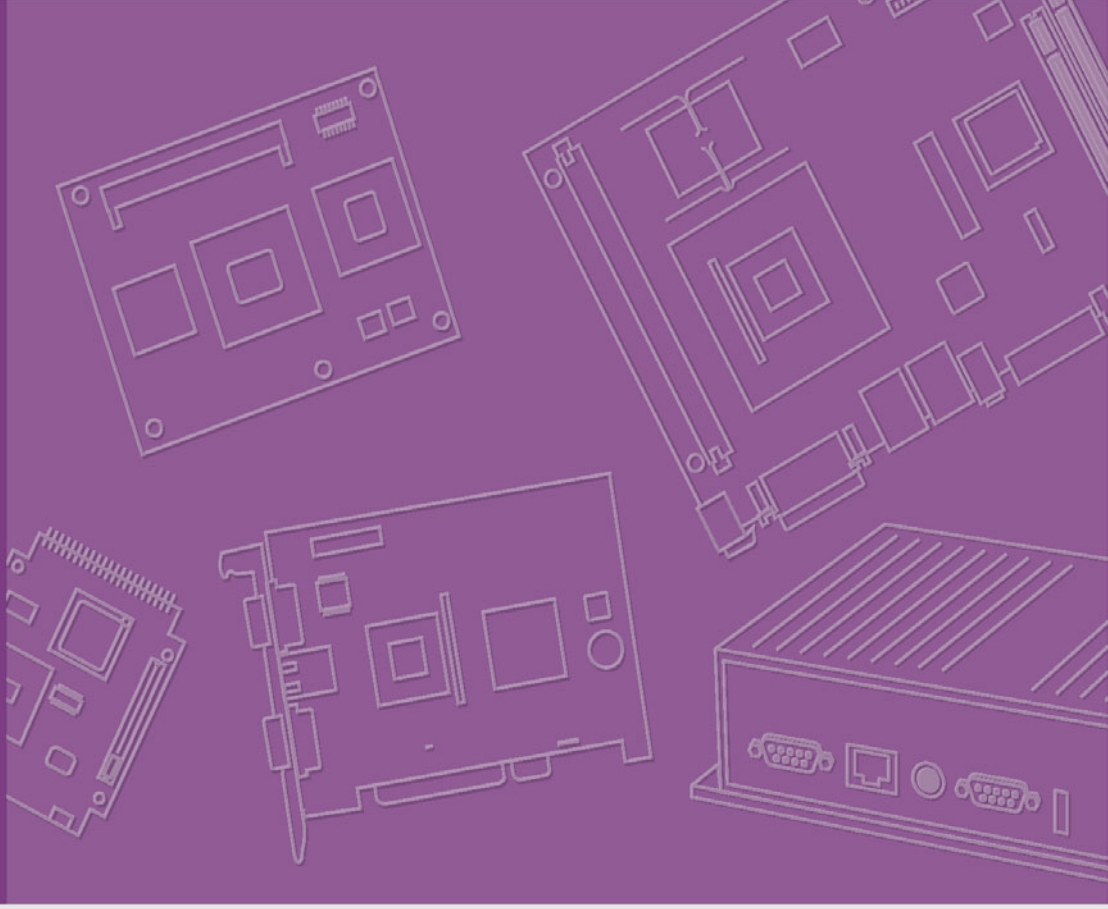

User Manual

ACP-2000MB

2U 19" Rackmount Chassis for ATX Motherboard

Trusted ePlatform Services

ADVANTECH

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Safety Instructions

1. Read these safety instructions carefully.
2. Keep this user manual for later reference.
3. Disconnect this equipment from AC outlet before cleaning. Do not use liquid or spray detergents for cleaning.
4. For pluggable equipment, the power outlet shall be installed near the equipment and shall 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 could cause damage.
7. Do not leave this equipment in an environment unconditioned where the storage temperature under 0° C (32° F) or above 40° C (104° F), it may damage the equipment.
8. The openings on the enclosure are for air convection hence protect the equipment from overheating. DO NOT COVER THE OPENINGS.
9. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
10. Place the power cord in a way that people can not step on it. Do not place anything over the power cord. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product.
11. All cautions and warnings on the equipment should be noted.
12. If the equipment is not used for a long time, disconnect it from the power source to avoid being damaged by transient over-voltage.
13. Never pour any liquid into ventilation openings. This could cause fire or electrical shock.
14. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
15. If any 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 user manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.
16. **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 the manufacturer's instructions.
17. THE COMPUTER IS PROVIDED WITH CD DRIVES COMPLY WITH APPROPRIATE SAFETY STANDARDS INCLUDING IEC 60825.

CLASS 1 LASER PRODUCT
KLASS 1 LASER PRODUKT

18. This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
    (1) this device may not cause harmful interference, and
    (2) this device must accept any interference received, including interference that may cause undesired operation.
19. **CAUTION:** Always completely disconnect the power cord from your 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.
20. **CAUTION:** Always ground yourself to remove any static charge before touching the motherboard, backplane, or add-on cards. Modern electronic devices are very sensitive to static electric charges. 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.
21. **CAUTION:** Any unverified component could cause unexpected damage. To ensure the correct installation, please always use the components (ex. screws) provided with the accessory box.

A Message to the Customer

Advantech customer services

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

To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical support

We want you to get the best performance possible from your products. 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.

Please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and can be easily solved over the phone.

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

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 out-of-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

When you open the carton, please make sure that the following materials have been shipped:

- ACP-2000MB Chassis
- User Manual
- Warranty Card
- Accessory box with a package of screws (for fastening the motherboard, disk drives, ears and handles, etc.), a pair of keys, a plastic post, a pair of ears and a pair of handles.

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ACP-2000MB mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the ACP-2000MB, check it for signs of shipping damage. (For examples: box damage, 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, please 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.

Contents

Chapter 1

General Information

This chapter provides general information about the ACP-2000MB.

Sections include:

- Introduction
- Specifications
- Power Supply Options
- Environmental Specifications
- Dimension Diagram

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 Specifications

- **Construction:** Heavy-duty steel
- **Disk Drive Capacity:** One 5.25" disk drive bay and three 3.5" disk drive bay (for FDD or internal HDD)
- **LED Indicators on Front Panel:** Bi-color LEDs (green/red) for power, temperature, and fan status; single-color LEDs (green) for HDD activity.
- **Switch and Buttons on Front Panel:** Power switch, System Reset button and Alarm Reset button
- **Front I/O Interfaces:** Dual USB ports and one PS/2 connector
- **Rear I/O Interfaces:** Reserved two 9-pin D-SUB openings
- **Security Protection:** The storage system, power switch, system reset button and alarm reset button are all behind the lockable door.
- **Cooling System:** Two 8 cm x 8 cm (47 CFM) easy-to-maintain cooling fans.
- **Air Filters:** Two easily maintained reusable filters near the front of the system fan and behind the front door.
- **Weight:** 11.5 kg (25.3 lbs)
- **Dimensions (W x H x D):** 482 x 88 x 450 mm (19" x 3.5" x 17.7")

1.3 Power Supply

Table 1.1: Power supply options	
Model Name	**1757000007G (ATX, PFC)**
Watts	300 W
Input rating	100 ~ 240 Vac (Full range)
Output voltage	+5 V @ 35 A, +3.3 V @ 20 A, +12 V @ 16 A, -5 V @ 0.5 A, -12 V @ 1 A, +5 Vsb @ 2 A
Minimum load	+5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, -5 V @ 0.05 A, -12 V @ 0.05 A, +5 Vsb @ 0.1 A
MTBF	97,800 hours @ 25° C
Safety	UL/TUV/CB/CCC

1.4 Environmental Specifications

Table 1.2: Environmental specifications		
Environment	**Operating**	**Non-operating**
Temperature	0 to 40° C (32 to 104° F)	-20 to 60° C (-4 to 140° F)
Humidity	10 to 85% @ 40° C, non-condensing	10 to 95% @ 40° C, non-condensing
Vibration	1 Grms	2 G
Shock	10 G with 11 ms duration, half sine wave	30 G
Safety	CE compliant	

1.5 Dimension Diagram

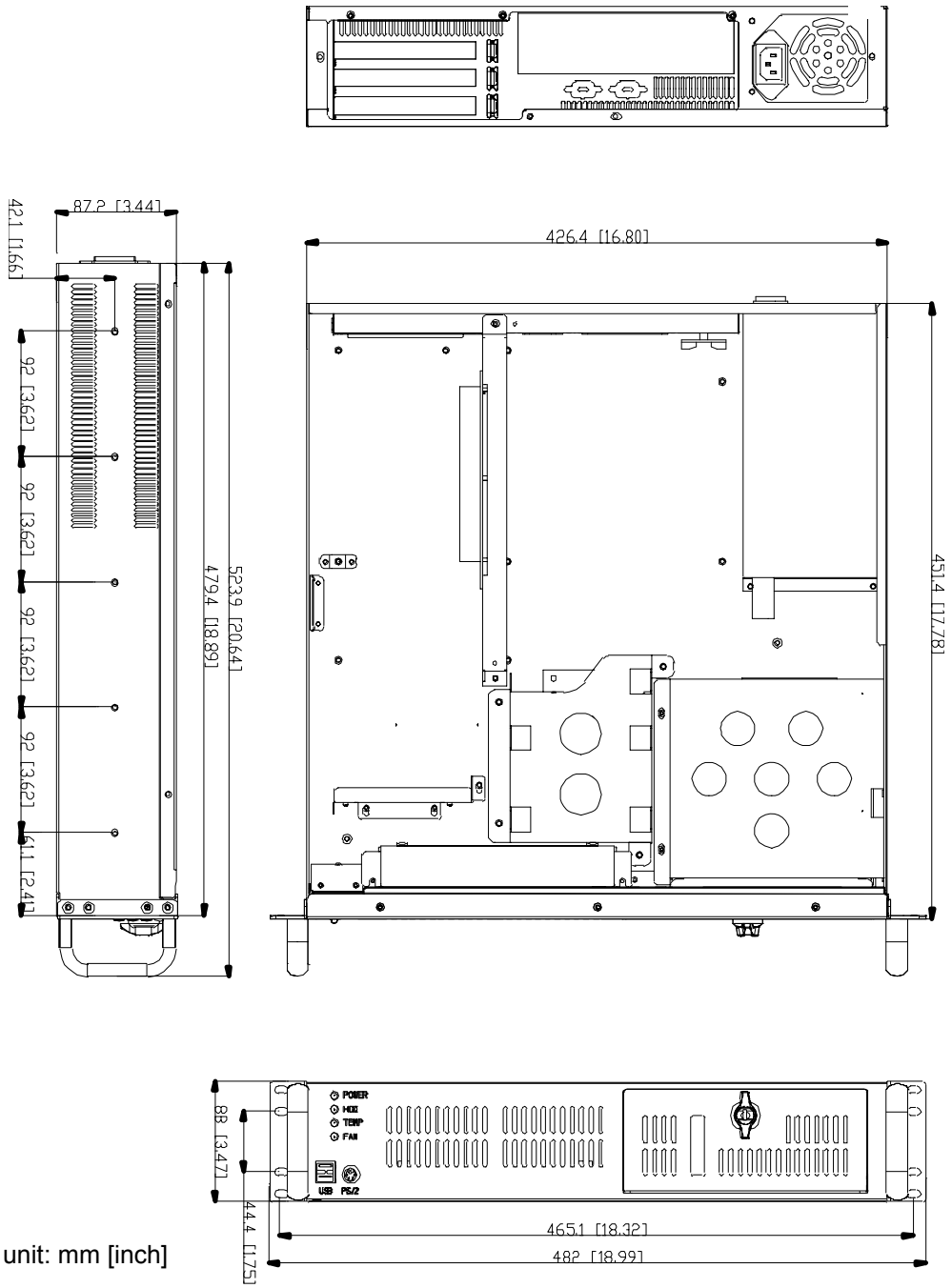


Figure 1.1 Dimension diagram

Chapter 2

System Setup

This chapter introduces the installation process.

Sections include:

- Installing the Motherboard
- Installing Add-on Cards
- Installing Disk Drives

The following procedures instruct users how to install a motherboard, add-on cards, and disk drives into the ACP-2000MB. Refer to Appendix A, the Exploded Diagram and the Parts List for more detailed information about parts for the ACP-2000MB.

Note! *Use caution when installing or operating the components with the chassis open. Be sure to turn off the power, unplug the power cord and ground yourself by touching the metal chassis before you handle any components inside the machine.*

2.1 Removing the Top Cover

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

2.2 Installing the Motherboard

The ACP-2000MB can support an ATX motherboard with up to three add-on cards via the expanded riser card.

To install the motherboard, please proceed as follows:

Note! *Use caution when installing a motherboard. We highly recommend choosing a CPU cooler which is lower than 67 mm to avoid component interference between the motherboard and the chassis, and to ensure good air flow inside the chassis.*

1. Remove the card holder by loosening the two screws.
2. Attach the motherboard I/O shielding onto the rear plate first. Then fasten the motherboard onto the chassis.
3. Return the card holder to its original position and fasten it.
4. Connect the 20-pin (or 24-pin) ATX power connector and the 4-pin +12 V power connector from the power supply to the motherboard.
5. Connect the 9-pin USB wire, PS/2 wire, Power switch wire, and the System Reset switch wire from the chassis to the motherboard.

2.3 Installing Add-on Cards

The ACP-2000MB supports up to three add-on cards via the riser card. To install the add-on cards, please proceed as follows:

1. Remove the corresponding I/O bracket attached to the rear plate of the chassis (see Figure 2.1). Insert an add-on card vertically into the proper slot on the riser card. For full-length cards, please make sure that the card bracket has been inserted properly and the other edge of the card has been inserted into the plastic guiding fillister. Then fasten the screws on the top of the I/O bracket. (see Figure 2.2)
2. Repeat Step 1 if there is more than one add-on card to be installed.

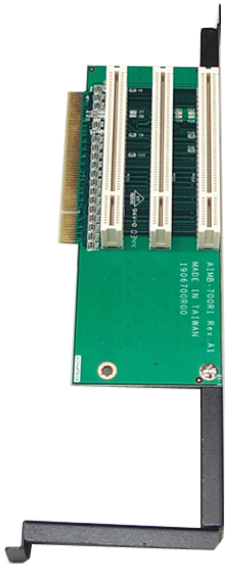


Figure 2.1 Card cage with riser card

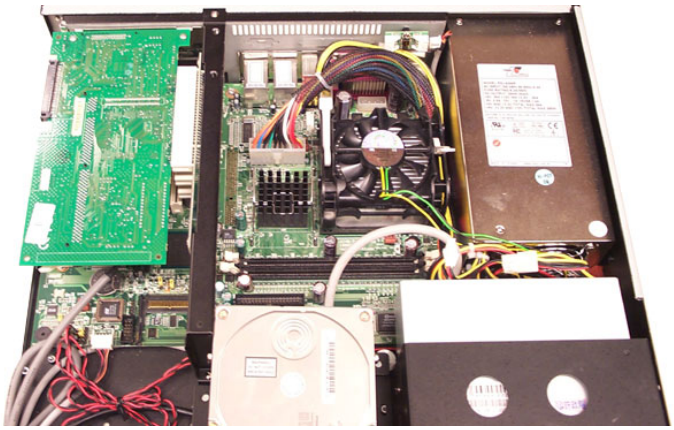


Figure 2.2 Installing PCI add-on card

2.4 Installing Disk Drives

The ACP-2000MB standard drive bay can hold one 5.25” device and three 3.5” drives (one external and two internal).

Figure 2.3 Drive bay for 5.25" device and 3.5" FDD

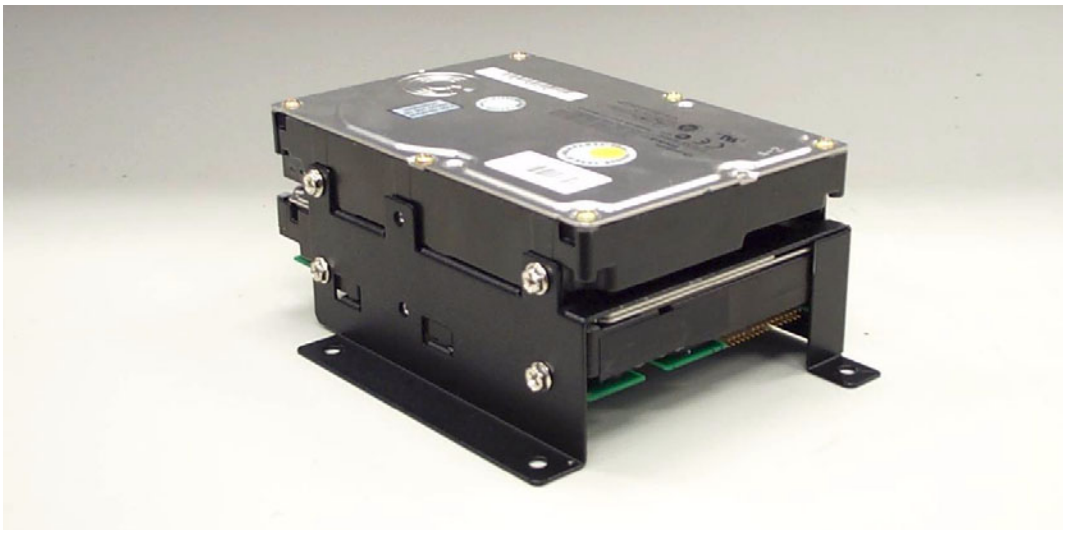


Figure 2.4 Drive bay for internal 3.5" HDD

1. To install the 5.25" device or 3.5" FDD, please undo the screws to remove the drive bay and its front covers.
2. Install 5.25” and 3.5” devices into their proper location as shown in Figure 2.3, and secure them with the screws provided.
3. Return storage back to original location shown in Figure 2.5 and secure them well.
4. To install the internal 3.5" HDD, please refer to Figure 2.4 to find the internal 3.5” HDD holder location. Remove the holder by loosening the four screws and install up to two internal 3.5” HDD.
5. Return storage back in place shown in Figure 2.5, and then secure them well.
6. Connect the suitable cables from the motherboard to the 3.5" internal HDD, the optical disk drive and FDD. Then, plug the power connector into each disk drive.

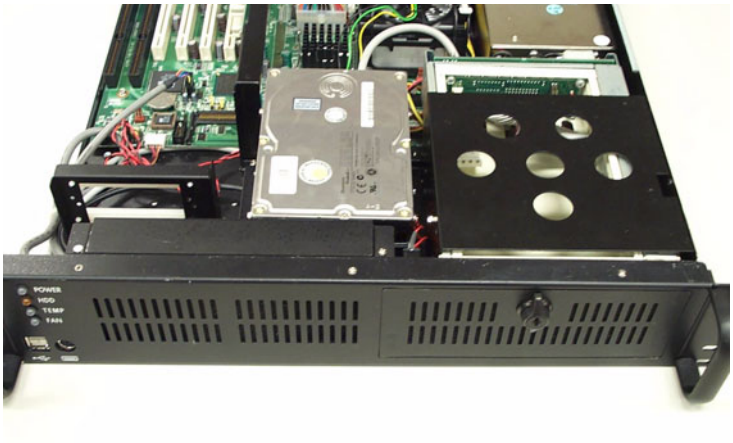


Figure 2.5 Location of storage devices

Chapter 3

Operation

This chapter introduce the system operating information.

Sections include:

- The Front Panel
- The Rear Panel
- Replacing the Cooling Fan
- Cleaning the Filter

3.1 The Front Panel

The front panel features a lockable door, four LED indicators and dual USB ports and a PS/2 connector. The front door can be closed with or without a key using the user-friendly rotary lock. Behind the opening door is a momentary power switch, a system reset button, and an alarm reset button.

3.1.1 Switch, Button and I/O Interfaces

- **Momentary Power switch:** Press this switch to turn the system power on or off. Please use the system shutdown or press this switch for few seconds to turn off the system ATX power.
- **Alarm Reset button:** Whenever a fault occurs in the system (e.g., fan failure or chassis overheating) an audible alarm will be activated. Pressing this button will stop the alarm from beeping.
- **System Reset button:** Press this button to reboot the system.
- **Dual USB port:** For connecting a wide range of USB devices for data transfer, backup or input.
- **PS/2 connector:** For connecting a keyboard or mouse depending on the motherboard design.

3.1.2 LED Indicators for System Status

Four LEDs are placed on the left side of the front panel to indicate system health and activity. Refer to Table 3.1 for an LED definition summary.

Table 3.1: LED indications function

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	Temperature in the chassis	Abnormal	Normal

When PWR LED turns on, it indicates system power on.

When HDD LED turns on, it indicates HDD data access.

When FAN LED turns RED and blinks, it 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.

When TEMP LED turns RED and blinks, it 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.

3.2 The Rear Panel

The rear panel comes with 3-slot I/O brackets, two reserved 9-pin D-SUB openings and a motherboard I/O opening.

3.3 Replacing the Cooling Fans

There are dual cooling fans as shown in Figure 3.1 located inside the chassis. The cooling fans are low maintenance and provide adequate cooling to the system. If one of those cooling fans fails, first please release dual cooling fan holder's two screws, move away internal 3.5" HDD storage to find the alarm board. Find FAN1 and FAN2 connectors on alarm board, pull out the power wires of the failed cooling fan from the alarm board. Replace failed cooling fan with a good one. Please refer to Figure 3.2.

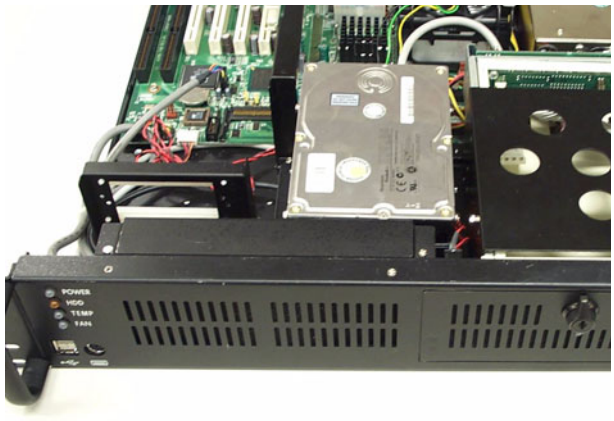


Figure 3.1 Dual cooling fans

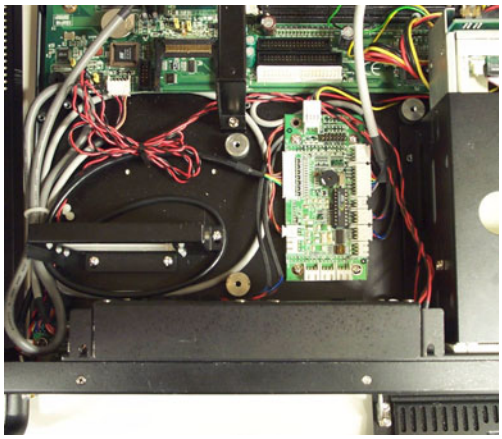


Figure 3.2 Cooling fan maintenance

3.4 Replacing the Filter

Please refer the Figure 3.3 to replace the filter if you find the filter is blocked with dust or other particles

Figure 3.3 Replacing fan filter and door filter

Chapter 4

Alarm Board

This chapter introduces the alarm board and thermal sensor specifications.

Sections include:

- Alarm Board Layout
- Alarm Board Specifications
- Thermal Sensor
- Sensor I.D. Number Setting

The alarm board is located under the 3.5" disk drive bay. The alarm board provides system detection functions that monitor the status of the computer system, including: thermal conditions, fans, power supply and HDD operation. Any problems with the system are reported through audible alarms and LED indicators.

The alarm board sounds an audible alarm whenever:

1. Any power supply module of the redundant power supply fails;
2. One of the system cooling fans fails;
3. The internal temperature of the chassis becomes too high.

To stop the alarm beep, press the Alarm Reset button on the front panel and then take the necessary action to fix the problem.

4.1 Alarm Board Layout

The layout and detailed specifications for connectors on the alarm board are shown in this diagram:

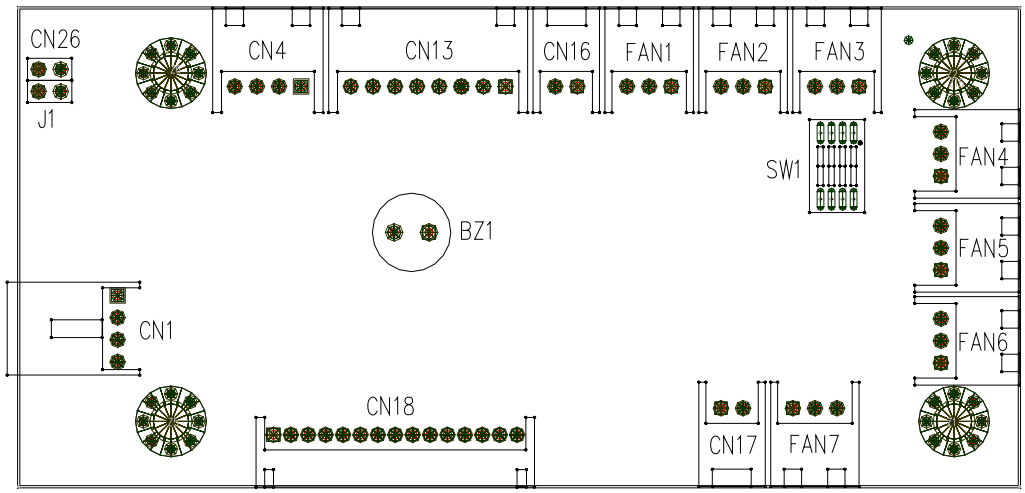


Figure 4.1 Alarm board layout

4.2 Alarm Board Specifications

- **Input Power:** +5 V, +12 V
- **Input Signals:**
  - 7 **fan** connectors
  - One **thermal sensor** connector (supports up to 8 thermal sensors connected in a series)
  - One **power good** input
  - One **alarm reset** input
  - One **voltage signal** connector (connected from the motherboard, and supports six voltages: +- 12 V, +- 5 V, +3.3 V, +5 Vsb)
  - One **hard disk LED** connector (connected from the motherboard)
- **Output Signals:**
  - One **LED board** connector
  - One **buzzer** output

4.2.1 Connectors & Pin Definition

Table 4.1: CN1, Auxiliary external power connector, standard mini 4-Pin power connector

Pin 1	+12 V	**Pin 3**	GND
Pin 2	GND	**Pin 4**	+5 V

Table 4.2: CN4, Thermal sensor (LM75) connector

Pin 1	+5 V	**Pin 3**	T_SDAT
Pin 2	T_SCLK	**Pin 4**	GND

Table 4.3: CN13, Voltage detect. input connector

Pin 1	+5 Vsb	**Pin 5**	+5 V
Pin 2	GND	**Pin 6**	+3.3 V
Pin 3	GND	**Pin 7**	-12 V
Pin 4	-5 V	**Pin 8**	+12 V

Table 4.4: CN16, Power good input connector

Pin 1	Power Good	**Pin 2**	GND

Table 4.5: CN17, Alarm reset connector

Pin 1	ALARM RESET	**Pin 2**	GND

Table 4.6: CN18, Output connector to LED board			
Pin 1	GND	**Pin 9**	Temperature Good
Pin 2	+5 V signal	**Pin 10**	Temperature Fail
Pin 3	+12 V signal	**Pin 11**	FAN Good
Pin 4	-5 V signal	**Pin 12**	FAN Fail
Pin 5	-12 V signal	**Pin 13**	N/A
Pin 6	HDD_1	**Pin 14**	+3.3 V signal
Pin 7	Power Good	**Pin 15**	+5 Vsb signal
Pin 8	Power Fail		

Table 4.7: CN26, HDD LED connector			
Pin 1	HLED_ACT	**Pin 2**	N/A

Table 4.8: FAN1~FAN7, Fan connectors			
Pin 1	GND	**Pin3**	FAN_DEC
Pin 2	+12 V		

Table 4.9: J1, External buzzer			
Pin 1	Buzzer	**Pin 2**	+5 V

Table 4.10: SW1, Fan number select switch			
Pin 1	GND	**Pin 5**	GND
Pin 2	FAN_SEL1	**Pin 6**	FAN_SEL3
Pin 3	GND	**Pin 7**	GND
Pin 4	FAN_SEL2	**Pin 8**	RESET

4.2.2 Switch Settings

The alarm board is designed to connect with up to 7 fans. Users can set the fan number by adjusting the switch, SW1, on the alarm board.

Table 4.11: SW1, Fan number setting

Fan Number	SW 1-1	SW 1-2	SW 1-3	SW 1-4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2 (default)	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF

Note!

Connect the fan connectors in the correct sequence: if two fans are set on SW1, the correct method is to connect them to connectors FAN1 and FAN2. If the two fans are connected to other fan connectors, out of sequence, such as FAN1 and FAN3 or FAN2 and FAN3 or FAN3 and FAN4, instead of FAN1 and FAN2, then the alarm will not function correctly.

4.3 Thermal Sensor

The ACP-2000MB is configured with a thermal sensor on the backside of the chassis (see Figure 4.2).

Thermal sensor

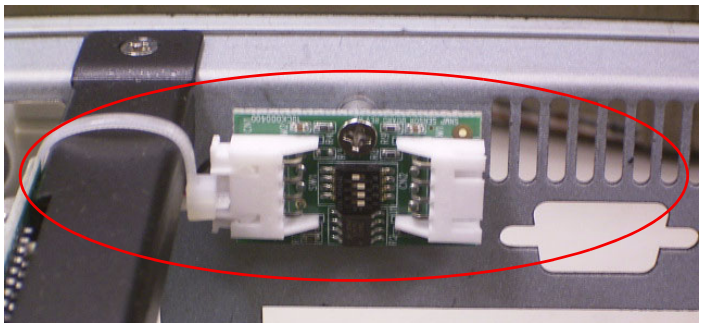


Figure 4.2 Thermal sensor location

Refer to Figure 4.3 for a diagram of the thermal sensor module layout.

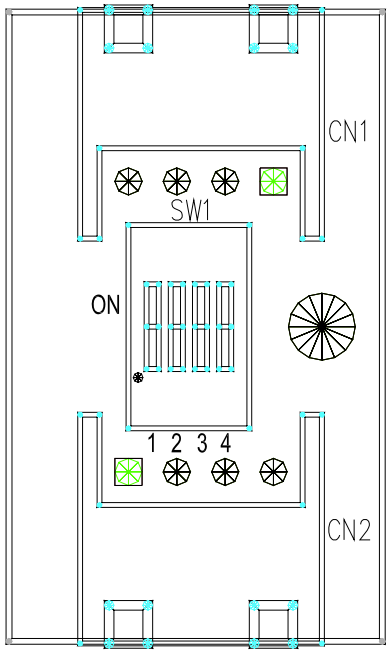


Figure 4.3 Thermal sensor module

The default sensor I.D. number is 1. Users can refer to Table 4.13 to set the sensor I.D. number by adjusting the switch, SW1, on the sensor module.

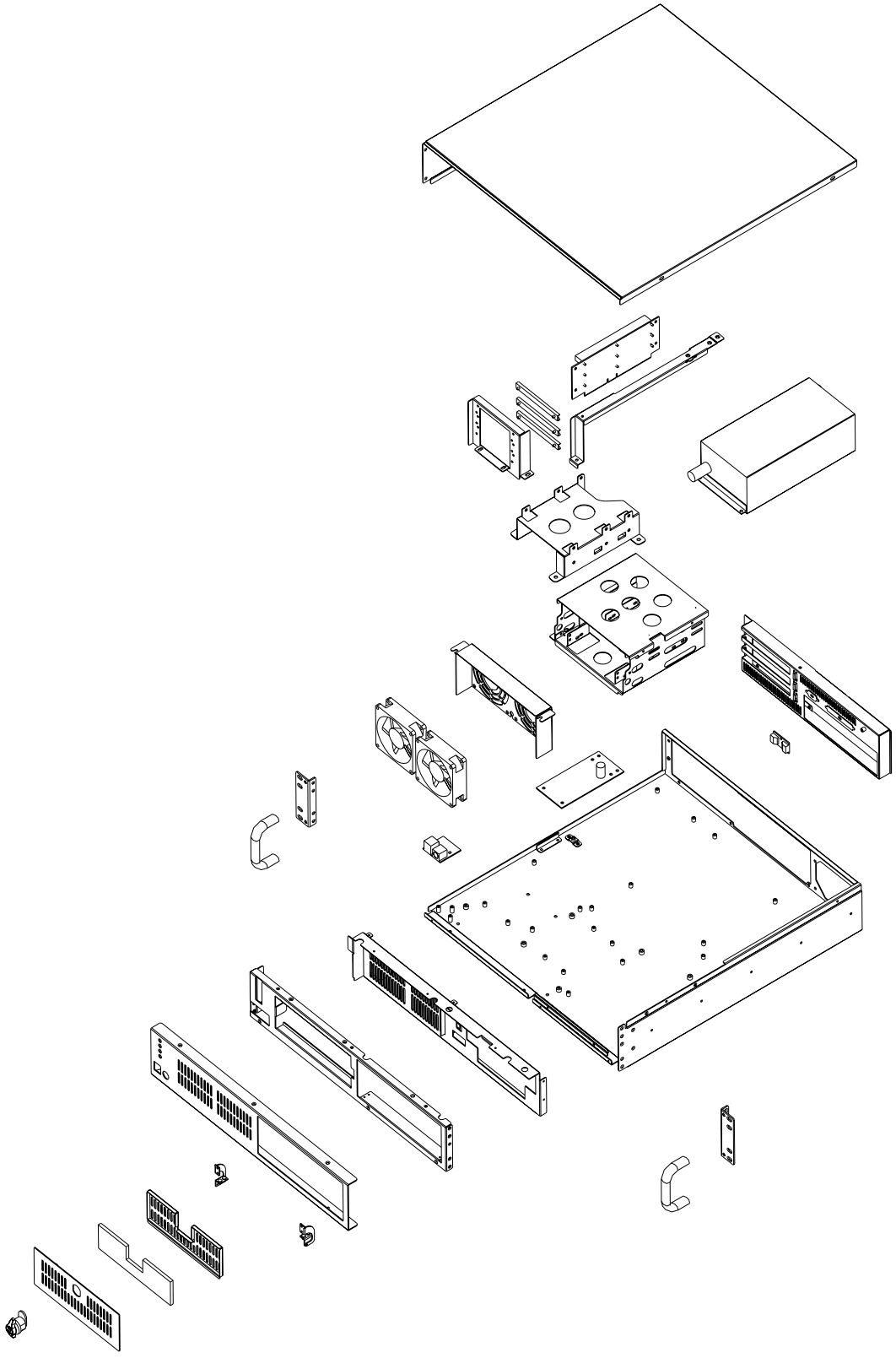
Table 4.12: CN1 & CN2, Temperature sensor connector			
Pin 1	+5 V	**Pin 3**	T_SDAT
Pin 2	T_SCLK	**Pin 4**	GND

Table 4.13: SW1, Thermal sensor I.D. setting				
Sensor I.D. No.	**SW 1-1**	**SW 1-2**	**SW 1-3**	**SW 1-4**
1 (default)	OFF	OFF	OFF	ON
2	OFF	OFF	ON	ON
3	OFF	ON	OFF	ON
4	OFF	ON	ON	ON
5	ON	OFF	OFF	ON
6	ON	OFF	ON	ON
7	ON	ON	OFF	ON
8	ON	ON	ON	ON

Appendix A

Exploded Diagram

A.1 Exploded Diagram



Appendix B

Motherboard Options

B.1 Motherboard Options

The ACP-2000MB supports a variety of Advantech ATX motherboards described below. Contact a local sales representative for more detailed information.

Table B.1: ATX motherboard options

Model Name	Bus				
	PCI	PCI/ISA	ISA	AGP	SATA
AIMB-750	2 (PCI-X 64-bit) 4 (PCI 32-bit)	-	-	1 (4X)	2
AIMB-744	2 (PCI-X 64-bit) 4 (PCI 32-bit)	-	-	1 (8X)	2
AIMB-742	(32-bit)	1	1	1 (8X)	-

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