

ACP-4320

**4U Height Industrial Chassis
with Dual front accessible
SAS/SATA HDD Trays for
Easy Maintenance**

User Manual

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Acknowledgements

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For technical support and service, please visit our support website at:
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Safety Instructions

1. Read these safety instructions carefully.
2. Keep this installation reference guide for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If 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.

15. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW 0°C (32°F) OR ABOVE 40° C (104° F). THIS MAY DAMAGE THE EQUIPMENT.
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 manufacture. 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 KLASSE 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 maximum performance 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 are 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 on 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, model no. of the product, 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

Before you installing your backplane or motherboard, please make sure that the following materials have been shipped:

- ACP-4320 Chassis
- User Manual
- Warranty Card
- Accessory box, including a pack of screws (for fixing backplane/motherboard and disk drives), a pair of keys, 1 piece of EMI spring shielding (for backplane version), 15 pieces rubber cushions (backplane version) or 7 pieces (motherboard), and 1 pair of ear handles.

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ACP-4320 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 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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General Information

Chapter 1 General Information

1.1 Introduction

The ACP-4320 is a 4U-high 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 both an ATX/mATX motherboard and an up to 15-slot PICMG 1.0 backplane or 12-slot PICMG1.3 express backplane, to bring users the flexibility on 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

General

- **Construction:** Heavy duty steel chassis
- **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 Environmental

- **Operating temperature:** 0 ~ 40°C (32°F ~ 104°F)
- **Temperature:** (Operating) 0 ~ 40°C (32 ~ 104°F)
(Non-operating) -20 ~ 60°C (-4 ~ 140°F)
- **Humidity:** (Operating) 10 ~ 85% @ 40°C, non-condensing
(Non-operating) 10 ~ 95% @ 40°C, non-condensing
- **Vibration (5 ~ 500 MHz):** (Operating) 1G rams
(Non-operating) 2G
- **Shock:** (Operating) 10G with 11 ms duration, half sine wave
(Non-operating) 30G
- **Acoustic Noise:** < 54dB sound pressure at 5 ~ 28°C (41 ~ 82°F)
- **Altitude:** 0 ~ 3,048 m (0 ~ 10,000ft)
- **Safety:** CE compliant

1.4 Power Supply Options

1.4.1 300W ATX power supply with PFC (PS-300ATX-ZBE)

- **Output rating:** 300 watts max.
- **Input rating:** 100 ~ 240 V_{AC} @ 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 V_{SB} @ 2 A
- **Minimum load:** +5 V @ 0.1 A, +12 V @ 0.5 A
- **MTBF:** 100,000 hours @ 25° C, full load
- **Safety:** UL/cUL/TUV/CB/CCC

1.4.2 400W ATX power supply with PFC (PS-400ATX-ZBE)

- **Output rating:** 400 watts max.
- **Input rating:** 100 ~ 240 V_{AC} @ 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 V_{SB} @ 2 A
- **Minimum load:** +5 V @ 3 A, +12 V @ 1 A, +5 V_{SB} @ 0.1 A
- **MTBF:** 91,000 hours @ 25° C, full load
- **Safety:** UL/cUL/TUV/CB/CCC

1.4.3 300W ATX redundant power supply (RPS-300ATX-ZE)

- **Output rating:** 300 watts max.
- **Input rating:** 100 ~ 240 V_{AC} @ 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 V_{SB} @ 2 A
- **Minimum load:** +5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A,
+5 V_{SB} @ 0.1 A
- **MTBF:** 100,000 hours @ 25° C, full load
- **Safety:** UL/cUL/TUV/CB/CC

1.4.4 400W ATX redundant power supply (RPS-400ATX-ZE)

- **Output rating:** 400 watts max.
- **Input rating:** 100 ~ 240 V_{AC} @ 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 V_{SB} @ 2 A
- **Minimum load:** +5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A,
+5 V_{SB} @ 0.1 A
- **MTBF:** 100,000 hours @ 25° C, full load
- **Safety:** UL/cUL/TUV/CB/CC

1.5 Passive Backplane Options

The ACP-4320BP chassis accepts up to a 15-slot backplane. Here is a summary of the supported backplanes manufactured by Advantech:

Table 1.1: PICMG 1.3 backplanes

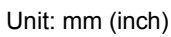
Model Name	Segment	Slots Per Segment				
		SHB*	PCIe x 16	PCIe x 8	PCI-X	PCI
PCE-7B13-64B1E	1	1	-	2	6	4
PCE-5B12-64B1E	1	1	1	-	6	4

* SHB: System Host Board

Table 1.2: PICMG 1.0 backplanes

Model Name	Segment	Slots Per Segment				
		PICMG	PICMG/PCI	PCI	PCI/ISA	ISA
PCA-6114-0C2E	1	-	-	-	-	14
PCA-6115-0B2E	1	-	-	-	-	15
PCA-6113P4R-0C2E	1	2	-	4	-	7
PCA-6114P7-0D3E	1	3	-	6	1	4
PCA-6114P10-0B2E	1	2	-	10	-	2
PCA-6114P12-0B3E	1	1	1	11	-	1
PCA-6113P7XE	1	2	-	7 (64-bit)	-	4
PCA-6114P12X-0A2E	1	1	1	11 (64-bit)	-	1

Please contact Advantech local sales representative for detailed backplane information.



1.7 Ordering Information

Table 1.3: ACP-4320 model list

Part Number	Power Supply	Motherboard/ Backplane	Regulation
MB Version			
ACP-4320MB-00XE	Without power supply, with ATX switch	Not included	None
ACP-4320MB-30ZE	PS-300ATX-ZB	Not included	CE
BP Version			
ACP-4320BP-00XE	Without power supply, with ATX switch	Not included	None
ACP-4320BP-30ZE	PS-300ATX-ZB	Not included	CE

System Setup

Chapter 2 System Setup

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 Chassis Cover

To remove the cover of the ACP-4320, please refer to Figure 2.1.

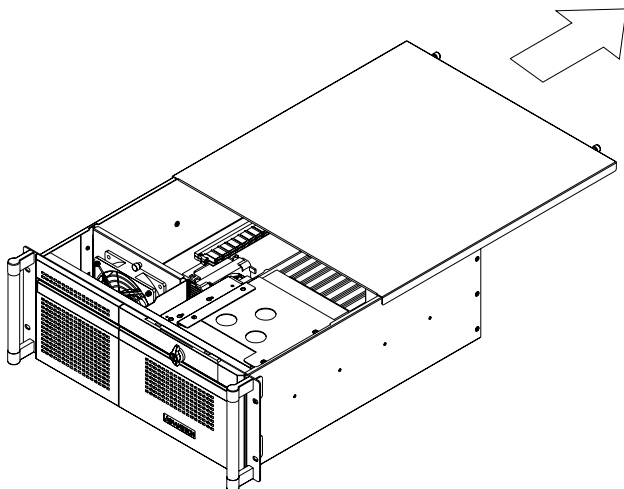


Figure 2.1: Removing the cover

2.2 Installing the Motherboard

The ACP-4320MB accepts both an ATX and a microATX motherboard. To install a motherboard, please proceed as follows:

1. Remove the two screws, which mount the hold-down clamp to the ACP-4320MB chassis, then take out the hold-down clamp.
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: Copper stub location for motherboard/backplane																																
MB \ Nut # Backplane	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 tighten the Copper Stub ***no more than 10 kgf • cm.***

Be careful to tighten the Copper Stub **no more than 10 kgf • cm**.

3. Refer to Figure 2.2, and, from inside of the chassis, attach the motherboard I/O shield onto the rear plate of the chassis.
4. Check all devices, such as CPU, CPU cooler and RAM and make sure they have been installed on the motherboard properly.

5. Refer to Figure 2.2, place the motherboard into the chassis, and fix it with screws.
6. Plug in the 20- or 24-pin ATX power connector and +12 V power connector from the power supply.
7. Connect the wires for the POWER switch, RESET switch, and the front USB from the motherboard to the front panel of the chassis.
8. 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: *All Advantech's industrial ATX/microATX motherboards support the front USB function. However, only the AIMB-750, 760, 762, 560 and the later industrial motherboards support the front LAN LED function.*

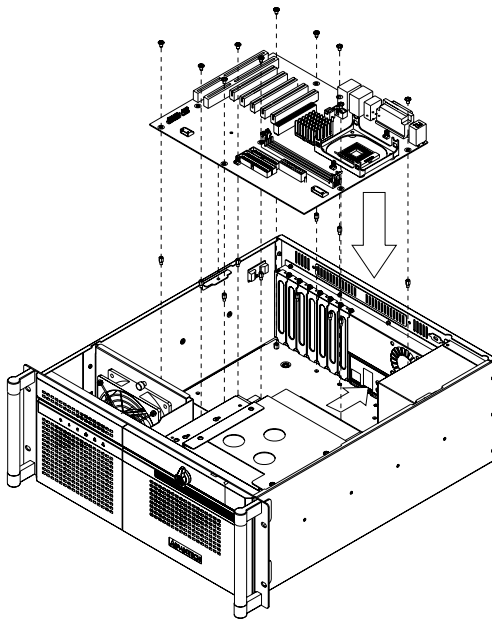


Figure 2.2: Installing a motherboard

2.3 Installing the Backplane & CPU Card

The ACP-4320BP accepts an up to 15-slot PICMG 1.0 backplane or 12-slot PICMG 1.3 express backplane. To install a backplane and a CPU card, proceed as follows:

2.3.1 Installing the Backplane

1. Remove the two screws, which mount the hold-down clamp to the ACP-4320BP chassis, then take out the hold-down clamp.
2. A yellow label (shown as Table 2.1) is located inside of the chassis bottom. It shows the copper stub locations for attaching the specific backplane or motherboard. Users can find the copper stubs in the accessory box. Be sure to follow the instructions and fasten the backplane or motherboard onto the chassis according to the correct stub locations.

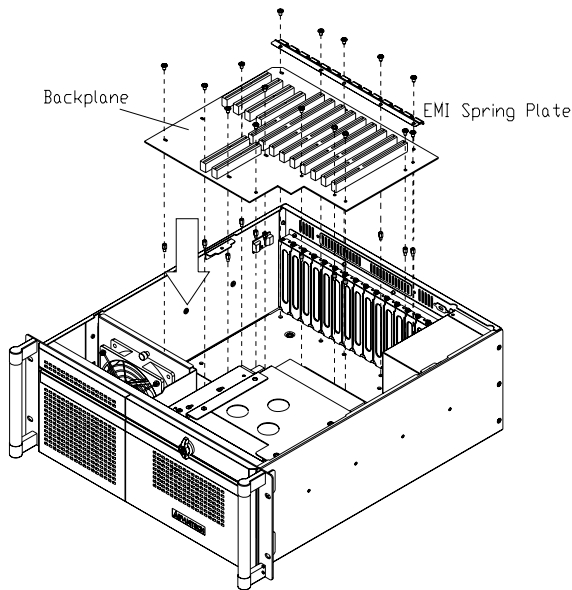


Figure 2.3: Installing a backplane

3. Refer to Figure 2.3, carefully place the backplane and the EMI spring plate into the ACP-4320BP chassis. For the bare ACP-4320BP chassis, the EMI spring plate is stored in the accessory box.
4. Fix the backplane with screws.

2.3.2 Installing the CPU Card

1. Before installing the CPU card, check all devices, such as CPU, CPU cooler and RAM modules and make sure they have been installed on the CPU card properly.
2. Carefully insert the CPU card in a PICMG slot. Make sure that the card bracket has been inserted properly and the other edge of the card has been fixed in the guiding rail. Fasten the card at the top of the bracket with a screw.
3. Plug in the 24- or 20-pin ATX power connector to the backplane, and the +12 V power connector to the CPU card (or backplane).
4. Connect the wires for the POWER switch, RESET switch, and the front USB from the chassis to the card.
5. Connect the wires for the POWER LED, HDD LED and LAN LED from the CPU card to the small LED board, which is attached to the front panel of the chassis.

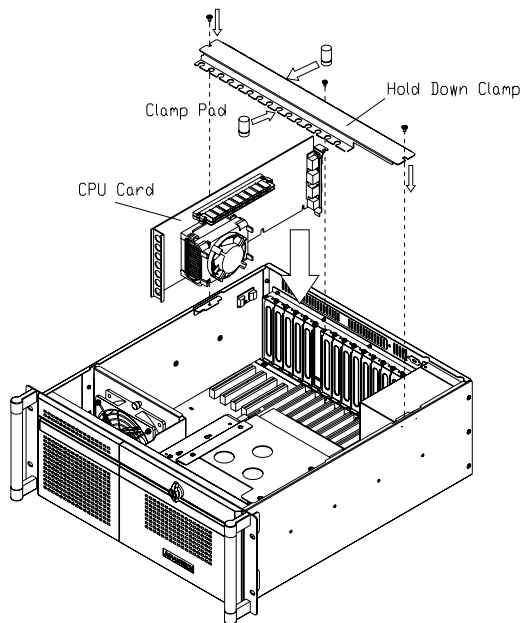


Figure 2.4: Installing the CPU card

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 Installing Add-on Card

To install a plug-in card, please proceed as follows:

1. Select a vacant slot to install the add-on card. Then remove the corresponding I/O bracket attached to the rear plate of the chassis.
2. Insert a plug-in card. Make sure that the card bracket has been inserted properly and the other edge of the card has been fixed in the guiding rail. Fasten the card at the top of the bracket with a screw.
3. Repeat Step 2 if there is more than one card.
4. Insert the clamp pad(s) into the hold-down clamp. The clamp pads cushion the plug-in cards from shock and vibration. The hold-down clamp has two rows of notches for the pads to be inserted, one row is for PCI cards, the other row for ISA cards. Depending on the card height, the buffers can be inserted as the narrow end face upwards or downwards.
5. After inserting the clamp pads, return the hold-down clamp and fasten it with screws.

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 swappability 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.*

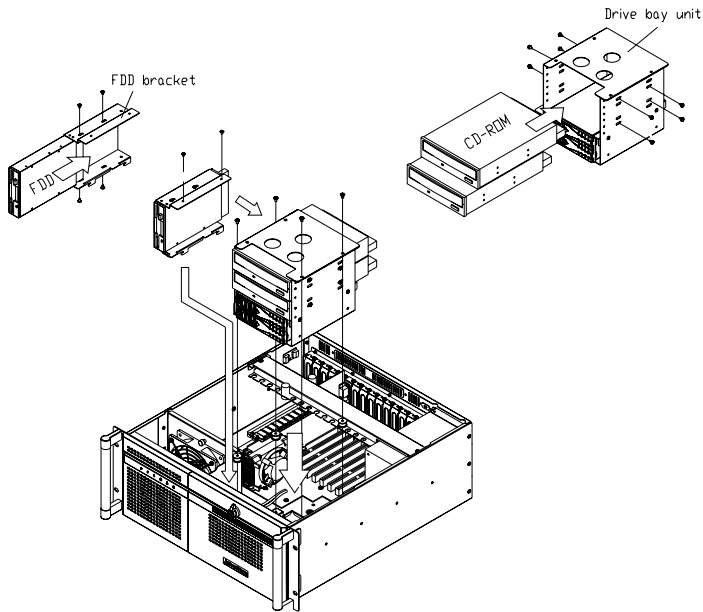


Figure 2.5: Installing the drives

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 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 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 the 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 2.6 and slide one hard disk drive into the proper location in the tray and fix it with 4 ~ 6 screws.

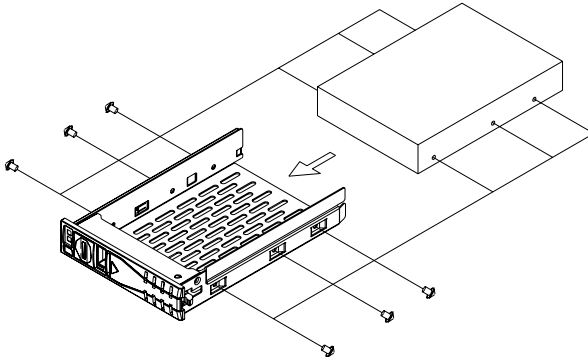


Figure 2.6: Installing a SATA HDD

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 SAS or SATA HDD to be installed.

CHAPTER

3

Operation

Chapter 3 Operation

3.1 The Front Section of ACP-4320

3.1.1 Switch and buttons

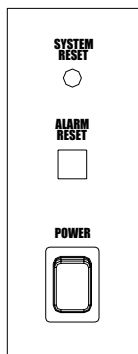


Figure 3.1: The switch & buttons on the front panel

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	N/A

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: SATA HDD LED indicator function

LED	Description	Green	Blue
	Power of HDD	Normal	N/A
	Status of HDD	N/A (SATA HDD) Normal (SAS HDD)	Data access

When the system power is on and the SAS or SATA HDD is connected properly, the HDD power LED is **Green**. If it fails to light up, check if you connected the SAS or SATA HDD properly. Or please ask a 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:

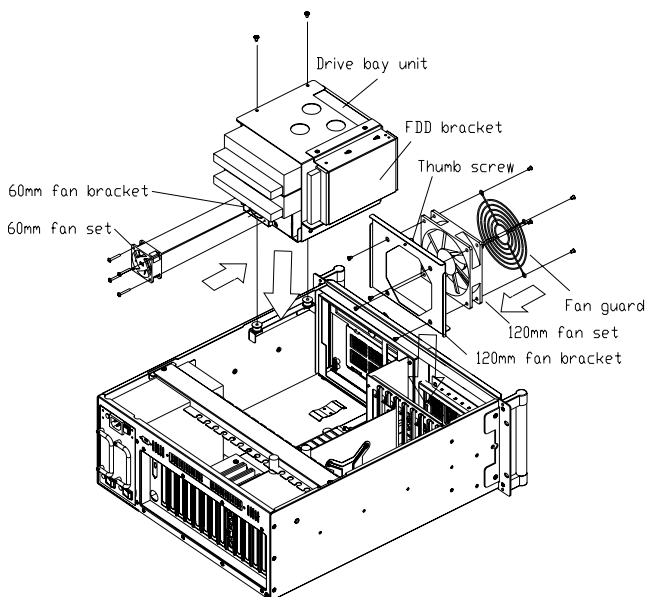


Figure 3.3: Replacing the fans

3.2.1 Replacing the 120 mm fan behind the front panel

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 two screws, which mount the FDD bracket to the drive bay unit.
2. Remove the four screws, which mount the drive bay unit to the chassis, then take out the drive bay unit.
3. Un-plug the fan power connector.
4. Remove the four screws, which mount the failed fan to the fan bracket, and take out the fan.
6. Place a new fan on the fan bracket, and fix it with four screws.
7. Plug in the fan power connector.
8. Return the drive bay unit into the chassis and fix it with four screws.
9. Return the FDD bracket and fix it with the four screws.

3.3 Cleaning the Filters

There are two filters in the ACP-4320: one in front of the fan and the other behind the front door. To clean the filters, proceed as follows.

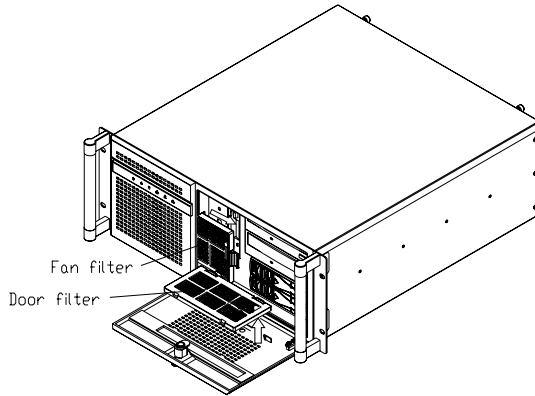


Figure 3.4: Removing the filters

1. Open the front door.
2. Pull out the filter behind the door by pushing two 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 3.4)
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:

3.4.1 Replacing the single PS/2 power supply

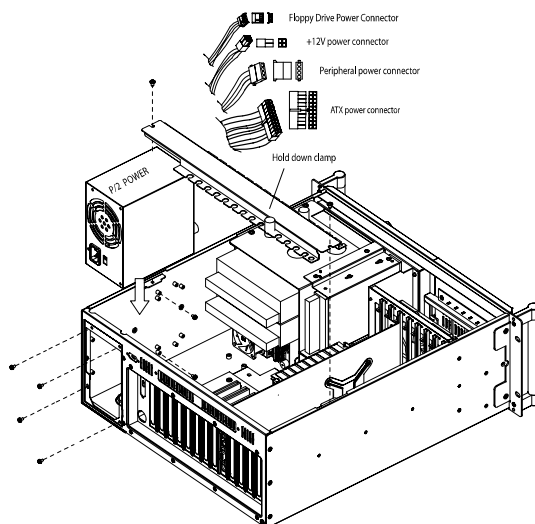


Figure 3.5: Changing the single PS/2 power supply

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 ACP-4320 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

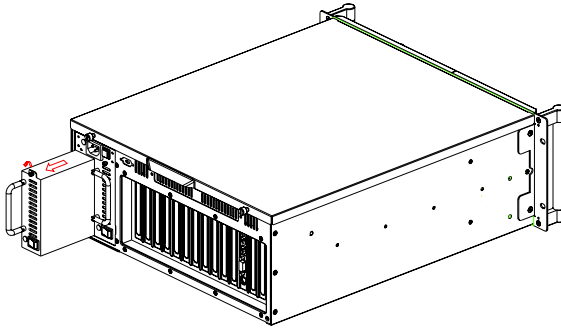


Figure 3.6: Replacing the power supply module

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.

Alarm Board

Chapter 4 Alarm Board

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.

4.1 Alarm Board Layout

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

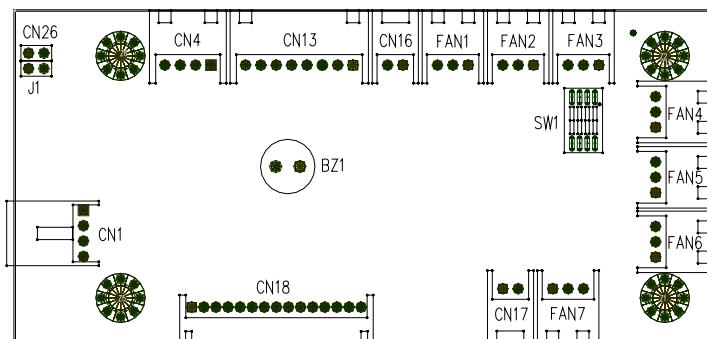


Figure 4.1: Alarm board layout

4.2 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

4.2.1 Connectors, Jumper and Pin Definition

Table 4.1: 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
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Table 4.1: Summary of the connectors , jumper and pin definition

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

4.2.2 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 4.2: 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

4.3 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 4.2 shows the layout of the thermal sensor module. The default sensor I.D. number is 1. Users can refer to *Section 4.4.1 Thermal sensor number setting* (see next page) to adjust the switch.

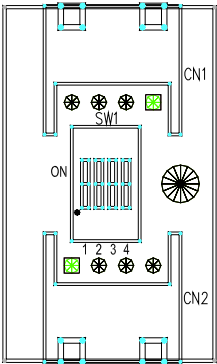


Figure 4.2: Thermal sensor module layout

Table 4.3: CN1 & CN2, Temperature sensor connector

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

Table 4.4: 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

Exploded Diagram

Appendix A Exploded Diagram

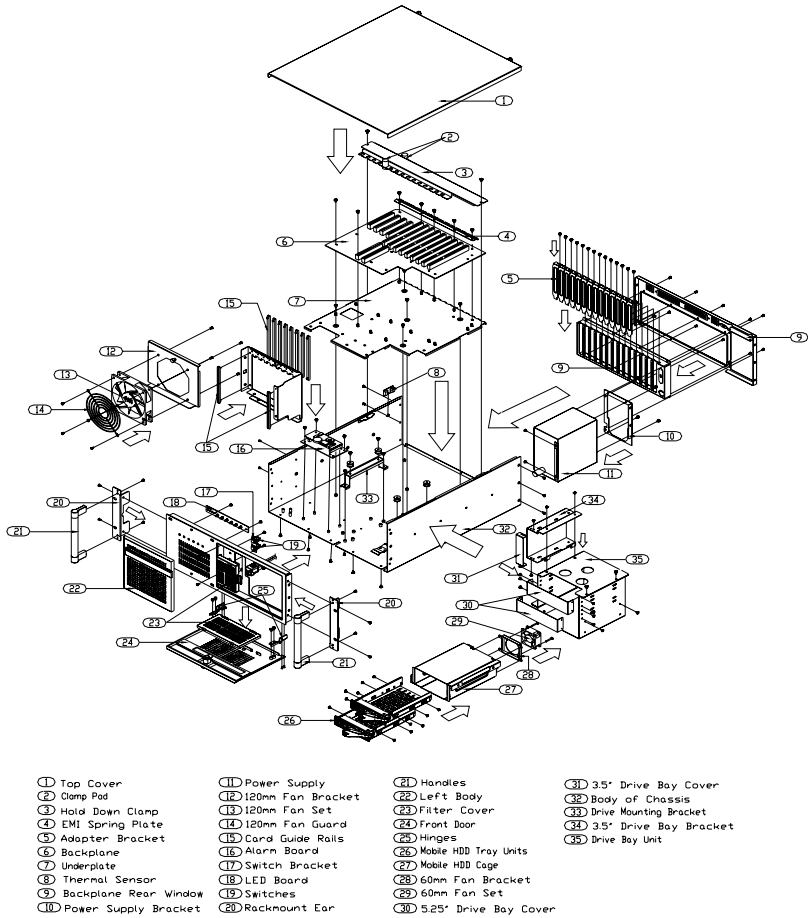


Figure A.1: Exploded diagram