

ACP-4320

**4U Industrial Chassis with Dual
Front-accessible
SAS/SATA HDD Trays**

Trusted ePlatform Services

ADVANTECH

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Acknowledgements

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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 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.

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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

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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.

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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.

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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:

- ACP-4320 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, 1 piece of EMI spring shielding (for backplane version), 15 pieces rubber cushions (backplane version) or 7 pieces (motherboard version), 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 ACP-4320, 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.

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Chapter 1

General Information

This chapter provides general information about the ACP-4320.

Sections include:

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

1.1 Introduction

The ACP-4320 is a 4U rackmount industrial computer chassis designed for building mission-critical applications. With the latest industrial design on its outlook, the ACP-4320 breakthroughs the traditional, rigid impression of industrial PCs, and provides users with both a high-performance and a state-of-the-art operating platform.

Dual front-accessible SAS/SATA HDD trays for easy maintenance

The ACP-4320 is supplied with two front-accessible SAS/SATA HDD trays, which provide the most economic and user-friendly solution for data storage. Users may easily replace a SAS/SATA HDD without opening the chassis cover. Other data storage options include two 5.25" drive bays for optical disk drives and one 3.5" drive bay for floppy drive disk or internal 3.5" hard drive disk. Moreover, the front accessible USB interface can be connected with various peripheral devices for data input, backup, and transferal.

Unique alarm detection and notification to reduce system down time

The ACP-4320 has a unique alarm module. This module automatically detects the system operating conditions, such as power, HDD, FAN, as well as in-chassis temperature, and it may show the system status on the front LED indicators. If any failure happens, the module will also give an audible alarm to notify users to take necessary actions.

Versatile industrial features

The ACP-4320 supports either an ATX or a MicroATX motherboard, plus an up-to-15-slot PICMG 1.0 backplane or 12-slot PICMG1.3 express backplane, bringing users flexibility for their system configuration planning.

It also provides a wide range of ATX power supply options for user selection: from 300W to 400W for both single and redundant power supply. The lockable front door prevents from any unauthorized access to data storage zone. Moreover, the streamlined in-chassis airflow design keeps the system cool, while the easy-to-maintain fans and filters shorten the system's MTTR (Mean Time to Repair). All these outstanding features make the ACP-4320 the best choice for price, performance and overall cost of ownership.

1.2 Specifications

- **Construction:** Heavy duty steel
- **Disk drive capacity:** Two front-accessible mobile trays for 3.5" SAS/SATA HDDs, one 3.5" bay for FDD or internal HDD, and two 5.25" bays for optical disk drives
- **I/O interfaces on front panel:** two USB ports
- **I/O interfaces on rear panel:** (BP version) one D-SUB 9-pin opening; (MB version) five D-SUB 9-pin & one 68-pin SCSI openings
- **Indicators on front panel:** LEDs for Power On, HDD activity, TEMP, FAN activity and LAN connection
- **Switches on front panel:** Power On/Off, System Reset and Alarm Reset
- **Fans:** 1 x 114 CFM & 1 x 28 CFM
- **Weight:** 17.6 kg (38.7 lb)
- **Dimensions (W x H x D):** 482 x 177 x 478 mm (19" x 7" x 18.8")

1.3 Power Supply Options

1.3.1 300W ATX power supply with PFC (PS-300ATX-ZBE)

Table 1.1: 300W ATX power supply with PFC (PS-300ATX-ZBE)	
Output rating	300 watts max. (ATX, PFC)
Input rating	100 ~ 240 VAC @ 50 ~ 60 Hz (full range)
Output voltage	+5 V @ 30 A, +3.3 V @ 28 A, +12 V @ 15 A, -5 V @ 0.3 A, -12 V @ 0.8 A, +5 VSB @ 2 A
Minimum load	+5 V @ 0.1 A, +12 V @ 0.5 A
MTBF	100,000 hours @ 25°C
Safety	UL/TUV/CB/CCC

1.3.2 400W ATX power supply with PFC (PS-400ATX-ZBE)

Table 1.2: 400W ATX power supply with PFC (PS-400ATX-ZBE)	
Output rating	400 watts max. (ATX, PFC)
Input rating	100 ~ 240 VAC @ 47 ~ 63 Hz (full range)
Output voltage	+5 V @ 35 A, +3.3 V @ 28 A, +12 V @ 30 A, -5 V @ 0.5 A, -12 V @ 0.8 A, +5 VSB @ 2 A
Minimum load	+5 V @ 3 A, +12 V @ 1 A, +5 VSB @ 0.1 A
MTBF	91,000 hours @ 25°C
Safety	UL/TUV/CB/CCC

1.3.3 300W ATX redundant power supply (RPS-300ATX-ZE)

Table 1.3: 300W ATX redundant power supply (RPS-300ATX-ZE)	
Output rating	300 watts max. (ATX, PFC)
Input rating	100 ~ 240 VAC @ 50 ~ 60 Hz (full range)
Output voltage	+5 V @ 25 A, +3.3 V @ 18 A, +12 V @ 16 A, -5 V @ 0.5 A, -12 V @ 0.5 A, +5 VSB @ 2 A
Minimum load	+5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, +5 VSB @ 0.1 A
MTBF	100,000 hours @ 25°C
Safety	UL/TUV/CB/CC

1.3.4 400W ATX redundant power supply (RPS-400ATX-ZE)

Table 1.4: 400W ATX redundant power supply (RPS-400ATX-ZE)	
Output rating	400 watts max. (ATX, PFC)
Input rating	100 ~ 240 VAC @ 47 ~ 63 Hz (full range)
Output voltage	+5 V @ 35 A, +3.3 V @ 25 A, +12 V @ 28 A, -5 V @ 0.5 A, -12 V @ 1.2 A, +5 VSB @ 2 A
Minimum load	+5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, +5 VSB @ 0.1 A
MTBF	100,000 hours @ 25°C
Safety	UL/TUV/CB/CC

1.4 Environment Specifications

Table 1.5: Environment specifications

Environment	Operating	Non-operating
Temperature	0 ~ 40°C (32 ~ 104°F)	-20 ~ 60°C (-4 ~ 140°F)
Humidity	10 ~ 85% @ 40°C, non-condensing	10~95% @ 40C, non-condensing
Vibration (5 ~ 500 MHz)	1G rms	2G
Shock	10G (with 11 ms duration, half sine wave)	30G
Safety	CE compliant	

1.5 Dimension Diagram

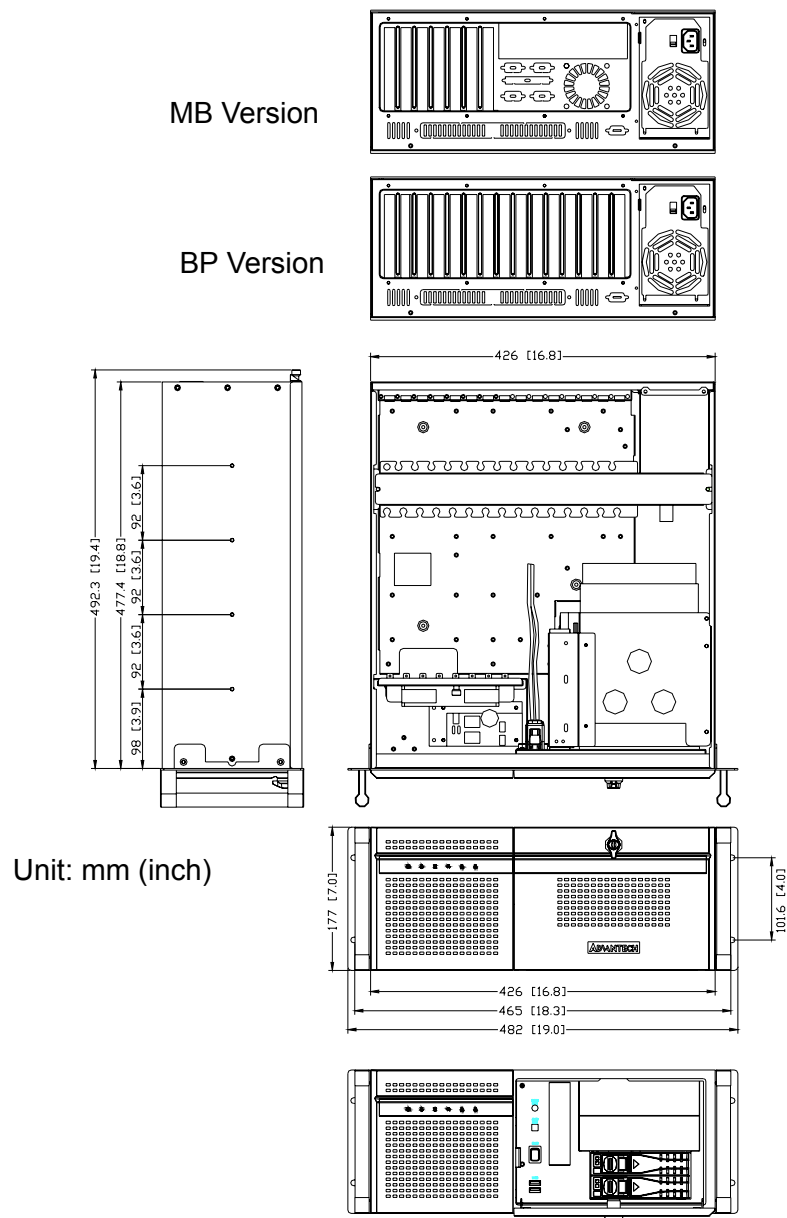


Figure 1.1 Diagram diagram

Chapter 2

System Setup

This chapter introduces the installation process.

Sections include:

- Installing the backplane or motherboard
- Installing CPU card or add-on card
- Installing disk drives
- Attaching the ears and handles

The following procedures are provided to assist you in installing a motherboard (or backplane), disk drives, and plug-in cards into the ACP-4320. Please also refer to the Appendix A, Exploded Diagram, for the detail parts of the chassis.

2.1 Removing the Top Cover

To remove the top cover, please refer to Figure 2.1.

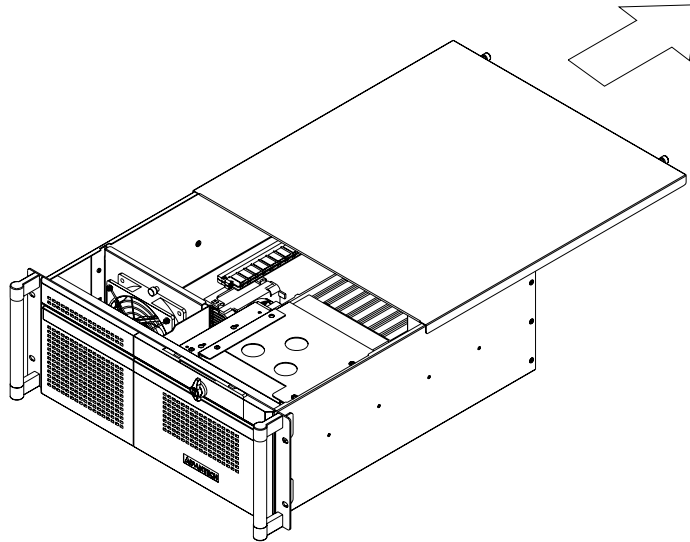


Figure 2.1 Removing the top cover

2.2 Installing the Backplane or Motherboard

The ACP-4320 supports either up to 15-slot backplane, or ATX/microATX motherboard. To install backplane or motherboard, please proceed as follows:

1. Dismantle the hold-down clamp by removing the two screws on both ends.
2. Find the yellow label (shown as Table 2.1) on the inside of the chassis bottom. It shows the copper stub locations for attaching the specific backplane or motherboard. Get the copper stubs from the accessory box and follow the table to screw the copper stubs on the proper locations

Table 2.1: Yellow label indicating copper stub locations

NUT NUMBER BP/MP MODEL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	X	A	M
PCA-6113P4R PCA-6114P7 PCA-6114P12	*	*	*	*	*		*	*	*	*	*	*	*	*			*	*	*	*												
PCA-6114P4 PCA-6114P10 PCA-6113DP4	*	*	*	*	*		*	*	*	*	*	*	*	*			*	*		*												
PCA-6114-B	*	*	*	*	*		*	*	*	*	*	*	*	*																		
PCA-6113P7X	*	*	*	*	*		*	*			*	*	*	*			*			*		*	*	*	*					*		
PCA-6115	*	*	*	*	*			*	*	*	*	*	*	*																		
PCA-6114P12X	*	*	*	*	*		*	*	*			*		*			*			*		*	*	*	*					*		
PCE-7B13-64 PCE-5B12-64	*	*	*	*	*		*		*	*	*	*	*	*			*	*		*							*	*				
AIMB-740 AIMB-741 AIMB-742	*	*	*				*		*		*			*																		
AIMB-744 AIMB-750 AIMB-760	*	*	*				*				*			*			*		*													
AIMB-762	*	*	*				*		*		*			*			*		*													
AIMB-554 AIMB-560		*	*				*				*			*					*													*

Be careful to screw the Copper Stub under 10 kgf•cm.

- While installing a BACKPLANE, put it in place and then attach the supplied EMI spring shielding onto it. Then fasten the screws provided. (see Figure 2.2),
- For the PICMG 1.0 BACKPLANE, connect the orange-white wire from connector "HCN1" on the backplane to connector "CN21" on the CPU card.
- While installing a MOTHERBOARD, attach the motherboard I/O shield onto the rear plate first. Then fasten the motherboard onto the chassis. (see Figure 2.3)
- Plug in the 20- pin (or 24-pin) ATX power connector and +12 V power connector from the power supply to the backplane or motherboard.
- Connect the wires for the POWER switch, RESET switch, and the front USB from the front panel to the motherboard.
- Connect the wires for the POWER LED, HDD LED and LAN LED from the motherboard to the small LED board, which is attached to the front panel of the chassis.

Note! AIMB-74X series motherboards don't support front LAN LED function.



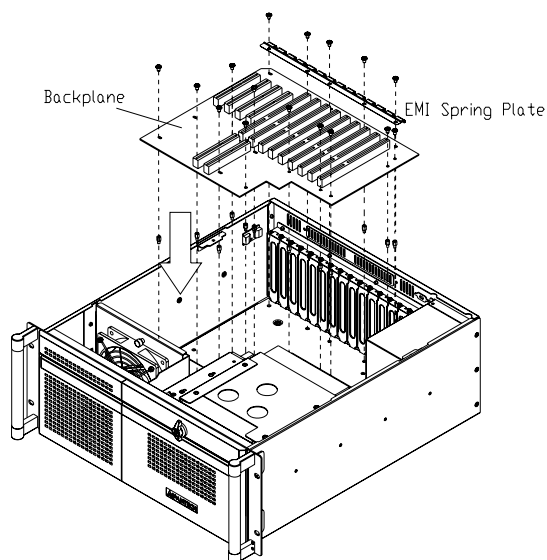


Figure 2.2 Installing a backplane

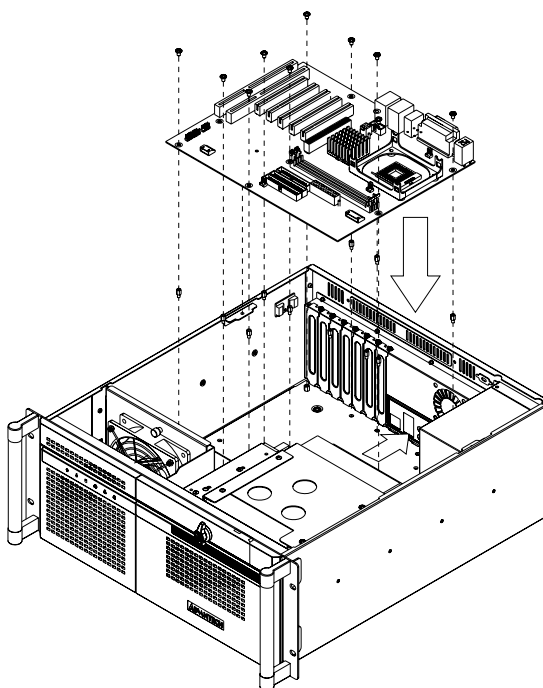


Figure 2.3 Installing a motherboard

2.3 Installing CPU card or Add-on Card

The ACP-4320BP accepts an up to 15-slot cards. To install a CPU card or add-on card, proceed as follows:

2.3.1 Installing the CPU Card

1. Select a vacant PICMG slot for the full-length CPU card, or a PCI/ISA slot for other add-on cards. Then, remove the corresponding I/O bracket attached to the rear plate of the chassis.
2. Insert the CPU card (with CPU, CPU cooler, RAM, and necessary cables installed) or add-on card vertically into the proper slot. For full-length CPU card, 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. Fasten the screws on the top of both brackets of the card. (see Figure 2.4).
3. Repeat Step 1 and 2 if there is more than one add-on card to be installed.
 4. Connect the wires for the POWER switch, RESET switch, and the Connect the 9-pin USB wire, Power switch wire, and the System Reset switch wire from the chassis to the CPU card. Connect the wire of LAN LED from the chassis to the CPU card. Connect the wire of HDD LED from the SATA HDD backplane to the CPU card.
 5. For the PICMG 1.0 BACKPLANE, connect the orange-white wire from the connector "CN20" on the CPU card to connector "HCN1" on the backplane. Connect the power switch wire from the chassis to connector "CN21" on the CPU card.

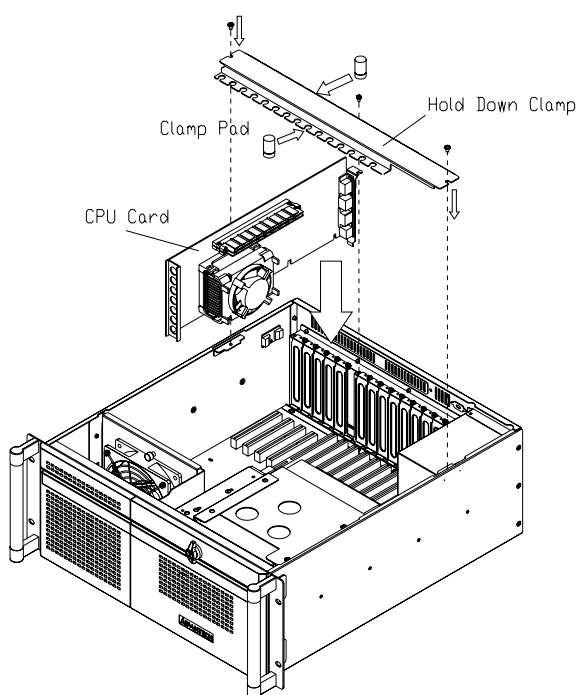


Figure 2.4 Installing a CPU card

Note! *Most of Advantech's full-sized CPU cards support the front USB function. However, only the PCA-6184-B, PCA-6186-B, PCA-6188, PCA-6190 and the later full-sized CPU cards support the front LAN LED function.*



2.4 Hold-down Clamp

The hold-down clamp protects all the cards from vibration and shock.

After installing all the cards, please refer to the following steps to install the rubber cushions and the hold-down clamp.

1. There are two rows of notches on both sides of the hold-down clamp for inserting into rubber cushions provided in the accessory box. One side is for PCI cards, while the other side is for ISA cards. Depending on the card height, the cushions can be inserted upward or downward. After the rubber cushions have been inserted into the notches, they will stabilize the add-on cards to protect them from shock and vibration. (see Figure 2.5)
2. Secure the hold-down clamp into its original position.

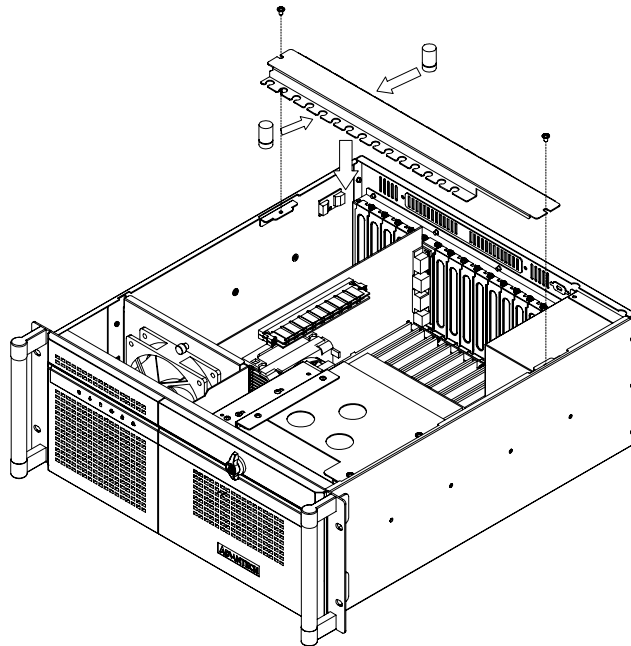


Figure 2.5 Installing rubber cushions and hold-down clamp

2.5 Installing Disk Drives

The ACP-4320 comes with two front-accessible SAS/SATA HDD trays; it also supports two 5.25" disk drives and one 3.5" floppy disk drive or an internal SATA/ATA hard disk drive.

Note! *For the first time installing all disk drives together into the ACP-4320 chassis, we suggest users install the two 5.25" disk drives (refer to Section 2.5.1) first, then the 3.5" floppy disk drive (refer to Section 2.5.2) or internal 3.5" hard disk drive (refer to Section 2.5.3), and finally, the dual SAS/SATA hard disk drives into the front-accessible SAS/SATA HDD trays (refer to Section 2.5.4).*



Note! *The ACP-4320's dual, front-accessible SAS/SATA HDD trays do not support the hot swap feature. User can install a SAS/SATA RAID card for the RAID application, but the SAS/SATA HDD LEDs won't function when the HDD fails, or when rebuilding the data, because it wasn't designed for the specific SAS/SATA RAID card. However users can still monitor status via the GUI application provided by the RAID card vendor.*

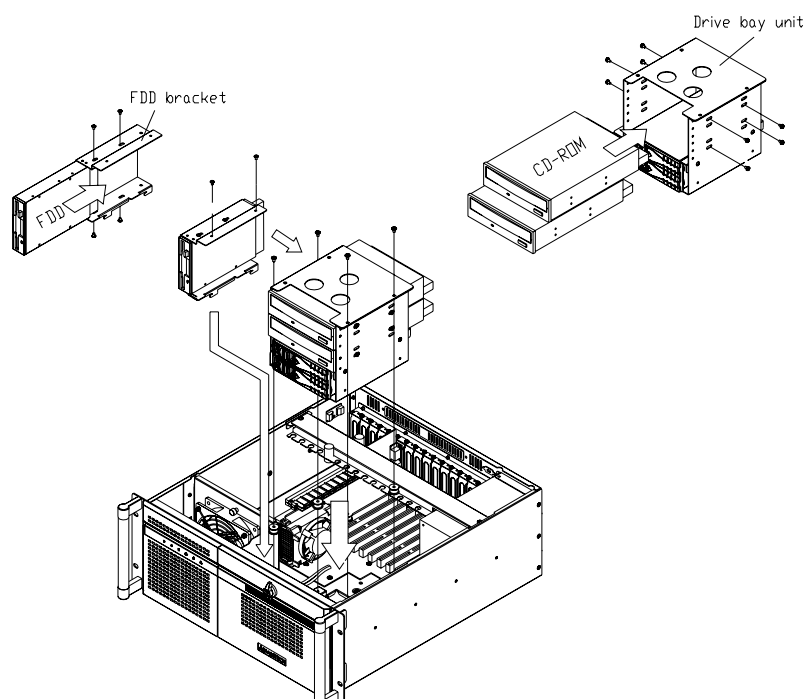


Figure 2.6 Installing the drives

2.5.1 Installing a 5.25" disk drive

1. Remove the two screws, which mount the FDD bracket to the drive bay unit.
2. Remove the four screws, which mount the drive bay to the chassis, then take out the drive bay.
3. Remove the front cover of one 5.25" drive bay. Insert one 5.25" disk drive (e.g., 5.25" CD-ROM/-RW) into the proper location in the drive bay and fix it with four screws.

4. Connect a 40-pin flat cable from the CPU card/motherboard to the optical disk drive.
5. Plug in a peripheral power connector from the power supply to the optical disk drive.
6. Repeat Steps 3 ~ 5 if there is more than one drive.
7. Return the drive bay unit into the chassis and fix it with the four screws.

2.5.2 Installing a 3.5" floppy disk drive

1. Remove the front cover of one 3.5" drive bay.
2. Insert one 3.5" floppy disk drive into the proper location in the FDD bracket and fix it with four screws.
3. Attach the FDD bracket to the drive bay unit and fix it with two screws.
4. Connect a 34-pin flat cable from the CPU card/motherboard to the floppy disk drive.
5. Plug in a floppy drive power connector from the power supply to the floppy disk drive.

2.5.3 Installing an internal hard disk drive in the 3.5" drive bay

1. Insert one 3.5" hard disk drive into the proper location in the FDD bracket and fix it with four screws.
2. Attach the FDD bracket to the drive bay unit and fix it with two screws.
3. Connect a 40-pin flat cable from the CPU card/motherboard to an ATA (IDE) hard disk drive or a SATA cable to a SATA hard disk drive.
4. Plug in a peripheral power connector from the power supply to the hard disk drive.

2.5.4 Installing a SAS/SATA HDD in the front-accessible HDD tray

ACP-4320 accepts both SAS and SATA HDDs. It is not necessary to remove top cover when installing a SAS or SATA HDD in any of the front-accessible HDD trays.

1. 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.
2. Refer to Figure 2.7 and slide one hard disk drive into the proper location in the tray and fix it with 4 ~ 6 screws.

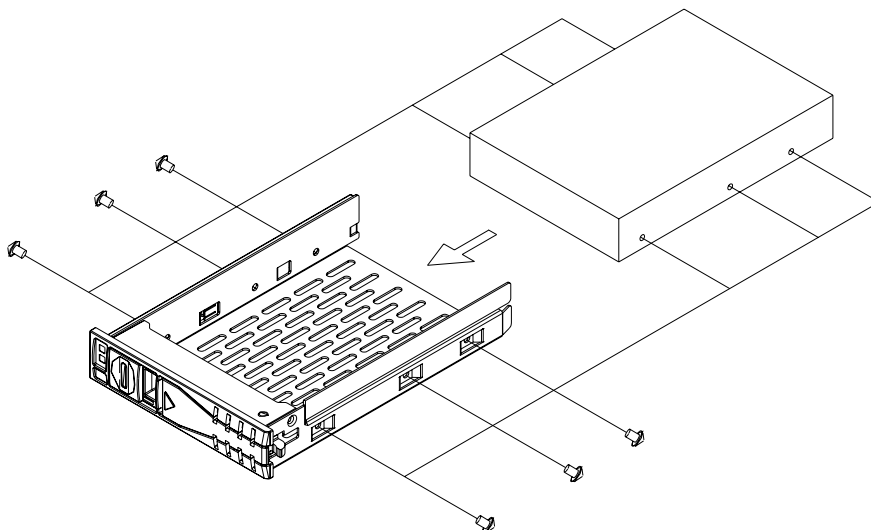


Figure 2.7 Installing a SAS or SATA HDD

3. Return and push the HDD tray into the chassis until the handle of tray is moving back. Right-shift the key latch of the HDD tray to lock the tray.
4. Repeat Steps 1 to 3 if there is a second HDD to be installed.

2.6 Attaching the Ears and Handles

There are a pair of ears and handles in the accessory box. If you need to install the chassis on the rack, refer to Figure 2.8 to fasten them to the front-right and front-left edges with the four screws provided.

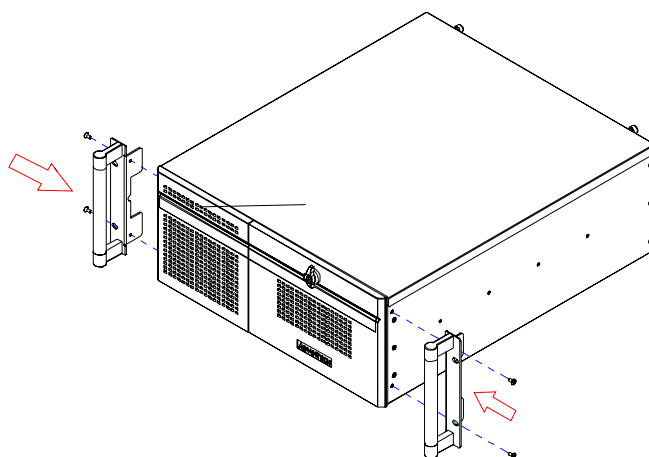


Figure 2.8 Attaching the ears and handles

Chapter 3

Operation

This chapter introduces the system operation information.

Sections include:

- The front panel
- Replacing the cooling fan
- Cleaning the filters
- Replacing the power supply

3.1 The Front Panel

3.1.1 Switch and buttons

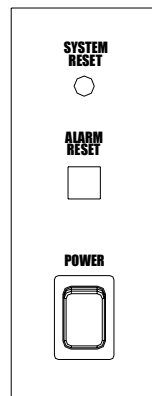


Figure 3.1 The switch & buttons on the front panel

System Reset Button: Press this switch to reinitialize the system.

Alarm Reset Button: Press this switch to suppress or stop an audible alarm. Whenever a fault in the system occurs (e.g., fan failure, or a too high in-chassis temperature), an audible alarm is activated. Pressing this switch will cause the alarm to stop.

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

3.1.2 LED indicators for System Status

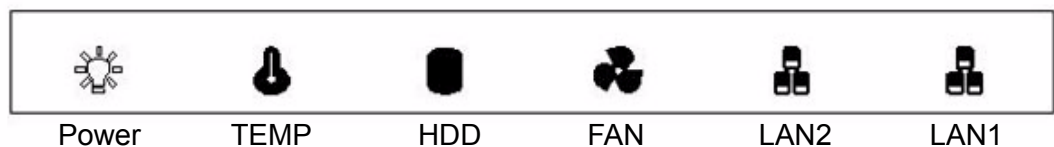


Figure 3.2 The LEDs on the front panel

Six LEDs (shown as Figure 3.2) are placed on the front panel of the ACP-4320 chassis to indicate the system health and activity. Please refer to Table 3.1 for the LED definition summary.

Table 3.1: LED definition summary

LED	Description	Green	Red
Power	System Power	Normal	Abnormal
TEMP	In-Chassis Temperature	Normal	Abnormal
HDD	Hard Disk Drive Activity	Data Access	N/A
FAN	Cooling Fan Status	Normal	Abnormal
LAN1 LAN2	LAN Connection	Link: Blinking only when Data Transition	

If the system is connected with a single PS/2 power supply, the **Power LED** is always **Green** when power on.

When the **PWR LED** is **RED**, it indicates a redundant power supply failure. To stop the alarm buzzer, press the **Alarm Reset** button. Then, check out the redundant power supply right away and replace the failed power supply module with a good one.

If the **TEMP LED** is **RED and blinking**, it means that the system detects an overly high temperature in the chassis. An audible alarm is activated. To stop the alarm buzzer, press the **Alarm Reset** button. Inspect the fan filter and the rear section of the chassis immediately. Make sure airflow inside the chassis is smooth and not blocked by dust or other particles.

When the **HDD LED** is **Green and blinking**, it indicates some data is written into or read from the HDD. When it becomes no light, it indicates no data write/read is under proceeding.



When the **FAN LED** is **RED and blinking**, it indicates a failed cooling fan, and the alarm buzzer is also activated. To stop the alarm buzzer, press the **Alarm Reset** button, and replace the failed fan immediately.

When the **LAN1/2 LED** is **Green**, it indicates the LAN is linked but no data is transmitted via the LAN. When it turns into blinking, it indicates some data is transmitted via the LAN.

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 function

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

When the system power is on and the SAS or SATA HDD is connected well, the HDD power LED is **Green**. If it fails to light up, check if you connected the SAS or SATA HDD well. Or please ask the technician to inspect the related cables in the chassis.

When the SAS or SATA HDD is transmitting data, the status LED blinks **BLUE**.

3.2 Replacing the Fans

There is one fan behind the front plate of ACP-4320 chassis and one fan behind the SAS/SATA drive bay. To replace either of the fans, please refer to Figure 3.3 and proceed as follows:

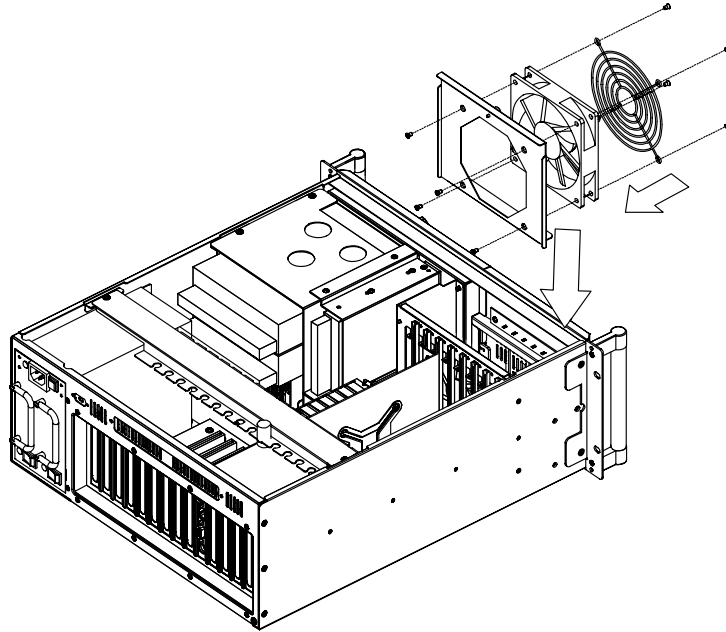


Figure 3.3 Replacing the system cooling fan

3.2.1 Replacing the system cooling fan

1. Un-plug the fan power connector.
2. Remove the thumb screw, which fixes the fan bracket to the chassis and lift it with two fingers.
3. Remove the four screws, which mount the failed fan to the fan bracket, and take out the fan.
4. Remove the four screws, which mount the fan guard to the failed fan, and take out the fan guard.
5. Get a new fan. Place the fan guard on the new fan and fix it with four screws.
6. Place the new fan on the fan bracket, and fix it with four screws.
7. Slide the fan bracket back to the chassis and fasten the thumb screw.
8. Plug in the fan power connector.

3.2.2 Replacing the fan behind the SAS/SATA HDD backplane

1. Remove the chassis 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 3.4).
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.

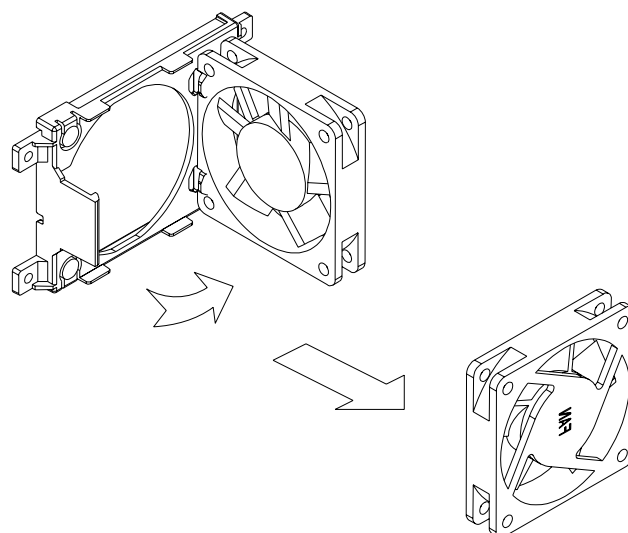


Figure 3.4 Replacing the fan behind the SAS/SATA HDD backplane

3.3 Cleaning the Filters

The filters function to block dust or particles from the work environment and to extend the longevity of the system. It is recommended to clean the filters periodically.

There are two filters in the chassis, one in front of the fan and the other behind the front door. To clean the filters, proceed as follows.

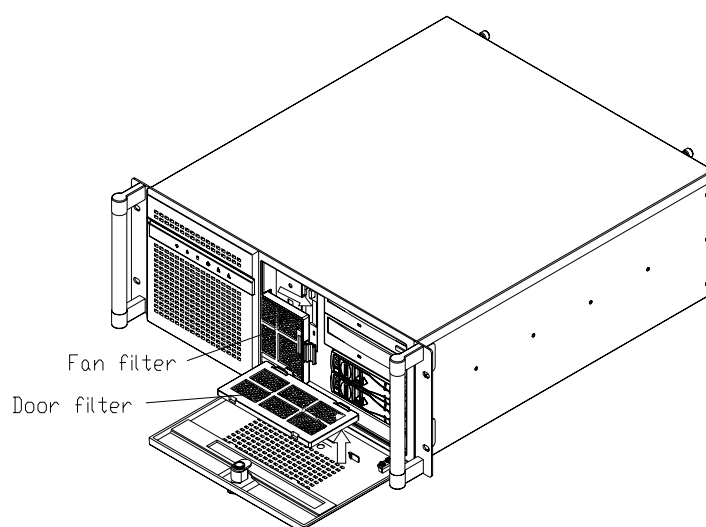


Figure 3.5 Removing the filters

1. Open the front door.
2. Pull out the filter behind the door by pushing two 2 clips; pull out the fan filter by pushing the hook and then slide it rightward.
3. Clean the filters with a soft brush or wash the dust away from the filters under running water. Then dry it. (see Figure 3.5)
4. Replace the filter inside the unit.

3.4 Replacing the Power Supply

The ACP-4320 supports either 300W/400W single PS/2 or 300W/400W redundant power supplies. To change a failed power supply, please proceed as follows:

Replacing the single PS/2 power supply

3.4.1 Changing the single PS/2 power supply

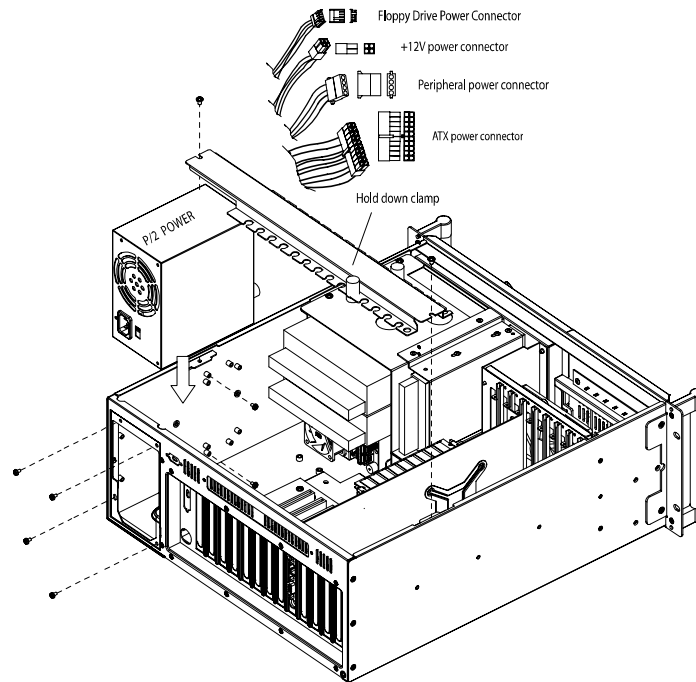


Figure 3.6 Changing the single PS/2 power supply

1. Un-plug the power cord from the power supply.
2. Remove the top cover.
3. Remove the two screws, which mount the hold-down clamp to the chassis, and take out the hold-down clamp.
4. Unplug the 20-/24-pin ATX power connector and +12V power connector from the backplane/motherboard, hard disk drives, floppy disk drive and peripherals.
5. Remove the six screws which mount the failed power supply to the chassis, then take out the power supply.
6. Place a new power supply into the chassis and fix it with the six screws.
7. Plug the ATX power connector and +12V power connector to the backplane/motherboard, as well as the hard disk drive and floppy drive and the peripheral power connectors to the proper disk drives.
8. Replace the hold down clamp and fix it with the two screws.
9. Replace the top cover and then plug in the power cord.

3.4.2 Replacing the Redundant Power Supply Module

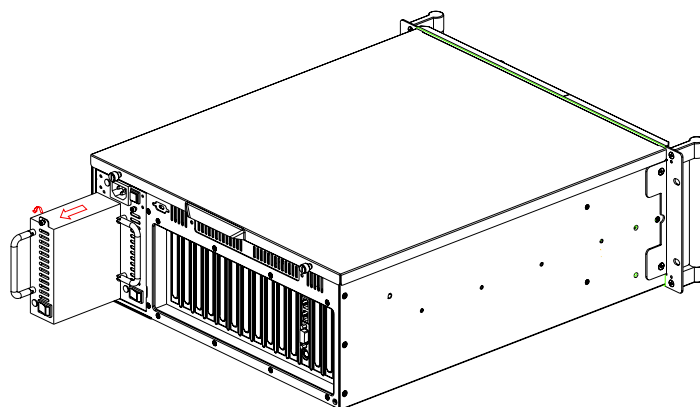


Figure 3.7 Replacing the redundant power supply module

1. Turn off the power switch of the failed power supply module.
2. Un-plug the power cord from the failed module.
3. Loosen the screw on the failed module and then grab the handle to gently pull it out.
4. Make sure that the new module is the same rating as the damaged one.
5. Slide the power supply module inward until it locks into the right position.
6. Secure the screw and replace the handle. Then plug the power cord and turn on the power switch on the new module.

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

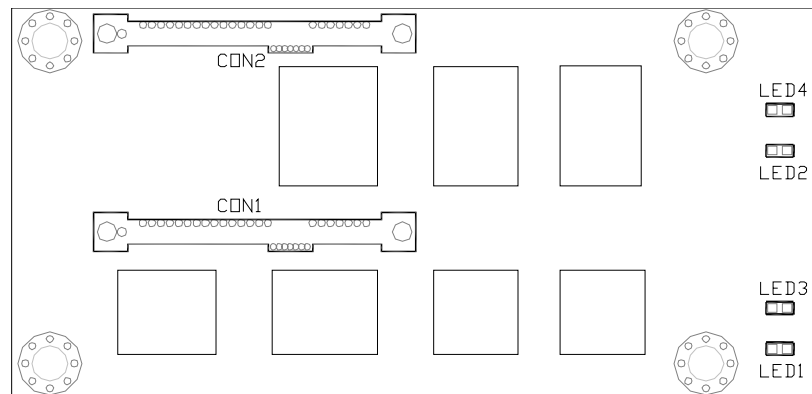


Figure 4.1 Front side layout (connect to the HDD)

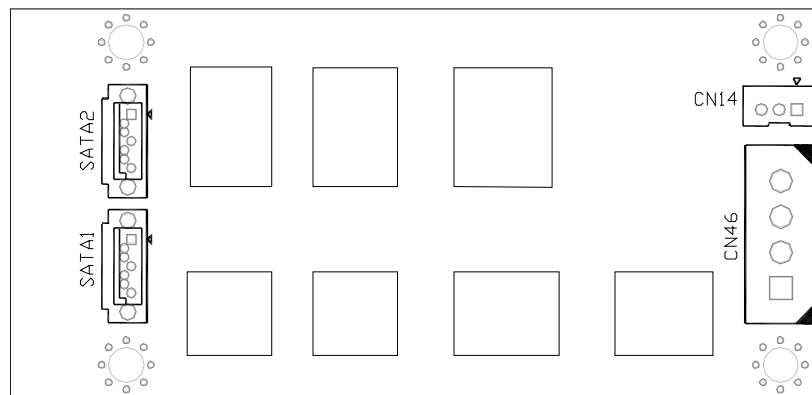


Figure 4.2 Rear side layout (connect to the RAID card or motherboard)

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 system fan. It makes an audible alarm when:

- Any power supply module of the redundant power supply fails
- One of the cooling fans fails
- Internal temperature of the chassis is too high

To stop the alarm beep, simply press the Alarm Reset button on the front panel.

5.1 Alarm Board Layout

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

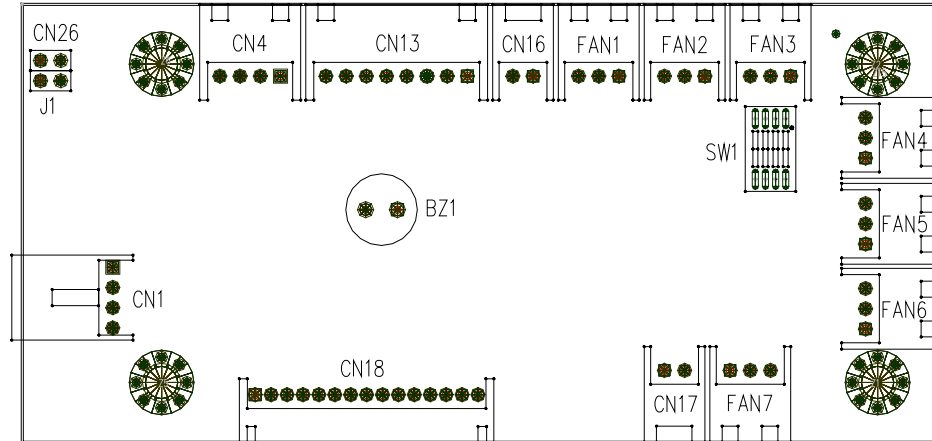


Figure 5.1 Alarm board layout

5.2 Alarm board specifications

Input Power: +5V, +12V

Input Signals:

- 7 fan connectors
- One thermal sensor connector (connects up to 8 thermal sensors in series)
- One Power Good connector
- One alarm reset connector
- One voltage signal connector (connect from the backplane / motherboard, supporting six voltages: +12 V, +5 V, +3.3 V and +5 Vsb)
- One HDD LED connector (connect from the CPU card/motherboard)

Output Signals:

- One LED board connector
- One Buzzer output

5.2.1 Connectors, Jumper and Pin Definition

Table 5.1: Summary of the connectors, jumper and pin definition

CN1: External power connector, standard mini 4-pin power connector

Pin 1	+12V @ 2A max.	Pin 2	GND
Pin 3	GND	Pin 4	+5V @ 2A max

CN4: Thermal sensor (LM75) connector

Pin 1	+5V	Pin 2	T_SCLK
Pin 3	T_SDAT	Pin 4	GND
CN13: Voltage detection 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: Power Good input connector			
Pin 1	Power Good A	Pin 2	GND
CN17: Alarm Reset connector			
Pin 1	Alarm reset	Pin 2	GND
CN18: Output connector to LED Board			
Pin 1	GND	Pin 2	+5 V Signal
Pin 3	+12 V Signal	Pin 4	-5 V Signal
Pin 5	-12 V Signal	Pin 6	HDD Signal
Pin 7	Power Good Signal	Pin 8	Power Fail Signal
Pin 9	Temperature Good Signal	Pin 10	Temperature Fail Signal
Pin 11	FAN Good Signal	Pin 12	FAN Fail Signal
Pin 13	N/A	Pin 14	+3.3 V Signal
Pin 15	+5 VSB Signal		
CN26: External HDD LED connector			
Pin 1	HLED_ACT	Pin 2	N/A
FAN1~FAN7: Fan connectors			
Pin 1	GND	Pin 2	+12 V
Pin 3	FAN_DEC		
J1: External speaker			
Pin 1	Buzzer	Pin 2	+5 V
SW1: Fan number select switch			
Pin 1	GND	Pin 2	FAN_SEL1
Pin 3	GND	Pin 4	FAN_SEL2
Pin 5	GND	Pin 6	FAN_SEL3
Pin 7	GND	Pin 8	Reset

5.2.2 Switch settings

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

Table 5.2: 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! Please connect the fan connectors in the correct sequence: If two fans are set on SW1, the correct method 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

There is a thermal sensor mounted on the right-wall plate, close to the rear side of the chassis. The thermal sensor monitors the in-chassis temperature. When the side temperature is overheated, the thermal sensor sends a signal to the alarm board and a continuous alarm will be activated. To stop the alarm beep, press the Alarm Reset button on the front panel. Figure 5.2 shows the layout of the thermal sensor module.

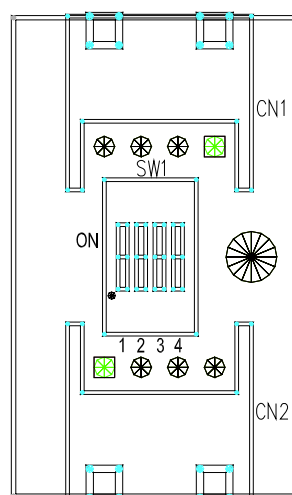


Figure 5.2 Thermal sensor module layout

The default sensor I.D. number is 1. Users can refer to Table 5.4 Thermal sensor number setting to adjust the switch.

Table 5.3: CN1 & CN2, Temperature sensor connector

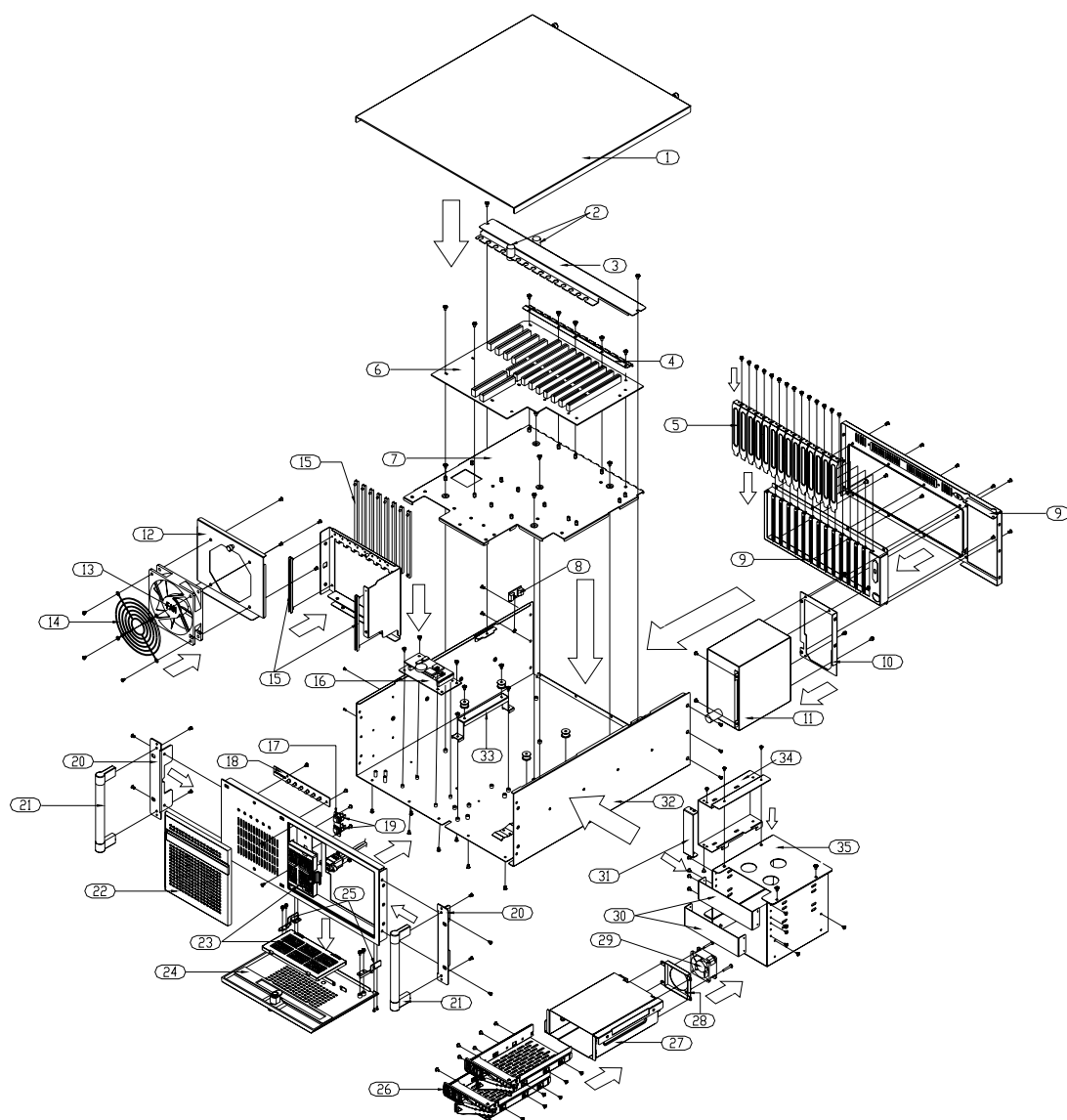
Pin 1	+5 V	Pin 2	T_SCLK
Pin 3	T_SDAT	Pin 4	GND

Table 5.4: SW1, Thermal sensor I.D. number setting

Sensor I.D. Number	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 &
Parts List



- | | | | |
|-------------------------|---------------------|--------------------------|---------------------------|
| ① Top Cover | ⑪ Power Supply | ⑳ Handles | ③① 3.5" Drive Bay Cover |
| ② Clamp Pad | ⑫ 120mm Fan Bracket | ㉒ Left Body | ③② Body of Chassis |
| ③ Hold Down Clamp | ⑬ 120mm Fan Set | ㉓ Filter Cover | ③③ Drive Mounting Bracket |
| ④ EMI Spring Plate | ⑭ 120mm Fan Guard | ㉔ Front Door | ③④ 3.5" Drive Bay Bracket |
| ⑤ Adapter Bracket | ⑮ Card Guide Rails | ㉕ Hinges | ③⑤ Drive Bay Unit |
| ⑥ Backplane | ⑯ Alarm Board | ㉖ Mobile HDD Tray Units | |
| ⑦ Underplate | ⑰ Switch Bracket | ㉗ Mobile HDD Cage | |
| ⑧ Thermal Sensor | ⑱ LED Board | ㉘ 60mm Fan Bracket | |
| ⑨ Backplane Rear Window | ㉑ Switches | ㉙ 60mm Fan Set | |
| ⑩ Power Supply Bracket | ㉒ Rackmount Ear | ③⑥ 5.25" Drive Bay Cover | |

Figure A.1 Exploded Diagram & Parts List

Appendix **B**

Backplane & Motherboard Options

B.1 Backplane Options

ACP-4320 support a variety of PICMG 1.3 / 1.0 backplanes. Users can contact a local sales representative for detailed specification and information.

Table B.1: PICMG 1.3 Backplane Options

Model Name	Segment	Slots Per Segment				
		SHB*	PCIe x 16	PCIe x 8	PCI-X	PCI
PCE-7B13	Single	1	-	2	6	4
PCE-5B12	Single	1	1	-	6	4

*SHB: System Host Board

Table B.2: PICMG 1.0 Backplane options

Model Name	Segment	Slots Per Segment			
		PICMG	PICMG/PCI	PCI	ISA
PCA-6114	Single	-	-	-	14
PCA-6114P4	Single	2	-	4	8
PCA-6114P7	Single	3	1	6	4
PCA-6114P10	Single	2	-	10	2
PCA-6114P12	Single	1	1	11	1
PCA-6114P12X	Single	1	1	11	1
PCA-6113P4R	Single	2	-	4	7
PCA-6113P7XE	Single	2	-	7	4

B.2 Motherboard Options

ACP-4320 supports a variety of Advantech ATX/MicroATX motherboards as below. Users can contact a local sales representative for detailed information.

Table B.3: ATX Motherboard Options

Model Name	Bus				
	PCI	PCI/ISA	ISA	AGP	SATA
AIMB-740	4 (32-bit)	1	1	-	-
AIMB-742	4 (32-bit)	1	1	1 (8X)	-
AIMB-744	2 (PCI-X 64-bit) 4 (PCI 32-bit)	-	-	1 (8X)	2
AIMB-750	2 (PCI-X 64-bit) 4 (PCI 32-bit)	-	-	1 (8X)	2
AIMB-760	1 (PCI-E 1X) 5 (PCI 32-bit)	-	-	-	4
AIMB-762	1 (PCIe 16X) 1 (PCIe 4X) 5 (PCI 32-bit)	-	-	-	4
AIMB-763	1 (PCIe 16X) 1 (PCIe 1X) 5 (PCI 32-bit)	-	-	-	4
AIMB-764	1 (PCIe 16X) 1 (PCIe 4X) 5 (PCI 32-bit)	-	-	-	5
AIMB-766	1 (PCIe 16X) 2 (PCIe 1X) 4 (PCI 32-bit)	-	-	-	6

Table B.4: MicroATX Motherboard Options

Model Name	Bus		
	PCI	AGP	SATA
AIMB-564	1 (PCIe x16), 1 (PCIe x4), 2 (PCI 32-bit)	-	7
AIMB-562	1 (PCIe x16), 1 (PCIe x1), 2 (PCI 32-bit)	-	4
AIMB-560	3 (PCI 32-bit)	-	4
AIMB-556	1 (PCIe x16), 1 (PCIe x4), 2 (PCI 32-bit)	-	4
AIMB-554	1 (PCIe x16), 1 (PCIe x4), 2 (PCI 32-bit)	-	2
AIMB-542	3 (PCI 32-bit)	1	2

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