ACP-2000MB

19” Rackmount
2U Height
Industrial Chassis

User’s Manual

Acknowledgments
IBM and PC are trademarks of International Business Machines Corporation.

On-line Technical Support
For technical support and service, please visit our support website at:
http://www.advantech.com/support

Note:

Part No. 20062K0010
1st Edition Printed Feb 2004

Contents

CHAPTER 1

General Information

Chapter 1 General Information

1.1 Introduction

The ACP-2000MB is a compact, rugged 2U-high 19" rackmount industrial computer chassis designed for space-conscious applications. Customers can expand their business without having to worry about space efficiency because the ACP-2000MB is only 2U-high and supports all AIMB series industrial motherboards. Fast-growing Internet service providers and corporate enterprise customers can use the ACP-2000MB as computing platforms for their mission critical applications. This chassis comes with 300W ATX PFC power supply, dual abundant cooling fans, front-accessible air filter, USB, PS/2 keyboard connector, system reset, system alarm reset and system power switch. The viewable LED indicators on front door support alarm notification of system status.
This ultra-compact 2U ATX M/B form factor delivers rack space optimization without sacrificing performance, expandability, serviceability, or manageability.

1.2 Specification

Table 1.1: Specification

		Front-accessible	Internal
Drive Bay	3.5"	1	2
	5.25"	1	
Cooling	Fan Air Filter	Front-location 2(47 CFM/each) Yes (front-accessible)	Rear-location
I/O Interface	USB PS/2	2(front-accessible) 1(keyboard, front-accessible)	
Miscellaneous	Indicator Front panel	LED display for Power, Temp, Fan and HDD activity D-SUB 9-pin brackets	
Environment		Operating	Non-Operating
	Temperature	0 ~ 40 ºC (32 ~ 104 ºF)	-20~60 ºC (-4~140 ºF)
	Humidity	10 ~ 85%	10 ~ 95 %
	Vibration (5-500 Hz)	1 Grms	2 G
	Shock	10 G (With 11 msec duration, 1/2 sine wave)	30G
	Altitude	10,000 ft	40,000 ft
	Acoustic Noise	Less than 52dB sound pressure at 5~28ºC (41~82ºF)	
Physical	Dimensions (W x H x D)	482 x 88 x 450 mm (19" x 3.46" x 17.8")	
	Weight	10.2 kg (17.6 lb)	
Compliance	Safety	CE compliant, UL/cUL approved	

1.3 Power Supply

Table 1.2: Power Supply

Model Name	Watt	Input	Output	Mini-load	Safety & MTBF
1757000007 (ATX,PFC)	300 W	100 ~ 240 Vac (Full-range)	+5 V @ 35 A +3.3 V @ 20A +12 V @ 16 A -12 V @ 1A -5 V @ 0.5 A +5 Vsb @ 2 A	+5V @ 3A +12V @ 2A -5V @ 0.05A -12V @ 0.05A +3.3V @ 1A +5Vsb @ 0.1A	UL/CE EN61000-3-2 Class D TUV/CB/CCC 97,800 hours @ 25°C

1.4 System Regulations & Optional Devices

Table 1.3: Ordering Information

Model Name	With Power Supply	With Riser Card	Mother Board	Regulation
ACP-2000MB-00X	W/O	9696070000 For AIMB series only	W/O For AIMB series only	None
ACP-2000MB-30Z	1757000007	9696070000 For AIMB series only	W/O For AIMB series only	CE/UL/cUL

Ordering P/N	Descriptions
SCD-FDD-COMBO	5.25” storage kit with slim 24X CD-ROM and standard 3.5” black FDD
SCD-ROM	Slim-type CD-ROM kit with slim 24X CD-ROM and 40-pin IDE connector
9684000014	3.5” FDD with Black Bezel
1759209201	Low profile PIII CPU cooler
1759252100	Low profile P4 CPU cooler up to 2.5G
1759214200	Low profile P4 CPU cooler up to 2.8G

1.5 Dimension Diagram

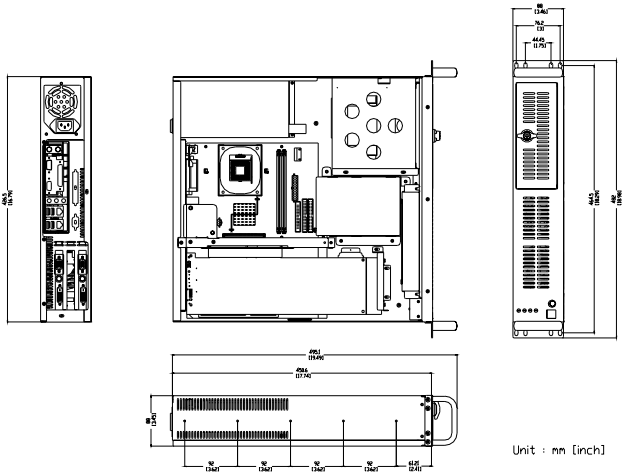


Figure 1.1: Dimension Diagram

CHAPTER 2

System Setup

Chapter 2 System Setup

2.1 System Installation

WARNING: Before starting the installation process, turn off the power switch and disconnect the system power cord from the chassis, or unplug the power cord from the power outlet. When in doubt, consult with an experienced technician.

2.1.1 Removing the top cover

First, remove the chassis cover by unscrewing six (6) M4 screws, which are on the both sides and rear location of chassis.

2.1.2 AIMB installation

Select one AIMB (Advantech Industrial M/B), such as AIMB-740 and install it into ACP-2000MB-30Z. There are three kinds of AIMB rear I/O form factor: w/o LAN port (such as AIMB-740V), single LAN port (such as AIMB-740VE/G) and dual LAN ports (such as AIMB-740E2). Take the ACP-2000MB rear I/O bracket from your AIMB accessory box and attach M/B I/O bracket with AIMB first, then install them into ACP-2000MB. After fixing AIMB to ACP-2000MB with six (6) screws, please refer to table 2.1 to connect AIMB to the correct cables.

Table 2.1: AIMB connector location list

ATX1	4-pin 12V power connector	ATX2	20-pin ATX power connector
CN12	5-pin K/B connector	USB	9-pin USB connector
CN18	2-pin RESET SW connector	CN19	2-pin HDD LED connector
CN21	2-pin POWER SW connector on		

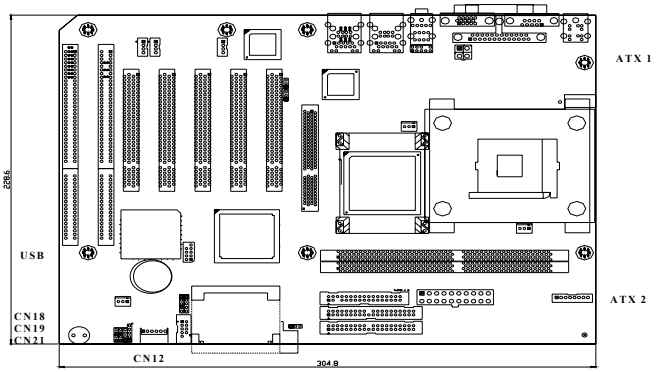


Figure 2.1 AIMB-740 Layout

2.1.3 Add-on Card Installation

Please follow the below installation guide to install PCI card into ACP-2000MB. First, release card cage, which is with riser card as figure 2-2, from ACP-2000MB by two (2) screws. Install your AIMB & M/B I/O window into ACP-2000MB and secure them with screws.

Figure 2.2 Card cage with riser card

Return card cage and riser card back to original location, but first you have to insert riser card into AIMB PCI 1-slot, then tighten them with the same two (2) screws you used before. Plug your PCI add-on cards into the PCI slots of riser card as showed by figure 2-3.

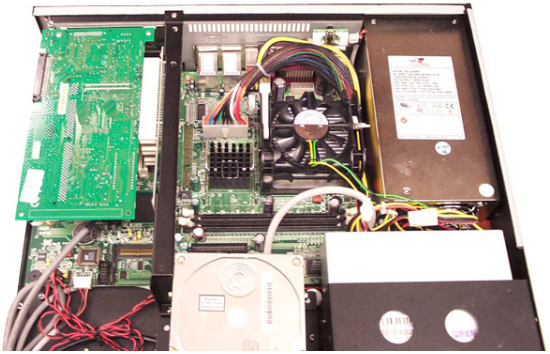


Figure 2.3 Install PCI add-on card

2.2 Peripheral Installation

The ACP-2000MB standard drive bay can hold one 5.25” device and three 3.5” drives.

Figure 2.4 5.25” & 3.5”

Figure 2.5 Internal 3.5” HDD

2.2.1 5.25” & 3.5” device

a. Undo the four screws then lift off the 5.25” & 3.5” drive bay.
b. Install 5.25” & 3.5” devices into their proper location as shown in figure 2-4, and secure them with the screws provided.
c. Return storage back to original location shown in figure 2-6 and secure them well.

2.2.2 Internal 3.5” HDD

Refer to figure 2-5 to find the internal 3.5” HDD holder location, release holder by four M4 screws and install up to two internal 3.5” HDD. Return storage back to original location shown in figure 2-6, and then secure them well.

Figure 2.6 Location of storage devices

2.3 System Status Indicator

Table 2.2 System Status LED			
LED	Description	RED	GREEN or Orange
PWR	System Power	N/A	Normal
HDD	Hard Drive activity	N/A	Data access
FAN	Cooling Fan status	Abnormal	Normal
TEMP	Chassis Temperature	Abnormal	Normal

PWR LED turns on, it indicates system power on.
HDD LED turns on, it indicates HDD data access

FAN LED turns RED and blinks, indicates a failing cooling fan. An alarm is also activated. To stop the alarm buzzer, press the alarm reset button then replace the fan with good one immediately.

TEMP LED turns RED and blinks, indicates system detects rising temperature inside the chassis. An alarm is also activated. To stop the alarm buzzer, press the alarm reset button. Inspect the system components, such as CPU cooler, or fan filter immediately. Make sure CPU cooler is working fine and airflow inside the chassis is smooth and not blocked with dust or other particles.

2.4 Cooling Fan & Filter

There are dual cooling fans as shown in figure 2-7 located inside the chassis. The cooling fans are low maintenance and provide adequate cooling to the system. If one of those cooling fails, please release two screws of dual cooling fan holder first, move away internal 3.5" HDD storage to find the alarm board. Find FAN1 and FAN2 connectors on alarm board, pull out the connector of the dual cooling fan from the alarm board. Replace failed cooling fan with good one. Please refer to figure 2-8.

Figure 2.7 Dual cooling fans

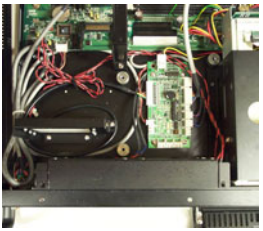


Figure 2.8 Cooling fan maintenance

Please refer the figure 2-9 to change the filter if you find the filter is blocked with dust or other particles

Figure 2.9 System Filter

2.5 Alarm Board, USB & PS/2

2.5.1 Alarm Board

The alarm board is located on the side of chassis. The detailed layout and specifications of the alarm board are as follows.

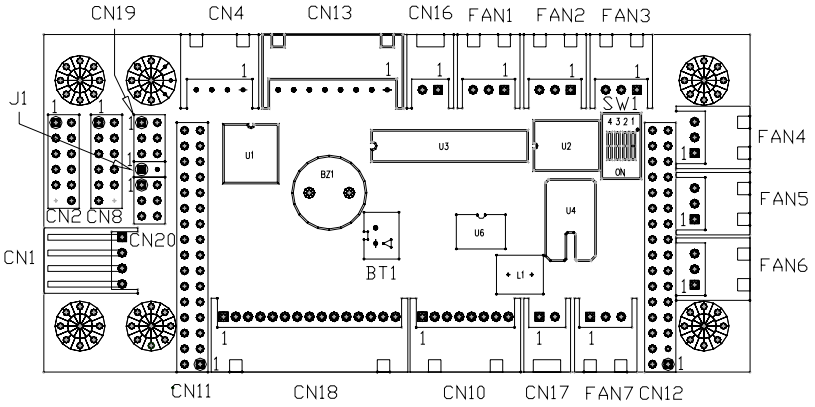


Figure 2.10 Alarm board layout

2.5.2 Alarm Board Specification

Table 2.3 Connector Description	
Input Power:	
CN1	+5V, +12V
Connector description	
FAN1~FAN7	FAN connector, Pin 1: GND, Pin 2: +12V, Pin 3: FAN Signal
CN2	10/100M LAN Connector
CN4	I2C sensor board connector. It can connect up to 8 thermal boards in a roll
CN8	RS-232 of alarm board connector
CN10	LCM display board connector
CN11~CN12	SNMP-1000 daughter board connector
CN13	Voltage signal connector, connect from PSU or backplane, includes ±12V, ±5V, 3.3V
CN16	Power good input
CN17	Alarm reset input
CN18	LED display board connector
CN19	Connector bank from CPU card (SBC)
CN20	Connector bank to system chassis
BT1	Battery pack connector
J1	Buzzer output

Table 2-4 Connector pin definition 1 of 2			
CN1 : External Power Connector, standard mini 4 Pin power connector			
Pin 1 : +12V, 2A current maximum		Pin 2 : GND	
Pin 3 : GND		Pin 4 : +5V, 2A current maximum	
CN2 : 10/100M LAN Connector			
Pin 1 : SPLED	Pin2 :TERMPLANE	Pin 3 : RX+	Pin 4 : RX-
Pin 5 : GND	Pin 6 : LVCC	Pin 7 : TX+	Pin 8 : TX-
Pin 9 : LILED	Pin10:TERMPLANE	Pin 11 : N/A	Pin 12 : NC
CN4 : I^2C Sensor board (LM75) Connector			
Pin 1 : +5V	Pin 2 : Sensor board I^2C bus clock	Pin 3 : Sensor board I^2C bus data	Pin 4 : GND
CN8 : RS-232 Connector			
Pin 1 : DCD	Pin 2 : RX	Pin 3 : TX	Pin 4 : DTR
Pin 5 : GND	Pin 6 : DSR	Pin 7 : RTS	Pin 8 : CTS
Pin 9 : RI	Pin 10 : NC	Pin 11 : NC	Pin 12 : N/A
CN10 : LCM Display Board Connector			
Pin 1 : LCM I^2C bus data	Pin 2 : LCM I^2C bus clock	Pin 3 : +12V	Pin 4 : GND
Pin 5 : +5V	Pin 6 : +5V	Pin 7 : Diagnostic LED	Pin 8 : GND

Table 2-4 Connector pin definition (con'd)			
CN11 : SNMP-1000 Daughter Board Connector (Left side)			
Pin 1 : SIN	Pin 2 : SOUT	Pin 3 : CTS#	Pin 4 : DCD#
Pin 5 : RTS#	Pin 6 : DTR#	Pin 7 : DSR#	Pin 8 : ID 0
Pin 9 : ATX ON	Pin 10 : DO 4	Pin 11 : GND	Pin 12 : DO 3
Pin 13 : Watchdog IN	Pin 14 : DO 2	Pin 15 : Watchdog OUT	Pin 16 : DO 1
Pin 17 : SPLED	Pin 18 : NC	Pin 19 : LILED	Pin 20 : NC
Pin 21 : GND	Pin 22 : NC	Pin 23 : TX+	Pin 24 : NC
Pin 25 : TX-	Pin 26 : NC	Pin 27 : RX+	Pin 28 : NC
Pin 29 : RX-	Pin 30 : NC	Pin 31 : TERMPLANE	Pin 32 : NC
CN12 : SNMP-1000 Daughter Board Connector (Right side)			
Pin 1 : NC	Pin 2 : NC	Pin 3 : Power Good	Pin 4 : NC
Pin 5 : NC	Pin 6 : NC	Pin 7 : Diag. LED	Pin 8 : FAN 1
Pin 9 : GND	Pin 10 : FAN 2	Pin 11 : GND	Pin 12 : FAN 3
Pin 13 : VCC	Pin 14 : FAN 4	Pin 15 : VCC	Pin 16 : FAN 5
Pin 17 : VCC	Pin 18 : FAN 6	Pin 19 : BEEP	Pin 20 : FAN 7
Pin 21 : 5VSB	Pin 22 : NC	Pin 23 : -5V	Pin24 : NC
Pin 25 : +5V	Pin 26 : B_SCLK	Pin 27 : +3.3V	Pin 28 : B_SDAT
Pin 29 : -12V	Pin 30 : T_SCLK	Pin 31 : +12V	Pin 32 : T_SDAT
CN13 : Voltage Detect Input Connector			
Pin 1 : 5VSB	Pin 2 : GND	Pin 3 : GND	Pin 4 : -5V
Pin 5 : +5V	Pin 6 : +3.3V	Pin 7 : -12V	Pin 8 : +12V
CN16 : 4 bit Power Good Input			
Pin 1 : Power GOOD		Pin 2 : GND	
CN17 : Alarm Reset			
Pin 1: Reset		Pin 2 : GND	
CN18 : LED Board Connector			
Pin 1 : GND	Pin 2 : +5V Signal	Pin 3 : +12V Signal	Pin 4 : -5V Signal
Pin 5 : -12V Signal	Pin 6 : HDD Signal	Pin 7 : Power Good	Pin 8 : Power Fail
Pin 9 : Temperature Good Signal	Pin 10 :Temperature Fail Signal	Pin 11 : Fan Good Signal	Pin 12 : FAN Fail Signal
Pin 13 : NC	Pin 14 : +3.3V	Pin 15 : 5VSB	
CN19 : Connector bank from CPU card			
Pin 1 : HDD LED Singal	Pin 2 : ATX soft power switch	Pin 3 : I^2C Clock	Pin 4 : ATX soft power switch(-)
Pin 5 : I^2C Data	Pin 6 : System Reset		
CN20 : Connector bank to Chassis			
Pin 1 : ATX Momentary switch	Pin 2 : ATX Momentary switch(-)	Pin 3 : GND	Pin 4 : System Reset Signal
Pin 5 : Watch Dog IN	Pin 6 : Watch Dog Out		
J1 : External Speaker			
Pin 1 : Buzzer		Pin 2 : +5V	

2.5.3 USB & PS/2

Table 2-5 Connector pin definition			
CN1 : Internal Keyboard connector			
Pin 1 : KBCK	Pin 2 : KBDT	Pin 3 : N/A	Pin 4 : GND
Pin 5 : KBVCC			
CN2 : Internal USB connector			
Pin 1 : USBV0	Pin2 : USBD0-	Pin 3 : USBD0+	Pin 4 : USBG0
Pin 5 : GND	Pin 6 : USBV1	Pin 7 : USBD1-	Pin 8 : USBD1+
Pin 9 : USBG1	Pin10: N/A		
CN3 : PS/2 female mini DIN 6-pin keyboard connector			
Pin 1 : KBDT	Pin 2 : N/A(MDT)	Pin 3 : GND	Pin 4 : KBVCC
Pin 5 : KBCK	Pin 6 : N/A(MCK)	Pin 7~9 : GND	
CN4 : USB x 2 connector			
Pin 1 : USBV0	Pin2 : USBD0-	Pin 3 : USBD0+	Pin 4 : USBG0
Pin 5 : GND	Pin 6 : GND	Pin 7 : USBV1	Pin 8 : USBD1-
Pin 9 : USBD1+	Pin 10 : USBG1	Pin 5 : GND	Pin 6 : GND

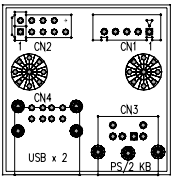
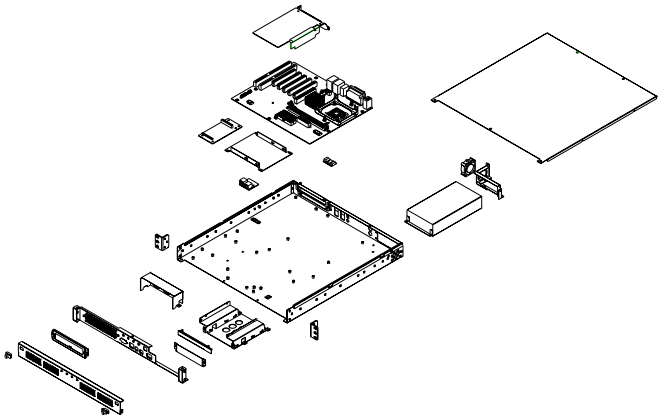


Figure 2.11 USB & PS/2 Layout

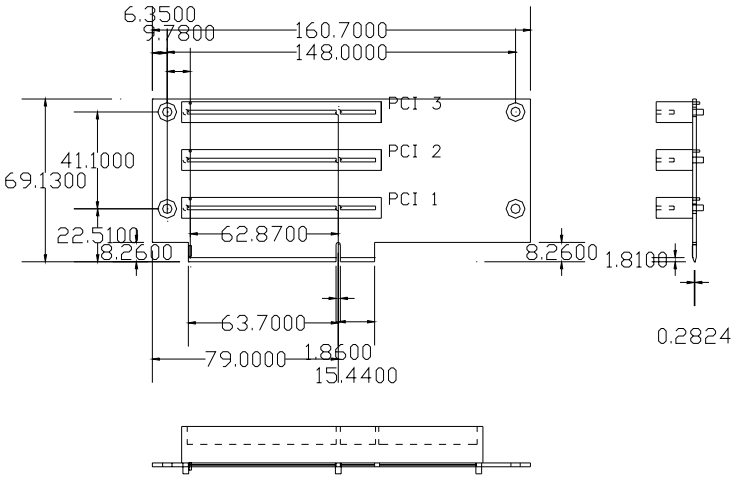
APPENDIX A

Exploded Diagram & Riser Card

Appendix A-1 Exploded Diagram



Appendix A-2 Riser Card



APPENDIX B

Safety Instructions

Appendix B Safety Instructions

Safety Instructions

1. Read these safety instructions carefully.

2. Keep this User's Manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Do not use a damp cloth, liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.

7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If one of the following situations arises, get the equipment checked by service personnel:

    a. The power cord or plug is damaged.

    b. Liquid has penetrated into the equipment.

    c. The equipment has been exposed to moisture.

d. The equipment does not work well, or you cannot get it to work according to the user's manual.

e. The equipment has been dropped and damaged.

f. The equipment has obvious signs of breakage.

15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70dB(A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

16. Any insulation on conductors inside EQUIPMENT which are connected to ACCESSIBLE METAL PARTS or other PROTECTIVELY EARTHED parts with a protective function to the PROTECTIVE EARTH TERMINAL shall be identified by the colors green and yellow at the termination of the conductors.

17. 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 typed recommended by the manufacturer. Discard use batteries according to the manufacturer's instructions.

18. The computer is provided with appropriate safety standards including lec 60826.

19. Install the computer. Before your begin make sure the Green/Yellow wire reliable connection between metal part of computer and earthing of final system.