menus are described on the following pages.

Aptio Setup Utility – Copyright (C) 2012 American Main <mark>Advanced </mark> Chipset Boot Security Save & Exit	Megatrends, Inc.
 PCI Subsystem Settings ACPI Settings Trusted Computing S5 RTC Wake Settings CPU Configuration SATA Configuration Intel(R) Rapid Start Technology PCH-FW Configuration Intel(R) Anti-Theft Technology Configuration USB Configuration Third Super IO Configuration H/W Monitor Super IO Configuration Second Super IO Configuration Serial Port Console Redirection 	PCI, PCI-X and PCI Express Settings. ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Me	egatrends, Inc.

3.3.2 PCI Configuration

Aptio Setup Utility - Advanced	· Copyright (C) 2012 American	Megatrends, Inc.
PCI Bus Driver Version	V 2.05.02	Value to be programmed into PCI Latency Timer Register.
PCI Common Settings		
PCI Latency Timer	[32 PCI Bus Clocks]	
VGA Palette Snoop	[Disabled]	
PERR# Generation	[Disabled]	
SERR# Generation	[Disabled]	
PCI Express Settings		
		↔: Select Screen
		T↓: Select Item
		Enter: Select ≠/_: Change Ont
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version 2.15.1236. C	opyright (C) 2012 American M	egatrends, Inc.

PCI Latency Timer

Use this to adjust the PCI Latency Timer. This option sets the latency of all PCI devices on the PCI bus. The Optimal and Fail-Safe default setting is 32.

VGA Palette Snoop

Set this value to allow the system to modify the VGA Palette Snoop settings. The Optimal and Fail-Safe default setting is "Disabled".

PERR# Generation
 Disable to suppress the PCI bridge data parity error generation capability.

SERR# Generation

Disable to suppress the PCI bridge system error generation capability.

3.3.3 PCI Express Settings

Aptio Setup Utility — Co Advanced	opyright (C) 2012 American	Megatrends, Inc.
PCI Express Device Register Settings Relaxed Ordering Extended Tag No Snoop Maximum Payload Maximum Read Request	[Disabled] [Disabled] [Enabled] [Auto] [Auto]	Enables or Disables PCI Express Device Relaxed Ordering.
PCI Express Link Register Settings ASPM Support WARNING: Enabling ASPM may cause some PCI-E devices to fail Extended Synch	[Disabled] [Disabled]	
Link Training Retry Link Training Timeout (uS) Unpopulated Links Restore PCIE Registers	[5] 100 [Keep Link ON] [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 2.15.1236. Cop	yright (C) 2012 American Me	egatrends, Inc.

Relaxed Ordering

Enables or disables PCIe device relaxed ordering of PCI Express traffic through switches and the Root Complex.

Extended Tag

Enables or disables Extended Tag. If enabled allows device to use 8-bit tag field in the Requester Transaction ID field.

No Snoop

Enables or disables the PCIe device No Snoop attribute of PCI Express traffic Refer to the PCI Express 1.0 specification.

Maximum Payload

Sets the maximum data payload size that a PCI Express device may transmit within a Transaction Layer Packet.

Maximum Read Request

Sets the maximum data payload size that a PCI Express device may request within a Transaction Layer Packet.

ASPM Support

Configures Active State Power Management, which can power down a link to a PCIe device even when the device is in a full power state. Forcing to L0s will keep the links powered up at all times, regardless of device presence.

Extended Synch

Enabling this setting allows generation of extended synchronization patterns, which may help to allow logic analyzers to achieve symbol lock before the link changes power states and resumes communication.

Link Training Retry

Sets or disables the number of retry attempts software will take to retrain the link if the first training attempt was unsuccessful.

Link Training Timeout (uS)

Sets the number of microseconds software will wait before polling the link training bit in the Link Status register.

Unpopulated Links

If set to "Disable Link," software will disable unpopulated PCIe links to save power.

Restore PCIE Registers Restore PCIE Registers.

3.3.4 ACPI settings

Aptio Setup Utility - Advanced	Copyright (C) 2012 American	Megatrends, Inc.
ACPI Settings		Enables or Disables BIOS ACPI
Enable ACPI Auto Configuration	[Disabled]	nato configuration.
Enable Hibernation ACPI Sleep State Lock Legacy Resources S3 Video Repost	[Enabled] [Both S1 and S3 avai] [Disabled] [Disabled]	
		<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 2.15.1236. Co	pyright (C) 2012 American M	egatrends, Inc.

Enable ACPI Auto Configuration
 Enable or disable BIOS ACPI auto configuration.
 Enable Hibernation

This item allows users to enable or disable Hibernation.

- ACPI Sleep State This item allows users to set the ACPI sleep state
- Lock Legacy Resources
 This item allows users to lock legacy devices' resources.

S3 Video Repost

Enable or disable video repost.

3.3.5 Trusted Computing



Security Device Support

Enable or disable BIOS support for security device.

3.3.6 S5 RTC wake Settings



Enable or disable system wake on alarm event.

Chapter 3 BIOS Operation

3.3.7 CPU Configuration

Aptio Setup Utility – Advanced	Copyright (C) 2012 American	Megatrends, Inc.
CPU Configuration Genuine Intel(R) CPU 0000 @ 2.60GHz CPU Signature Processor Family Microcode Patch FSB Speed Max CPU Speed Max CPU Speed CPU Speed Processor Cores Intel HT Technology Intel VT-× Technology Intel VT-× Technology G4-bit EIST Technology CPU C3 state CPU C3 state CPU C4 state CPU C5 state L1 Data Cache L2 Cache L3 Cache	306c2 6 ffff0006 100 MHz 2600 MHz 800 MHz 2800 MHz 4 Supported Sup	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled. ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	munight (C) 0010 American H	odotpopdo Tpo

3.3.8 SATA Configuration

Aptio : Advanced	Setup Utility – Copyright (C)	2012 American M	Megatrends, Inc.
SATA Controller(s) SATA Mode Selection	[Enabled] [IDE]	E	Enable or disable SATA Device.
Serial ATA Port 1 Software Preserve Serial ATA Port 2 Software Preserve Serial ATA Port 3 Software Preserve mSATA Software Preserve	Empty Unknown Empty Unknown Empty Unknown Empty Unknown		
		- - - - - - - - - - - - - - - - - - -	<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>
Versi	on 2.15.1236. Copyright (C) 2	012 American Meg	gatrends, Inc.

SATA Controllers

To enable or disable SATA controller.

SATA Mode Selection

This can be configured as IDE or AHCI mode.

3.3.9 Intel Rapid Start Technology



Intel Rapid Start Technology

This item allows users to enable or disable Intel Rapid Start Technology.

3.3.10 USB Configuration

Aptio Setup Utility - (Advanced	Copyright (C) 2012 American	Megatrends, Inc.
USB Configuration		Enables Legacy USB support.
USB Module Version	8.10.28	support if no USB devices are connected. DISABLE option will
USB Devices: 1 Drive, 1 Keyboard, 1 Mouse, 3	2 Hubs	keep USB devices available only for EFI applications.
Legacy USB Support USB3.0 Support XHCI Hand-off EHCI Hand-off USB Mass Storage Driver Support	[Enabled] [Enabled] [Enabled] [Disabled] [Enabled]	
USB hardware delays and time-outs: USB transfer time-out Device reset time-out Device power-up delay	[20 sec] [20 sec] [Auto]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. 51: Conceral Wein
Mass Storage Devices: JetFlashTS4GJFV30 8.07	[Auto]	F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1236. Co	ouright (C) 2012 American M	egatrends. Inc.

Legacy USB Support

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

- USB3.0 Support
 - This item allows users to enable or disable USB3.0.
- XHCI Hand-off This is just a workaround item under OS without XHCI hand-off support.
- EHCI Hand-off

This is just a workaround item under OS without EHCI hand-off support.

- USB Mass Storage Driver Support
 This item allows users to enable or disable USB Mass Storage Driver Support.
- USB hardware delays and time-outs
 To set up parameter for detect USB device.
- Mass Storage Devices Shows USB mass storage device information.

3.3.11 Super IO Configuration

	Aptio Setup Utility - Advanced	Copyright (C) 2012 American	Megatrends, Inc.
Γ	Super IO Configuration		Set Parameters of Serial Port
	Super IO Chip Serial Port 1 Configuration Serial Port 2 Configuration Parallel Port Configuration Digital I/O Configuration	NCT6776F	
•	Smart Fan Function Smart Fan Mode Configuration	[Enabled]	
	Case Open Warning Wake On Ring Deep S4/S5 Watch Dog Timer	[Disabled] [Disabled] [Disabled] [Disabled]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2 15 1236 Pr	nuright (P) 2012 American Mu	egatrends Inc

Aptio Setup Utili Advanced	ity – Copyright (C) 2012 Americ	an Megatrends, Inc.
Serial Port 1 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=3F8h; IRQ=4;	
Change Settings	[Auto]	
		<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 2.15.123	36. Copyright (C) 2012 American	Megatrends, Inc.

Serial Port 1 Configuration

Serial Port

To "enable" or "disable" Serial Port 1.

Change Settings

To select the IO address/IRQ setting for serial port 1.



Serial Port 2 Configuration

Serial Port

To "enable" or "disable" Serial Port 2.

- Change Settings To select the IO address/IRQ setting for serial port 2.
- Device Mode
 Device mode select.

Parallel Port Configuration



Parallel Port

To enable or disable Parallel Port.

Super IO Configuration



Serial Port 3 Configuration

Serial Port

To "enable" or "disable" Serial Port 3.

Change Settings

To select the IO address/IRQ setting for serial port 3.

Auto flow control

When the COM is to set as RS-485, it supports auto flow control function.



Serial Port

To "enable" or "disable" Serial Port 4.

Change Settings

To select the IO address/IRQ setting for serial port 4.

Aptio Setup Ut: Advanced	ility – Copyright (C) 2012 Americ	can Megatrends, Inc.
Serial Port 5 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=C90h; IRQ=10;	(Guil)
Change Settings	(Auto)	
		↔: Select Screen ↑↓: Select Item
		Enter: Select +/−: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults F4: Soup & Evit
		ESC: Exit
Version 2.15.1	1236. Copyright (C) 2012 American	n Megatrends, Inc.

Serial Port 5 Configuration

Serial Port

To ,"enable" or "disable" Serial Port 5.

Change Settings

To select the IO address/IRQ setting for serial port 5.



Serial Port 6 Configuration

Serial Port

To "enable" or "disable" Serial Port 6.

Change Settings

To select the IO address/IRQ setting for serial port 6.



Serial Port 7 Configuration

Serial Port

To "enable" or "disable" Serial Port 7.

Change Settings

To select the IO address/IRQ setting for serial port 7.

Auto flow control

When the COM is to set as RS-485, it supports auto flow control function.



Serial Port 8 Configuration

Serial Port

To "enable" or "disable" Serial Port 8.

Change Settings

To select the IO address/IRQ setting for serial port 8.



Serial Port 9 Configuration

Serial Port

To "enable" or "disable" Serial Port 9.

Change Settings

To select the IO address/IRQ setting for serial port 9.



Serial Port 10 Configuration

Serial Port

To "enable" or "disable" Serial Port 10.

Change Settings

To select the IO address/IRQ setting for serial port 10.

Aptio Setup Utility - Advanced	- Copyright (C) 2012 American	Megatrends, Inc.
Super IO Configuration		Set Parameters of Serial Port
Super IO Chip > Serial Port 1 Configuration > Serial Port 2 Configuration > Parallel Port Configuration > Digital I/O Configuration	NCT6776F	
Smart Fan Function ▶ Smart Fan Mode Configuration	[Enabled]	
Case Open Warning	[Disabled]	
Deep S4/S5 Watch Dog Timer	[Disabled] [Disabled]	<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>
Version 2.15.1236. (Copyright (C) 2012 American M	legatrends, Inc.

Digital I/O Configuration
 To configure Digital I/O

Case Open Warning

To "enable" or "disable" Case Open Warning

Wake on Ring
 To "enable" or "disable" Wake on Ring

Watch Dog Timer

To "enable" or "disable" Watch Dog Timer

Aptio Setup U Advanced	tility – Copyright (C) 2012	American Megatrends, Inc.
Digital I/O Configuration		Configure Digital I/O Pin.
Digital I/O Pin 1 Digital I/O Pin 2 Digital I/O Pin 3 Digital I/O Pin 4 Digital I/O Pin 5 Digital I/O Pin 6 Digital I/O Pin 7 Digital I/O Pin 8	[Input] [Input] [Input] [Input] [Input] [Input] [Input]	
		<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 2.15	.1236. Copyright (C) 2012 A	merican Megatrends, Inc.

Digital I/O Configuration

To set up Digital I/O 1~8 to "input" or "output".

3.3.12 Smart Fan Configuration

Aptio Setup Utility Advanced	– Copyright (C) 2012 Ameri	can Megatrends, Inc.
Smart Fan Mode Configuration		CPU Fan Mode Select
CPU Fan Mode CPUFAN Temperature 1 CPUFAN DC/PWM 1 CPUFAN Temperature 2 CPUFAN DC/PWM 2 CPUFAN Temperature 3 CPUFAN Temperature 4 CPUFAN Temperature 4 CPUFAN Critical Temperature	[SMART FAN IV Mode] 40 127 57 170 74 214 90 255 90	
CPUFAN Critical Temp Tolerance	1	
System Fan Mode SYSFAN Temperature 1 SYSFAN DC/PWM 1 SYSFAN Temperature 2 SYSFAN DC/PWM 2 SYSFAN DC/PWM 3 SYSFAN DC/PWM 3 SYSFAN Temperature 4 SYSFAN DC/PWM 4 SYSFAN Critical Temperature SYSFAN Critical Temp Tolerance	[SMART FAN IV Mode] 40 127 57 170 74 214 90 255 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

To adjust CPU smart fan.

System Smart Fan

To adjust System Smart Fan.

Aptio Setup Utility Advanced	– Copyright (C) 2012 America	n Megatrends, Inc.
Pc Health Status		Enabled or Disabled CPU
System temperature	: +34°C	Warning Temperature function
CPU temperature (PECI)	: +51°C	
CPUFAN Speed	: 2477 RPM	
SYSFAN1 Speed	: NZA	
SYSFAN2 Speed	: N/A	
VCORE	: +1.800 V	
+12V	: +12.302 V	
+5V	: +5.086 V	
+5VSB	: +4.990 V	
+3.3V	: +3.343 V	↔: Select Screen
VBAT	: +2.880 V	↑↓: Select Item
		Enter: Select
CPU Warning Temperature	[Disabled]	+/-: Change Opt.
ACPI Shutdown Temperature	[Disabled]	F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version 2_15_1236	Convright (C) 2012 American	Megatrends. Inc.

CPU Warning Temperature

Use this to set the CPU warning temperature threshold. When the system CPU reaches the warning temperature, the buzzer will beep.

ACPI Shutdown Temperature

This screen allows users to set the CPU temperature at which the system will automatically shut down to prevent the CPU from overheating damage.

3.4 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.

3.4.1 PCH-IO Configuration

Aptio Setup Utility – Copyright (C) 2012 American Main Advanced <mark>Chipset</mark> Boot Security Save <u>e</u> xit	Megatrends, Inc.
 PCH-ID Configuration System Agent (SA) Configuration 	PCH Parameters
	<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 2.15.1236. Copyright (C) 2012 American Me	gatrends, Inc.

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Antio Cotum Utili	itu Comuniatt (C) 2012 Am	aniaan Magatranda Tha
Chipset	itg – copyright (c) 2012 H⊪	erican Megatrenus, inc.
Intel PCH RC Version Intel PCH SKU Name Intel PCH Rev ID	1.7.0.0 B85 05/C2	PCI Express Configuration settings
 PCI Express Configuration USB Configuration PCH Azalia Configuration 		
LAN1 Controller LAN1 PXE OpROM	[Enabled] [Disabled]	
LAN2 Controller LAN2 PXE OpROM	[Enabled] [Disabled]	the Soloot Sonoon
PCIE Wake	[Disabled]	fl: Select Item Enter: Select
Restore AC Power Loss	[Power Off]	+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.123	36. Copyright (C) 2012 Amer	ican Megatrends, Inc.
PCI Express Configura Detail of PCI Express ite	ition ems.	
USB Configuration Details of USB items.		

PCH Azalia Configuration Details of PCH azalia items.

- LAN controller
 Enables or disables the LAN1/2 controller.
- LAN option-ROM Enables or disables the LAN1/2 option-ROM.
- PCIE Wake Enables or disables PCIE device wake up from sleep state.
- Restore AC Power Loss
 This item allows users to select off, on and last state.

3.4.1.1 PCI Express Configuration



PCI Express Clock Gating

Enable or disable PCI express clock gating.

Subtractive Decode

Enable or disable Subtractive decode.

Chapter 3 BIOS Operation

3.4.1.2 PCI Express Root Port 1/4/5

Aptio Setup Utility - Chipset	· Copyright (C) 2012 American	Megatrends, Inc.
PCI Express Root Port 1 ASPM Support L1 Substates URR FER NFER CER CTO SEFE SENFE SECE PME SCI Hot Plug PCIE Speed Detect Non-Compliance Device Extra Bus Reserved Reseved Memory Prefetchable Memory Reserved I/O PCIE LTR PCIE LTR PCIE LTR Lock Snoop Latency Override Non Snoop Latency Override	<pre>[Enabled] [Auto] [L1.1 & L1.2] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Enabled] [Auto] [Disabled] 0 10 10 4 [Enabled] [Enabled] [Enabled] [Auto] [Auto]</pre>	Control the PCI Express Root Port. ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit ESC: Exit
VCI 310H 2.13.1200. C	opgi 1girt (6) 2012 milei 160m m	egad enus, inc.
Aptio Setup Utility - Chipset	· Copyright (C) 2012 American	Megatrends, Inc.
PCI Express Root Port 4 ASPM Support L1 Substates URR FER NFER CER CTO SEFE SENFE SECE PME SCI Hot Plug PCIe Speed Detect Non-Compliance Device Extra Bus Reserved Reseved Memory Prefetchable Memory Reserved I/O PCIE LTR PCIE LTR PCIE LTR PCIE LTR PCIE LTR Lock Snoop Latency Override	[Enabled] [Auto] [L1.1 & L1.2] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Auto] [Disabled] 0 10 4 [Enabled] [Enabled] [Auto] [Auto] [Auto]	Control the PCI Express Root Port. ++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

PCI Express Root Port 5[Enabled]Control the PCI Express RootASPM Support[Disabled]Port.L1 Substates[L1.1 & L1.2]URR[Disabled]FER[Disabled]NFER[Disabled]CCR[Disabled]CTO[Disabled]SEFE[Disabled]SENFE[Disabled]SECE[Disabled]POLE Speed[Auto]Pefet Sura Bus Reserved0Reserved I/O4PCIE LTR[Enabled]PCIE LTR Lock[Enabled]PCIE LTR[Auto]PCIE LTR[Auto]PCIE LTR[Auto]PCIE LTR[Auto]PCIE LTR[Auto]PCIE LTR[Auto]PCIE LTR[Aptio Setup Utility - Chipset	· Copyright (C) 2012 American	Megatrends, Inc.
Not FlogInstalledPCIe Speed[Auto]Ptetex Non-Compliance Device[Disabled]Detect Non-Compliance Device[Disabled]Extra Bus Reserved0Extra Bus Reserved0Prefetchable Memory10Prefetchable Memory10Frefetchable Memory10Frefetchable Memory10Fit General HelpReserved I/04PCIE LTR[Enabled]PGIE LTR Lock[Enabled]F4t Save & ExitSnoop Latency Override[Auto]Extra Lock[Auto]	PCI Express Root Port 5 ASPM Support L1 Substates URR FER NFER CER CTO SEFE SENFE SECE PME SCI Hot Blur	[Enabled] [Disabled] [L1.1 & L1.2] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled]	Control the PCI Express Root Port.
	PCIe Speed Detect Non-Compliance Device Extra Bus Reserved Reseved Memory Prefetchable Memory Reserved I/O PCIE LTR PCIE LTR PCIE LTR Lock Shoop Latency Override Non Shoop Latency Override	[Auto] [Disabled] 0 10 10 4 [Enabled] [Enabled] [Auto] [Auto]	<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>

This pages allow users to adjust parameter for PCI express root port 1&4&5.

ASPM Support

Allow user to set the ASPM Level. Force L0s - Force all links to L0s State. AUTO - BIOS auto configure. DISABLE - Disables ASPM.

URR

Enable or disable PCI Express Unsupported Request Reporting.

FER

Enable or disable PCI Express Device Fatal Error Reporting.

NFER

Enable or disable PCI Express Device Non-Fatal Error Reporting.

CER

Enable or disable PCI Express Device Correctable Error Reporting.

СТО

Enable or disable PCI Express Completion Timer TO.

SEFE

Enable or disable Root PCI Express System Error on Fatal Error.

SENFE

Enable or disable Root PCI Express System Error on Non-Fatal Error.

SECE

Enable or disable Root PCI Express System Error on Correctable Error.

PME SCI

Enable or disable PCI Express PME SCI.

Hot Plug

Enable or disable PCI Express Hot Plug.

PCIe Speed Select PCI Express port speed.

Extra Bus Reserved

Extra Bus Reserved for bridges behind this Root Bridge.

- Reserved Memory Reserved Memory Range for this Root Bridge.
- Prefetchable Memory
 Prefetchable Memory Range for this Root Bridge.
- Reserved I/O Reserved I/O (4K/8K/12K/16K/20K) Range for this Root Bridge

3.4.2 USB Configuration

Aptio Setup Utilit Chipset	y – Copyright (C) 2012 Amer	ican Megatrends, Inc.
USB Configuration USB Precondition XHCI Mode BTCG	[Disabled] [Auto] [Enabled]	Precondition work on USB host controller and root ports for faster enumeration.
		<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 2.15.1236	. Copyright (C) 2012 Americ	an Megatrends, Inc.

USB Precondition

Enables or disables the USB Precondition.

XHCI Mode

This item allows users to select USB port mode.

BTCG

Enables or disables the BTCG.

3.4.3 PCH Azalia Configuration



Azalia

This item allows user to enable or disable azalea device.

3.4.4 System agent Configuration

Aptio Setup Chipset	Utility – Copyright (C) 2012 Americ	can Megatrends, Inc.
System Agent Bridge Name System Agent RC Version VT-d Capability	Haswell 1.7.1.0 Supported	Check to enable VT–d function on MCH.
 ∨T-d ▶ Graphics Configuration ▶ DMI Configuration ▶ NB PCIe Configuration ▶ Memory Configuration 	[Enabled]	
		++: Select Screen ↑↓: Select Item
		Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.	15.1236. Copyright (C) 2012 America	n Megatrends, Inc.



Primary Display

This item allows users to select which graphics controller to use as the primary boot device.

Internal Graphics This item allows users to enable or disable IGD.

Aperture Size

This item allows users to select aperture size.

DVMT Pre-Allocated

This item allows users to select DVMT pre-allocated memory size.

DVMT Total Gfx Mem

This item allows users to select DVMT total memory size.

Gfx Low Power Mode

This item allows users to enable or disable Gfx Low Power Mode

LCD Control

This item allows users to setup Display Control configuration.

3.4.4.1 LCD Control configuration



Primary IGFX Boot Display

This items allow users to select the video device which will be activated during post. The available options are VBIOS Default, VGA1, LVDS/VGA2, DVI.

LVDS Panel Type:

1024 x 768 18-bit

1024 x 768 24-bit

1280 x 1024 48-bit

1366 x 768 24-bit

Backlight Signal Control

Backlight signal mode select.

3.4.5 NB PCIe Configuration

Aptio Setup Utility - Chipset	Copyright (C) 2012 American	Megatrends, Inc.	
NB PCIe Configuration PEGO PEGO – Gen X	Not Present [Auto]	Configure PEGO BO:D1:FO Gen1-Gen3	
Run-time C7 Allowed Enable PEG Detect Non-Compliance Device Program PCIE ASPM after OpROM PEGO De-emphasis Control PEGO - ASPM PEG Sampler Calibrate Swing Control PEC Conf Control	[Enabled] [Auto] [Disabled] [Jisabled] [-3.5 dB] [Auto] [Disabled] [Full]		
Gen3 Eq Phase 2 PEG Gen3 Root Port Preset Value for PEG Gen3 Endpoint Preset Value each PEG Gen3 Endpoint Hint Value each L	[Enabled] each Lane Lane ane	↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt.	
Gen3 Eq Preset Search Always re-search Gen3 Eq Preset Allow PERST# GPIO Usage Preset Search Dwell Time Timing Margin Steps Timing Argin Steps	[Enabled] [Disabled] [Enabled] 1000 2	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Voltage Margin Steps Voltage Start Margin	2 20 ▼		
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.			

PEG0 - Gen x

Select PEG0 speed.

 PEG0 ASPM=> Enable/Disable PEG0 ASPM function. (ASPM: Active State Power Management)

Enable PEG

This item allows users to enable or disable PEG always.

Detect Non-Compliance Device

This item allows users to enable or disable Detect Non-Compliance Device function.

3.4.6 Memory Information

Aptio Setup Utility - Chipset	Copyright (C) 2012 American	Megatrends, Inc.
Memory Information	t i i i i i i i i i i i i i i i i i i i	Select DIMM timing profile that should be used.
Memory RC Version	1.7.1.0	
Memory Frequency	1333 Mhz	
Total Memory	2048 MB (DDR3)	
Memory Voltage	1.50v	
DIMMA1	2048 MB (DDR3)	
DIMMB1	Not Present	
CAS Latency (tCL)	9	
Minimum delay time		
CAS to RAS (tRCDmin)	9	
Row Precharge (tRPmin)	9	
Active to Precharge (tRASmin)	24	
XMP Profile 1	Not Supported	↔+: Select Screen
XMP Profile 2	Not Supported	↑↓: Select Item
		Enter: Select
DIMM profile	[Default DIMM profile]	+/-: Change Opt.
Memory Frequency Limiter	[Auto]	F1: General Help
Max TOLUD	[Dynamic]	F2: Previous Values
Enh Interleave Support	[Enabled]	F3: Optimized Defaults
RI Support	[Enabled]	F4: Save & Exit
DLL Weak Lock Support	[Enabled]	ESC: Exit
Mc Lock	[Enabled]	
Ch Hash Support	[Enabled]	
Ch Hash Mask	12494	
		Instatused and Tax
version 2.15.1236. C	opyrigπt (C) 2012 American M	legatrenus, Inc.

Memory Frequency Limiter

Select memory frequency limiter for auto, 1333, 1600.

3.5 Boot Configuration

Aptio Setup Utility – Main Advanced Chipset <mark>Boot</mark> Sec	Copyright (C) 2012 American urity Save & Exit	Megatrends, Inc.
Boot Configuration Setup Prompt Timeout Bootup NumLock State	1 [0n]	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waition
Quiet Boot	[Disabled]	watting.
Boot Option Priorities		
Boot Option #1	[UEET: JetElashTS46J]	
Boot Option #2	[JetFlashTS4GJFV30 8.07]	
Hard Drive BBS Priorities		
		<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 2.15.1236. C	opyright (C) 2012 American M	egatrends, Inc.
Setup Prompt Timeout

This item allows you to change number of seconds to wait for setup activation key.

Bootup NumLock State Select the Dever on state for Num

Select the Power-on state for Numlock.

Quiet Boot

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

- Boot Option #1
 Set the system boot order.
- Boot Option #2

Set the system boot order.

3.6 Security Setting

Aptio Setup Main Advanced Chipset	Utility – Copyright (C) 2012 A Boot Security Save & Exit	merican Megatrends, Inc.
Password Description		Set Administrator Password
If ONLY the Administrator' then this only limits acce only asked for when enteri If ONLY the User's passwor is a power on password and boot or enter Setup. In Se have Administrator rights. The password length must b in the following range: Minimum length	s password is set, ss to Setup and is ng Setup. d is set, then this must be entered to tup the User will e 3 20	
Maximum iength	20	++: Select Screen ↑↓: Select Item
Administrator Password User Password		Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Select Security Setup from the AIMB-503 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>: Change Administrator / User Password.

Administrator Password

Select this option and press <ENTER> to access the sub menu, and then type in the password. Set the Administrator password.

User Password

Select this option and press <ENTER> to access the sub menu, and then type in the password. Set the User Password.

3.7 Save & Exit Configuration

Save Changes and Exit Discard Changes and Reset Discard Changes and Reset Save Options Save Changes Discard Changes Restore Defaults Restore User Defaults Restore User Defaults Boot Overnide JetFlashTS46JFV30 8.07 UEFI: JetFlashTS46JFV30 8.07 Launch EFI Shell from filesystem device F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	Aptio Setup Utility – Copyright (C) 2012 American Main Advanced Chipset Boot Security Save & Exit	Megatrends, Inc.
	Main Advanced Chipset Boot Security Save & Exit Save Changes and Exit Save Changes and Reset Discard Changes and Reset Save Options Save Options Save Changes Discard Changes Discard Changes Discard Changes Discard Changes Save as User Defaults Restore Defaults Save as User Defaults Boot Override JetFlashTS4GJFV30 8.07 UEFI: JetFlashTS4GJFV30 8.07 Launch EFI Shell from filesystem device	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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.

- 1. 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>.

Restore Default

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.

Boot Override

Shows the boot device types on the system.



Chipset Software Installation Utility

4.1 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-503 are located on the software installation CD. The driver in the folder of the driver CD will guide and link you to the utilities and drivers under a Windows system. Updates are provided via Service Packs from Microsoft*.



The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.

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.

4.2 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:

- Core PCI PnP services
- Serial ATA interface support
- USB 1.1/2.0/3.0 support (USB 2.0 driver needs to be installed separately for Win98)

This utility is used for the following versions of Windows, and it has to be

Identification of Intel chipset components in the Device Manager

installed before installing all the other drivers:

Note!



- Windows 7 (32-bit)
- Windows 7 (64-bit)

4.3 Windows 7 Driver Setup

1. Insert the driver CD into your system's CD-ROM drive. You can see the driver folder items. Navigate to the "Intel chip" folder and click "Setup.exe" to complete the installation of the driver.





VGA Setup

5.1 Introduction

The Intel Core i7/i5/i3/Pentium CPUs with dual cores are embedded with an integrated graphics controller. You need to install the VGA driver to enable this function.

Optimized integrated graphic solution: With Intel Graphics Flexible, versatile display options and 32-bit 3D graphics engine are supported. Dual independent displays and enhanced display modes for widescreen flat panels include extended, twin, and clone dual display modes, plus optimized 3D support delivers an intensive and realistic visual experience.

5.2 Windows 7



Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 5 for information on installing the CSI utility.

Insert the driver CD into your system's CD-ROM drive. Navigate to the "Intel Graphics" folder and click "setup.exe" to complete the installation of the drivers for Windows 7.





LAN Configuration

6.1 Introduction

The AIMB-503 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Realtek RTL8111E-VL (LAN1) and Realtek RTL8111E-VL (LAN2)) that offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 1000 Mbps.

6.2 Installation

Note!

		-		
		1.2		
	12	_	. 1	
15	_	_		
16	_	_		

Before installing the LAN drivers, make sure the CSI utility has been installed on your system. See Chapter 5 for information on installing the CSI utility.

The AIMB-503's Realtek RTL8111E-VL (LAN1) and Realtek RTL8111E-VL (LAN2) Gigabit integrated controllers support all major network operating systems. However, the installation procedure varies from system to system. Please find and use the section that provides the driver setup procedure for the operating system you are using.

6.3 Windows® 7 Driver Setup (Realtek RTL8111E-VL)

Insert the driver CD into your system's CD-ROM drive. Select the LAN folder then navigate to the directory for your OS.





Programming the Watchdog Timer

A.1 Programming the Watchdog Timer

AIMB-503's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog Timer Overview

The watchdog timer is built into the super I/O controller Nuvoton NCT6776F. It provides the following user-programmable functions:

- Can be enabled and disabled by user program
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes
- Generates an interrupt or resets signal if the software fails to reset the timer before time-out

A.1.2 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. You must first assign the address of register by writing an address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).



Table A.1: Watchdog	Timer Reg	isters
Address of Register (2E)	Attribute	
Read/Write	Value (2F) & description	
87 (hex)		Write this address to I/O address port 2E (hex) twice to unlock the NCT6776F.
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watch- dog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to bit 3: set second as counting unit. [default] Write 1 to bit 3: set minutes as counting unit.
F6 (hex)	write	0: stop timer [default] 01~FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watch- dog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/write	Bit 7:Write 1 to enable mouse to reset the timer, 0 to disable[default]. Bit 6: Write 1 to enable key- board to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immedi- ately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is "timeout".
AA (hex)		Write this address to I/O port 2E (hex) to lock the watchdog timer 2.

A.1.3 Example Program

1. Enable watchdog timer and set 10 sec. as timeout interval

-----Mov dx,2eh ; Unlock NCT6776F Mov al,87h Out dx,al Out dx.al :-----Mov al,07h ; Select registers of watchdog timer Out dx,al Inc dx Mov al,08h Out dx,al :-----Dec dx ; Enable the function of watchdog timer Mov al,30h Out dx,al Inc dx Mov al.01h Out dx,al :-----Dec dx ; Set second as counting unit Mov al,0f5h Out dx,al Inc dx In al,dx And al.not 08h Out dx,al :-----Dec dx; Set timeout interval as 10 seconds and start counting Mov al.0f6h Out dx,al Inc dx Mov al,10 Out dx,al ;-----Dec dx ; Lock NCT6776F Mov al,0aah Out dx.al 2. Enable watchdog timer and set 5 minutes as timeout interval ;-----Mov dx,2eh ; Unlock NCT6776F Mov al,87h Out dx.al Out dx,al

:-----Mov al,07h ; Select registers of watchdog timer Out dx,al Inc dx Mov al,08h Out dx,al ;-----Dec dx ; Enable the function of watchdog timer Mov al,30h Out dx.al Inc dx Mov al,01h Out dx,al ;-----Dec dx ; Set minute as counting unit Mov al,0f5h Out dx,al Inc dx In al.dx Or al,08h Out dx,al ·-----Dec dx ; Set timeout interval as 5 minutes and start counting Mov al,0f6h Out dx.al Inc dx Mov al.5 Out dx,al :-----Dec dx ; Lock NCT6776F Mov al,0aah Out dx,al 3. Enable watchdog timer to be reset by mouse ._____ Mov dx,2eh ; Unlock NCT6776F Mov al,87h Out dx,al Out dx,al :-----Mov al,07h ; Select registers of watchdog timer Out dx,al Inc dx Mov al,08h Out dx,al :-----

Dec dx ; Enable the function of watchdog timer Mov al,30h Out dx,al Inc dx Mov al,01h Out dx,al ;-----Dec dx ; Enable watchdog timer to be reset by mouse Mov al,0f7h Out dx.al Inc dx In al.dx Or al.80h Out dx,al -----Dec dx ; Lock NCT6776F Mov al,0aah Out dx,al 4. Enable watchdog timer to be reset by keyboard :-----Mov dx,2eh ; Unlock NCT6776F Mov al,87h Out dx.al Out dx,al ;-----Mov al,07h ; Select registers of watchdog timer Out dx,al Inc dx Mov al,08h Out dx,al ;-----Dec dx ; Enable the function of watchdog timer Mov al,30h Out dx.al Inc dx Mov al,01h Out dx,al ;-----Dec dx ; Enable watchdog timer to be strobed reset by keyboard Mov al,0f7h Out dx.al Inc dx In al.dx Or al,40h Out dx,al

;-----Dec dx ; Lock NCT6776F Mov al,0aah Out dx,al 5. Generate a time-out signal without timer counting :-----Mov dx,2eh ; Unlock NCT6776F Mov al,87h Out dx,al Out dx,al ;-----Mov al,07h ; Select registers of watchdog timer Out dx,al Inc dx Mov al,08h Out dx,al ;-----Dec dx ; Enable the function of watchdog timer Mov al,30h Out dx,al Inc dx Mov al,01h Out dx,al ;-----Dec dx ; Generate a time-out signal Mov al,0f7h Out dx,al ;Write 1 to bit 5 of F7 register Inc dx In al,dx Or al,20h Out dx,al ;-----Dec dx ; Lock NCT6776F Mov al,0aah Out dx,al



I/O Pin Assignments

B.1 LAN&USB Connector (LAN1_USB45, LAN2_USB12)



LAN1_USB45, LAN2_USB12	LAN&USB Connector
Part Number	12GA1652003674
Pin	Pin Name
1	GND
2	LAN_MDI0_P
3	LAN_MDI0_N
4	LAN_MDI1_P
5	LAN_MDI1_N
6	LAN_MDI2_P
7	LAN_MDI2_N
8	LAN_MDI3_P
9	LAN_MDI3_N
10	GND
11	LAN_ACT#
12	LAN_ACTP
13	LINKLED#_N
14	LINKLED#_Q
15	+USBV89
16	LP9-
17	LP9+
18	GND
19	+USBV89
20	LP8-
21	LP8+
22	GND

Appendix B I/O Pin Assignments

B.2 USB Connector (USB3,67/89/1011)





Pin	Signal
1	+5V
2	DO-
3	DO+
4	GND

Table B.2: USB Connector (USB67/89/1011)			
USB67/89/1011	USB connector		
Part Number	12GP06-016R000		
Pin	Pin Name		
1	+USBV01		
2	+USBV01		
3	LP0-		
4	LP1-		
5	LP0+		
6	LP1+		
7	GND		
8	GND		
9	NC		
10	GND		

B.3 USB Power Setting (JUSBPWR12, JUSBPWR34, JUSBPWR8~11, JUSBPWR3,6,7)

1	JUSBPWR12	for LAN2_USB12-
	JUSBPWR34	for LAN1_USB45.
30	JUSBPWR3,6,7	for USB3 and USB67.
	JUSBPWR8~11	for USB89 and USB1011

1

Table B.3: USB Power Setting (JUSBPWR12, JUSBPWR34, JUSBPWR8~11, JUSBPWR3,6,7)

Pin	Signal
1	+5V_DUAL
2	USB12/KBMS 5VPower Input
3	+5V

B.4 VGA, DVI-D Connector (VGA1/DVI1)



Table B.4: VGA, DVI-D Connector (VGA1/DVI1)

Pin	Signa	Pin	Signal	
D1	RED	D2	GREEN	
D3	BLUE	D4	ID2	
D5	GND	D6	RED GND	
D7	GREEN GND	D8	BLUE GND	
D9	VCC_VGA	D10	SGND	
D11	ID0	D12	SDA	
D13	HSYNC	D14	VSYNC	
D15	SCL	1	TMDS DATA2?	
2	TMDS DATA2+	3	TMDS DATA 2/4 Shield	
4	GND	5	GND	
6	DDC clock	7	DDC data	
8	GND	9	TMDS DATA1-	
10	TMDS DATA1+	11	TMDS DATA 1/3 Shield	
12	GND	13	GND	
14	+5V	15	GND	
16	Hot Plug Detect	17	TMDS DATA0?	
18	TMDS DATA0+	19	TMDS DATA 0/5 Shield	
20	GND	21	GND	
22	TMDSCLK Shield	23	TMDS CLK0+	
24	TMDS CLK0-			
H1	GND	H2	GND	
H3	GND	H4	GND	
H5	GND			

B.5 Display Port Connector (DP1)



Table B.5: Display Port Connector (DP1)				
Pin	Signa	Pin	Signal	
1	Lane 0+	2	GND	
3	Lane 0-	4	Lane2+	
5	GND	6	Lane 2-	
7	Lane 2+	8	GND	
9	Lane 2-	10	Lane 3+	
11	GND	12	Lane 3-	
13	DP_DETECT	14	GND	
15	AUX+	16	GND	
17	AUX-	18	DP_HPD	
19	GND	20	+3.3V	

B.6 COM Port Connector (COM2)





Table B.6: COM Port Connector (COM1)	
COM1	COM Port Connector
Pin	Signal
1	DCD#
2	RXD
3	TXD
4	DTR#
5	GND
6	DSR#
7	RTS#
8	CTS
9	RI#

Table B.7: COM Port Connector (COM2)	
COM2	COM Port Connector
Part Number	12G07120010T
Pin	Pin Name
1	DDCD1#
2	DDSR1#
3	RRXD1
4	RRTS1#
5	TTXD1
6	CCTS1#
7	DDTR1#
8	COM1_RRI1
9	GND

B.7 COM Port Connector (COM3456/COM78910)



Table B.8: COM Port Connector (COM3456/COM78910)		
COM3456/COM78910	COM Port Connector	
Part Number	12G07120010T	
Pin	Pin Name	
1	COM3_1	
2	DDSR3#	
3	COM3_2	
4	RRTS3#	
5	COM3_3	
6	CCTS3#	
7	COM3_4	
8	RRI3#	

Table B.8: COM Port Connector (COM3456/COM78910)
9	GND
10	GND
11	DDCD4#
12	DDSR4#
13	RRXD4
14	RRTS4#
15	TTXD4
16	CCTS4#
17	DDTR4#
18	RRI4#
19	GND
20	GND
21	DDCD5#
22	DDSR5#
23	RRXD5
24	RRTS5#
25	TTXD5
26	CCTS5#
27	DDTR5#
28	RRI5#
29	GND
30	GND
31	DDCD6#
32	DDSR6#
33	RRXD6
34	RRTS6#
35	TTXD6
36	CCTS6#
37	DDTR6#
38	RRI6#
39	GND
40	GND

B.8 KB/MS Connector (KBMS1)



Table B.9: KB/MS Connector (KBMS1)

KBMS1	KB/MS Connector	
Part Number	12G14101306P	
Pin	Pin Name	
1	CKBDATA	
2	NC	
3	GND	
4	+5V_KBMS	
5	CKBCLK	
6	NC	
7	CMSDATA	
8	NC	
9	GND	
10	+5V_KBMS	
11	CMSCLK	
12	NC	

B.9 KB/MS Header (KBMS2)



Table B.10: KB/MS Header (KBMS2)

KBMS2	KB/MS Header	
Part Number	12GA1655006020	
Pin	Pin Name	
1	CKBCLK	
2	CKBDATA	
3	CMSDATA	
4	GND	
5	+5V_KBMS	
6	CMSCLK	

B.10 CPU FAN Connector (CPU FAN1)

You can use an LED to indicate when the single board computer is on. Pin 1 of JFP2 supplies the LED's power, and Pin 3 is the ground.



Table B.11: CPU FAN Connector (CPU FAN1)		
CPU FAN1	CPU FAN Connector	
Part Number	12G08000504A	
Pin	Pin Name	
1	GND	
2	CPU_SFAN_PWR	
3	CPU_SFAN_D	
4	NC	

B.11 System Fan Connector (SYS FAN1/SYS FAN2)

You can use an LED to indicate when the single board computer is on. Pin 1 of JFP2supplies the LED's power, and Pin 3 is the ground.



Table B.12: System Fan Connector (SYS FAN1/SYS FAN2)		
SYS FAN1/SYS FAN2	System Fan Connector	
Part Number	12G08002003C	
Pin	Pin Name	
1	GND	
2	SYS1_SFAN_PWR	
3	SYS1_SFAN_D	

B.12 Power Switch/HDD LED/SMBUS/Speaker (JFP1)

The single board computer has its own buzzer. You can also connect it to the external speaker on your computer chassis.





Table B.13: Power Switch/HDD LED/SMBUS/Speaker (JFP1)				
Pin	Signa	Pin	Signal	
1	+5V	2	HDDLED+	
3	Power Button+	4	NC	
5	HDDLED-	6	Power Button-	
7	SPK_P3	8	SMB_SATA	
9	System Reset+	10	SPK_P4	
11	SMB_CLK	12	System Reset-	

B.13 Power LED and Keyboard Lock Pin Header (JFP2)

1	2	3	4	5
	0	0	0	0

Table B.14: Power LED and Keyboard Lock Pin Header (JFP2)		
JFP2	Power LED and Keyboard Lock Pin Header	
Part Number	12G06000005C	
Pin	Pin Name	
1	SIO_SUSLED	
2	NC	
3	GND	
4	#KEYLOCK	
5	GND	
Note: Pin1,3 provide LED function ; Pin4,5 provide the ability to lock PS/2 (KBMS) .		

B.14 Audio jack (AUDIO1)



Table B.15: Audio Jack (AUDIO1)	
AUDIO1	Audio Jack
Part Number	12GS2400005F04
Pin	Pin Name
A1	LIN1_L
A2	LIN1_JD
A3	GND
A4	LIN1_R
B1	FRONT_L
B2	FRONT_JD
B3	GND
B4	FRONT_R
C1	MIC1_L
C2	MIC1_JD
C3	GND
C4	MIC1_R
CO	GND

B.15 SM BUS Connector (SMBUS1)



Table B.16: SM BUS Connector (SMBUS1)		
SMBUS1	SM BUS Connector	
Part Number	12GA1655001154	
Pin	Pin Name	
1	+5V	
2	SMB_CLK_MAIN	
3	SMB_DATA_MAIN	
4	GND	

B.16 SATA Connector (SATA1/2/3)



Table B.17: SATA Connector (SATA1/2/3)		
SATA1/2/3	SATA Connector	
Part Number	12GP24-006R000	
Pin	Pin Name	
1	GND	
2	SATA_TXP0_C	
3	SATA_TXN0_C	
4	GND	
5	SATA_RXN0_C	
6	SATA_RXP0_C	
7	GND	

B.17 VOLT Connector (VOLT1)



Table B.18: VOLT Connector (VOLT1)		
VOLT1	VOLT Connector	
Part Number	12GA1655008020	
Pin	Pin Name	
1	+5VA	
2	GND	
3	GND	
4	-5V	
5	+5V	
6	+3P3V	
7	-12V	
8	+12V	

B.18 Front Audio Header (FPAUD1)

FPAUD1			
1		2	
3		4	
5		6	
7			-
9		10	_
HEADER_2X5P_K8			

Table B.19: Front Audio Header (FPAUD1)		
FPAUD1	Front Audio Header	
Part Number	12G06105010V	
Pin	Pin Name	
1	MIC2_L	
2	GND	
3	MIC2_R	
4	F_AUDIO_DET#	
5	LIN2_R	
6	MIC2_JD	
7	SENSE_B	
8	NC	
9	LIN2_L	
10	LIN2_JD	

B.19 ATX 24-pin Power Connector (EATXPWR1)



Table B.20: ATX 24-pin Power Connector (EATXPWR1)		
EATXPWR1	ATX 24-pin Power Connector	
Part Number	12G15020024J	
Pin	Pin Name	
1	+3.3V	
2	+3.3V	
3	GND	
4	+5V	
5	GND	
6	+5V	
7	GND	
8	PWROK	
9	5VSB	
10	+12V	
11	+12V	
12	+3.3V	
13	+3.3V	
14	-12V	
15	GND	
16	PSON#	
17	GND	
18	GND	
19	GND	
20	-5V	
21	+5V	
22	+5V	
23	+5V	
24	GND	

B.20 ATX 4-pin Power Connector (ATX12V1)



Table B.21: ATX 4-pin Power Connector (ATX12V1)		
ATX12V1	ATX 4-pin Power Connector	
Part Number	12G150200047	
Pin	Pin Name	
1	GND	
2	GND	
3	+12V_CPU	
4	+12V_CPU	

B.21 SPI Connector (SPI_CN1)



Table B.22: SPI Connector (SPI_CN1)		
SPI_CN1	SPI Connector	
Part Number	12G06100008T	
Pin	Pin Name	
1	SPI_POWER	
2	GND	
3	SPI_CS#	
4	SPI_CLK	
5	SPI_MISO	
6	SPI_MOSI	
7	NC	
8	SPI_HOLD#	

B.22 Inverter Power Output (INV1)



Table B.23: Inverter Power Output (INV1)		
INV1	Inverter Power Output	
Part Number	12GA1655000453	
Pin	Pin Name	
1	+12V	
2	GND	
3	ENABKL	
4	VBR	
5	+5V	

B.23 LVDS Connector (LVDS1)



Table B.24: LVDS Connector (LVDS1)		
LVDS1	LVDS connectror	
Part Number	12GS1600024H03	
Pin	Pin Name	
1	VDD_LVDS1	
2	VDD_LVDS1	
3	GND	
4	GND	
5	VDD_LVDS1	

6	VDD_LVDS1
7	LVDS1_A0N
8	LVDS1_A4N
9	LVDS1_A0P
10	LVDS1_A4P
11	GND
12	GND
13	LVDS1_A1N
14	LVDS1_A5N
15	LVDS1_A1P
16	LVDS1_A5P
17	GND
18	GND
19	LVDS1_A2N
20	LVDS1_A6N
21	LVDS1_A2P
22	LVDS1_A6P
23	GND
24	GND
25	LVDS1_CLK1
26	LVDS1_CLK2N
27	LVDS1_CLK1P
28	LVDS1_CLK2P
29	GND
30	GND
31	LVDS1_SCD
32	LVDS1_SDD
33	GND
34	GND
35	LVDS1_A3N
36	LVDS1_A7N
37	LVDS1_A3P
38	LVDS1_A7P
39	LVDS1_ENBKL1
40	LVDS1_VCON

B.24 GPIO Connector (GPIO1)



Table B.25: GPIO Connector (GPIO1)		
GPIO1	GPIO Connector	
Part Number	12G061100107	
Pin	Pin Name	
1	SIO_GPIO0	
2	SIO_GPIO1	
3	SIO_GPIO2	
4	SIO_GPIO3	
5	SIO_GPIO4	
6	SIO_GPIO5	
7	SIO_GPIO6	
8	SIO_GPIO7	
9	VCC_GPIO	
10	GND	

B.25 Debug Port (LPC1)



Table B.26: Debug Port (LPC1)	
LPC1	Debug Port
Part Number	12GA1653007220
Pin	Pin Name
1	CLK_PCI_P80
2	LAD1
3	PLTRST#
4	LAD0
5	LFRAME#
6	+3P3V
7	LAD3
8	GND
9	LAD2
10	SMB_CLK_MAIN
11	SERIRQ
12	SMB_DATA_MAIN
13	+5V_DUAL
14	+5V
B.26 DMA Channel Assignments

Table B.27: DMA Channel Assignments		
Channel	Function	
0	Available	
1	Available	
2	Available	
3	ECP Printer Port (LPT1)	
4	Cascade for DMA controller 1	
5	Available	
6	Available	
7	Available	

B.27 Interrupt Assignments

Table B.28: Interrupt Assignments		
Priority	Interrupt#	Interrupt source
1	NMI	Parity error detected
2	IRQ0	Interval timer
3	IRQ1	Keyboard
-	IRQ2	Interrupt from controller 2 (cascade)
4	IRQ8	Real-time clock
5	IRQ9	Cascaded to INT 0A (IRQ 2)
6	IRQ10	Serial communication port 3/4/5/6
7	IRQ11	Serial communication port 7/8/9/10
8	IRQ12	PS/2 mouse
9	IRQ13	INT from co-processor
10	IRQ14	Primary IDE Channel
11	IRQ15	Secondary IDE Channel
12	IRQ3	Serial communication port 2
13	IRQ4	Serial communication port 1
14	IRQ5	Available
15	IRQ6	Available
16	IRQ7	Parallel port 1 (print port)

B.28 1st MB Memory Map

Table B.29: 1st MB Memory Map		
Addr. range (Hex)	Device	
E0000h - FFFFFh	BIOS	
CC000h - DFFFFh	Unused	
C0000h - CBFFFh	VGA BIOS	
A0000h - BFFFFh	Video Memory	
00000h - 9FFFFh	Base memory	



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