User Manual

ACP-4000 / IPC-611 / IPC-610 Series

4U-High Rackmount Chassis

Trusted ePlatform Services

ADVANTECH

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Acknowledgements

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On-line Technical Support

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

http://www.advantech.com/support

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 protects 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 such 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 long time, disconnect it from the power source to avoid being damaged by transient over-voltage.
13. Never pour any liquid into ventilation openings. This could cause fire or electrical shock.
14. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
15. If any of the following situations arises, get the equipment checked by service personnel:
    a) The power cord or plug is damaged.
    b) Liquid has penetrated into the equipment.
    c) The equipment has been exposed to moisture.
    d) The equipment does not work well or you cannot get it to work according to user manual.
    e) The equipment has been dropped and damaged.
    f) The equipment has obvious signs of breakage.
16. **CAUTION:** The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the 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.

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CLASS 1 LASER PRODUCT
KLASSE 1 LASER PRODUKT
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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

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°Øs customer services.

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

Technical support

We want you to get the best performance possible from your products. If you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

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

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

Product Warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.

3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.

4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

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

Initial Inspection

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

■   Chassis
■   User Manual
■   Warranty Card
■   Accessory box with a package of screws (for fastening the backplane or motherboard, optical disk drive, other disk drives, ear handles, etc.), a pair of keys, a pc of EMI spring shielding (backplane version only), 15 pcs rubber cushions (backplane version only) or 7 pcs (motherboard version only) , and a 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 product mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the product, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also, please notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Contents

Chapter 4   Alarm Board   (ACP-4000 only).. 29

Appendix A   Exploded Diagram 35

Appendix B   Backplane and Motherboard Options.. 41

Chapter 1

General Information

This chapter provides general information.

Sections include:

■ Introduction

■ Specifications

■ Dimension diagram

■ Power supply options

■ Environment specification

1.1 Introduction

The ACP-4000, IPC-611 and IPC-610 series are 4U-high 15-slot rackmount chassis designed for mission critical applications. They support versatile 15-slot passive backplanes or ATX/microATX motherboards, high efficient switching power supply, and easy-to-maintain cooling fans. ACP-4000 especially provides the alarm module to monitor system status such as power, HDD, temperature and fans to minimize system downtime. A wide range of standard computing peripherals can be integrated with these chassis to meet different applications under rugged environments 24 hours a day, 7 days a week.

1.2 ACP-4000/IPC-610-H

1.2.1 Specifications of ACP-4000/IPC-610-H

Table 1.1: Specifications			
		Front-accessible	Internal
Drive Bay	3.5"	1	-
	5.25"	3	-
Cooling	Fan	2 (85 CFM)	
	Air Filters	Yes	
Front I/O Interface	USB	2	
	PS/2	1	
Miscellaneous	LED Indicator	ACP-4000: Power on, HDD, TEMP, Fan and voltages	
		IPC-610-H: Power on, HDD and voltages activity	
	Rear panel	BP: 1 D-SUB 9-pin reserved opening MB: 5 D-SUB 9-pin & 1 68-pin SCSI reserved openings	
Physical	Dimensions (W x H x D)	482 x 177 x 480 mm (19" x 7"x 18.9")	
	Weight	ACP-4000: 18 kg (39.6 lb)	
		IPC-610-H: 17 kg (37.4 lb)	
Color	ACP-4000: black(4C2X); IPC-610-H: beige(414U)		
Power supply options	PS-250ATX-ZE, PS-300ATX-ZBE, PS-400ATX-ZBE, PS-500ATX-ZE, PS-700ATX-ZE, PS-300ATX-DC48E, RPS-300ATX-ZE, RPS-400ATX-ZE		

1.2.2 Dimension Diagram of ACP-4000

motherboard   backplane

101.6 [4.0]

426 [16.8]

426 [16.8]
465 [18.3]
482 [19.0]

177 [7.0]

92 [3.6] 92 [3.6] 92 [3.6] 86 [3.4]

477.4 [18.8]

486.7 [19.2]

12 [0.5]

Unit: mm[inch]

Figure 1.1 Dimension diagram of ACP-4000

1.2.3 Dimension Diagram of IPC-610-H

motherboard   backplane

101.6 [4.0]

426 [16.8]

426 [16.8]
465 [18.3]
482 [19.0]

177 [7.0]

92 [3.6] 92 [3.6] 92 [3.6] 86 [3.4]

477.4 [18.8]

486.7 [19.2]

12 [0.5]

Unit: mm[inch]
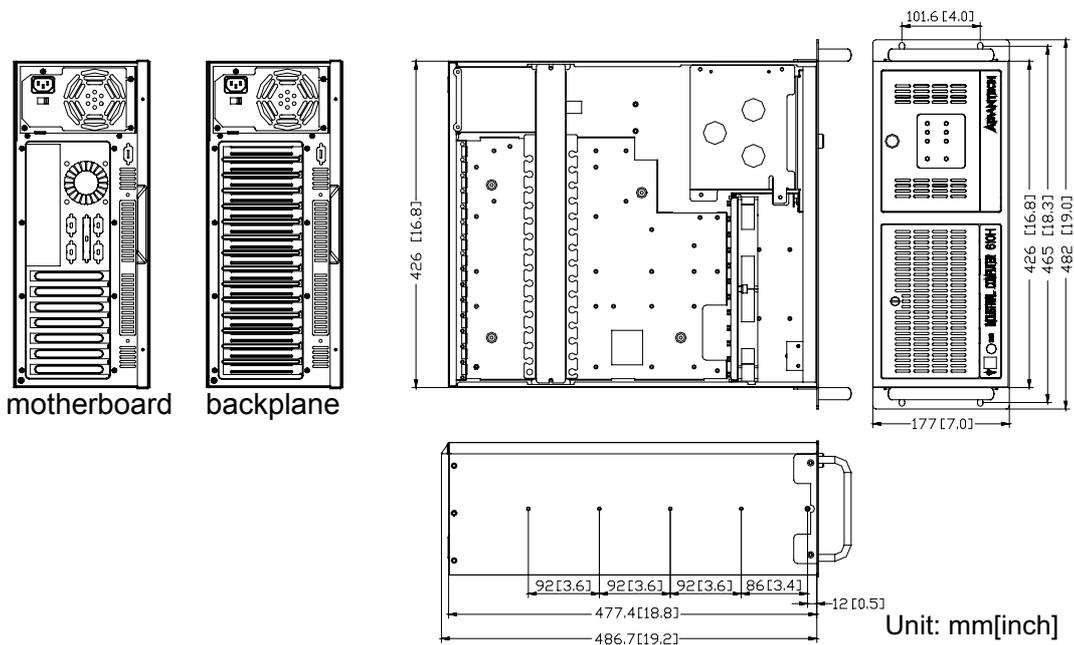
Figure 1.2 Dimension diagram of IPC-610-H

1.3 IPC-610-F

1.3.1 Specifications of IPC-610-F

Table 1.2: Specifications		Front-accessible	Internal
Drive Bay	3.5"	1	1
	5.25"	3	-
Cooling	Fan	1 (85 CFM)	
	Air Filters	Yes	
Miscellaneous	LED Indicator	Power, HDD and Keyboard-Lock status	
	Rear panel	BP: 1 D-SUB 9-pin reserved opening MB: 5 D-SUB 9-pin & 1 68-pin SCSI reserved openings	
Physical	Dimensions (W x H x D)	482 x 177 x 452 mm (19" x 7"x 17.8") for BP	
		482 x 177 x 502 mm (19" x 7"x 19.8") for MB	
	Weight	18 kg (39.6 lb)	
Color	beige(414U)		
Power supply options	PS-250ATX-ZE, PS-300ATX-ZBE, PS-400ATX-ZBE, PS-500ATX-ZE, PS-700ATX-ZE (MB only), PS-300ATX-DC48E, RPS-300ATX-ZE, RPS-400ATX-ZE		

1.3.2 Dimension Diagram of IPC-610-F

motherboard backplane

Unit: mm[inch]

Figure 1.3 Dimension diagram of IPC-610-F

1.4 IPC-610-E

1.4.1 Specificaitons of IPC-610-E

Table 1.3: Specifications		Front-accessible	Internal
Drive Bay	3.5"	1	2
	5.25"	2	-
Cooling	Fan	1 (85 CFM)	
	Air Filters	Yes	
Front I/O Interface	K/B Connector	1(front-accessible 5-pin DIM connector)	
Miscellaneous	LED Indicator	Power, HDD and Keyboard-Lock	
	Rear panel	1 D-SUB 9-pin, 1 D-SUB 25-pin and 1 AT keyboard connector reserved openings	
Physical	Dimensions (W x H x D)	482 x 177 x 452 mm (19"x 7" x 17.8")	
	Weight	17.5 kg (38.5 lb)	
Color	beige(414U)		
Power supply options	PS-250ATX-ZE, PS-300ATX-ZBE, PS-400ATX-ZBE, PS-500ATX-ZE		

1.4.2 Dimension Diagram of IPC-610-E
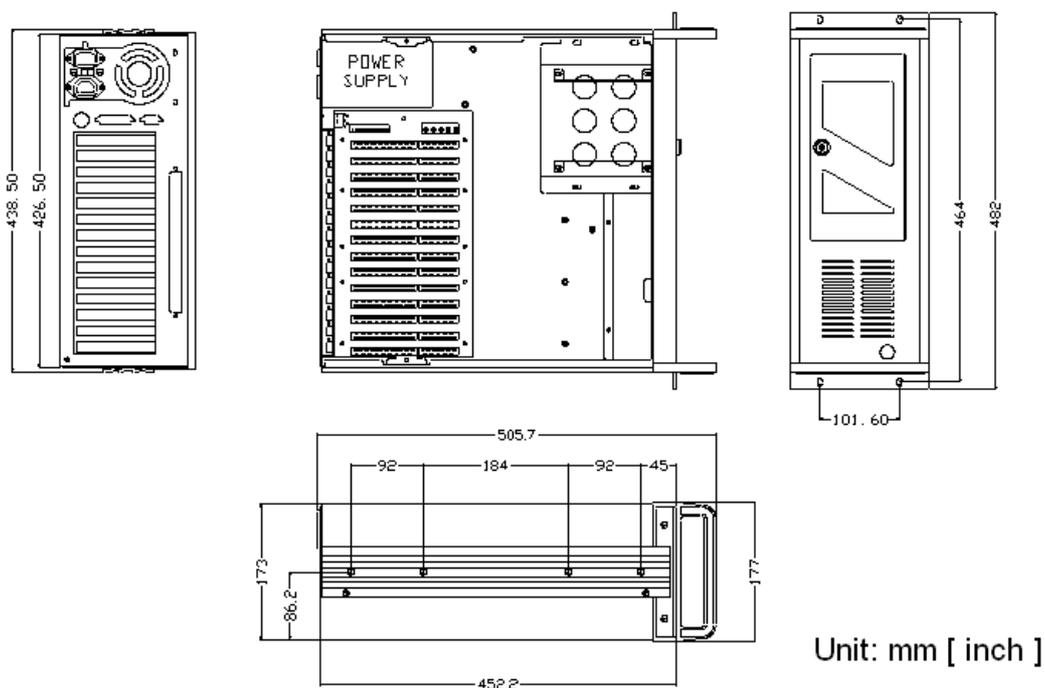
Figure 1.4 Dimension diagram of IPC-610-E

1.5 IPC-610-L/IPC-611

1.5.1 Specifications of IPC-610-L/IPC-611

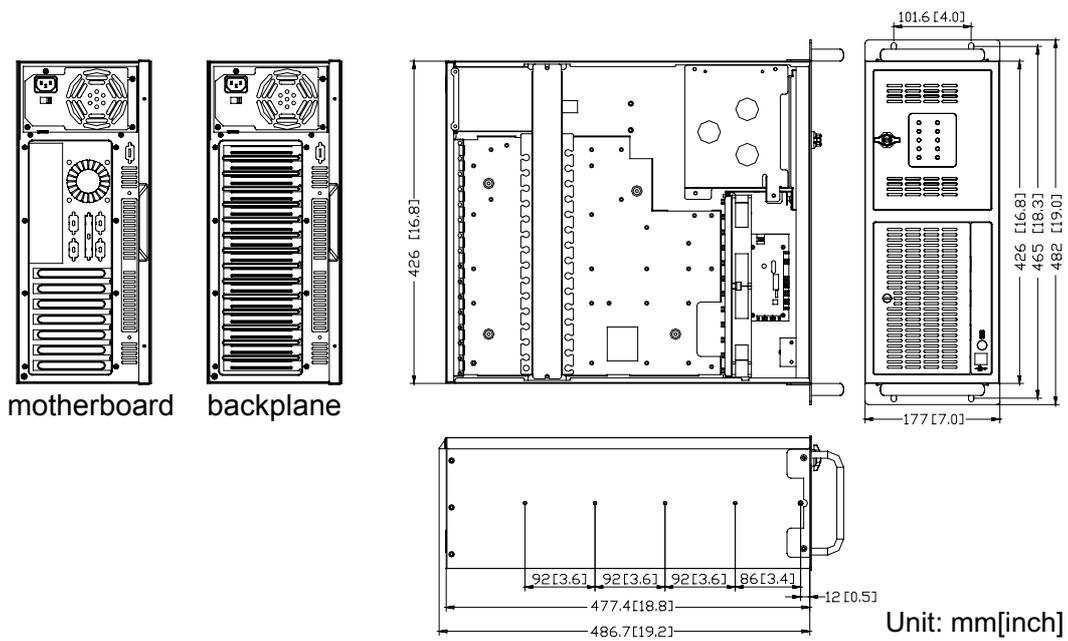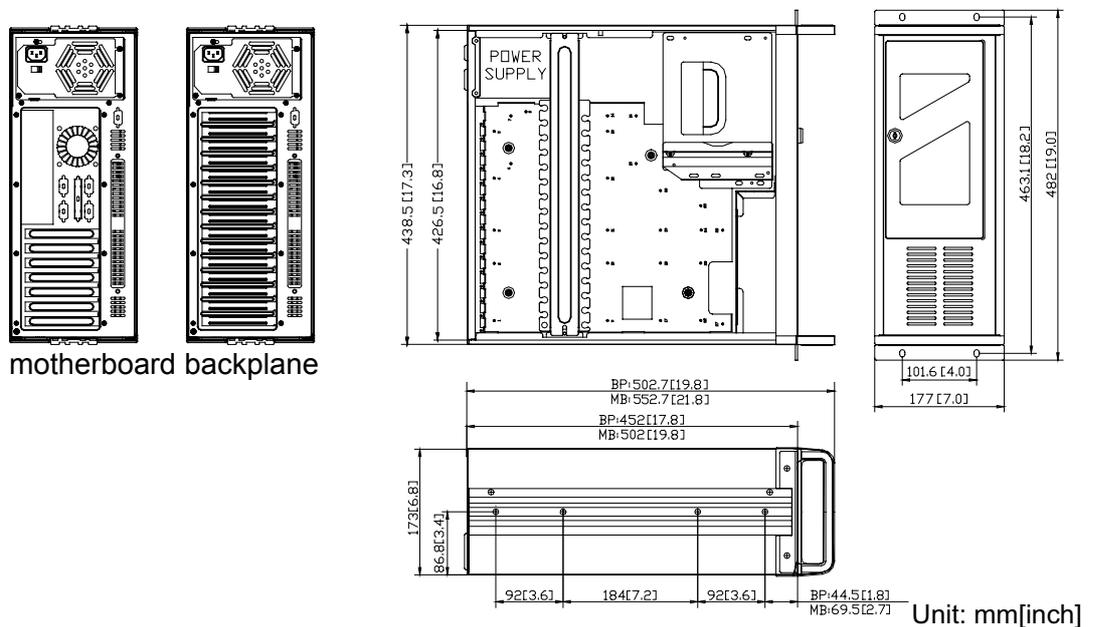| Table 1.4: Specifications			
		Front-accessible	Internal
Drive Bay	3.5"	1	-
	5.25"	3	-
Cooling	Fan	1 (85 CFM)	
	Air Filters	Yes	
Miscellaneous	LED Indicator	Power on and HDD activity	
	Rear panel	BP: 1 D-SUB 9-pin served opening MB: 5 D-SUB 9-pin & 1 68-pin SCSI reserved openings	
Physical	Dimensions (W x H x D)	482 x 177 x 480 mm (19" x 7" x 18.9")	
	Weight	16.5 kg (36.3 lb)	
Color		IPC-610-L: beige(414U); IPC-611: black(4C2X)	
Power supply options		PS-250ATX-ZE, PS-300ATX-ZBE, PS-400ATX-ZBE, PS-500ATX-ZE, PS-700ATX-ZE, PS-300ATX-DC48E, RPS-300ATX-ZE, RPS-400ATX-ZE	

1.5.2 Dimension Diagram of IPC-610-L

motherboard   backplane

Unit: mm[inch]
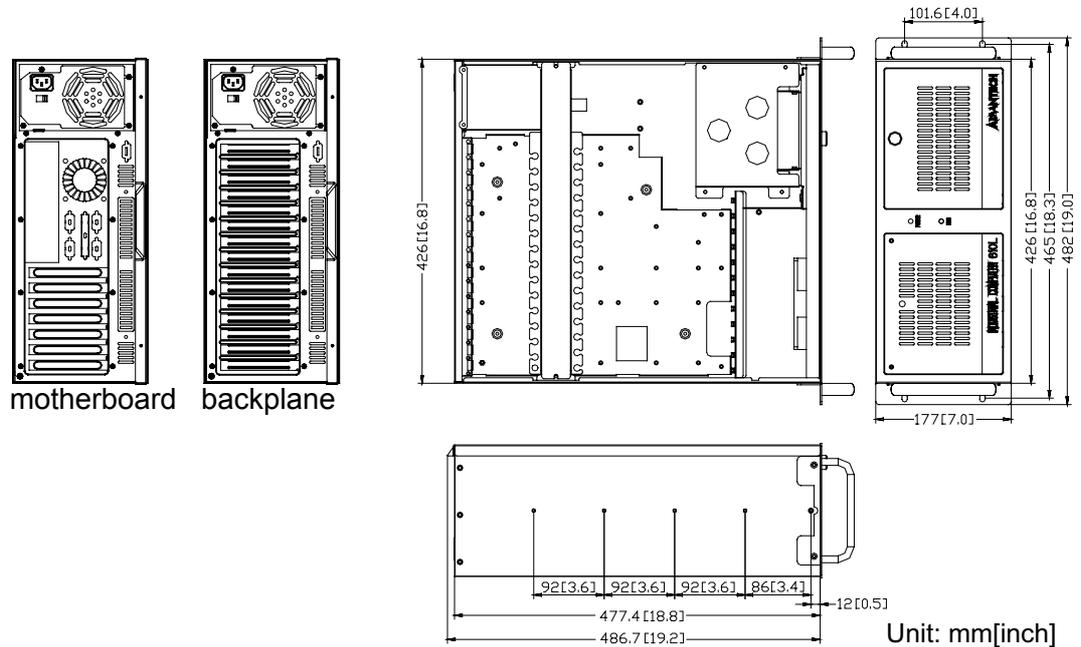
Figure 1.5 Dimension diagram of IPC-610-L

1.5.3 Dimension Diagram of IPC-611
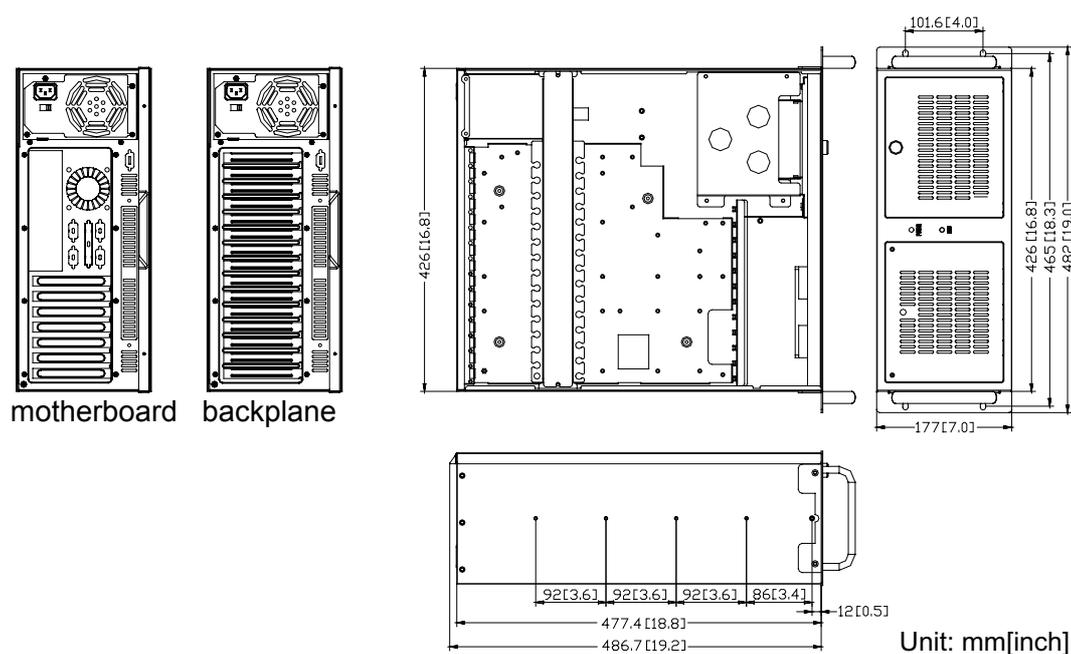
Figure 1.6 Dimension diagram of IPC-611

1.6 Power Supply Options

Table 1.5: Power supply options		
Model Name	**PS-250ATX-ZE**	**PS-300ATX-ZBE**
Watt	250 W max. (ATX, PFC) (single PS/2)	300 W max. (ATX, PFC) (single PS/2)
Input rating	115 / 230 Vac (Selectable)	100 ~ 240 Vac (Full range)
Output voltage	+5 V @ 27 A, +3.3 V @ 20 A +12 V @ 13 A, -12 V @ 0.8 A -5 V @ 0.3 A, +5 Vsb @ 2 A	+5 V @ 30 A, +3.3 V @ 28 A, +12 V @ 15 A, -12 V @ 0.8 A, -5 V @ 0.3 A, +5 Vsb @ 2 A
Minimum load	+5 V @ 0.5 A, +3.3 V @ 0.3 A, +12 V @ 1 A	+5 V @ 0.1 A, +3.3 V @ 0.3 A
MTBF	100,000 hours @ 25°C	100,000 hours @ 25°C
Safety	UL/TUV/CB/CCC	UL/TUV/CB/CCC
Model Name	**PS-400ATX-ZBE**	**PS-500ATX-ZE**
Watt	400 W max. (ATX, PFC) (single PS/2)	500 W (ATX, PFC) (single PS/2)
Input rating	100 ~ 240 Vac (Full range)	100 ~ 240 Vac (Full range)
Output voltage	+5 V @ 35 A, +3.3 V @ 28 A, +12 V @ 30A, -5 V @ 0.5 A, -12 V @ 0.8 A, +5 Vsb @ 2 A	+5 V @ 40 A, +3.3 V @ 30 A, +12 V @ 30 A, -5 V @ 0.8 A, -12 V @ 1 A, +5 Vsb @ 2 A
Minimum load	+5 V @ 3 A, +12 V @ 1 A, +5 Vsb @ 0.1 A	+5 V @ 2.5 A, +3.3 V @ 1 A, +12 V @ 1 A, +5 Vsb @ 0.1 A
MTBF	91,000 hours @ 25° C	98,000 hours @ 25° C
Safety	UL/TUV/CB/CCC	UL/TUV/CB/CCC

Model Name	PS-700ATX-ZE	RPS-300ATX-ZE
Watt	700 W (ATX, PFC) (single PS/2+)	300 W max. (ATX, PFC) (1+1 redundant)
Input rating	100 ~ 240 Vac (Full range)	100 ~ 240 Vac (Full range)
Output voltage	+5 V @ 50 A, +3.3 V @ 45 A, +12 V @ 36 A, -5 V @ 0.8 A, -12 V @ 0.1 A, +5 Vsb @ 2 A	+5 V @ 25 A, +3.3 V @ 18 A, +12 V @ 16 A, -12 V @ 0.5 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, +5 Vsb @ 0.1 A	+5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A
MTBF	72,000 hours @ 25° C	100,000 hours @ 25° C
Safety	UL/TUV/CB/CCC	UL/TUV/CB/CCC

Model Name	RPS-400ATX-ZE	PS-300ATX-DC48
Watt	400 W (ATX, PFC) (1+1 redundant)	300 W (ATX) (single PS/2)
Input rating	100 ~ 240 Vac (Full range)	DC -48 Vac
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	+5 V @ 30 A, +3.3 V @ 28 A, +12 V @ 15 A, -12 V @ 0.8 A, -5 V @ 0.3 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	+5 V @ 0.3 A, +3.3 V @ 0.3 A, +12 V @ 0.2 A
MTBF	100,000 hours @ 25° C	100,000 hours @ 25° C
Safety	UL/TUV/CB/CCC	UL/TUV/CB/CCC

1.7 Environment Specifications

Table 1.6: 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	1G rms	2G
Shock	10G with 11 ms duration, half sine wave	30G
Safety	CE compliant	

Chapter 2

System Setup

This chapter introduces the installation process.

Sections include:

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

The following procedures instruct users to install a backplane/motherboard, add-on cards, and disk drives into the chassis. Please also refer to Appendix A, Exploded Diagram, for the detailed parts of the chassis. For some installation steps which is similar to other chassis model, we just use IPC-610-F to explain the procedures.

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

2.1 Removing the Top Cover

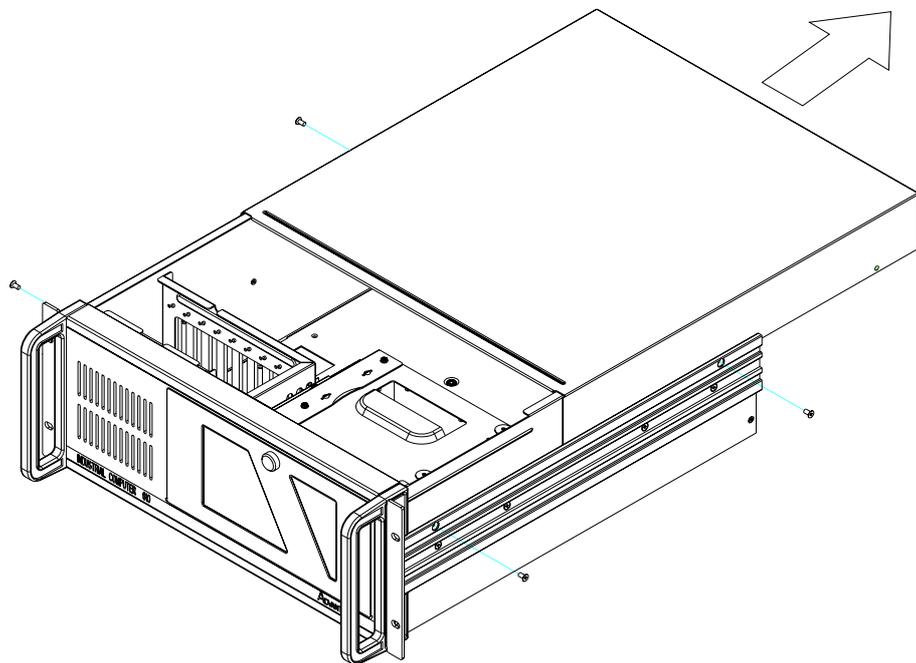Remove the chassis top cover by releasing the screws on sides of the chassis.

Figure 2.1 Removing the top cover

2.2 Installing the Backplane or Motherboard

These chassis supports either up to 15-slot backplane or ATX/MicroATX motherboard. To install the backplane or motherboard, please proceed as follows:

> **Note!** Use caution when installing a motherboard. It's highly recommended to integrate Advantech motherboard series with this chassis to ensure the quality, safety and the air flow design.

1. Dismantle the hold-down clamp by removing the two screws on its both ends.
2. A yellow label is located inside of the chassis bottom. (see Figure 2.2) 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 instruction and fasten the backplane or motherboard onto the chassis with the correct stub locations.
3. While installing a BACKPLANE, fasten it in place and attach the supplied EMI spring shielding with the screws provided. (see Figure 2.3)
4. For the PICMG 1.0 BACKPLANE, connect the orange-white wire from connector 'HCN1' on the backplane to connector 'CN21' on the CPU card.
5. While installing a MOTHERBOARD, attach the motherboard I/O shielding onto the rear plate first. Then fasten the motherboard onto the chassis. (see Figure 2.4)
6. Connect the 20-pin (or 24-pin) ATX power connector and the 4-pin +12V power connector from the power supply to the backplane or the motherboard. (For the PICMG 1.0 BACKPLANE, the 4-pin +12 V power connector is connected to the CPU card.)
7. Connect the 9-pin USB wire, PS/2 wire, Power switch wire, and the System Reset switch wire from the chassis to the motherboard.
8. Connect the wire of HDD LED from the chassis to the motherboard.

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-6114-B	*	*	*	*	*		*	*	*	*	*	*	*	*																		
PCA-6113P7X	*	*	*	*	*		*	*			*	*		*			*		*			*	*		*					*		
PCA-6115	*	*	*	*	*			*	*	*	*	*	*																			
PCA-6114P12X	*	*	*	*	*		*	*	*			*		*			*		*			*	*		*					*		
PCE-7B13-64 PCE-5B12-64	*	*	*	*	*		*		*	*		*		*			*	*		*							*	*				
AIMB-740 AIMB-742	*	*	*				*		*		*			*																		
AIMB-744 AIMB-750 AIMB-760	*	*	*				*				*			*			*		*													
AIMB-762 AIMB-764	*	*	*				*		*		*			*			*		*													
AIMB-542 AIMB-554 AIMB-556 AIMB-560 AIMB-562		*	*				*				*			*					*													*

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

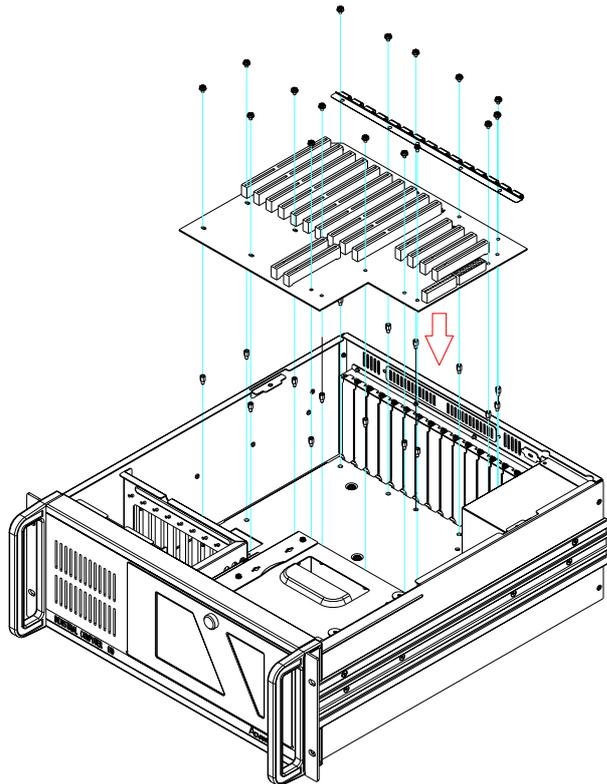**Figure 2.2 Yellow label indicating copper stub locations**

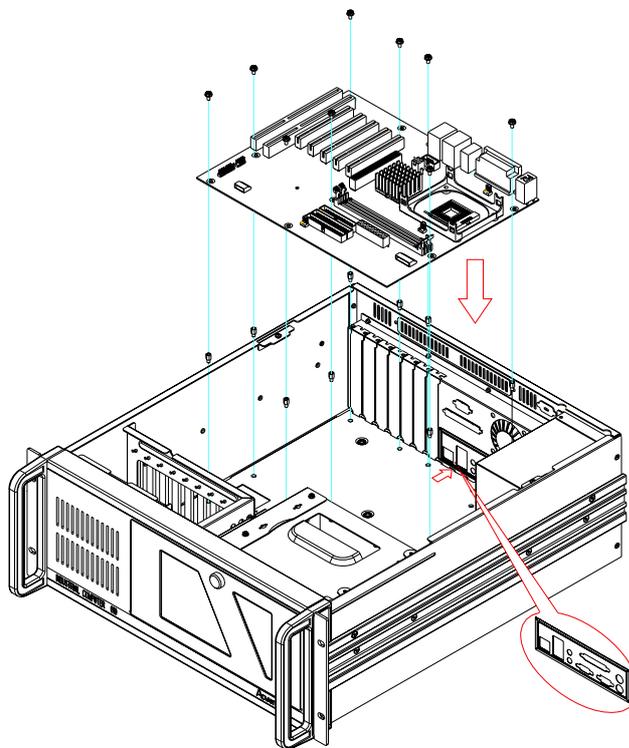**Figure 2.3 Installing the backplane**

Figure 2.4 Installing a motherboard

2.3 Installing CPU Card or Add-on Card

These chassis supports up to 15 cards. To install a CPU card or add-on cards, please proceed as follows:

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 2.5)
3. Repeat Step 1 and 2 if there is more than one add-on card to be installed.
4. Connect the 9-pin USB wire, PS/2 wire, power switch wire and the System Reset switch wire from the chassis to the CPU card.
5. Connect the wire of HDD LED from the chassis to the CPU card.
6. For the PICMG1.0 Backplane, connect the orange-white wire from the connector 'CN20'on the CPU card to the connector 'HCN1' on the backplane. Connect the 4-pin +12 V power connector from the power supply to the CPU card.
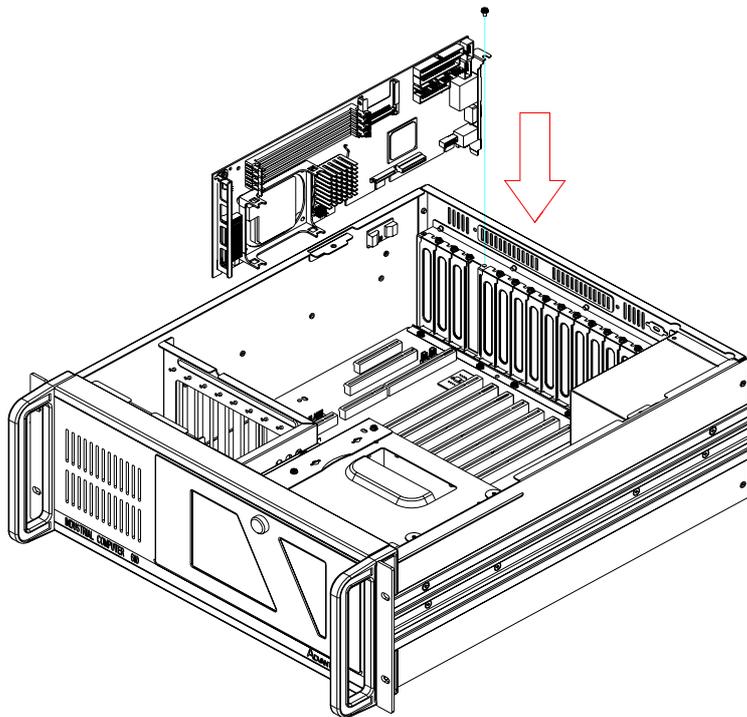

Figure 2.5 Installing a full-length card

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. 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 2.6)

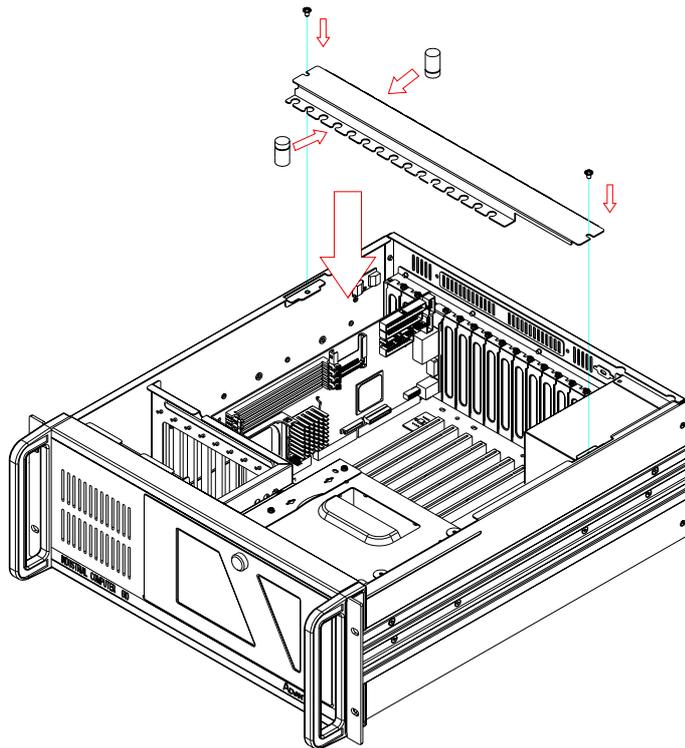2. Secure the hold-down clamp into its original position.

Figure 2.6 Installing rubber cushions and hold-down clamp

2.5 Installing Disk Drives

Please refer to the following instructions to install the various disk drives.

1. Remove the disk drive housing by simply undoing the screws on top of it. Then remove the front cover as well if you want to install the optical disk drive, mobile rack, or FDD. If you install the internal 3.5" HDD, then the front cover does not need to be removed.

2. Insert the disk drive into the proper location in the bracket and secure them with the screws provided.

3. Return the housing with the disk drives in the original position and fasten it with the screws.

4. Connect the suitable cables (ex. IDE, SCSI, SATA, or SAS, etc.) from the CPU card or the motherboard to the various disk drives. Then plug the power connector into each disk drive.
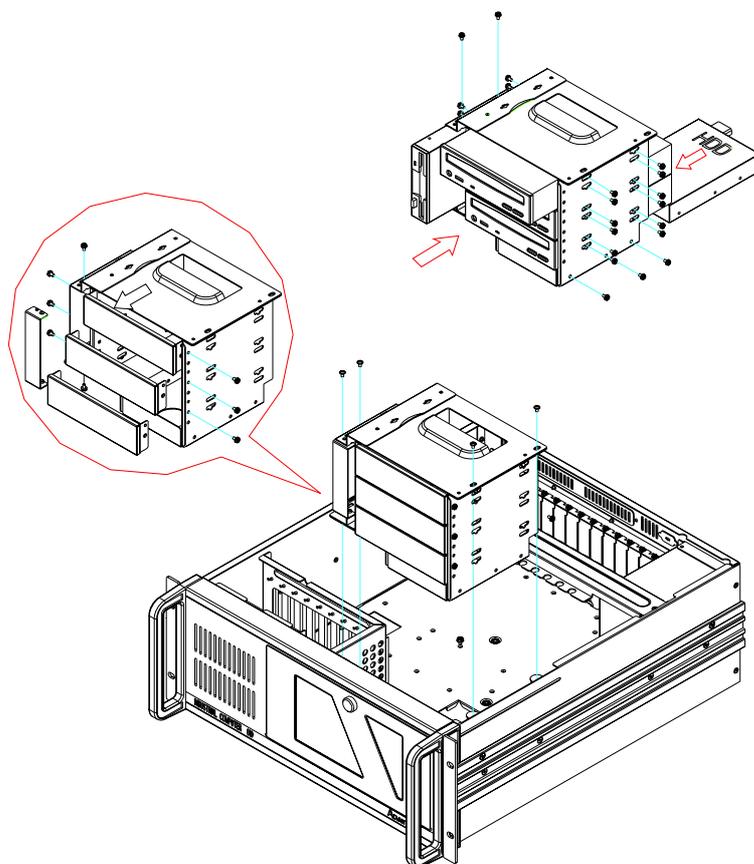
Figure 2.7 Installing disk drives

2.6 Attaching the Ears & Handles

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

If you have prepared the slide rails and plan to attach them onto the chassis, for IPC-610-F/IPC-610-E, please detach the decorated bars on both sides of the chassis first.

Figure 2.8 Attaching the ears and handles

Chapter 3

Operation

This chapter introduces the system operation information.
Sections include:
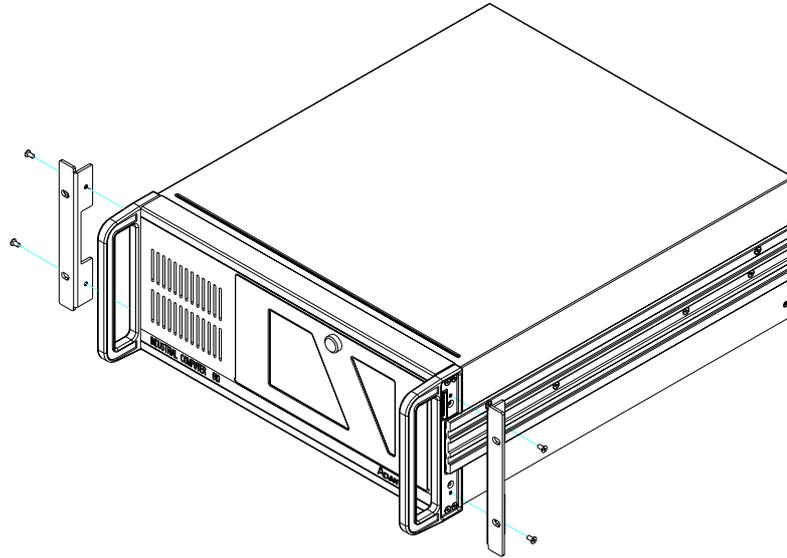- **The front panel**
- **The rear panel**
- **Replacing the cooling fan**
- **Replacing the filter**
- **Replacing the power supply**

3.1 The Front Panel

The front panel features a lockable door, LED indicators, PS/2 and dual USB ports. The user can close the door with or without a key. There is a momentary power switch, a system reset button (and an alarm reset button for ACP-4000; a keyboard lock button for IPC-610-F & IPC-610-E; an AT keyboard connector for IPC-610-E). Their individual functions are described as below.

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 (ACP-4000): 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.

Keyboard Lock button (IPC-610-F/IPC-610-E): Press this button to lock/unlock the keyboard operation.

PS/2 port: For connecting keyboard or mouse depending on the motherboard.

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

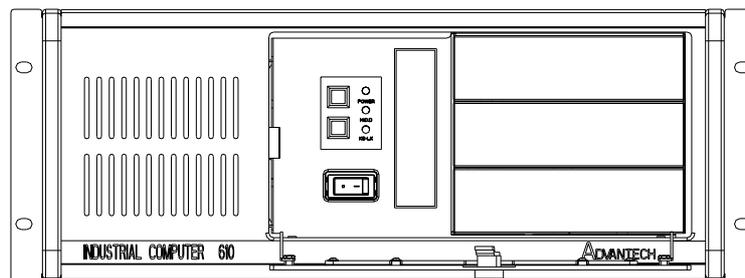**AT keyboard connector (IPC-610-E):** For connecting AT keyboard.

Figure 3.1 Front panel of IPC-610-F

3.1.2 LED Indicators for System Status

The LEDs are placed on the front panel to indicate system health and activity. Please refer to Table 3.1 for the LED definition summary. Different chassis have different LED layout and functions.

Table 3.1: LED indicator functions			
LED	**Description**	**Green**	**Red**
Power	System Power	Normal	Abnormal
Hard Disk	Hard Disk drive activity	Data access	No light
Temperature	Temperature in the chassis	Normal	Abnormal
Fan	Cooling fan status	Normal	Abnormal

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

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

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

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

3.2 The Rear Panel

For the backplane version, the rear plate includes with 15-slot I/O brackets and a reserved 9-pin D-SUB opening. (see Figure 3.2). For the motherboard version, the rear plate includes with 7-slot I/O brackets, 5 reserved 9-pin D-SUB openings and a 68-pin SCSI opening. (see Figure 3.3).

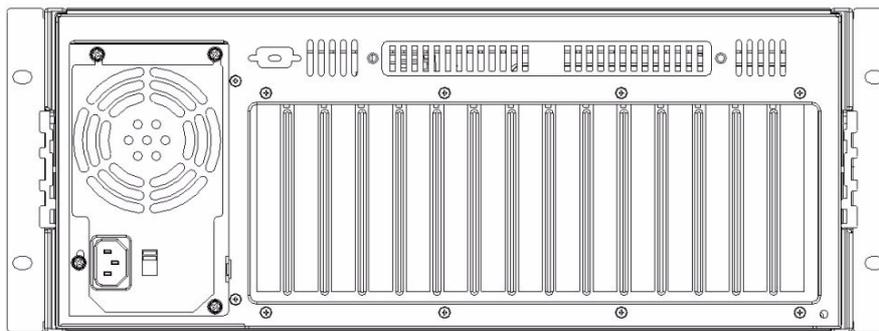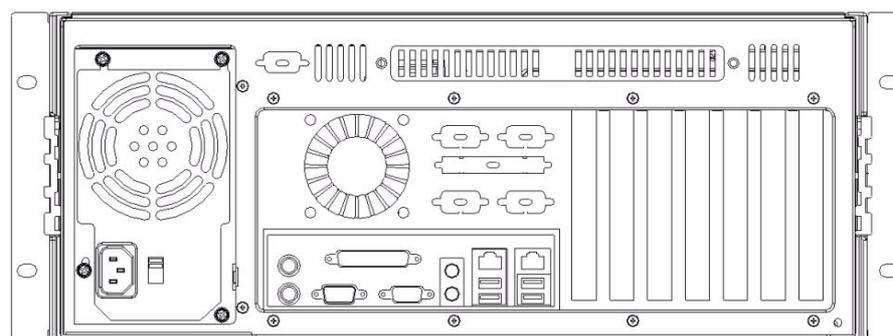**Figure 3.2 Rear panel of backplane version**

Figure 3.3 Rear panel of motherboard version

There is a ground screw with a washer located on the lower right of the rear panel. This will protect the system in case the electric leakage happens.

3.3 Replacing the Cooling Fan

3.3.1 Replacing the Cooling Fan for ACP-4000/IPC-610-H

There are two cooling fans behind the front panel. They are easily maintained. The fans provide the system with ample cooling by blowing air rearwards. Please proceed according to the instructions below.

1. Remove the top cover.
2. Unplug the fan power connector.
3. Loosen the thumbscrew on top of the fan unit and then gently pull it out.
4. Loosen the four screws on the fan bracket and the four screws on the fan guard and replace it with a new one.
5. Fix the new cooling fan on the fan guard and the bracket by screwing in the eight screws. (see Figure 3.4)
6. Replace the fan unit into the chassis by tightening the thumbscrew and reconnecting the fan power connector.
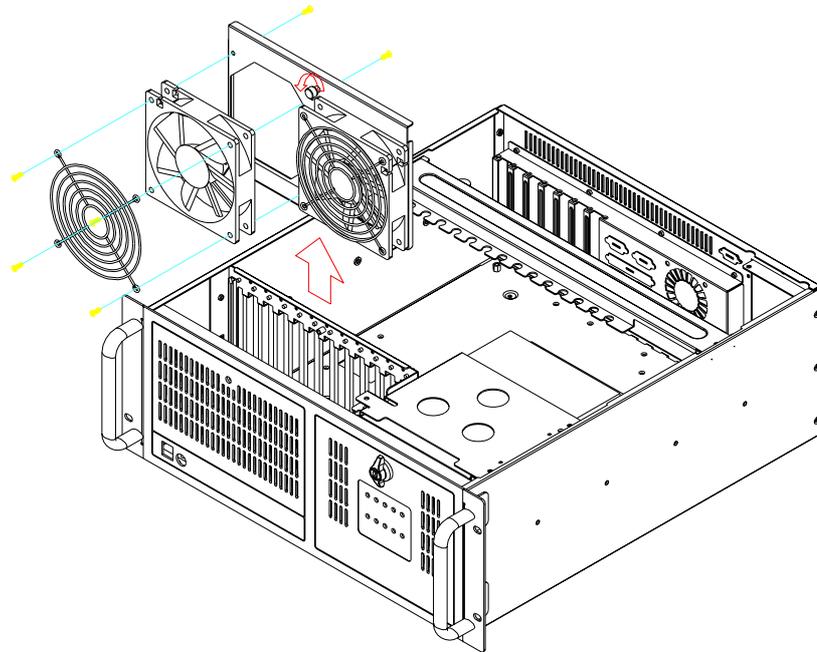7. Replace the top cover and fasten it.

Figure 3.4 Replacing the cooling fan for ACP-4000/IPC-610-H

3.3.2 Replacing the Cooling Fan for IPC-610-F/IPC-610-E

There is a cooling fan behind the front panel. Please proceed according to the instructions below.

1. Remove the top cover.
2. For IPC-610-F, loosen the screw on the fan bracket and remove the fan unit.
3. Loosen the screws on the fan bracket and remove the fan. (see Figure 3.5)
4. For IPC-610-E, unplug the fan power connector and then remove the 4 screws on the fan and fan guard.
5. Fix the new cooling fan on the fan bracket.
6. For IPC-610-F, replacing the fan unit into the chassis. For IPC-610-E, tighten the screws and reconnect the fan power connector.
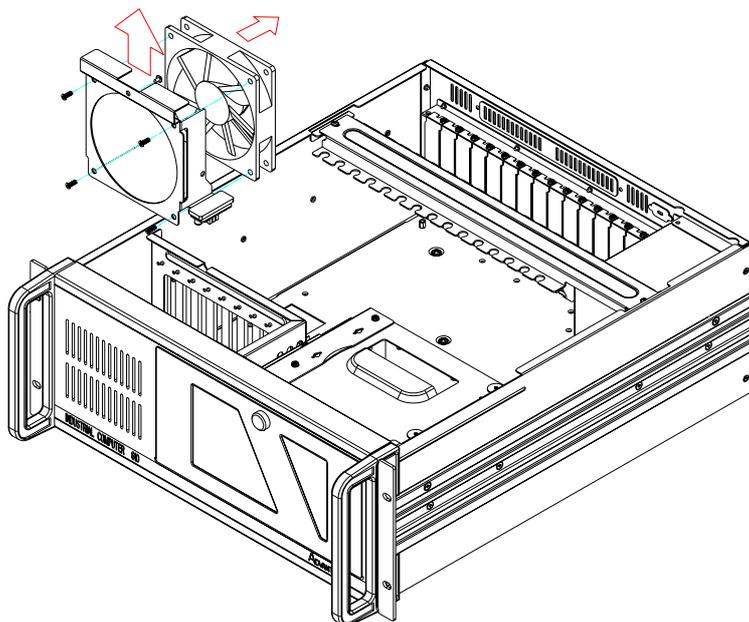7. Replace the top cover and fasten it securely.

Figure 3.5 Replacing the cooling fan for IPC-610-F

3.3.3 Replacing the Cooling Fan for IPC-610-L/IPC-611

There is a cooling fan behind the front panel. Please proceed according to the instructions below.

1. Remove the front left cover.
2. Unplug the fan power connector.
3. Loosen the screws on the fan unit and then gently pull it out.
4. Loosen four screws on the fan bracket and the four screws on the fan guard and replace it with a new one. (see Figure 3.6)
5. Fix the new cooling fan on the fan guard and the bracket by screwing in the eight screws.
6. Replace the fan unit into the chassis and reconnect the fan power connector.
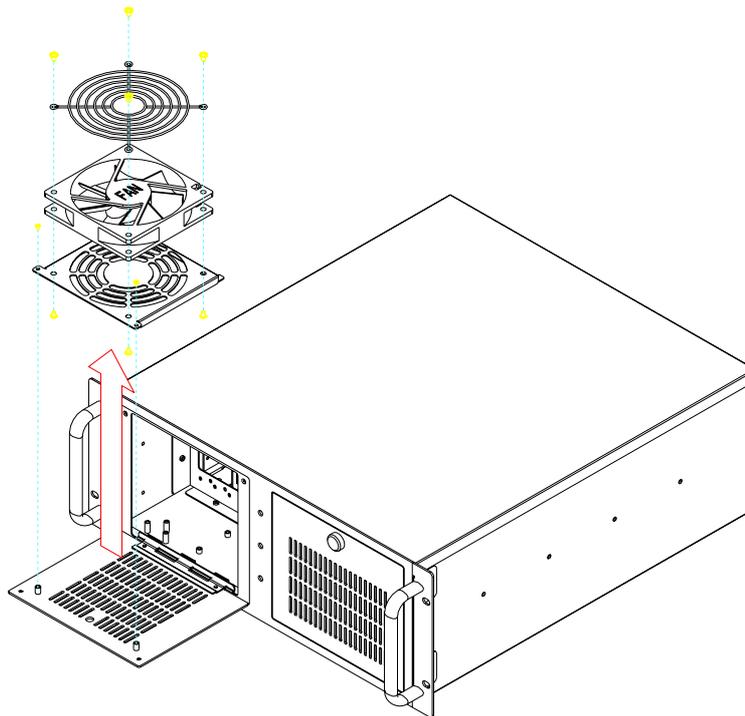7. Replace the front left cover and fasten it.

Figure 3.6 Replacing the cooling fan for IPC-610-L/IPC-611

3.4 Replacing the Filter

3.4.1 Replacing the Filters for ACP-4000/IPC-610-H

The filter functions to block dust or particles from the work environment and to extend the longevity of the system. It's better to clean the filters periodically. To replace the filter, proceed as follows.

1. Open the front door and the front left panel (with a coin).
2. Simply pull out the fan filter behind the left panel; pull out the door filter by loosening the screws on the filter covers.
3. Put the new filters in place and then fasten the screws. (see Figure 3.7)

Figure 3.7 Replacing the filters for ACP-4000/IPC-610-H

3.4.2 Replacing the Filters for IPC-610-F/IPC-610-E

The filter functions to block dust or particles from the work environment and to extend the longevity of the system. It's better to clean the filter periodically. To replace the filters, proceed as follows.

1. Open the front door.
2. Pull out the filter by pushing the hook and then slide it rightwards. (see Figure 3.8)
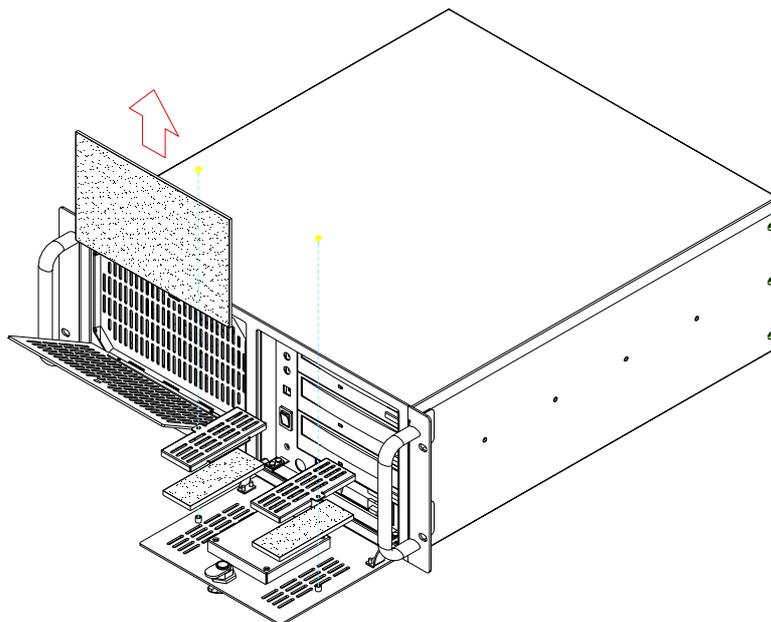3. Put the new filter in place and then fasten the screws.
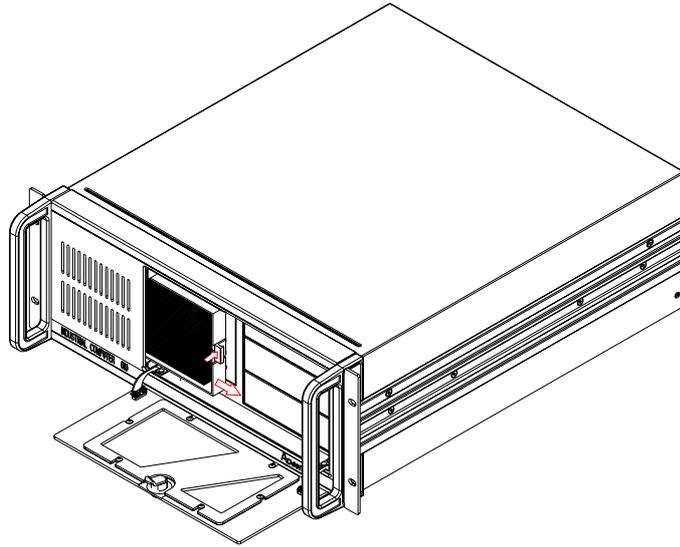
Figure 3.8 Replacing the filters for IPC-610-F/IPC-610-E

3.4.3 Replacing the Filters for IPC-610-L/IPC-611

The filter functions to block dust or particles from the work environment and to extend the longevity of the system. It's better to clean the filters periodically. To replace the filter, proceed as follows.

1. Open the front door and the front left panel.
2. Pull out the filter behind the front door by loosening the screws; simply pull out the fan filter from the filter bracket. (see Figure 3.9)
3. Put the new filters in place and then fasten the screws.

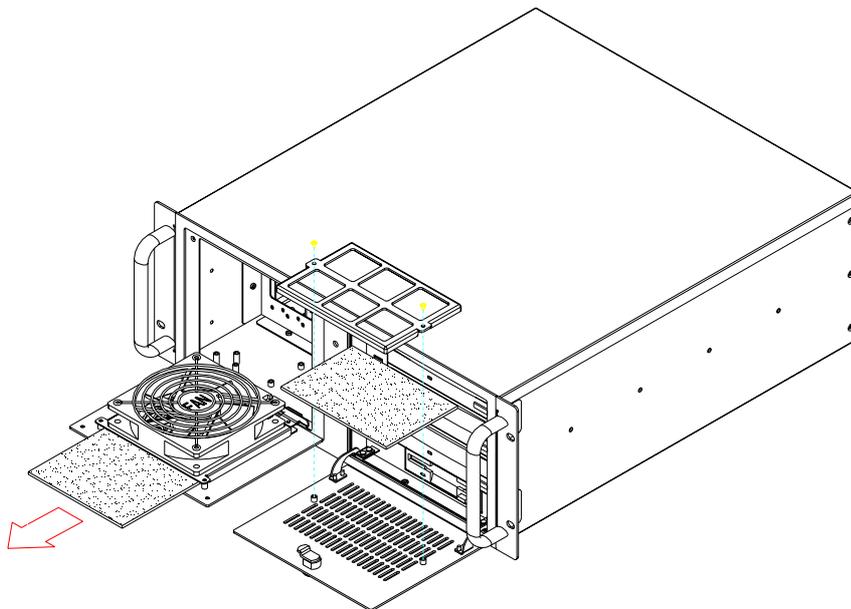**Figure 3.9 Replacing the filters for IPC-610-L/IPC-611**

3.5 Replacing the Power Supply

These chassis support either a single PS/2 or a redundant power supply (not for IPC-610-E). To replace the power supply, please proceed as below.

3.5.1 Replacing the Single PS/2 Power Supply

1. Unplug the power cord from the power supply.
2. Remove the top cover and the hold-down clamp.
3. Unplug the 20-pin (or 24-pin) ATX power connector and 4-pin +12V power connector from the backplane/motherboard, as well as the power connectors from all disk drives.
4. Loosen the six screws on the power supply bracket and then gently pull it up (see Figure 3.10).
5. Replace the power supply with a new one and then fasten it onto the chassis.
6. Plug the 20-pin (or 24-pin) ATX power connector and 4-pin +12V power connector to the backplane/motherboard, then plug other power connectors to the disk drives and peripherals.
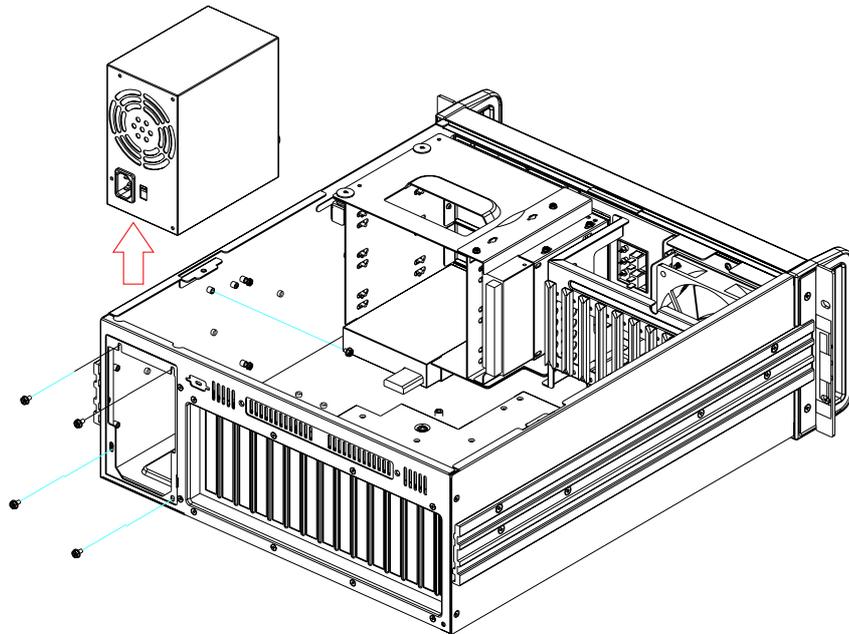7. Return the hold-down clamp and top cover, then Plug in the power cord.

Figure 3.10 Replacing the single power supply

3.5.2 Replacing the Redundant Power Supply Module

1. Turn off the power switch of the failed power supply module.
2. Unplug 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. (see Figure 3.11).
4. Make sure that the new power supply module is the same rating as the currently installed 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 in the power cord and turn it on.
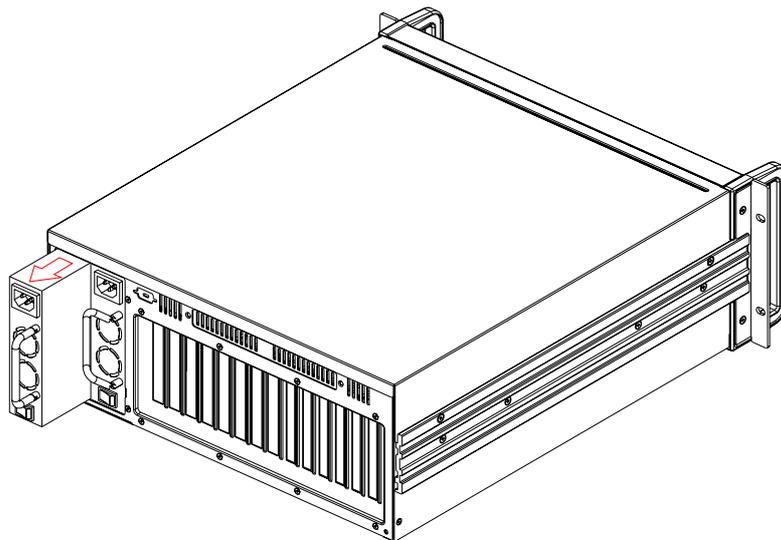
Figure 3.11 Replacing the power supply module

Note!

When you plug two power cords into the same bank of sockets, please align them in the same direction (see Figure 3.12).

Figure 3.12 Power cord plugs orientation on the socket

Chapter 4

Alarm Board (ACP-4000 only)

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 of ACP-4000 is located behind the cooling fan near the middle section. The alarm board makes an audible alarm when:

a) Any power supply module of the redundant power supply fails

b) One of the cooling fans fail.

c) The Internal temperature of the chassis is too high

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

4.1 Alarm Board Layout

The layout and detailed specification of the alarm board are given below:
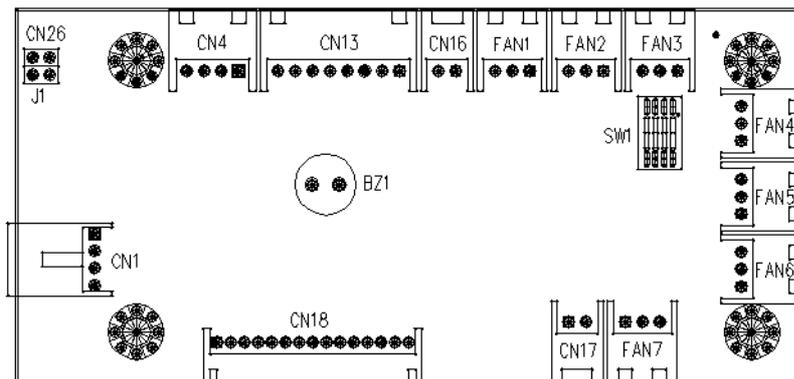
Figure 4.1 Alarm Board Layout

4.2 Alarm Board Specifications

Input Power: +5V, +12V

Input Signals:

- 7 fan connectors
- One 'thermal sensor' connector (supports up to 8 thermal sensors in series)
- One 'power good' input
- One 'alarm reset' input
- One 'voltage signal' connector (connect from the backplane / motherboard, supporting six voltages: ±12V, ±5V, +3.3V, and +5Vsb)
- One 'hard disk 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: 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 connector			
Pin 1	+5 V	Pin 3	T_SDAT
Pin 2	T_SCLK	Pin 4	GND

Table 4.3: CN13, Voltage detection input connector			
Pin 1	+5 Vsb	Pln 5	+5 V
Pin 2	GND	Pin 6	+3.3 V
Pin 3	GND	Pin 7	-12 V
Pin 4	-5V	Pin 8	+12 V

Table 4.4: CN16, Power good input connector			
Pin 1	Power Good	Pin 2	GND

Table 4.5: CN17, Alarm reset connector			
Pin 1	ALARM RESET	Pin 2	GND

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

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

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

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

4.2.2 Switch Settings

The alarm board is designed to connect with up to 7 fans. 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 (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.*

4.3 Thermal Sensor

The ACP-4000 is configured with a thermal sensor located at the rear plate of the chassis. (see Figure 4.2)
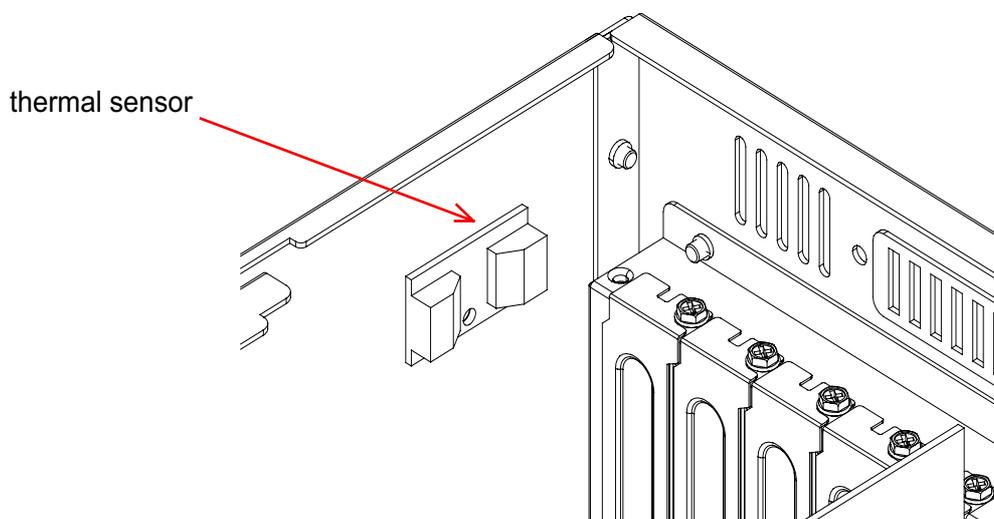

Figure 4.2 Thermal sensor location

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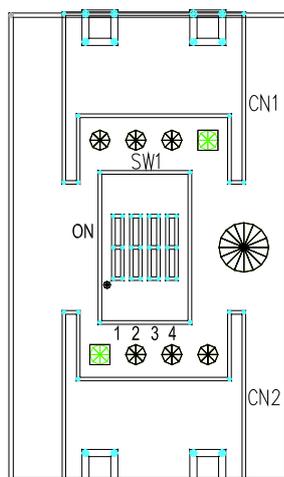

Figure 4.3 Thermal sensor module

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

Table 4.12: CN1 & CN2, Temperature sensor connector			
Pin 1	+5V	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

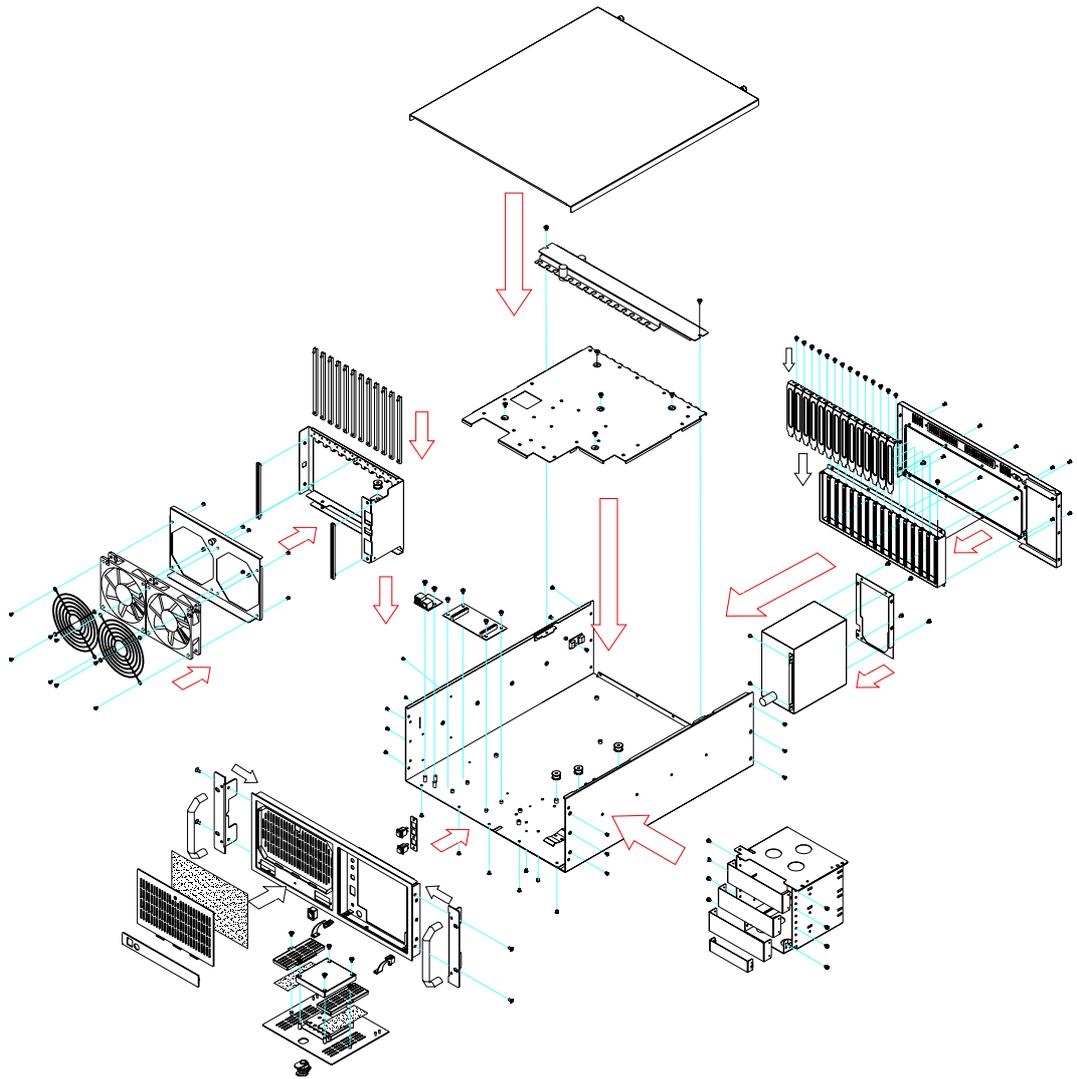## Exploded Diagram

A.1 ACP-4000 Exploded Diagram

Figure A.1 Exploded diagram of ACP-4000

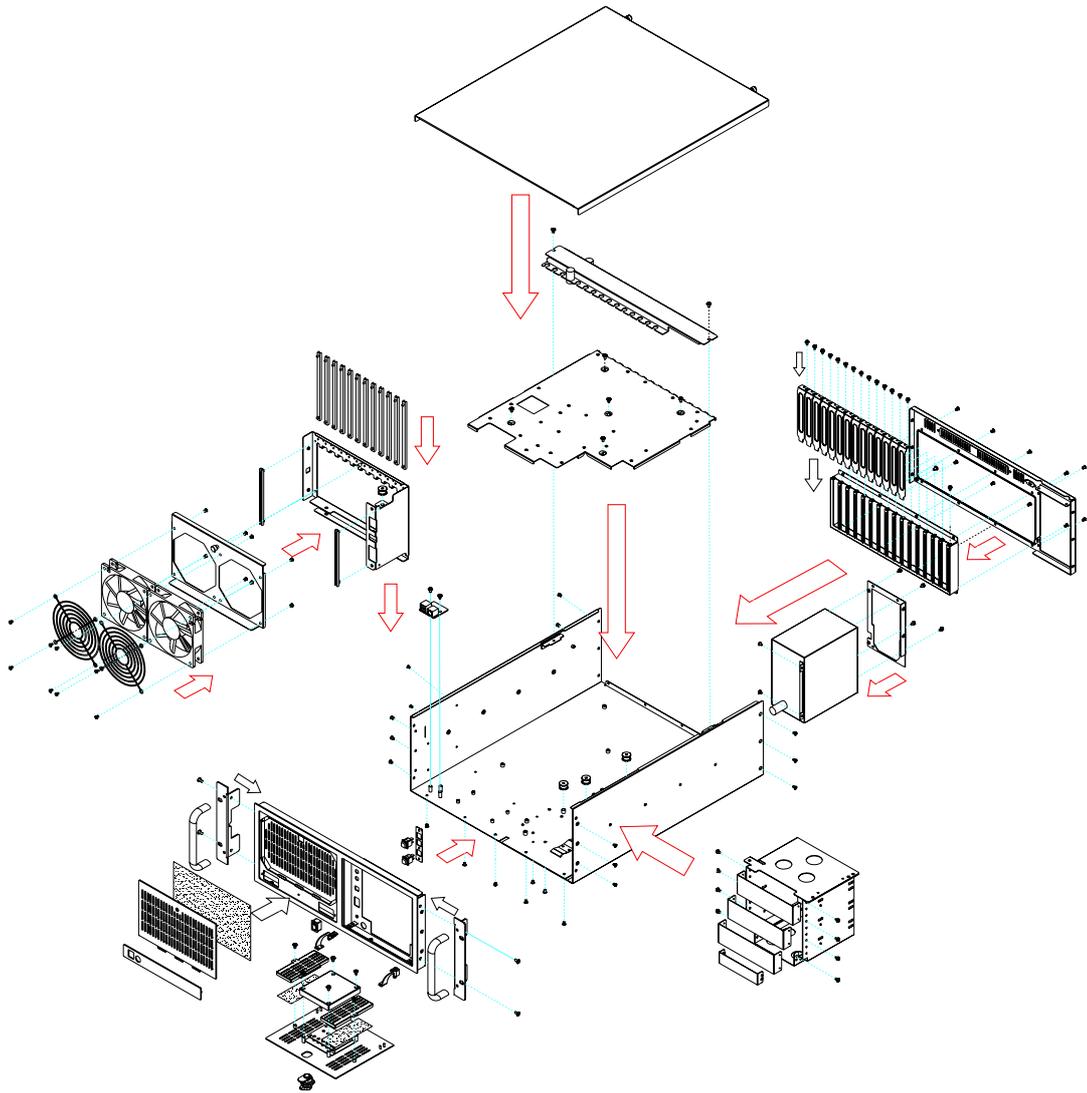# A.2 IPC-610-H Exploded Diagram

Figure A.2 Exploded diagram of IPC-610-H

A.3 IPC-610-F Exploded Diagram
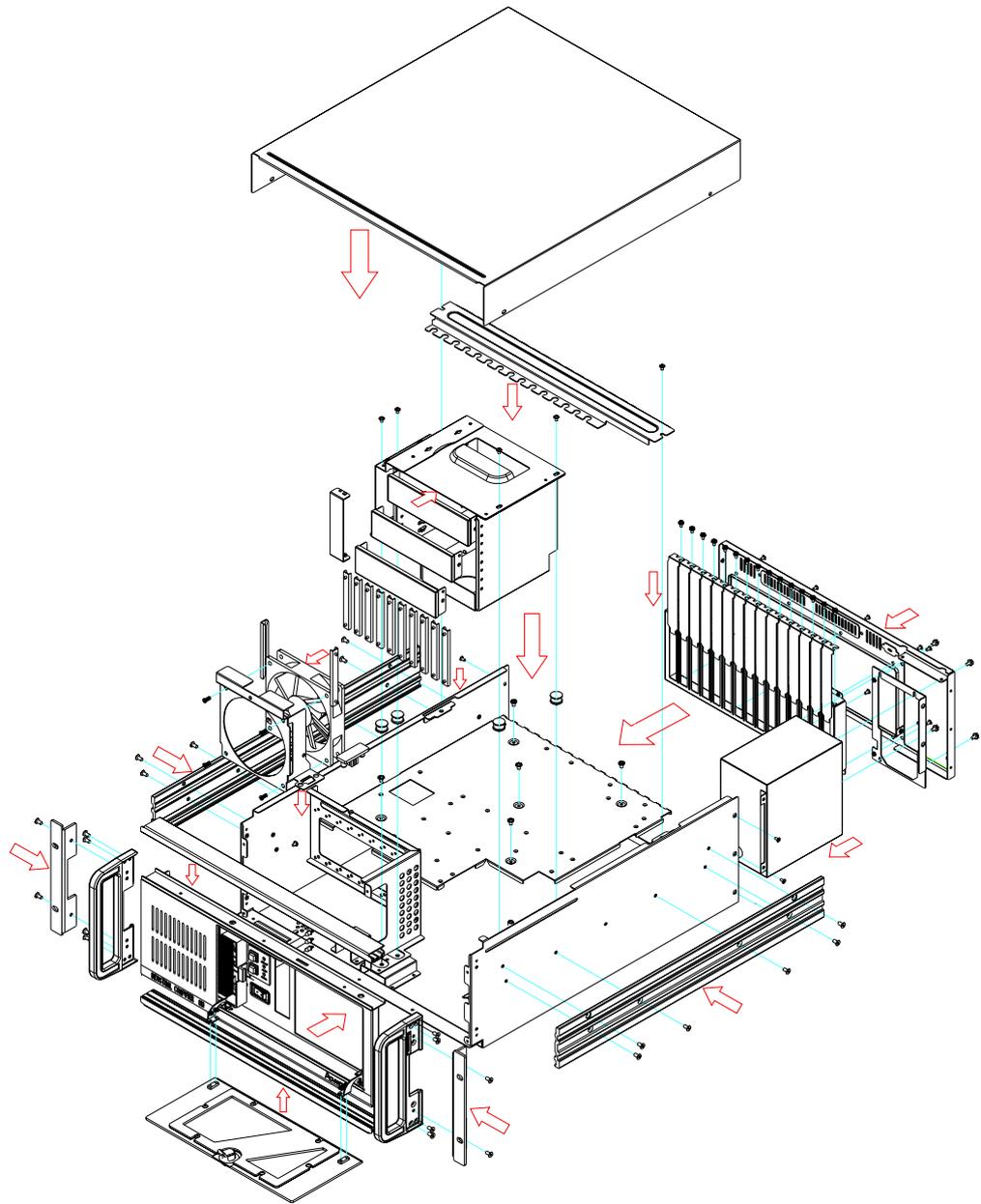
Figure A.3 Exploded diagram of IPC-610-F

A.4 IPC-610-E Exploded Diagram

Top cover
Hold-down clamp
Backplane (B/P)
Disk drive bay
Power supply
Anti-vibration stand
Rear cover
Ear
B/P rear window
Handle
Slide rail
Slide rail
Front window
Handle
Front cover
Ear
Fan guard
Cooling fan
Filter cover
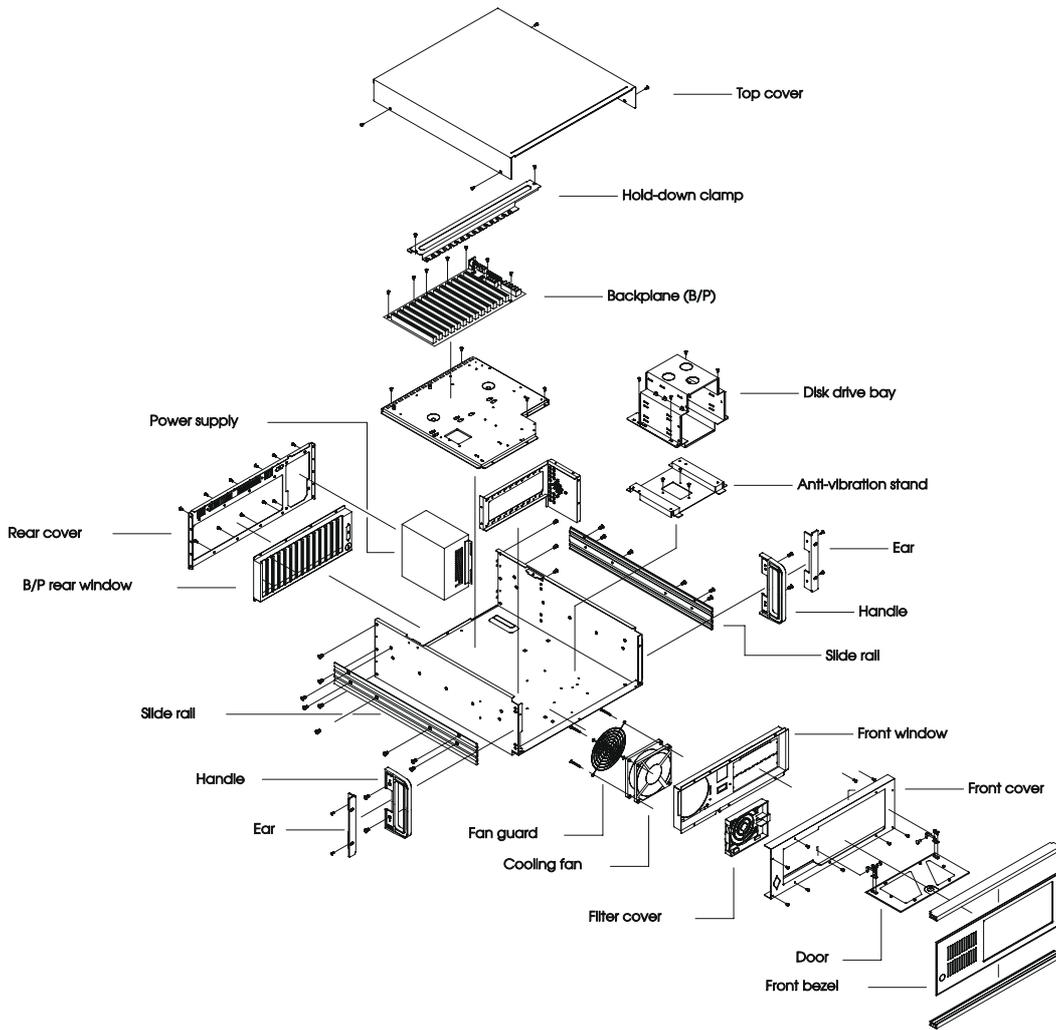Door
Front bezel

Figure A.4 Exploded diagram of IPC-610-E
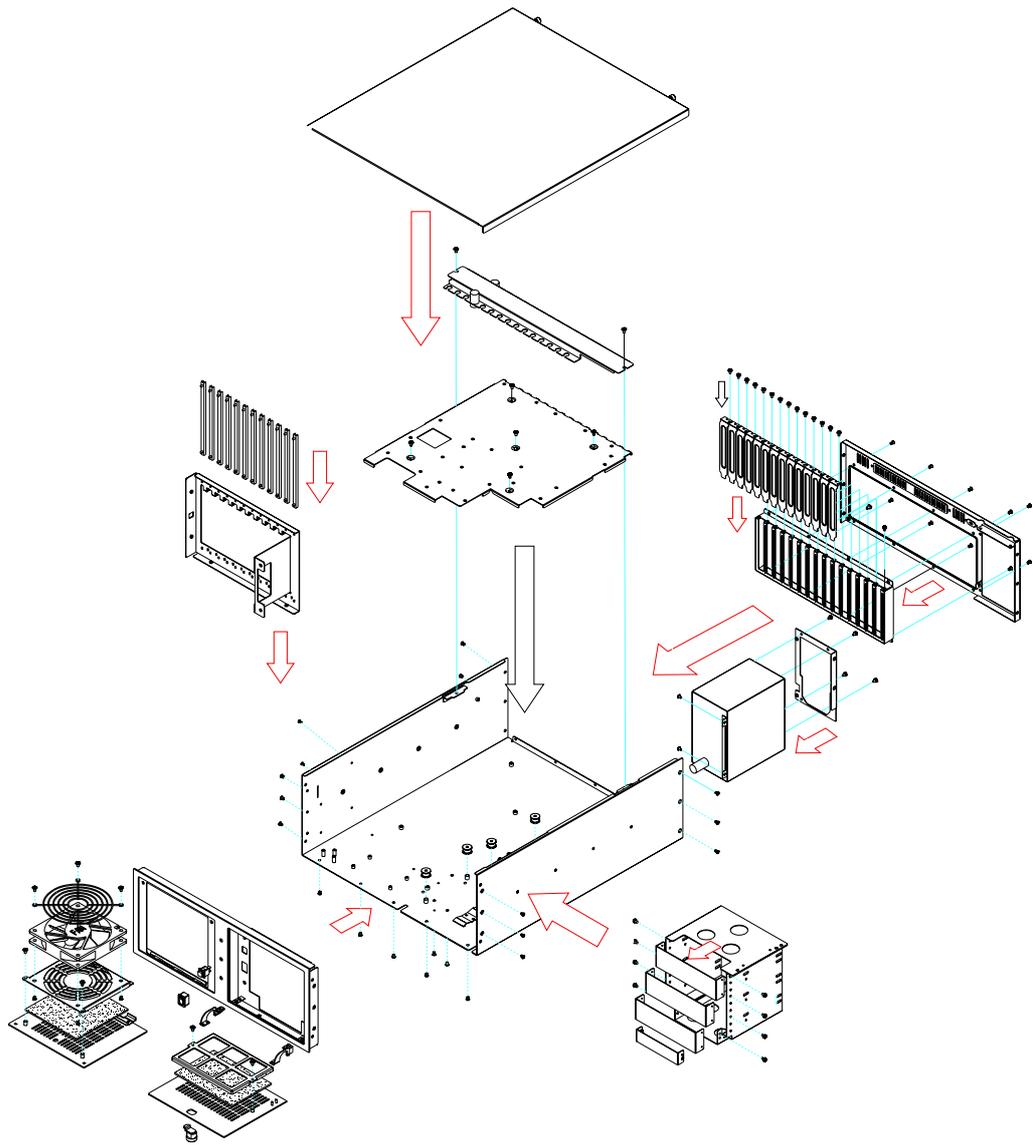
A.5 IPC-610-L/IPC-611 Exploded Diagram

Figure A.5 Exploded diagram of IPC-610-L/IPC-611

Appendix B

Backplane and Motherboard Options

B.1 Backplane Options

ACP-4000, IPC-611 and IPC-610 series 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-4000, IPC-611 and IPC-610 series (except IPC-610-E) support 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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