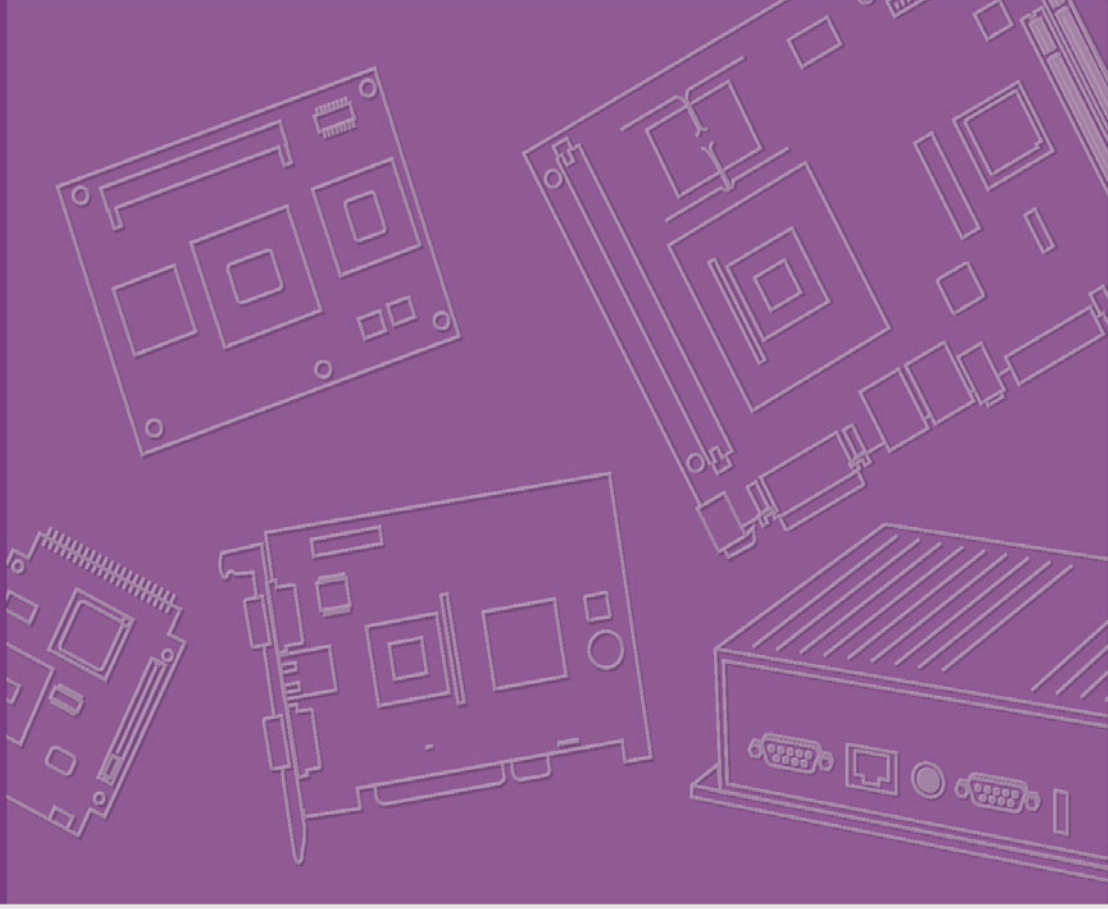

User Manual

ACP-2320MB

2U-high Rackmount Chassis with Dual SAS/SATA HDD Trays

Trusted ePlatform Services

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Acknowledgements

The ACP-2320, AIMB-742, AIMB-744, AIMB-750, AIMB-760, AIMB-762, AIMB-763, AIMB-764, AIMB-542, AIMB-552, AIMB-554, AIMB-556, AIMB-560, AIMB-562 and AIMB-564 are trademarks of Advantech Co., Ltd. All other product names or trademarks are the properties of their respective owners.

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Printed in China December 2008

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 0º C (32º F) or above 40º C (104º 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 the installation reference guide.
    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 I LASER PRODUCT
    KLASS I 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

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.

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, type of PC, CPU speed, Advantech products used, other hardware and software used, etc. Note anything abnormal and list any on-screen 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 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

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

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

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the product mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the product, 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, 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-2320MB.

Sections include:

- Introduction
- Specifications
- Power supply options
- Environment specifications
- Dimension diagram

1.1 Introduction

The ACP-2320MB is a compact, rugged, 2U-high rackmount industrial computer chassis designed for space-conscious applications. With only 2U height, ACP-2320MB can accept Advantech ATX/MicroATX motherboard with up to three full-length add-on cards with the optional riser card, or with up to 7 low profile add-on cards by using the optional special rear I/O bracket.

Dual mobile SAS / SATA HDD trays

ACP-2320MB comes with two mobile SAS / SATA HDD trays, which provide the most economic solution for data mirroring. Other data storage options include one slim-type optical disk drive and two internal 3.5” HDDs with shock-resistant protection. And the front dual USB and PS/2 I/O interfaces can be connected with various peripheral devices for data input, backup, and transferring.

Unique alarm detection and notification to reduce system down time

ACP-2320MB has an unique alarm module. This module automatically detects the system operating conditions, such as power, HDD, fan, and system temperature. Once any failure happens, the module gives an audible alarm to notify users to take necessary actions. It also shows the system status on the front LED indicators.

1.2 Specifications

- **Construction:** Heavy-duty steel
- **Disk Drive Capacity:** dual mobile SAS / SATA HDD trays, one slim-type optical disk drive, and two internal 3.5” HDDs
- **LED Indicators on Front Panel:** Bi-color LEDs (green/red) for Power, Temperature, and Fan status; single-color LED (orange) for HDD activity. For the SAS / SATA storage, each mobile tray has a single-color LED (green) that displays SAS / SATA HDD power and a single-color LED (blue) that displays SAS / SATA HDD status
- **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:** dual 8 cm x 8 cm (47 CFM) hot-swappable cooling fans & one 6 cm (28 CFM) fan behind the SAS / SATA HDD backplane
- **Air Filters:** Two easily maintained filters near the front of the system fans and behind the front door
- **Weight:** 11.7 kg (25.7 lbs)
- **Dimensions (W x H x D):** 482 x 88 x 480 mm (19" x 3.46" x 18.9")

1.3 Power Supply Options

The ACP-2320MB can accommodate the 2U-high power supply. Please see the options as below.

Table 1.1: Power supply options

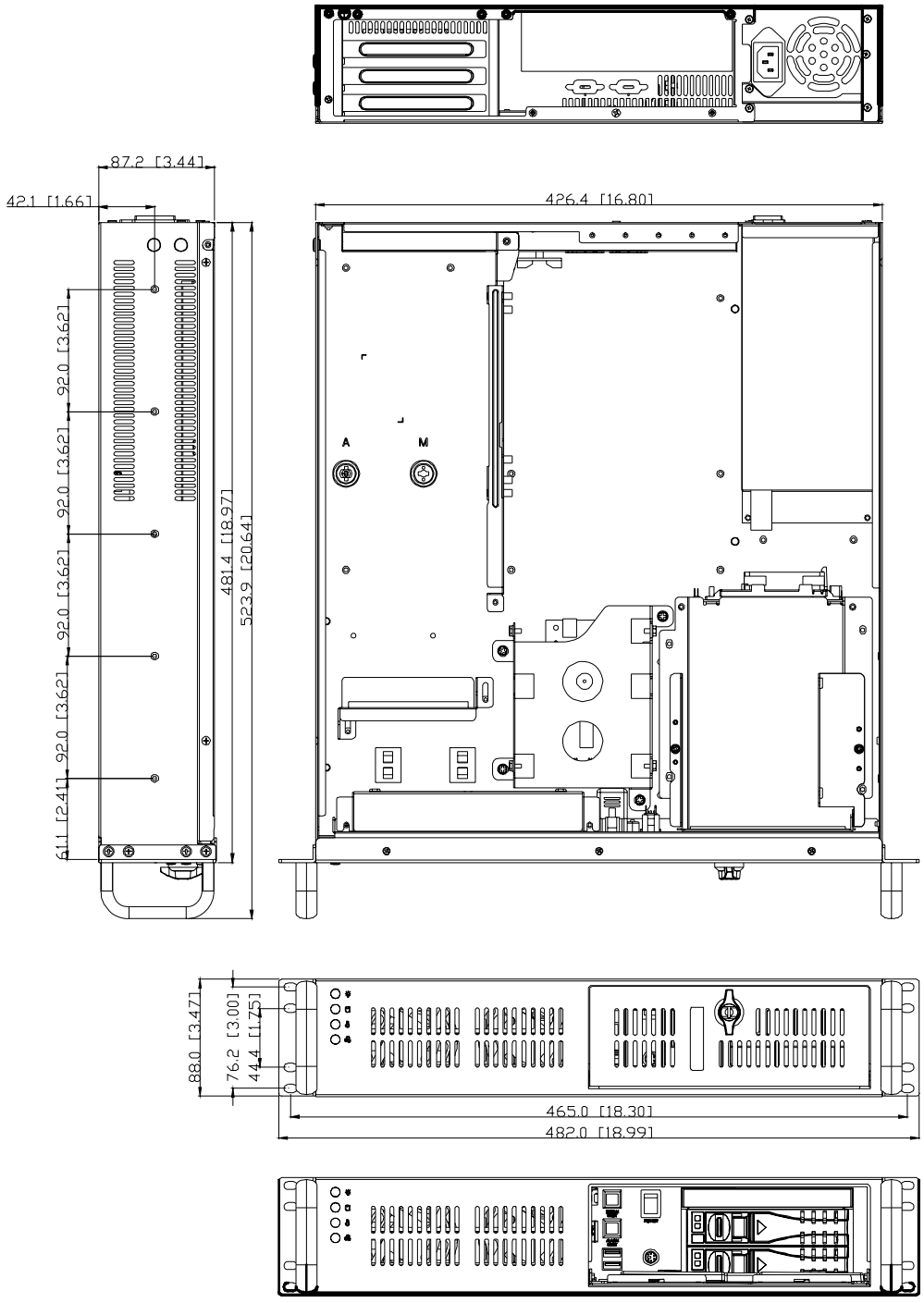
Model Name	1757000007G	1757000105G
Watt	300 W max. (ATX, PFC) (single 2U-high)	400 W max. (ATX, PFC) (single 2U-high)
Input rating	100 ~ 240 Vac (Full range)	100 ~ 240 Vac (Full range)
Output voltage	+5 V @ 35 A, +3.3 V @ 20A , +12 V @ 16 A, -12 V @ 1A, -5 V @ 0.5 A, +5 Vsb @ 2.0 A	+5 V @ 25 A, +3.3 V @ 20A, +12 V @ 28 A, -12 V @ 0.5A, -5 V @ 0.5 A, +5 Vsb @ 2 A
Minimum load	+5V @ 3A, +3.3V @ 1A, +12V @ 2A, -12V @ 0.05A, -5V @ 0.05A, +5Vsb @ 0.1A	+5V @ 3A, +3.3V @ 1A, +12V @ 2A, +5Vsb @ 0.1A
MTBF	97,800 hours @ 25° C	100,000 hours @ 25° C
Safety	UL/TUV/CB/CCC	UL/TUV/CB/CCC

1.4 Environment Specifications

Table 1.2: Environment 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



unit: mm (inch)

Figure 1.1 Dimension diagram

Chapter 2

System Setup

This chapter introduces the installation process.

Sections include:

- Installing a motherboard
- Installing a riser card and add-on cards
- Installing disk drives
- Attaching the ears and handles

The following procedures instruct users to install a motherboard, a riser card, add-on cards, and disk drives into the chassis. Please also refer to the Appendix A, Exploded Diagram and Parts List, for the detailed parts of the chassis.

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

To remove the cover, please proceed as below.

1. Loosen five screws on the rear and both sides of the top cover.
2. Slide the top cover backwards and then lift it up. (see Figure 2.1)

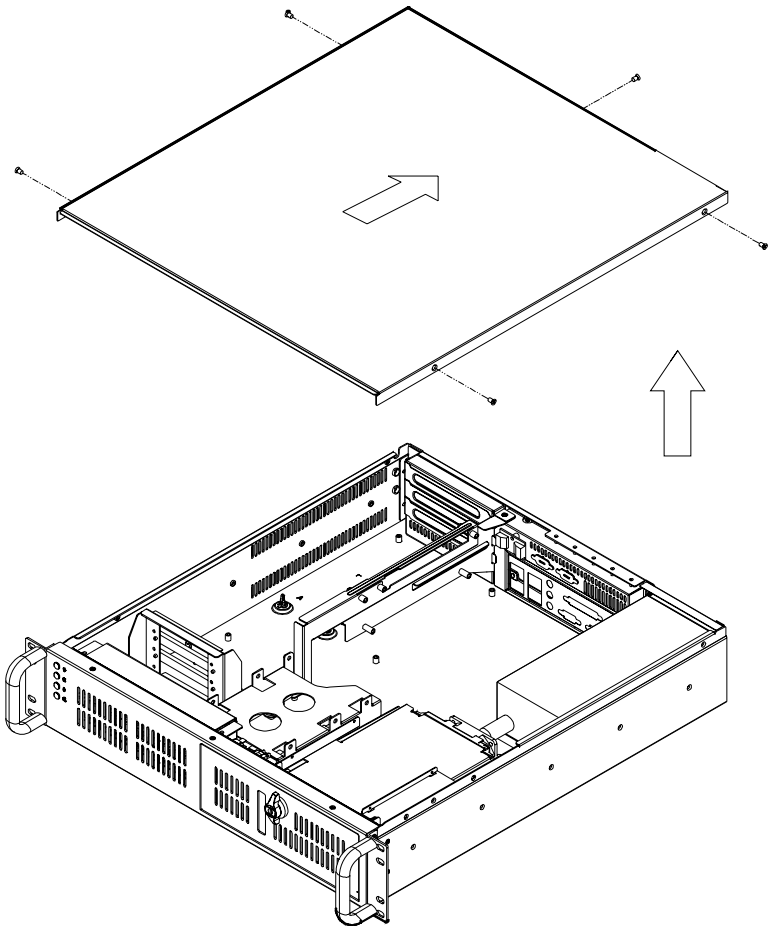


Figure 2.1 Removing the top cover

2.2 Installing a Motherboard

The ACP-2320MB can support ATX / MicroATX motherboard with up to 3 add-on cards via the expanded riser card, or 7 low profile add-on cards via the optional special rear I/O bracket. To install a motherboard, please proceed as follows:

Note! *Use caution when installing a motherboard. It's highly recommended to choose a CPU cooler which is lower than 67 mm to avoid any component interference between a motherboard and the chassis and to ensure the best air flow inside the chassis.*

1. Remove the card holder by loosening the two screws.
2. A yellow label is located inside of the chassis bottom. (see Figure 2.2) It shows the plastic post location for attaching the specific ATX / MicroATX motherboard. Users can find the plastic post in the accessory box (see Figure 2.3). Insert the plastic post into the correct location and then rotate counterclockwise to fasten it onto the chassis.

Model \ Mark	A	M
ATX motherboard	✳	
MicroATX motherboard		✳
Special: AIMB-744 AIMB-750 AIMB-760		

The plastic post is in the accesory box. Be sure to attach the post onto the correct location.

Figure 2.2 Yellow label indicating plastic post locations

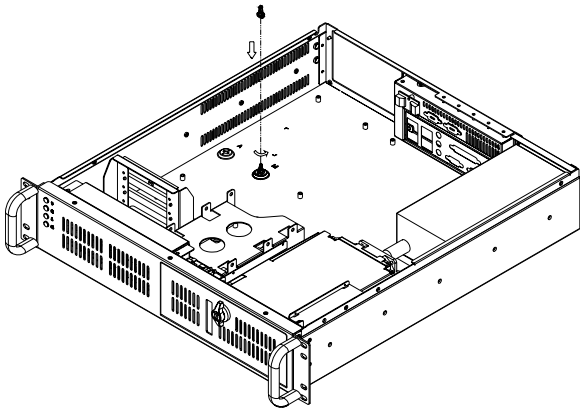


Figure 2.3 Fastening the plastic post

3. Attach the motherboard I/O shielding onto the rear plate first. Then fasten the motherboard onto the chassis. (see Figure 2.4)
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. Return the card holder to its original position and fasten it in case you don't need to install the riser card and add on card.
6. Connect the 9-pin USB wire, PS/2 wire, HDD LED wires, Power switch wire, and the System Reset switch wire from the chassis to the motherboard.

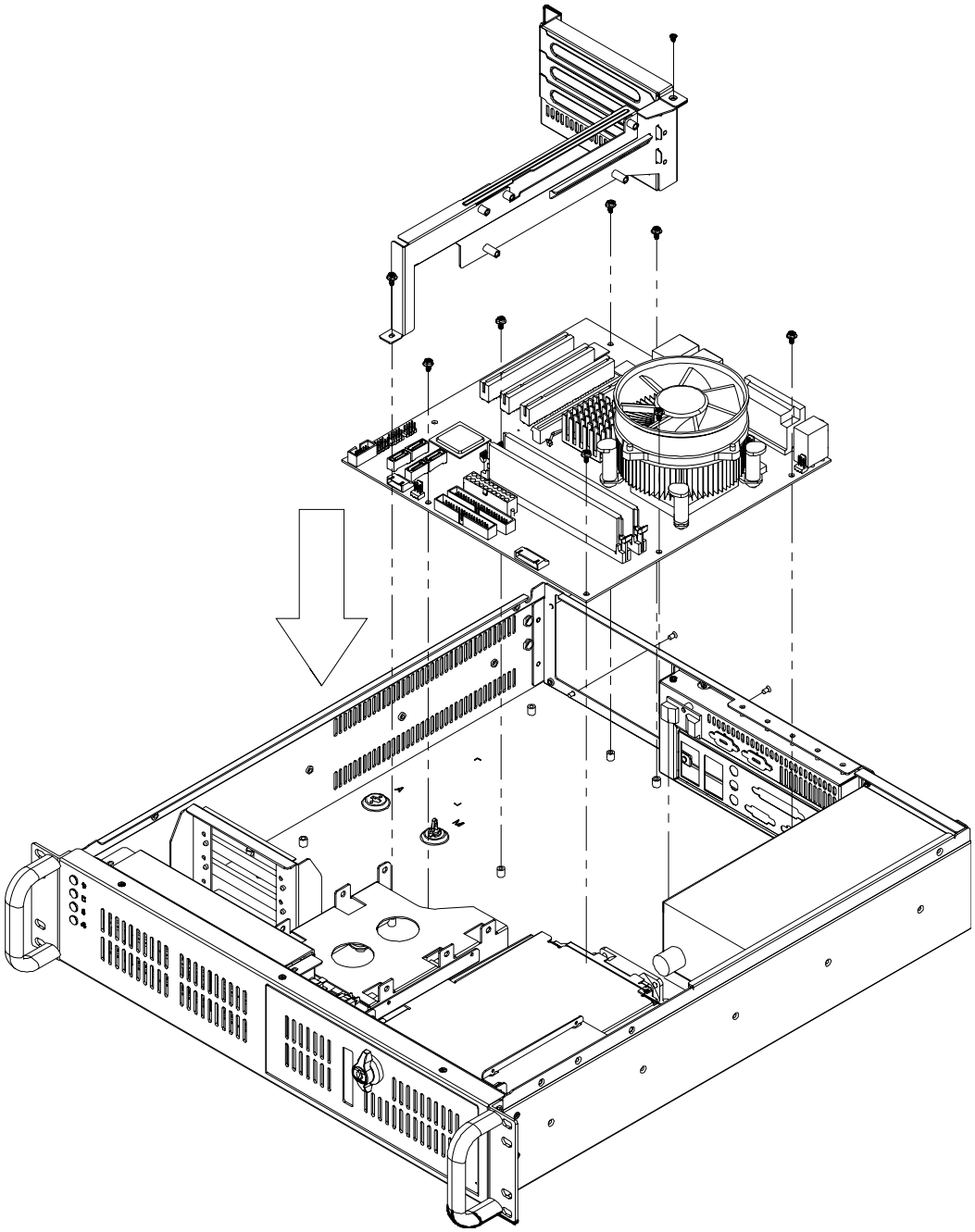


Figure 2.4 Installing a motherboard

2.3 Installing a Riser Card and Add-on Cards

The ACP-2320MB supports up to 3 add-on cards via the riser card. To install the riser card and add-on cards, please proceed as follows:

1. Fasten the riser card to the riser card holder with the four screws. Then insert this unit to the slot on the motherboard. (see Figure 2.5)
2. Remove the corresponding I/O bracket attached to the rear plate of the chassis. 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 2.6)
3. Repeat Step 2 if there is more than one add-on cards to be installed.
4. Return the riser card holder and fasten it onto the chassis.

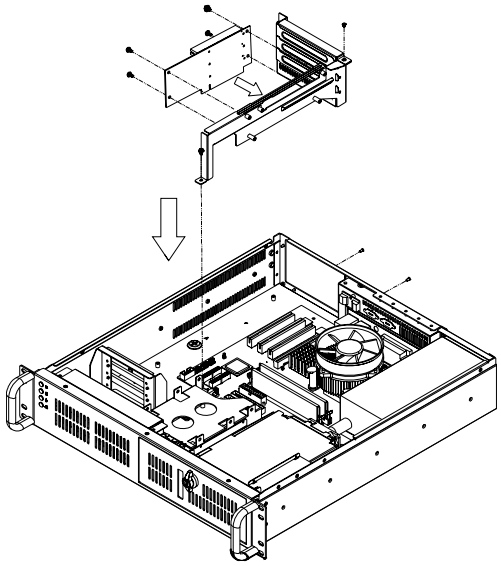


Figure 2.5 Installing a riser card

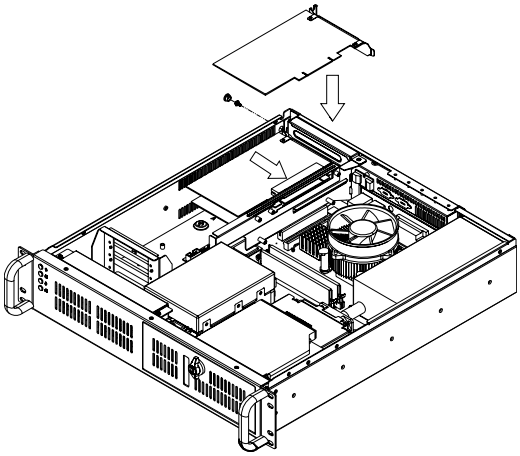


Figure 2.6 Installing an add-on card

Note! *The riser card of the motherboard is specially designed to support Advantech AIMB-7XX and AIMB-5XX series. There might be compatibility issue with other vendor's motherboards.*

If users purchase the ACP-2320MB with the low profile rear I/O bracket, then simply install the low-profile add-on card to the selected PCI/PCIe slot on the motherboard and fasten the card securely.

2.4 Installing the Disk Drives

The ACP-2320MB comes with two easy-to-maintain SAS / SATA HDD trays; it also accepts one slim type optical disk drive; it can also accommodate two internal 3.5” HDDs. Please refer to the following instructions to install the various disk drives.

2.4.1 Installing a SAS / SATA HDD in the Mobile HDD tray

ACP-2320MB accepts both SAS and SATA HDD. Users do not need to remove chassis cover when installing a SAS / SATA HDD into the mobile HDD trays.

1. Open the front door.
2. If you want to install a SAS / SATA HDD into the lower mobile tray, it is necessary to remove the front door first. The small door is attached to the ACP-2320MB with the hinges without screws.
3. Left-shift the key latch of one HDD tray to unlock the tray. Hold the handle of the tray and draw it out from the chassis.
4. Slide one SAS / SATA disk drive into the proper location in the tray and fix it with 4 ~ 6 screws.
5. Return and push the HDD tray to the chassis until the handle of tray is moving back. Right-shift the key latch of the HDD tray to lock the tray.
6. Repeat Steps 3 to 5 if there is the 2nd SAS / SATA HDD to be installed.

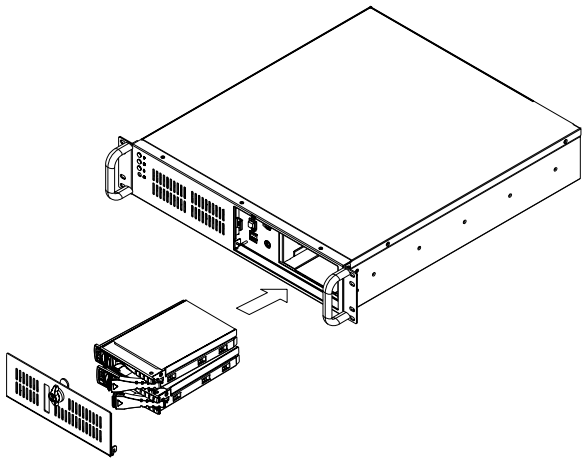


Figure 2.7 Removing the front door and the mobile SAS / SATA HDD trays

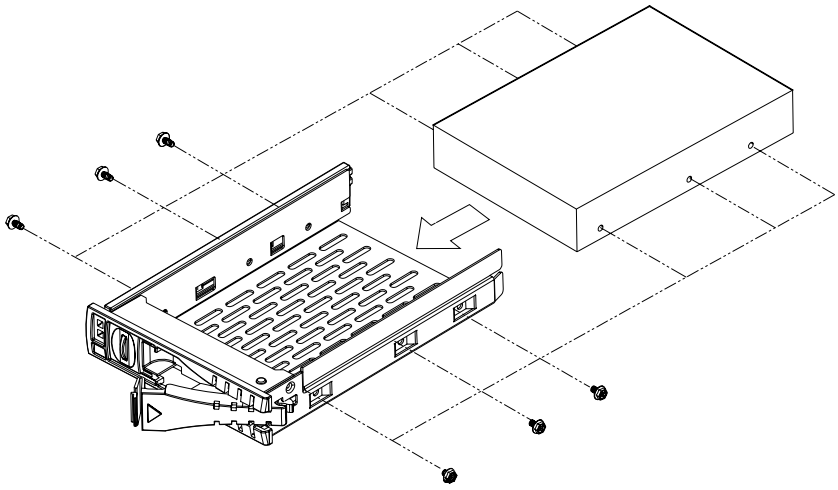


Figure 2.8 Installing a SAS / SATA HDD

2.4.2 Installing the internal HDD

The ACP-2320MB provides a shockproof housing to hold two 3.5” internal HDDs. To install the internal HDD, please follow these steps for installation.

1. To install the 3.5” internal HDD, simply release the four screws on top of the disk drive bracket. (see Figure 2.9)
2. Insert the disk drive into the proper location in the bracket and secure them with the screws provided.
3. Return the disk drive bracket in the original position and fasten it with the screws.
4. Connect the suitable cable from the motherboard to the 3.5” internal HDD. Then plug the power connector into each disk drive.

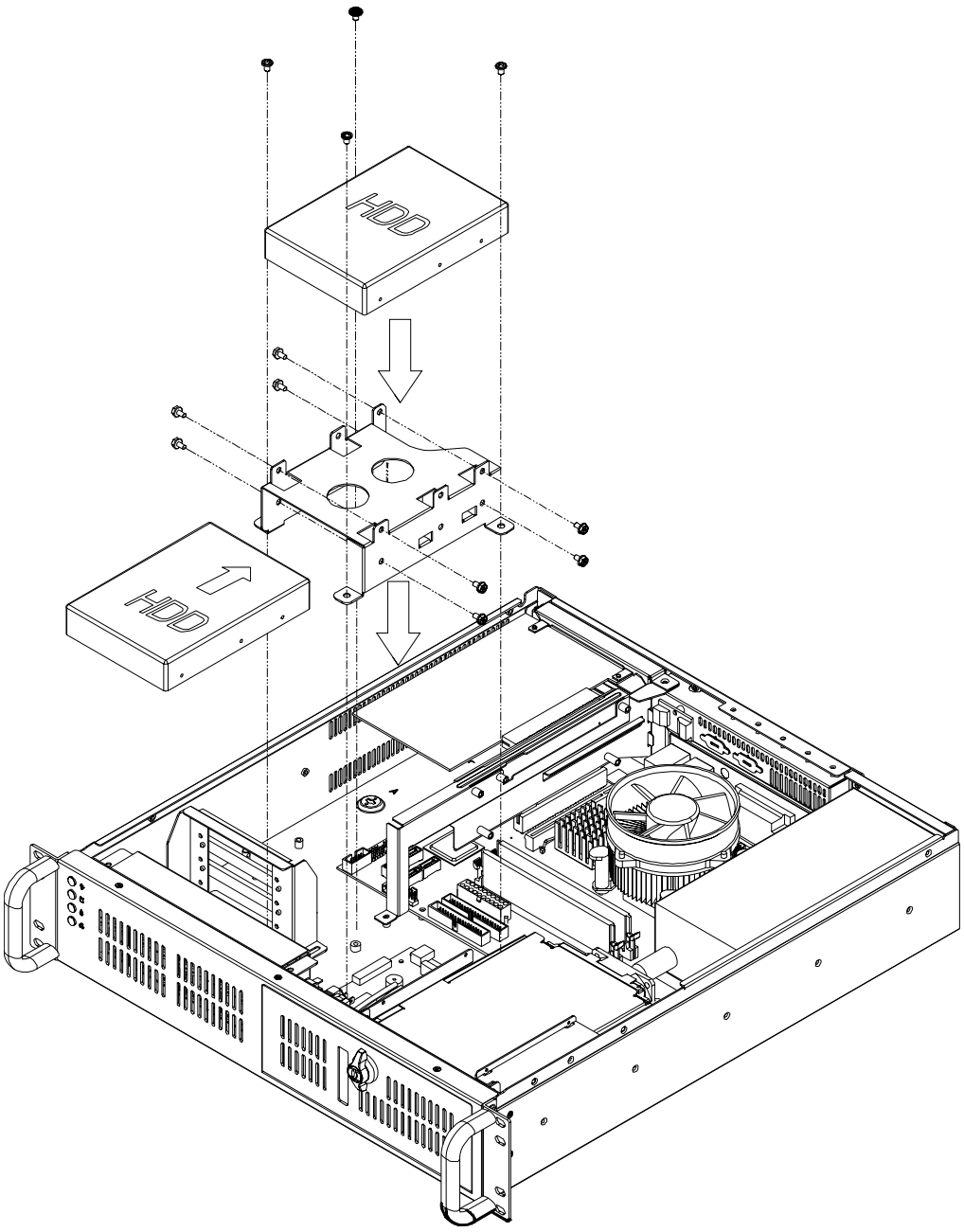


Figure 2.9 Installing the internal HDD

2.4.3 Installing a slim-type optical disk drive

1. Undo the two screws on the top of the SAS / SATA HDD housing and take out the brackets.
2. Remove the front cover for the slim-type optical disk drive.
3. Find a small PCB converter (See Figure 2.10) and connect it to the slim-type optical disk drive. Then fix it onto the optical disk drive by tightening the two screws provided. (See Figure 2.11)
4. Fix the optical disk drive onto the brackets with the four screws provided.
5. Return the brackets with the slim-type optical disk drive in the original position and fasten it with the screws.
6. Connect the 40-pin IDE flat cable from the motherboard to the optical disk drive. Also plug the 4-pin power connector.

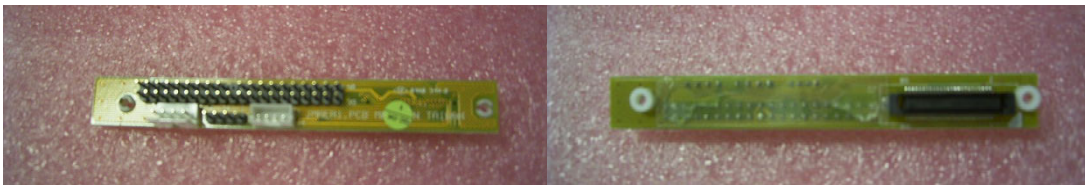


Figure 2.10 Small convert for slim-type optical disk drive

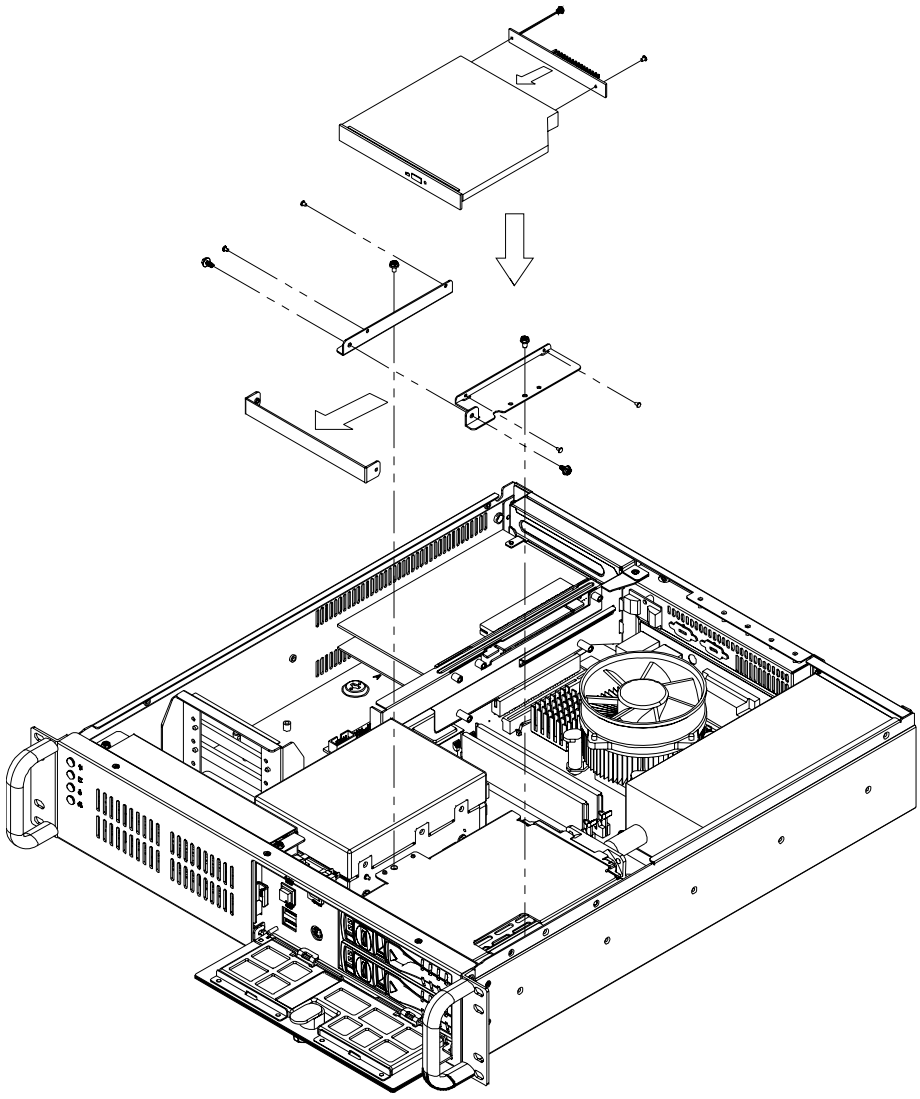


Figure 2.11 Installing a slim-type optical disk drive

2.5 Attaching the Ears and Handles

There is a pair of ears and handles in the accessory box. If you need to install them, please refer to Figure 2.12 to simply fasten them to the front-right and front-left mounting ears with the screws provided.

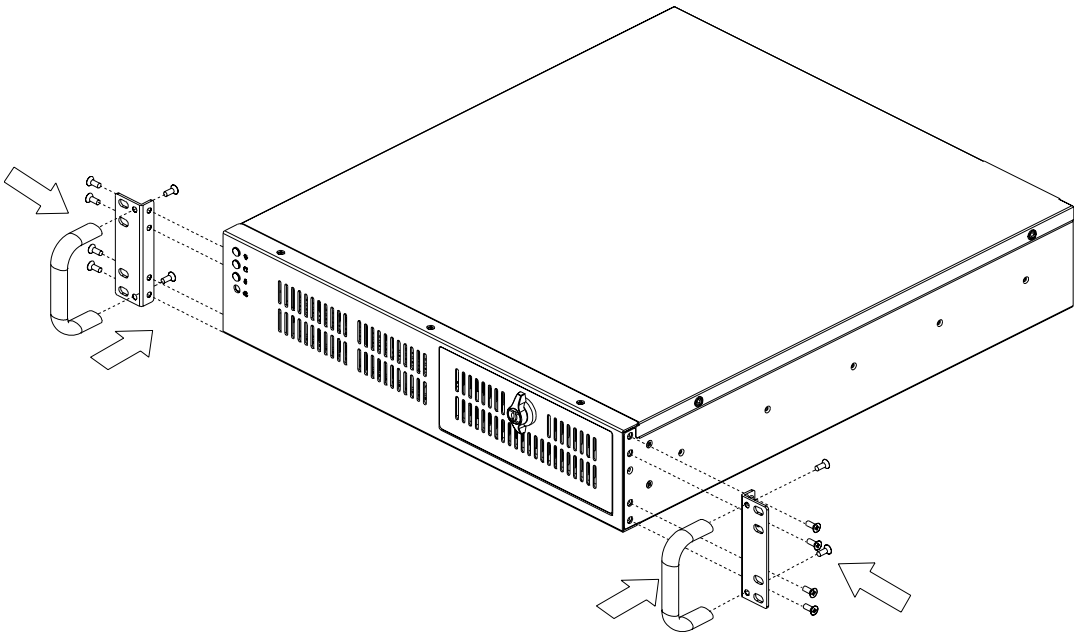


Figure 2.12 Attaching the ears and handles

Chapter 3

Operation

This chapter introduces the system operation information.

Sections include:

- The front panel
- The rear panel
- Replacing the cooling fans
- Cleaning the filters
- Replacing the power supply

3.1 The Front Panel

The front panel features the lockable door, four LED indicators, a dual USB port and a PS/2 connector. The user can close the door with or without the key with the user-friendly rotary lock. When opening the door, there is a momentary power switch, a system reset button, and an alarm reset button. Specific functions are described as below.

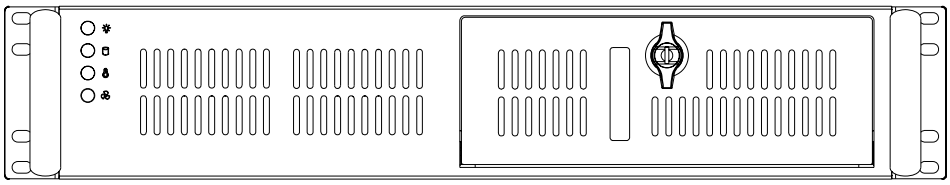


Figure 3.1 Front panel with door closed

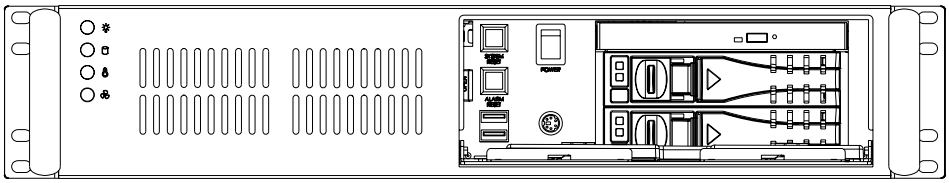


Figure 3.2 Front panel with door open

3.1.1 Switch, buttons and I/O interfaces

Momentary Power switch: Press this switch to turn the system power on or off. Please use system shutdown or press this switch for a few seconds to turn off the system ATX power.

System Reset button: Press this switch to reboot the system.

Alarm Reset button: Whenever a fault occurs in the system (e.g., fan failure or the chassis is overheated), the audible alarm will be activated. Press this button will stop the alarm from beeping.

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 mother-board 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 the LED definition summary.

Table 3.1: LED indicator functions

LED	Description	Green	Orange	Red
	System power	Normal	N/A	Abnormal
	Hard disk drive activity	N/A	Data access	N/A
	Temperature in the chassis	Normal	N/A	Abnormal
	Cooling fan status	Normal	N/A	Abnormal

When the system power is on, the **POWER LED** is always **Green**.

When the **POWER LED** is **Red**, it indicates a redundant power supply failure. To stop the alarm beep, press the **Alarm Reset** button. Examine the redundant power supply module right away and replace the failed module with a working one.

When the **HDD LED** is blinking **Orange**, it means the HDD is transmitting data.

When the **FAN LED** is **Red**, it indicates a failed cooling fan, and the alarm is also activated. To stop the alarm beep, press the **Alarm Reset** button and then replace the failed fan with a working one immediately.

If the **TEMP LED** is **Red**, it means that inside of the chassis is overheated (more than 50° C). An audible alarm will be activated. To stop the alarm beep, press the **Alarm Reset** button. Inspect the fan filter and the rear section of the chassis immediately. Make sure the airflow inside the chassis is smooth and not blocked by dust or other particles.

3.1.3 LED indicators for SAS / SATA HDD power & status

Each SAS / SATA HDD tray has a pair of LED indicators for displaying the SAS / SATA HDD power and the activity status. Please refer to Table 3.2 for the LED definition summary.

Table 3.2: SAS / SATA HDD LED indicator functions

LED	Description	Green	Blue
	HDD Power	HDD power on	N/A
	HDD Status	N/A	Data access: Blinking Idle: Light (SAS HDD) No light (SATA HDD)

When the system power is on and the SAS / SATA HDD is well connected, the HDD power LED glows steady **Green**. If it fails to light up, check connect the SAS / SATA connection. Or please ask a technician to inspect the related cables in the chassis.

When the SAS / SATA HDD is transmitting some data, the HDD LED blinks blue. Depending on the type of HDD, the HDD LED indications are different. When an SAS HDD is idle, the HDD LED glows steady blue. When an SATA HDD is idle, the HDD LED is off.

3.2 The Rear Panel

The rear plate includes 3-slot I/O brackets and two reserved 9-pin D-SUB openings and a motherboard I/O opening. (see Figure 3.3).

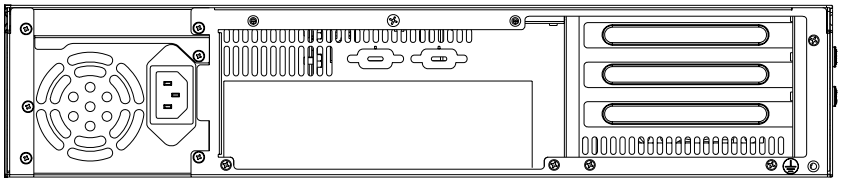


Figure 3.3 Rear panel with standard I/O brackets

There is an optional rear I/O bracket for installing low profile add-on cards. (see Figure 3.4)

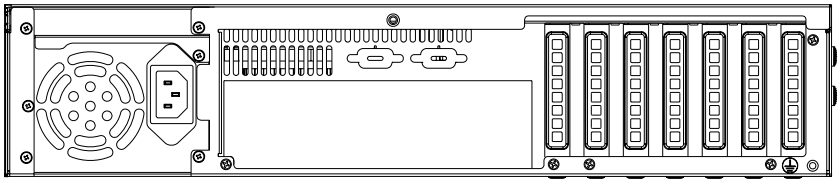


Figure 3.4 Rear panel with low profile I/O brackets

There is a ground screw with a washer located on the lower right of the rear panel; when properly grounded, this protects the system in case of electric leakage.

3.3 Replacing the Cooling Fans

There are two easily maintained system cooling fans behind the front plate of the chassis and one fan behind the SAS / SATA HDD backplane.

3.3.1 Replacing the system cooling fan

1. Remove the top cover.
2. Unplug both fans' power connectors.
3. Loose the two screws on the fan bracket and gently pull it out. (see Figure 3.5)
4. Remove the four screws on the failed fan unit and take out the fan.
5. Fasten a new fan onto the fan bracket.
6. Return the fan bracket to the chassis and fasten it with two screws.
7. Plug in both fans' power connectors.
8. Replace the top cover and fasten it.

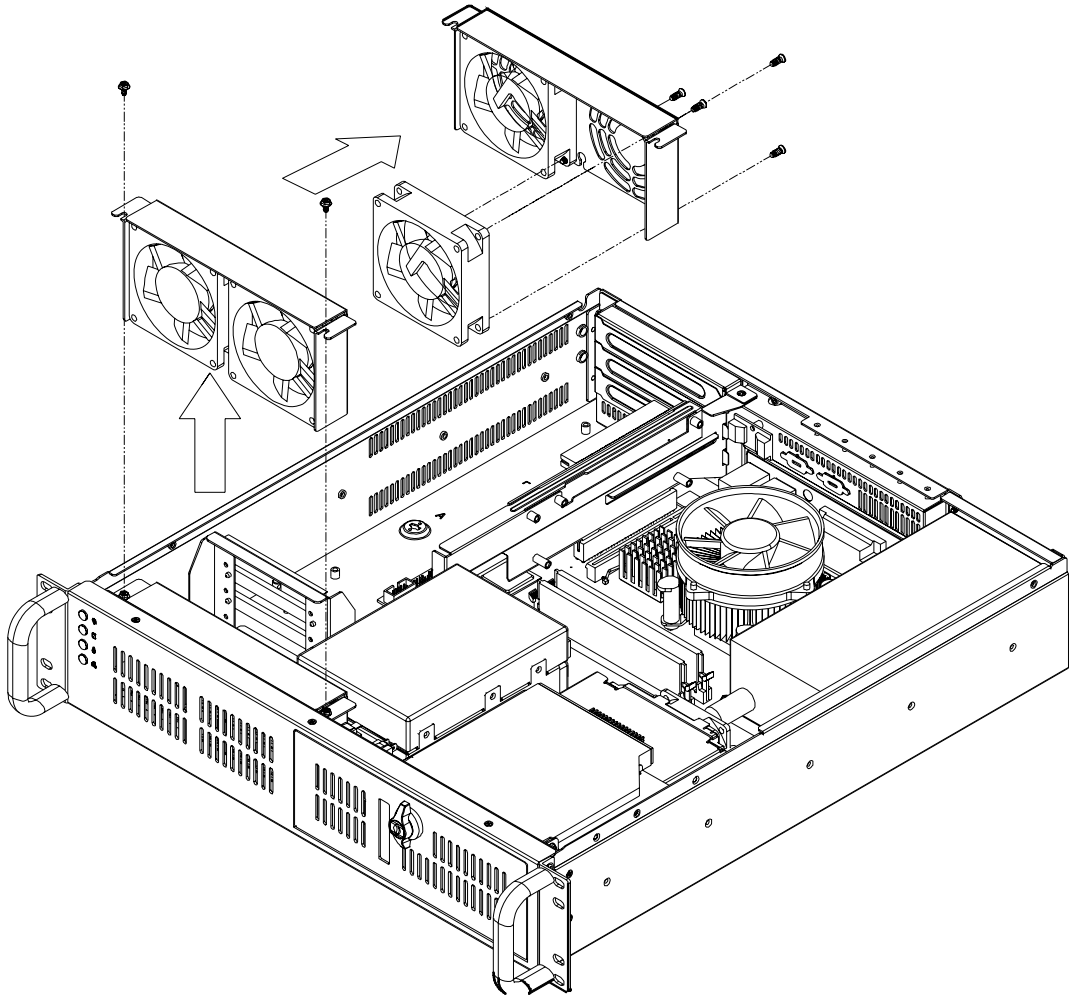


Figure 3.5 Replacing the system fan

3.3.2 Replacing the fan behind the SAS / SATA HDD backplane

1. Remove the top cover.
2. Unplug the fan power connector.
3. Push the hook on the left side of the fan to take out the fan (see Figure 3.7).
4. Replace the broken fan with a new one.
5. Stick the fan to the hook on the right side of the bracket, then directly push the fan into the bracket.
6. Plug in the fan power connector.
7. Replace the top cover and fasten it.

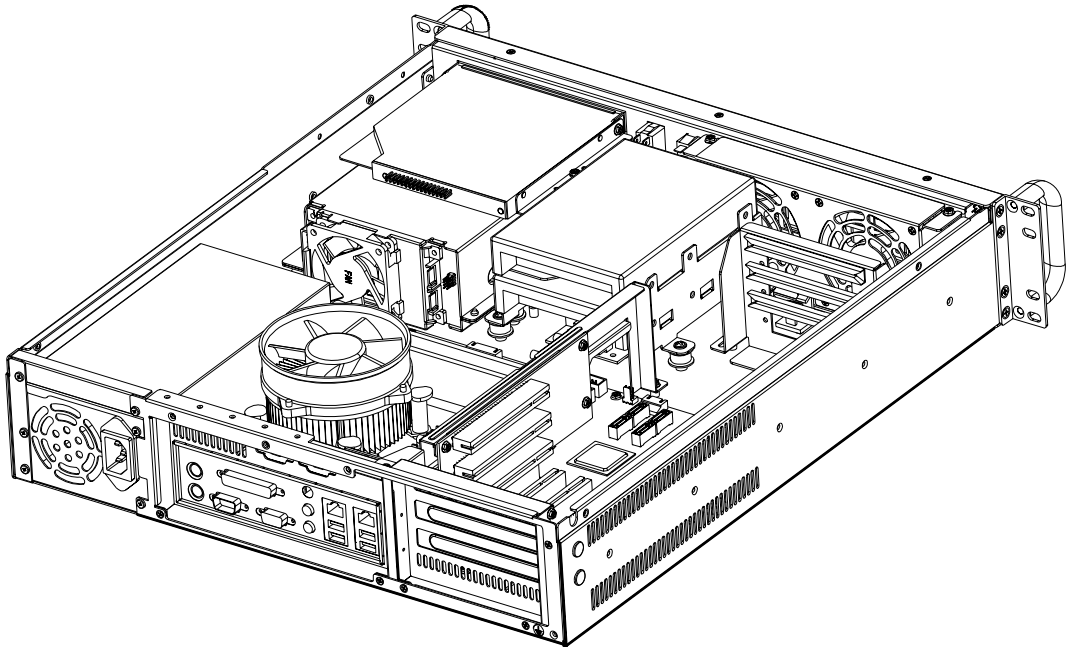


Figure 3.6 Replacing the fan behind the SAS / SATA HDD backplane

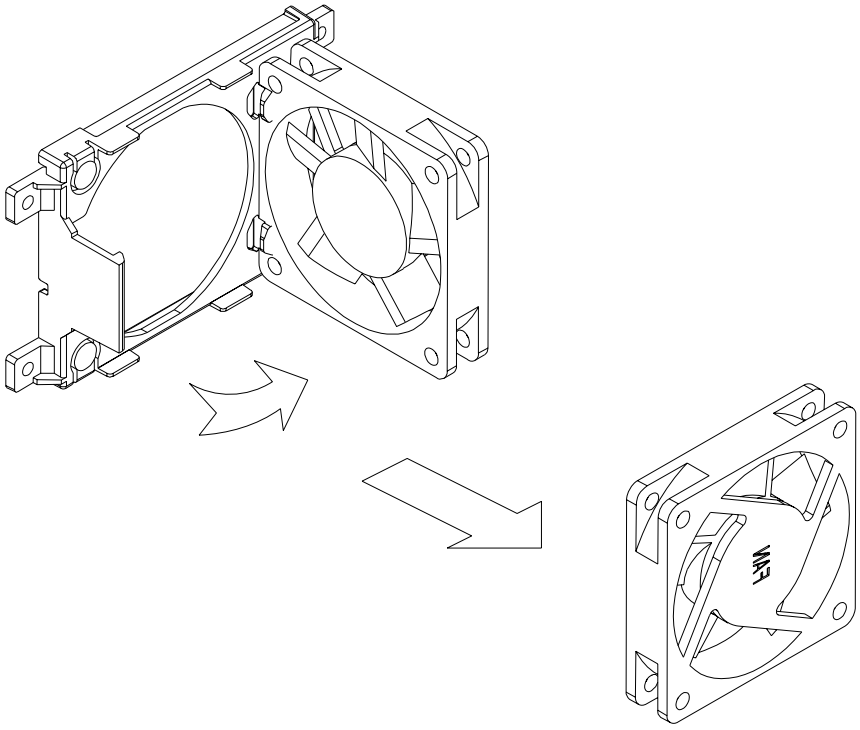


Figure 3.7 Remove the fan from the plastic bracket

3.4 Cleaning the Filters

The filters function to block dust or particles from the work environment and to extend the longevity of the system. Periodic filter cleaning is recommended. There are two filters in the chassis: one is in front of the system fans and the other is behind the front door. To clean the filters, proceed as follows:

1. Open the front door.
2. To remove the door filter, simply push the hook and pull it out.
3. To pull out the fan filter, push the hook and slide it to the right. (see Figure 3.8)
4. Clean the filter with a soft brush or wash the dust away from the filter with flowing water and let it dry thoroughly.
5. Replace the filters inside the unit.

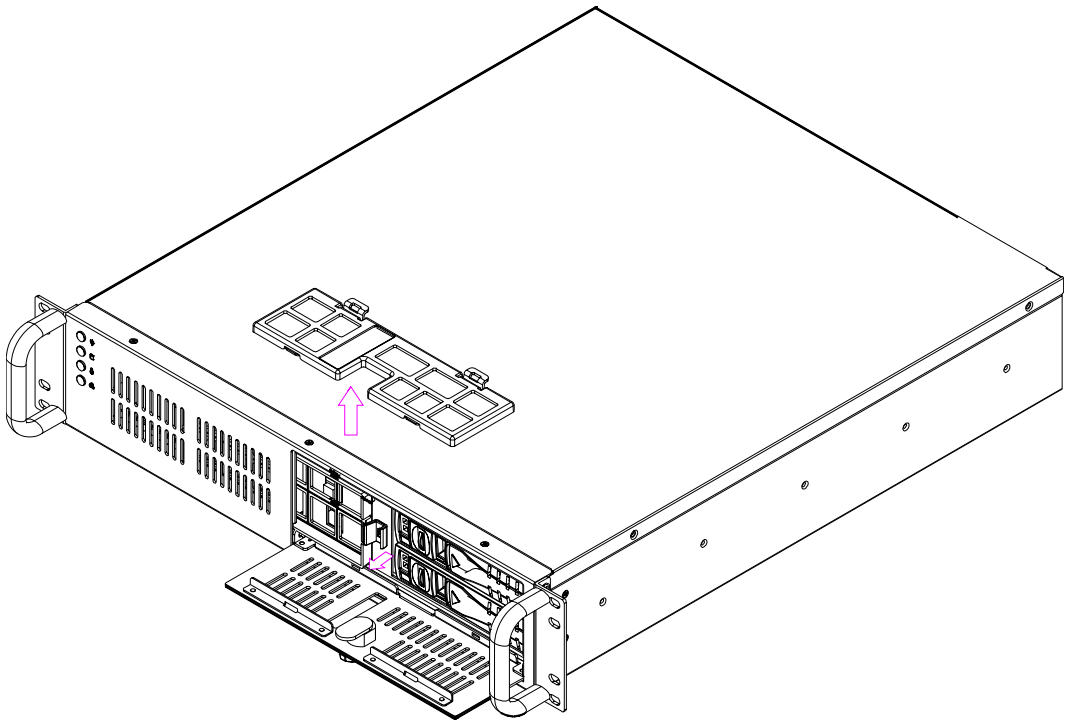


Figure 3.8 Cleaning the filters

3.5 Replacing the Power Supply

The ACP-2320MB supports a single 2U-high power supply. To replace the power supply, proceed as follows:

1. Unplug the power cord from the power supply.
2. Remove the top cover.
3. Unplug the 20-pin (or 24-pin) ATX power connector and 4-pin +12 V power connector from the motherboard, as well as the power connectors from the disk drives and peripherals.
4. Loosen the three screws on the rear plate and the two screws on the power supply bracket and then gently take it out. (see Figure 3.9)
5. Replace the power supply with a new one and fasten it onto the chassis.
6. Plug the 20-pin (or 24-pin) ATX power connector and 4-pin +12V power connector to the motherboard. And plug other power connectors to the disk drives and peripherals.
7. Return the top cover. Then plug in the power cord.

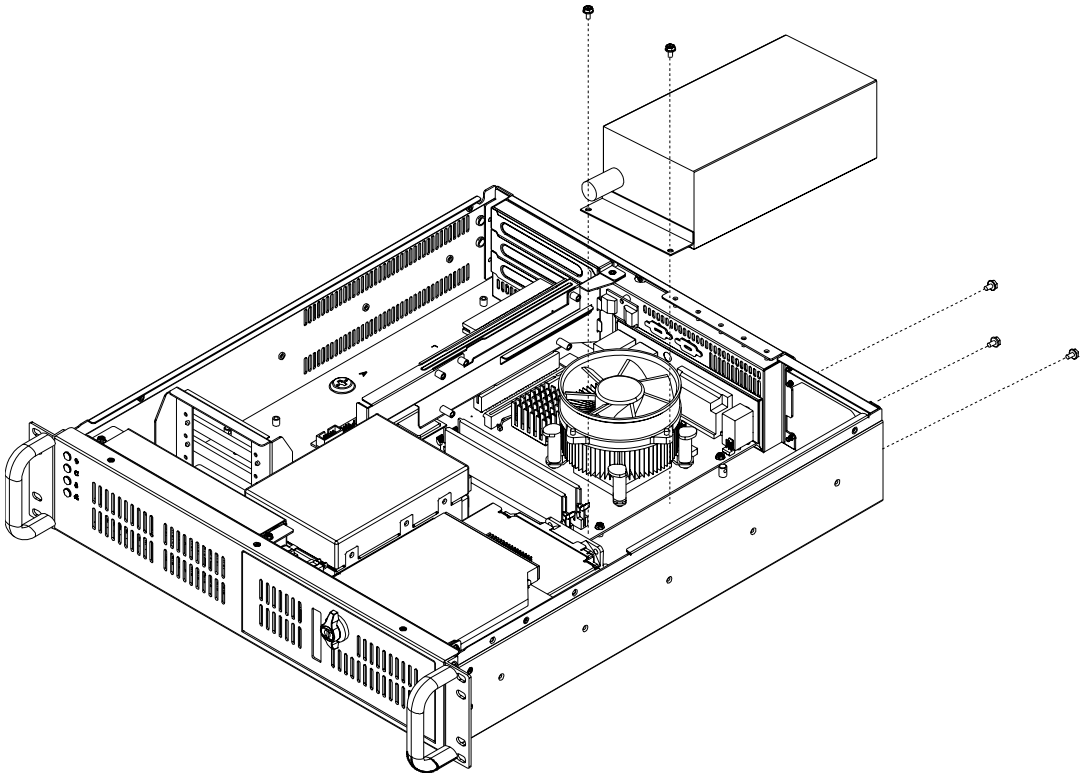


Figure 3.9 Replacing the power supply

Chapter 4

Dual-Slot SAS/SATA Backplane

This chapter introduces the SAS/ SATA HDD backplane information.

Sections include:

- Backplane layout
- Connectors & pin definition

4.1 Backplane Layout

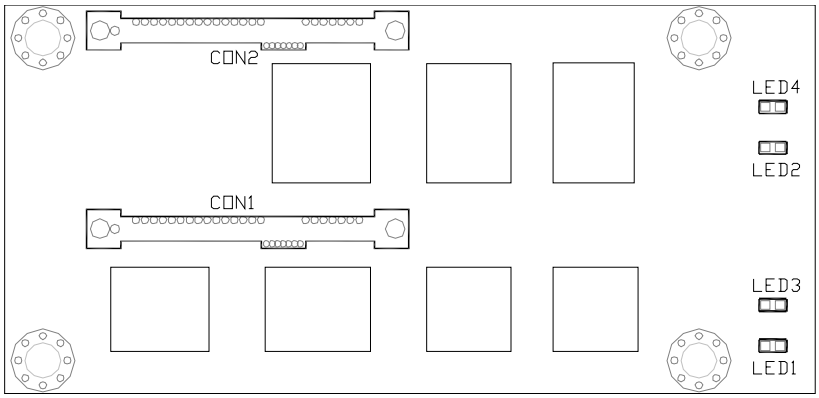


Figure 4.1 Front side layout (connect to the HDD)

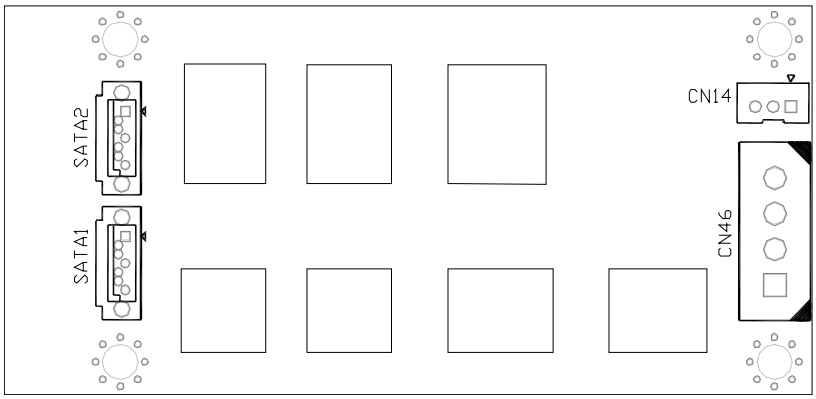


Figure 4.2 Rear side layout (connect to the RAID card or motherboard)

4.2 Connectors & Pin Definition

Table 4.1: SAS / SATA HDD connectors and LEDs on front side	
CON1 ~ CON2	SAS / SATA HDD connectors
LED3 ~ LED4	SATA HDD1 ~ HDD2 power LED (green)
LED1 ~ LED2	SATA HDD1 ~ HDD2 Bi-Color LED (blue) HDD Activity (blue)

Table 4.2: SATA cable connectors on rear side	
SATA1 ~ SATA2	Cable connectors for connecting to SAS / SATA RAID card or motherboard

Table 4.3: CN46, Power connector			
Pin1	+12 V	Pin3	GND
Pin2	GND	Pin4	VCC

Table 4.4: CN14, Fan connector			
Pin1	GND	Pin3	+5 V
Pin2	+12 V		

Chapter 5

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 internal disk drive housing. The alarm module provides system detection functions that monitor the entire 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 makes an audible alarm when:

a. Any power supply module of the redundant power supply fails.
b. One of the cooling fans fails.
c. The temperature inside the chassis is too high.

To stop the alarm beep, simply press the Alarm Reset button and then take the necessary action to fix it.

5.1 Alarm Board Layout

The layout and detailed specification of the alarm board are given below:

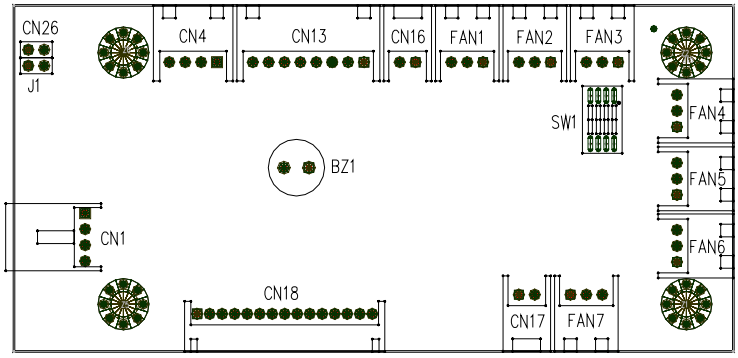


Figure 5.1 Alarm board layout

5.2 Alarm Board Specifications

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

5.2.1 Connectors, Jumper and Pin Definition

Table 5.1: 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 5.2: CN4, Thermal sensor connector			
Pin 1	+5 V	Pin 3	T_SDAT
Pin 2	T_SCLK	Pin 4	GND

Table 5.3: CN13, Voltage detection 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 5.4: CN16, Power good input connector			
Pin 1	Power Good	Pin 2	GND

Table 5.5: CN17, Alarm reset connector			
Pin 1	ALARM RESET	Pin 2	GND

Table 5.6: 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 5.7: CN26, External HDD LED connector			
Pin 1	HLED_ACT	Pin 2	N/A

Table 5.8: FAN1~FAN7, Fan connectors			
Pin 1	GND	Pin3	FAN_DEC
Pin 2	+12V		

Table 5.9: J1, External buzzer			
Pin 1	Buzzer	Pin 2	+5V

Table 5.10: 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

5.2.2 Switch Settings

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

Table 5.11: 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	OFF	ON	OFF	OFF
3 (default)	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! *Please connect the fan connectors in the correct sequence: If two fans are set on SW1, the correct method is to connect them into 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, then the alarm will not function correctly.*

5.3 Thermal Sensor

The ACP-2320MB is configured with a thermal sensor located at the rear side of the chassis. Please refer to Figure 5.2 for a diagram of the thermal sensor module.

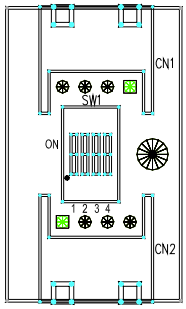


Figure 5.2 Thermal sensor module

The default sensor I.D. number is 1. Users can refer to Table 5.13 to set the sensor I.D. number by adjusting the switch, SW1, on the sensor module.

Table 5.12: CN1 & CN2, Thermal sensor connector

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

Table 5.13: SW1, Thermal sensor I.D. number 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 and Parts List

A.1 Exploded Diagram

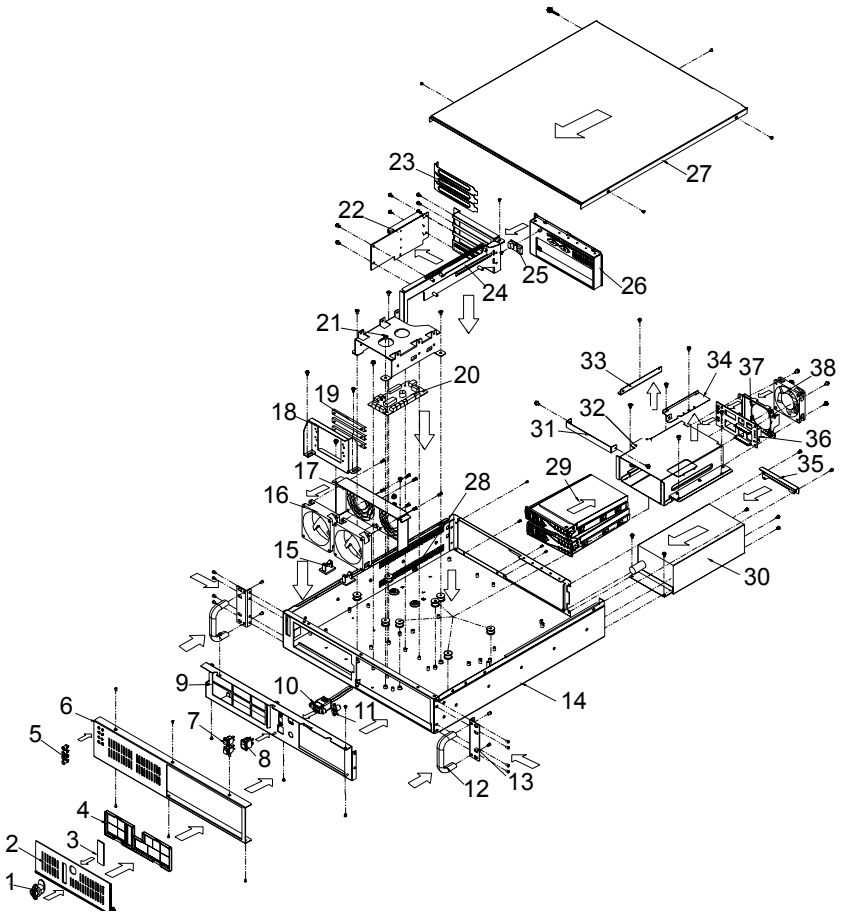


Figure A.1 ACP-2320MB exploded diagram

Table A.1: Parts list			
1	Key Set	20	Alarm Board
2	Front Door	21	Internal HDD Bracket
3	Transparent Sheet	22	Riser Card (Optional)
4	Air Filter	23	I/O Bracket
5	LED Holder	24	Card Support Beam
6	Front Panel	25	Thermal Board
7	Cable	26	Rear Plate
8	ATX Cable	27	Top Cover
9	Front Plate	28	Motherboard Plastic Post
10	USB	29	HDD Tray
11	PS/2	30	Power Supply
12	Handles	31	Slim ODD Cover
13	Rack Mounting	32	HDD Bracket
14	Chassis	33	Slim ODD Bracket L
15	Wire Saddle	34	Slim ODD Bracket R
16	System Fans	35	Power Bracket
17	Fan Bracket	36	SAS / SATA HDD Backplane
18	Guide Rail Bracket	37	Fan Bracket
19	Add-on Card Guide Rail	38	HDD Fan

Appendix B

Motherboard & Riser Card Options

B.1 Motherboard Options

ACP-2320MB supports a variety of Advantech ATX / MicroATX motherboards as below. Users can contact a local sales representative for detailed information.

Table B.1: ATX motherboard options

Model Name	Bus				
	PCI	PCI/ISA	ISA	AGP	SATA
AIMB-764	1 (PCIe x16) 1 (PCIe x4) 5 (PCI 32-bit)	-	-	-	5
AIMB-763	1 (PCIe x16) 1 (PCIe x1) 5 (PCI 32-bit)	-	-	-	4
AIMB-762	1 (PCIe x16) 1 (PCIe x4) 5 (PCI 32-bit)	-	-	-	4
AIMB-760	1 (PCIe x1) 5 (PCI 32-bit)	-	-	-	4
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)	-

Table B.2: MicroATX motherboard options

Model Name	Bus		
	PCI	AGP	SATA
AIMB-556	1 (PCIe x16) 1 (PCIe x4) 2 (PCI 32-bit)	-	3
AIMB-554	1 (PCIe x16) 1 (PCIe x4) 2 (PCI 32-bit)	-	2
AIMB-552	3 (PCI 32-bit)	-	2
AIMB-542	3 (PCI 32-bit)	1 (8x)	2

B.2 Riser Card Options

ACP-2320MB supports a variety of riser cards for Advantech ATX/ MicroATX motherboards as below. Users can contact a local sales representative for detailed information.

Table B.3: Riser card options

Model Name	Interface	Expansion slots	Compatible Motherboards
AIMB-R4301	PCIe x4	3 PCIe x1	AIMB-764 / 762/ 556/ 554; 762 & 554 only support one PCIe x1 (the lowest slot)
AIMB-R430P	PCIe x4	3 PCI	AIMB-764 / 762 / 556 / 554
AIMB-R431F	PCIe x16 + PCIe x4	1 PCIe x16 + 2 PCIe x1	AIMB-764 / 762 / 556 / 554; 762 & 554 only support one PCIe x1 (the lowest slot) except one PCIe x16
AIMB-RP30P	PCI	3 PCI	AIMB-760 / 750 / 744 / 742 / 542 / 560 / 552; AIMB-542 only support one PCI (the lowest slot)
AIMB-RP3PF	PCIe x16 + PCI	1 PCIe x16 + 2 PCI	AIMB-763 / 564 / 562
AIMB-RH31P	PCI + PCIe x1	2 PCI + 1 PCIe x1	AIMB-760

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