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## **AIMB-764**

Socket LGA 775

Intel Core 2 Duo processor / Intel Pentium D / Pentium 4 / Celeron D

1066 MHz FSB

Industrial ATX Motherboard  
with PCIe/DDR2/Dual GbE

## **User Manual**

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## AIMB-764 Memory Tested for Compatibility

Brand	Size	Speed	Type	Vendor PN	Advantech PN	Memory	Result
Apacer	1GB	DDR2 533	DDR2	78.01066.400	NA	SAMSUNG K4T51083QB-ZKD5 (128x4)	PASS
Transcend	256MB	DDR2 533	DDR2	TS32MLQ 64V5F	NA	SAMSUNG 443 K4T56083QF-GCD5 (32x8)	PASS
DSL	512MB	DDR2 533	DDR2	NA	NA	Infineon HYB18T512 800AF37 FSS43331 (64x8)	PASS
	1GB	DDR2 533	DDR2	NA	NA	ELPIDA E5108AE-5C-E (64x8)	PASS
Apacer (RoHS)	1GB	DDR2 533	DDR2	78.01G66.420	NA	ELPIDA E5108AG-5C-E (64x8)	PASS
	512MB	DDR2 667	DDR2	78.91G92.420	NA	ELPIDA E5108AG-6E-E (64x8)	PASS
	1GB	DDR2 667	DDR2	78.01G92.420	NA	ELPIDA E5108AG-6E-E (64x8)	PASS
Transcend (RoHS)	256MB	DDR2 533	DDR2	TS32MLQ 64V5M	96D2-256M533NN-TR	Infineon HYB18T512 160AF3.7 3VV21710 (32x16)	PASS
	512MB	DDR2 533	DDR2	TS64MLQ 64V5J	96D2-512M533NN-TR1	SEC K4T51083QC (64X8)	PASS
	1GB	DDR2 533	DDR2	TS128ML Q64V5J	96D2-1G533NN-TR1	SEC K4T51083QC (64X8)	PASS
	512MB	DDR2 667	DDR2	TS64MLQ 64V6J	96D2-512M667NN-TR	SEC K4T51083QC ES (64x8)	PASS
	512MB	DDR2 667	DDR2	TS64MLQ 64V6J		SEC K4T51083QC	PASS
	1GB	DDR2 667	DDR2	TS128ML Q64V6J	96D2-1G667NN-TR	5*32 D9DCL	PASS
	2GB	DDR2 667	DDR2	TS256ML Q64V6U		SEC K4T51083QC ES	PASS
Transcend	1GB	DDR2 800	DDR2	TS256ML Q64V6U		ProMOS V59C1512804QBF2 5 (64x8)	PASS
DSL	1GB	DDR2 667	DDR2	NA	NA	ELPIDA E5108AGBG-6E-E (64x8)	PASS
	1GB	DDR2 800	DDR2	NA	NA	Qimonda HYB18T512800BF2 5F(64x8)	PASS
	1GB	DDR2 800	DDR2	NA	NA	ELPIDA E5108AHSE-8E-E	PASS

## AIMB-764 Network Feature Comparison

<b>LAN/Model</b>	<b>AIMB-764G2-00A1E</b>	<b>AIMB-764VG-00A1E</b>
LAN1: Intel 82566DM	Yes	Yes
LAN2: Intel 82573L	Yes	No

## **Product warranty**

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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 material 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-764 Intel Core 2 Duo / Pentium D / Pentium 4 / Celeron D processor based industrial motherboard
- 1 AIMB-764 startup manual P/N: 2002076410
- 1 CD with utility P/N: 2066000E10
- 1 FDD cable P/N: 1700340640
- 1 Ultra ATA 66/100 HDD cable P/N: 1701400452
- 2 Serial ATA HDD data cable P/N: 1700003194
- 2 Serial ATA HDD power cable P/N: 1703150102
- 1 COM port cable kit P/N: 1701090401
- 1 I/O port bracket P/N: 1962015680
- 1 jumper package P/N: 9689000068
- 1 warranty card P/N: 2190000902

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-764 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-764, 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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CHAPTER

1

# Hardware Configuration

# Chapter 1 Hardware Configuration

## 1.1 Introduction

---

The AIMB-764 is the most advanced Intel Q965 product for industrial applications that require high-performance computing. The motherboard supports Intel Core 2 Duo / Dual-Core Pentium D / Pentium 4 / Celeron D processors with 533/800/1066 MHz front side bus and DDR2 533/667/800 MHz memory up to 8 GB.

The AIMB-764 incorporates the Intel Q965 chipset to offer cost-effective integrated graphics. The Q965 chipset uses the Intel Extreme Graphics architecture to maximize VGA performance and share up to 256 MB of system memory. When higher graphics performance is needed, the AIMB-764 provides a mainstream PCIe x16 expansion slot for add-on graphic cards. In addition, the AIMB-764 has a single/dual Gigabit Ethernet LAN via a dedicated PCIe x1 bus, which offers bandwidth of up to 500 MB/s, eliminating network bottlenecks. High reliability and outstanding performance make the the AIMB-764 the ideal platform for industrial networking applications.

By using the Intel ICH8DO chipset, the AIMB-764 offers five 32-bit, 33-MHz PCI slots; one PCIe x4 slot, one PCIe x16 slot and a variety of features such as 5 on-board SATA II interfaces (bandwidth = 300 MB/s) with software for RAID 0, 1, 10 and 5; 10 USB 2.0 connections; 1 ATA 100/66/33 port; and HD Audio. These powerful I/O capabilities ensure even more reliable data storage capabilities and high-speed I/O peripheral connectivity. When accompanied by Advantech's SNMP-1000 intelligent SNMP/HTTP system manager module, the AIMB-764 permits users to monitor and manage the system remotely. This is particularly crucial for mission-critical applications.

The AIMB-764 also adopts Advantech's unique patented "Sleep Mode Control Circuit" for AT Power Mode.

With all the excellent features and outstanding performance, the AIMB-764 is definitely the ideal platform for today's industrial applications.

## 1.2 Features

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- **PCIe architecture:** The Intel Q965 and ICH8DO PCIe chipset provide 1 PCIe x16 slot, 1 PCIe x4 slot and a PCIe x1 link for the Gigabit LAN.
- **High Performance I/O Capability:** Dual/single Gigabit LAN via PCIe x1 bus, 5 PCI 32-bit/33MHz PCI slots, 5 SATA2 connectors and 10 USB 2.0 ports.
- **Standard ATX form factor with industrial features:** AIMB-764 provides industrial features like long product life, reliable operation under wide temperature range, watchdog timer, CMOS backup functions, etc.
- **Health status monitoring and remote management:** System voltage levels, fan speed and CPU temperature are monitored to ensure stable operation. The remote management interface allows the system to be managed through Ethernet when it is connected to the SNMP-1000 Remote HTTP/SNMP System Manager.
- **BIOS CMOS backup and restore:** When BIOS CMOS setup has been completed, data in the CMOS RAM is automatically backed up to the Flash ROM. This is particularly useful in harsh environments which may cause setup data loss such as battery failure. Upon such an error occurring, the BIOS will check the data, and automatically restore the original data for booting.
- **Automatically power on after power failure:** It is often required to have an unattended system come back to operation when power resumes after a power failure. Advantech's industrial motherboard allows users to set the system to power on automatically without pushing the power on button.

## 1.3 Specifications

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### 1.3.1 System

- **CPU:** Intel LGA 775 Core 2 Duo, Pentium D, Pentium 4, Celeron D up to 2.66/3.4/3.8/3.2 GHz, FSB 533/800/1066 MHz. Advantech also certifies several optional high-performance CPU coolers for high-speed CPUs in 2U chassis or in high-temperature environments.

**Note:** *Advantech certifies two LGA775 CPU cooler solutions. Both coolers are capable of keeping the temperature of 115W-thermal-spec CPUs within specification under environmental temperatures of 55° C without a chassis or 40° C with a chassis.*

*1750000334: LGA 775 CPU cooler up to 3.8 GHz (115 W), 4U, 5U and 7U chassis*

*1750001661: LGA 775 CPU cooler up to 3.8 GHz (115 W), 2U, 4U, 5U and 7U chassis*

- **L2 Cache:** CPU has one of the following built-in full-speed L2 caches  
2 x 1024 KB / 2 x 2048 KB for Pentium D CPUs,  
2 x 4096 MB for Intel Core 2 Duo CPUs,  
1024 KB / 2048 KB for Pentium 4 CPUs,  
256 KB / 512 KB for Celeron D CPUs
- **BIOS:** Award 16 Mbit SPI
- **System Chipset:** Intel Q965 with ICH8DO
- **SATA hard disk drive interface:** Five on-board SATA2 connectors support Advanced Host controller interface (AHCI) technology and have data transmission rates up to 300 MB/s.
- **One on-board IDE connector:** Supports PIO mode 4 (16.67 MB/s) and ATA 33/66/100 (33/66/100 MB/s) BIOS enabled/disabled.
- **Floppy disk drive interface:** Supports one floppy disk drive, 5¼" (360 KB and 1.2 MB) or 3½" (720 KB, 1.44 MB). BIOS enable/disable

### 1.3.2 Memory

- **RAM:** Up to 8 GB in four 240-pin DIMM sockets. Supports dual-channel DDR2 533/667/800 SDRAM.

**Note:**

1. A 64-bit OS may not fully detect 8 GB of RAM when 8 GB is installed.
2. A 32-bit OS may not fully detect 4 GB of RAM when 4 GB is installed.

### 1.3.3 Input/Output

- **PCIe slots:** 1 PCIe x16 expansion slot and 1 PCIe x4 expansion slot.
- **PCI Bus:** 5 PCI slots, 32-bit, 33 MHz PCI 2.2 compliant
- **Enhanced parallel port:** Configured to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/ECP
- **Serial ports:** Two serial ports, one DB-9 (RS-232) connector and one onboard pin header (RS-232/422/485). Ports can be individually configured to COM1, COM2, or disabled
- **Keyboard and PS/2 mouse connector:** Two 6-pin mini-DIN connectors are located on the mounting bracket for easy connection to a PS/2 keyboard and mouse.
- **USB port:** Supports up to eight USB 2.0 ports with transmission rates up to 480 Mbps.

### 1.3.4 Ethernet LAN

- Supports single/dual 10/100/1000Base-T Ethernet port(s) via PCIe x1 bus which provides a 500 MB/s data transmission rate.
- **Interface:** 10/100/1000Base-T
- **Controller:** LAN1: Intel 82566DM, LAN2: Intel 82573L

### 1.3.5 Industrial features

- **Watchdog timer:** Can generate a system reset or IRQ11. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels).

### 1.3.6 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 55° C (32 ~ 131° F, Depending on CPU)
- **Storage temperature:** -20 ~ 70° C (-4 ~ 158° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +3.3 V, ±5 V, ±12 V

- **Power consumption:** Maximum: +5 V at 4.5 A, +3.3 V at 4 A, +12 V at 10 A, 5 Vsb at 1 A (Intel Core 2 Duo 2.13 GHz and four 1 GB DDR2 667 SDRAM)
- **Board size:** 304.8 x 228.6 mm (12" x 9.6")
- **Board weight:** 0.5 kg (1.68 lb)

## 1.4 Jumpers and Connectors

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Connectors on the AIMB-764 motherboard link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers that are used to configure your system for your application.

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

**Table 1.1: Jumper list**

<b>Label</b>	<b>Function</b>
J1	CMOS
JWDT1	Watchdog reset
PSON1	AT(1-2) / ATX(2-3)
JSETCOM2	COM2 RS-232/422/485 jumper setting

**Table 1.2: Connectors**

<b>Label</b>	<b>Function</b>
IDE1	Primary IDE connector (one channel)
FDD1	FDD connector
LPT1	Parallel port, parallel port x 1, supports SPP/EPP/ECP mode
LAN1_USB12	LAN1 / USB port 1, 2
LAN2_USB34	LAN2 / USB port 3, 4
VGA1	VGA connector
COM1	Serial port: COM1; RS-232
COM2	Serial port: COM2; RS-232 (9-pin connector)
KBMS1	PS/2 keyboard and mouse connector
KBMS2	External keyboard connector (6-pin)
JIR1	Infrared connector



**Table 1.2: Connectors**

<b>Label</b>	<b>Function</b>
JFP3	Keyboard lock and power LED Suspend: fast flash (ATX/AT) System On: on (ATX/AT) System Off: off (AT) System Off: slow flash (ATX)
JFP2	External speaker / SATA HDD LED connector / SM Bus connector
JFP1	Power switch / reset connector
JCASE1	Case open
VOLT1	Voltage display
JOBS1	HW monitor Close: enable OBS alarm Open: disable OBS alarm
CPUFAN1	CPU fan connector (4-pin)
SYSFAN1	System fan connector (4-pin)
CHAFAN1	Chassis fan connector (4-pin)
LANLED1	LAN1/2 LED extension connector
AUDIO1	Audio connector
CDIN1	CD_IN connector
HD1	HD audio front panel pin header
USB56	USB port 5, 6
USB78	USB port 7, 8
USB910	USB port 9, 10
SA1	Serial ATA1
SA2	Serial ATA2
SA3	Serial ATA3
SA4	Serial ATA4
SA5	Serial ATA5
ATX1	ATX 12 V auxiliary power connector (for CPU)
ATX2	ATX 24-pin main power connector (for system)
PCIEX16_1	PCIe x16 slot 1
PCIEX4_1	PCIe x4 slot 1
PCIEX_SW1	PCIe x4 slot 1 by 1 x PCIe_4 (ON) PCIe x4 slot 1 by 4 x PCIe_1 (1-2)
PCI1	PCI slot 1
PCI2	PCI slot 2

**Table 1.2: Connectors**

<b>Label</b>	<b>Function</b>
PCI3	PCI slot 3
PCI4	PCI slot 4
PCI5	PCI slot 5
BT1	Battery connector
SP1	Buzzer
CPU1	CPU socket
DIMMA1	Channel A DIMM1
DIMMA2	Channel A DIMM2
DIMMB1	Channel B DIMM1
DIMMB2	Channel B DIMM2
SPI_CN1	Update BIOS pin header