

ACP-1320BP

1U-high Rackmount IPC Chassis
with Dual SATA Storage Trays

Trusted ePlatform Services

ADVANTECH

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Part No. 2002132020

Printed in China

Edition 1

September 2008

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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

Before you begin installing your CPU card, please make sure that the following materials have been shipped:

- ACP-1320 Chassis
- User Manual
- Warranty Card
- Accessory box with a package of screws (for fastening the various disk drives)

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ACP-1320 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-1320, 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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CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Warnings, Cautions and Notes

Warning! Warnings indicate conditions, which if not observed, can cause personal injury!



Caution! Cautions are included to help you avoid damaging hardware or losing data. e.g.



There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advan-tech.com

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
16. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

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

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

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Take anti-static precautions before making any configuration changes. Otherwise, electrostatic discharges can occur when connecting a jumper or installing a card or other device; these discharges can severely damage sensitive electronic components.

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Chapter 1

General Information

1.1 Introduction

ACP-1320BP is a compact, rugged 19" rackmount industrial computer chassis designed for space-conscious applications. With only 1U height, ACP-1320BP can accept versatile 3-slot passive backplanes and two full-sized PCI cards via backplanes.

Dual front-accessible SATA HDD trays

ACP-1320BP comes with two easy-to-maintain SATA HDD trays, which provides the most economic solution for data mirroring. Users can easily replace a SATA HDD without opening the chassis top cover. Other data storage options include one slim-type optical disk drive and one 3.5" HDD bays with shock-resistant protection. Also, the front accessible USB 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-1320BP has the unique alarm module. This module automatically detects the system operating conditions, such as HDD, FAN, and system temperature, and it shows the system status on the front LED indicators. Once any failure happens, the module also gives both audible and visible alarm to notify users to take necessary actions.

And more

ACP-1320BP comes with a 300W ATX 1U-high power supply; a 250W power supply is available for customized projects. Streamlined with an efficient cooling design, the in-chassis airflow keeps the system from over-heating. All these outstanding features make ACP-1320BP the best choice for price, performance, and total cost of ownership.

1.2 Specifications

- **Construction:** Heavy-duty steel
- **Disk drive capacity:** Two front-accessible SATA trays, one slim-type optical disk drive, and one 3.5" drive bay for FDD or HDD
- **I/O interfaces on front panel:** Dual USB ports
- **I/O interfaces on rear panel:** One D-SUB 9-pin opening
- **Indicators on front panel:** LEDs for Power, HDD, TEMP, FAN LAN 1 and LAN 2
- **Switches on front panel:** ATX system switch, system reset and alarm reset
- **Cooling fans:** Three 4 cm x 4 cm (24 CFM) + one 4 cm x 4 cm (14 CFM) cooling fans
- **Expansion:** Supports two full-sized add-on cards
- **Weight:** 8.2 Kg (18.1 lb) with 300W power supply
- **Dimensions:** 480 mm (W) x 44 mm (H) x 620 mm (D) (19" x 1.7" x 24.3")

1.3 Power Supply Options

Table 1.1: Power supply options for BACKPLANE version

Model Name	1757001797	1757000160G
Watt	250 W max. (ATX, PFC) (single power)	300 W (ATX, PFC) (single power)
Input Rating	100 ~ 240 Vac (Full range)	100 ~ 240 Vac (Full range)
Output Voltage	+5 V @ 23 A, +3.3 V @ 14 A, +12 V @ 16 A, -12 V @ 0.5 A, -5 V @ 0.2 A, +5 Vsb @ 2 A	+5 V @ 25 A, +3.3 V @ 14 A, +12 V @ 16 A, -12 V @ 1 A, -5 V @ 0.5 A, +5 Vsb @ 2 A
Minimum Load	+5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, -12 V @ 0.1 A, -5 V @ 0 A, +5 Vsb @ 0.1 A	+5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, -12 V @ 0.05 A, -5 V @ 0.05 A, +5 Vsb @ 0.1 A
MTBF	114,000 hours @ 25° C	100,000 hours @ 25° C
Safety	CE/UL/TUV/CB/CCC	CE/UL/TUV/CB/CCC

1.4 Environmental 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 (5 ~ 500Hz)	0.5G rms	2 G
Altitude	0 to 3,048 m (0 ~ 10,000 ft)	
Safety	CE compliant	

1.5 Dimensions of ACP-1320BP

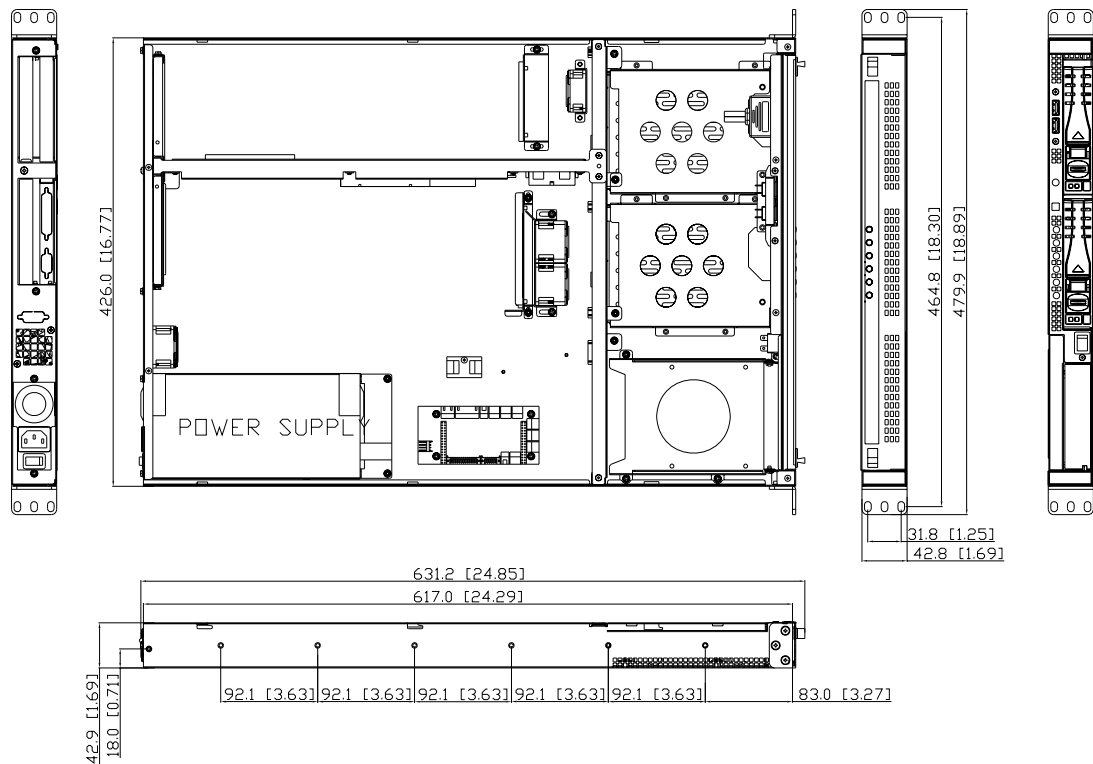


Figure 1.1 Dimensions of ACP-1320BP

Chapter 2

System Setup

2.1 Introduction

The following procedures are provided to assist you in installing a backplane, CPU card, drives, and add-in cards into ACP-1320BP chassis. Please also refer to the Appendix A, Exploded Diagram, for the parts naming in this manual.

2.2 Removing the cover

To remove the cover of the ACP-1320BP, please refer to Figure 2-1. Remove screws; slide cover back; lift cover up.

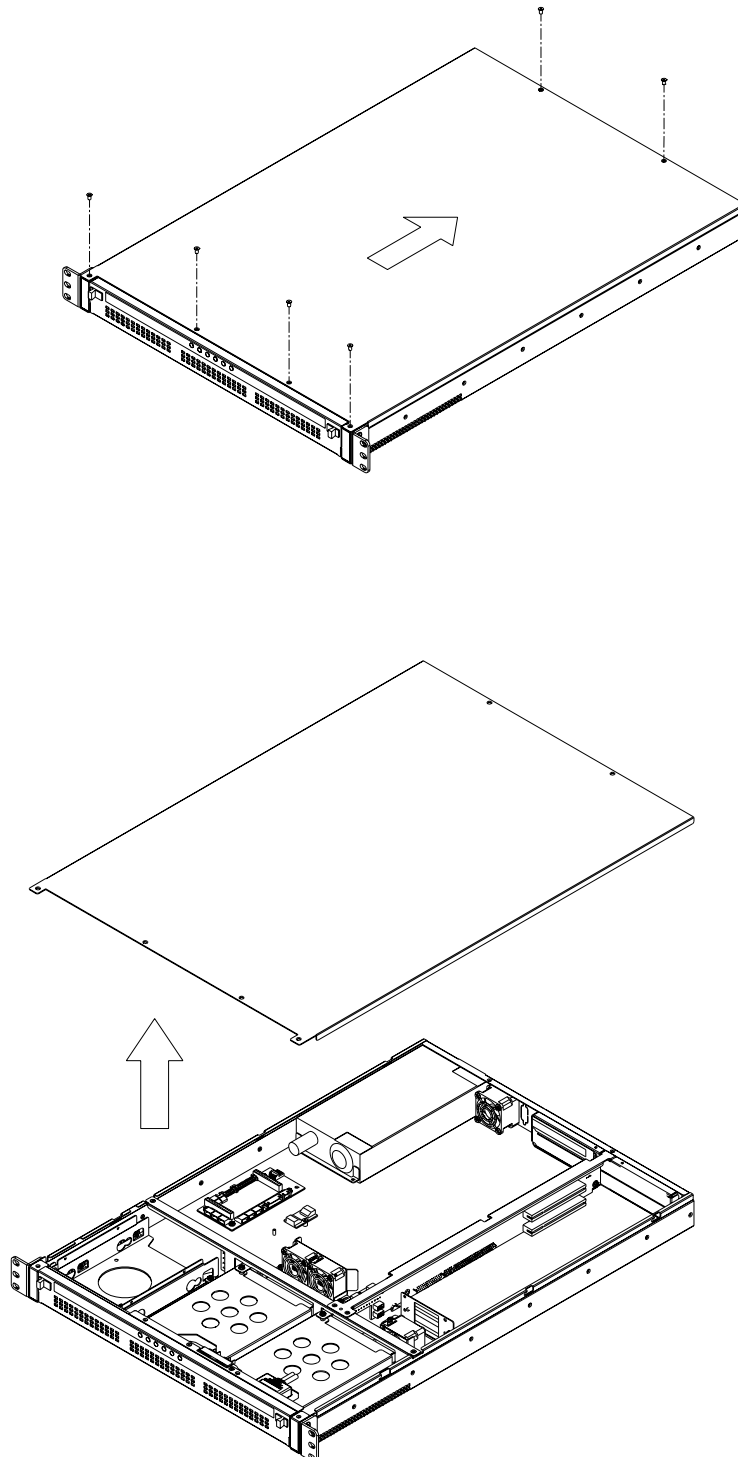


Figure 2.1 Removing the cover

2.3 Installing the backplane and the CPU card

ACP-1320BP accepts 3-slot backplane. To install the backplane, refer to figures and proceed as follows:

Note! To ensure the best air flow inside the chassis, choosing a CPU cooler which is lower than 22 mm is highly recommended.



1. Fix the backplane to the backplane holder (T-bar) of chassis with screws.
2. Fix the CPU card on the backplane and card guide with screws.
3. Fix the backplane holder (include CPU card and backplane) on the SATA BP bracket and card guide on the chassis simultaneously with screws.
4. Plug in the 20/24-pin ATX power connector and +12 V power connector from the power supply, also the 9-pin USB connectors from the front panel of the chassis.
5. Connect the POWER SW, RESET SW, LAN LED from chassis to the backplane and HDD LED cables from the alarm board to the backplane.

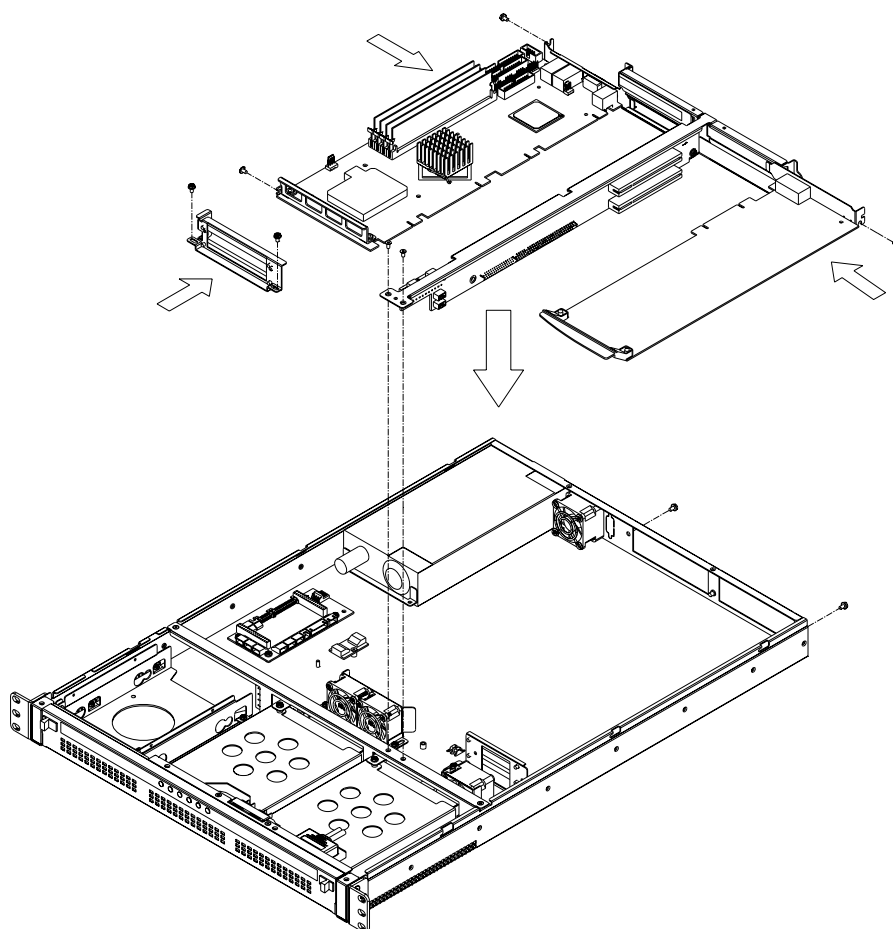


Figure 2.2 Installing a backplane, CPU card and add-on card

2.4 Installing add-on cards

ACP-1320BP can accept one PCI/PCIe add-on card on the backplane. To install an add-on card, also refer to Figure 2.2 and proceed as follows:

1. Plug in the add-on card until the card's gold fingers have been inserted in a PCI/PCIe slot of the backplane completely.
2. Make sure that the card bracket has been inserted properly and the other edge of the card has been fixed in the guiding rail.
3. Fasten the card at the top of the bracket with a screw.

2.5 Adding disk drives

ACP-1320BP comes with two easy-to-maintain SATA HDD trays; it also accepts one slim type optical disk drive and one 3.5" HDD/FDD. To install any of these disk drives, refer to Figures 2.3 ~ 2.6 and proceed as follows:

2.5.1 Installing a SATA HDD in the SATA HDD tray

ACP-1320BP accepts both SATA and SATA II HDD. It is not necessary to remove ACP-1320BP's cover when installing a SATA HDD in any of the SATA HDD trays.

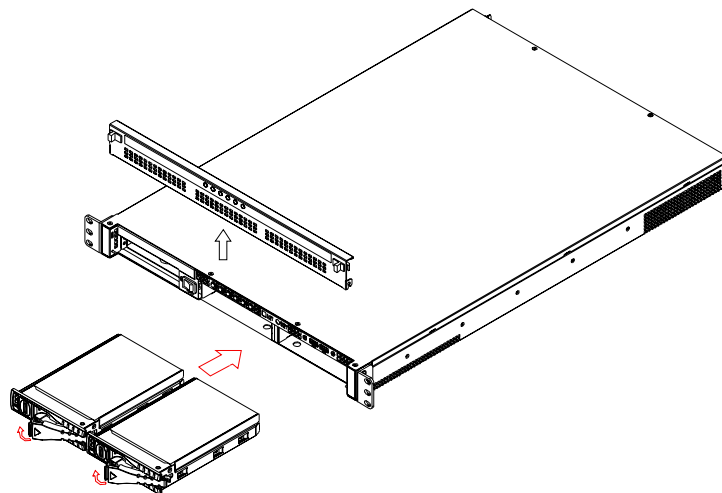


Figure 2.3 Removing the front bezel of the drive bay

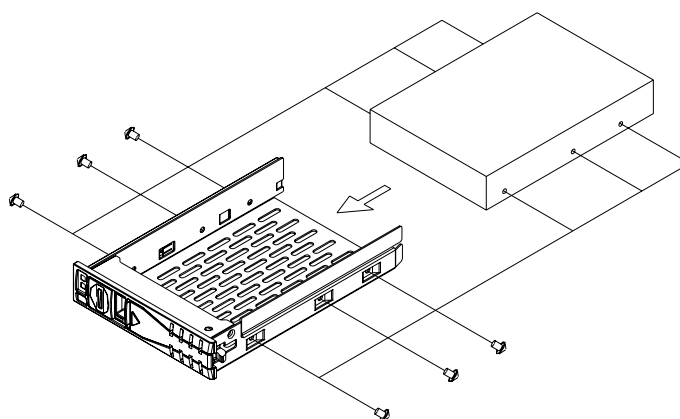


Figure 2.4 Installing a SATA HDD

1. Open the front bezel of the drive bay.
2. If you want to install a SATA HDD into SATA tray, it is necessary to remove the front bezel first. The front bezel is attached to the ACP-1320BP with bezel latch, but NOT fixed with screws.
3. Left-shift the key latch of one SATA HDD tray to unlock the tray. Hold the handle of the tray and draw it out from ACP-1320BP chassis.
4. Slide one SATA disk drive into the proper location in the tray and fix it with 4 ~ 6 screws.
5. Return and push the SATA 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 SATA HDD to be installed.

2.5.2 Installing a 3.5" HDD/FDD in the 3.5" drive bay and a slim-type CD-ROM/-RW

1. Remove the four screws, which mount the slim-type optical disk drive and 3.5" HDD brackets on the chassis.
2. Insert the hard drive disk into the proper location in the drive bay and fix it with 4 screws.
3. Connect a suitable cable from the motherboard to an ATA (IDE) HDD or a SATA cable to a SATA HDD.
4. Find a small PCB converter and connect it to the slim-type optical disk drive. Then fix it in place by tightening the two screws provided.
5. Insert slim-type optical disk drive into the proper location, and fix it with 4 screws.
6. Insert the proper power connector into each drive.
7. Return the HDD drive and slim-type optical disk drive with the bracket on the chassis and fix it with four screws.
8. Connect the 40-pin IDE flat cable from the CPU card to the optical disk drive.

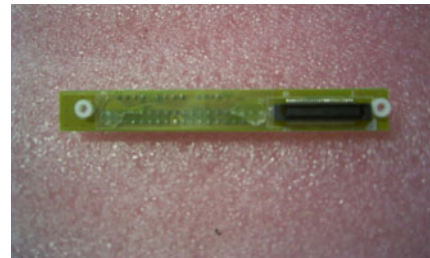
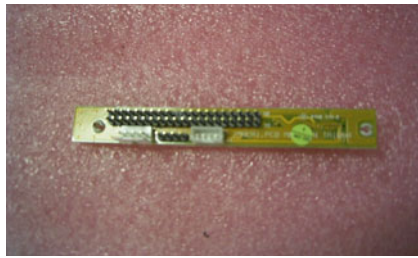


Figure 2.5 Small converter for slim-type optical disk drive

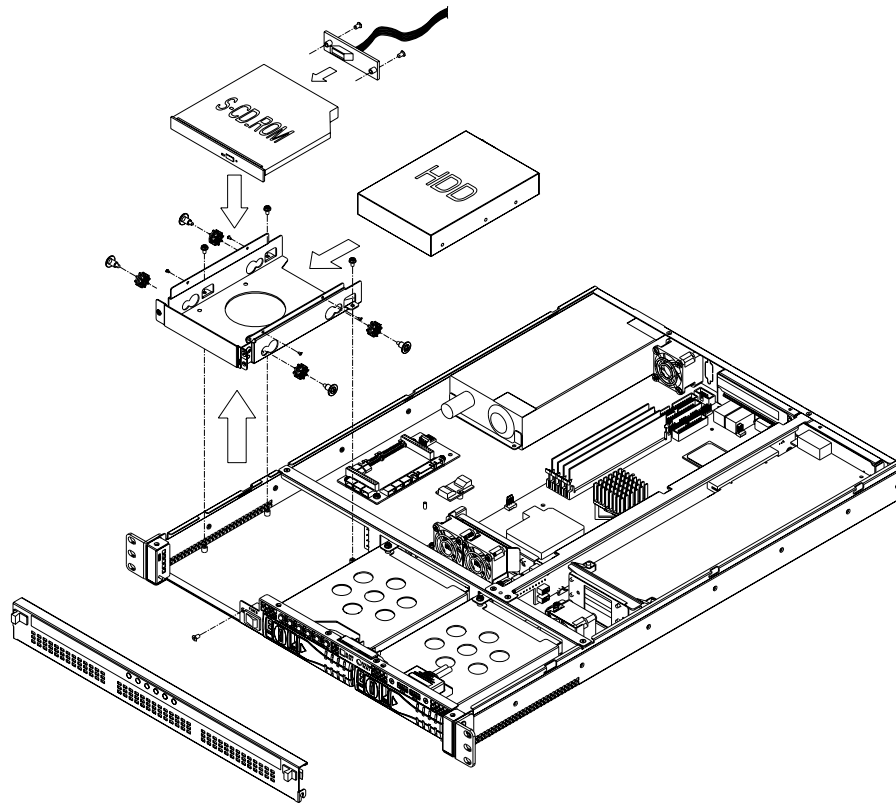


Figure 2.6 Installing an HDD/FDD and slim-type optical disk in the 3.5" drive bay

Chapter 3

Operation

3.1 The Front Panel

The front panel features six LED indicators. The user can close the door with the user-friendly latch. When the door is open, one sees a momentary power switch, a System Reset button, an Alarm Reset button, and a dual USB port. Their individual functions are described as below.

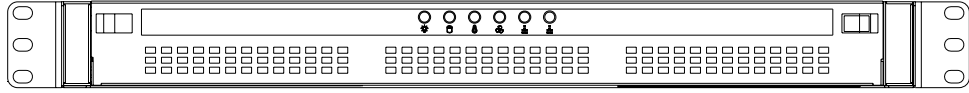


Figure 3.1 Closed front panel

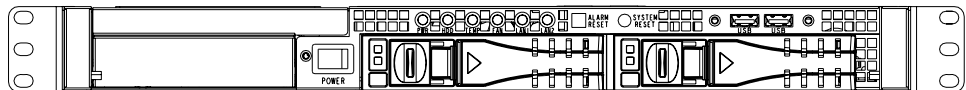


Figure 3.2 Open front panel

3.1.1 Switch, Button and I/O Interfaces

Momentary Power switch:

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

System Reset button:

Press this button 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. Pressing this button will stop the alarm from beeping.






Dual USB ports:

For connecting a wide range of USB devices for data transfer, backup or input.

3.1.2 LED indicators

Six LEDs are placed in the middle of the front panel to indicate system health and activity. Please refer to Table 3.1 for the LED definition summary.

Table 3.1: LED indicator functions

LED	Description	Green	Red	Orange
Power 	System power	Normal	N/A	N/A
Fan 	Cooling fan status	Normal	Abnormal	N/A
Temperature 	Temperature in the chassis	Normal	Abnormal	N/A
Hard Disk 	Hard disk drive activity	N/A	No light	Normal
LAN 	LAN1 & LAN2 status	Normal	No light	N/A
	Data transmit through LAN	Blinking		

When the system power is on, the power LED is always **GREEN**.

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 replace the failed fan with a good one immediately.

If the temperature LED is **RED**, it means that the 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.

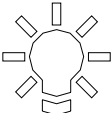
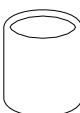
If the HDD LED stays **ORANGE**, it means the data is transmitting and HDD LED turns into blinking.

If the LAN1/LAN2 LED stays **GREEN**, it means the network connection works normally. When data is transmitting through the network, the LAN LED blinks. When the LAN1/LAN2 LED fails to light up, inspect the LAN cable and the connections.

3.1.3 LED Indicators for SATA HDD Power & Status

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

Table 3.2: Table 3.2: SATA HDD LED indicators function for ACP-1320

LED	Description	Green	Blue
	power of HDD	HDD power on	N/A
	Status of HDD	N/A	Data access

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

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

3.2 Replacing the Cooling Fans

There are two fans close to the rear window of the ACP-1320BP chassis.

1. Un-plug the fan power connector.
2. Remove the two screws, which mount the fan bracket on the chassis, and take it out.
3. Remove the screws, which mount the failed fan to the fan bracket, and take out the fan.
4. Place a new fan on the fan bracket, then fasten them with two screws.
5. Place the fan bracket back to the drive bay and fasten it with screws.
6. Plug in the fan power connector.

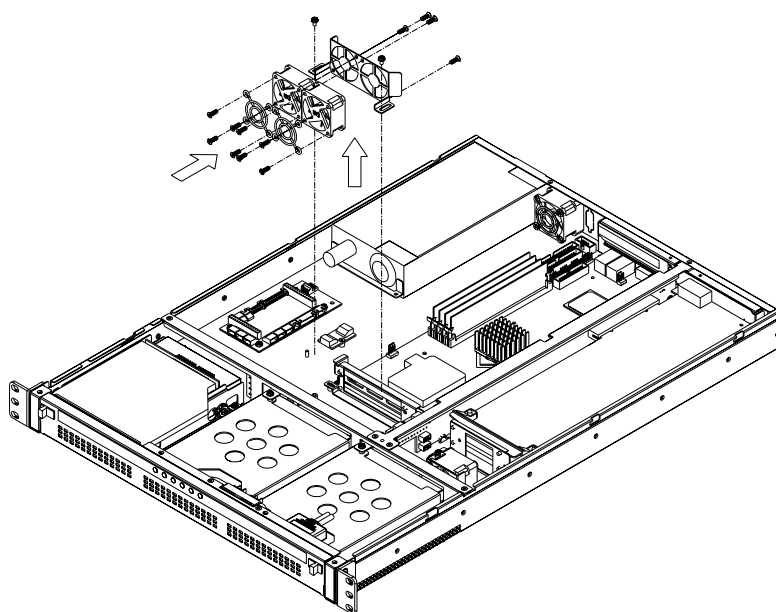


Figure 3.3 Replacing the cooling fans

3.3 Replacing the power supply

ACP-1320BP supports a single 1U-high power supply. To change the power supply, refer to Figure 3.4 and proceed as follows:

1. Un-plug the AC inlet from the power supply of ACP-1320BP.
2. Remove the top cover of ACP-1320BP.
3. Unplug the ATX power connector and +12V power connector from the CPU card, and the peripheral power connector(s) from the drive disk(s).
4. Remove the two screws, which mount the power supply bracket to the chassis, and the other two screws, which mount the fan bracket on the chassis, then lift the power supply.
5. Place a new power supply into the chassis and fasten it with the four screws.
6. Plug the ATX power connector and +12V power connector to the CPU card, and the peripheral power connector(s) to the proper drive disks.
7. Return the cover of ACP-1320BP and plug in the AC inlet.

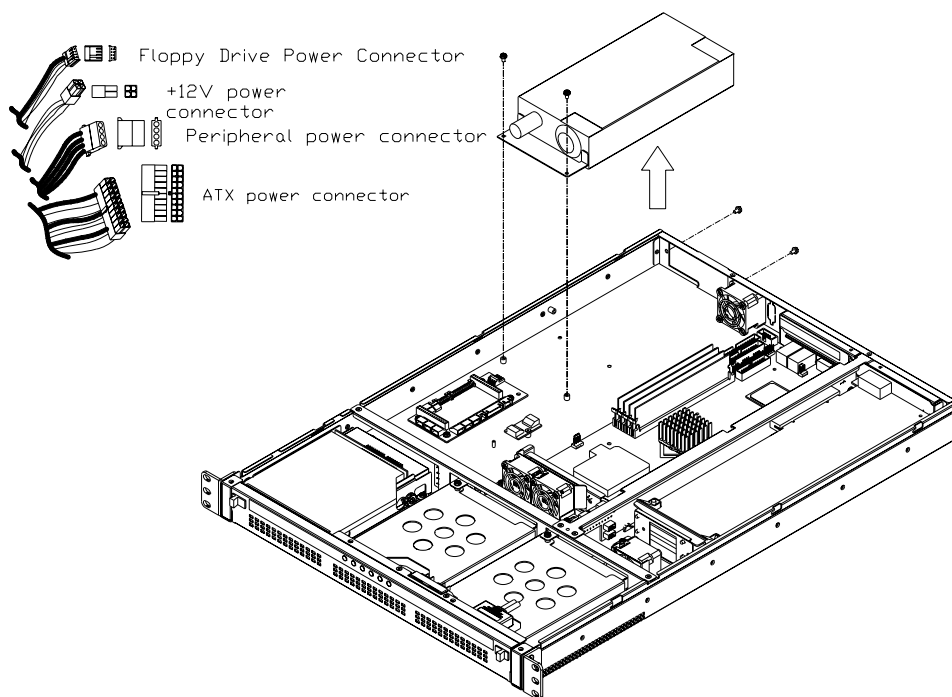


Figure 3.4 Changing the power supply

Chapter 4

Alarm Board

4.1 Introduction

The alarm board is located in the middle section, between the driver bay and the power supply. The alarm board gives an audible alarm when:

- A cooling fan fails
- Chassis internal temperature is too high

To stop the alarm beep, simply press the Alarm Reset button on the front panel, then take the necessary actions to remedy the situation.

4.2 Alarm Board Layout

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

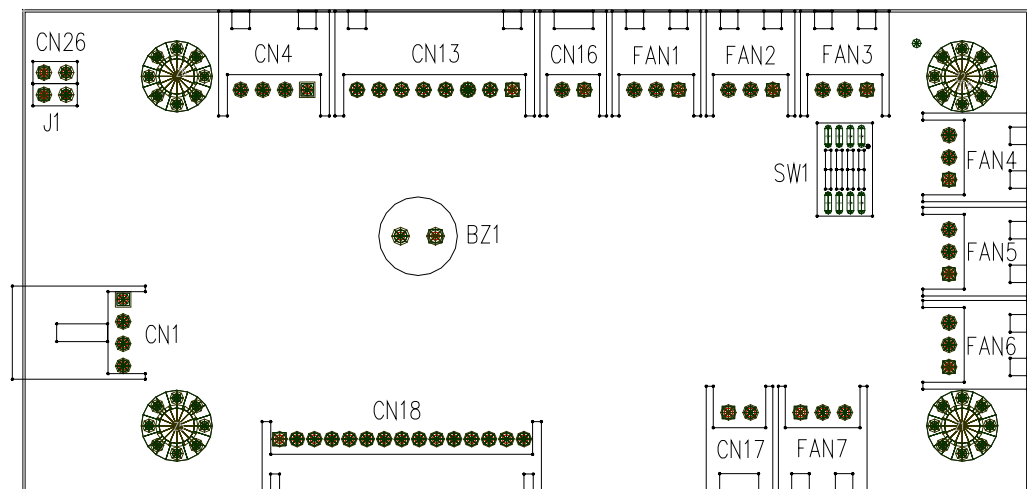


Figure 4.1 Alarm board layout

4.3 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 backplane, and support six voltages: ± 12 V, ± 5 V, +3.3V, +5 Vsb)
- One 'hard disk LED' connector (connect from the CPU card or the motherboard)

Output Signals:

- One 'LED board' connector
- One 'buzzer' output

4.3.1 Connectors, Jumper and Pin Definition

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

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

Table 4.2: CN4, Thermal sensor (LM75) connector

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

Table 4.3: CN13, Voltage detect input connector

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

Table 4.4: CN16, Power good input connector

Pin 1	Power Good	Pin 2	GND
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Table 4.5: CN17, Alarm reset connector

Pin 1	ALARM RESET	Pin 2	GND
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Table 4.6: CN18, Output connector to LED board

Pin 1	GND	Pin 9	Temperature Good
Pin 2	+5 V signal	Pin 10	Temperature Fail
Pin 3	+12 V signal	Pin 11	FAN Good
Pin 4	-5 V signal	Pin 12	FAN Fail
Pin 5	-12 V signal	Pin 13	N/A
Pin 6	HDD_1	Pin 14	+3.3 V signal
Pin 7	Power Good	Pin 15	+5 Vsb signal
Pin 8	Power Fail		

Table 4.7: CN26, External HDD LED connector

Pin 1	HLED_ACT	Pin 2	N/A
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Table 4.8: FAN1~FAN7, Fan connectors

Pin 1	GND	Pin 3	FAN_DEC
Pin 2	+12 V		

Table 4.9: J1, External buzzer

Pin 1	Buzzer	Pin 2	+5 V
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Table 4.10: SW1, Fan number select switch


Pin 1	GND	Pin 5	GND
Pin 2	FAN_SEL1	Pin 6	FAN_SEL3
Pin 3	GND	Pin 7	GND
Pin 4	FAN_SEL2	Pin 8	RESET

4.3.2 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 4.11: 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	ON	ON	OFF	OFF
4(default)	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF

Note!  Connect the fan connectors in the correct sequence: If two fans are set on SW1, the correct method is to connect them 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.

4.4 Thermal Sensor

The ACP-1320 is configured with a thermal sensor located at the rear plate of the chassis. (see Figure 4.2) Please refer to Figure 4.3 for a diagram of the thermal sensor module layout.

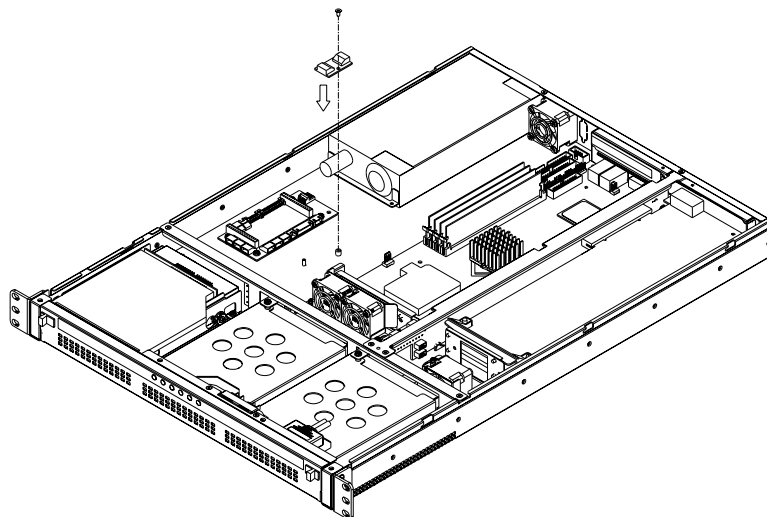


Figure 4.2 Thermal sensor location

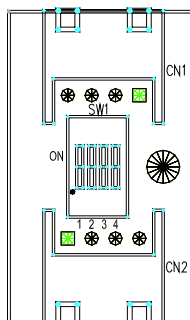


Figure 4.3 Thermal sensor module

Users can set up to 8 thermal sensors. The default sensor I.D. number is 1. Users can refer to Table 4.13 to set the sensor I.D. number by adjusting the switch, SW1, on the sensor module.

Table 4.12: CN1 & CN2, Temperature sensor connector

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

Table 4.13: SW1, Thermal sensor I.D. 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

A.1 Exploded Diagram

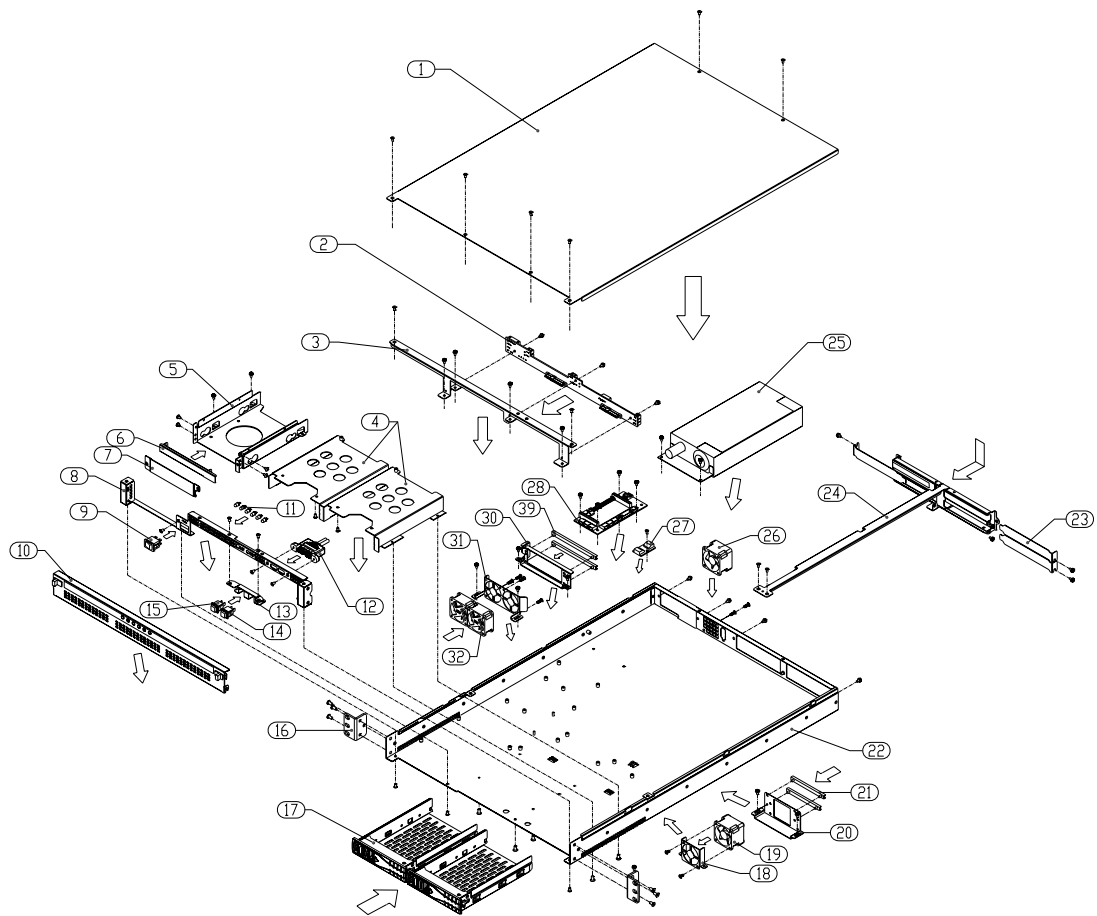


Figure A.1 Exploded Diagram

Table A.1: Parts List

1	Top cover	17	HDD drawer
2	SATA BP	18	Fan holder I
3	SATA BP bracket	19	System fan x 1(40*15mm)
4	Tray Bay	20	Card Guide holder
5	Driver Bay	21	PCB guide rail
6	Slim FDD cover	22	Chassis
7	3.5" drive cover	23	Adapter bracket
8	Bezel	24	Card support ASM
9	Power switch	25	Power
10	Front door	26	System fan x 1(40*28mm)
11	LED housing	27	Thermal board
12	USB cable	28	Common alarm
13	Switch holder	29	PCB guide rail
14	System Reset Switch	30	Card guide
15	Alarm Reset Switch	31	Fan holder 2
16	Rack mount bracket	32	Dual system fan(40*28mm)

Appendix **B**

Backplane Options

B.1 Backplane Options

ACP-1320BP supports a variety of PICMG 1.0/1.3 backplanes. Please contact a local sales representative for detailed information.

Table B.1: PICMG1.3 Backplane Options

Model Name	Segment	Slots Per Segment			
		SHB*	PCIe x 16	PCIe x 4	PCI
PCE-5B03V-01A1E	Single	1	1	-	1
PCE-5B03V-00A1E	Single	1	1	1	-

*System Host Board

Table B.2: PICMG1.0 Backplane Options

Model Name	Segment	Slots Per Segment		
		SHB*	PCI	PCI-X
PCA-6103P2V-0A2E	Single	1	2	-
PCA-6103P2VX-B2E	Single	1	-	2

*System Host Board

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