

ACP-4010

**4U-High 15-slot Rackmount
Chassis with Vertical Drive
Bay Design**

Trusted ePlatform Services

ADVANTECH

Copyright

This documentation and the software included with this product have been copyrighted by Advantech Co., Ltd. in February, 2009. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, or for any infringements of the rights of third parties which may result from its use.

Acknowledgements

The ACP-4010, AIMB-740, AIMB-742, AIMB-744, AIMB-750, and AIMB-760, AIMB-762, AIMB-763, AIMB-764, AIMB-766, PCE-5B12, PCE-7B13, PCA-6115, PCA-6114, PCA-6114P4, PCA-6114P7, PCA-6114P10, PCA-6114P12,

PCA-6114P12X, PCA-6113P4R, and PCA-6113P7XE are trademarks of Advantech Co., Ltd. All other product names or trademarks are the properties of their respective owners.

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

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

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

Product warranty

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

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

If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

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

1. Collect all the information about the problem encountered, for example, type of PC, CPU speed, Advantech products used, other hardware and software used, etc. Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

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

1. ACP-4010 Chassis
2. User Manual
3. Warranty Card
4. 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 (for backplane version), 15 pcs rubber cushions (backplane version) or 7 pcs (motherboard version), 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 ACP-4010 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-4010, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also, please notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Contents

Chapter	1	General Information	1
1.1		Introduction	2
1.2		Specifications	2
1.3		Power Supply Options.....	3
		Table 1.1: Power supply options	3
1.4		Environment Specifications	4
		Table 1.2: Environment specifications	4
1.5		Dimension Diagram.....	4
		Figure 1.1 Dimension diagram.....	4
Chapter	2	System Setup	5
2.1		System Setup	6
2.2		Removing the Top Cover	6
		Figure 2.1: Removing the chassis top cover	6
2.3		Installing the Backplane or Motherboard.....	7
		Figure 2.2: Yellow label indicating copper stub locations	7
		Figure 2.3: Installing the backplane	8
		Figure 2.4: Installing a motherboard	8
2.4		Installing CPU Card or Add-on Card	9
		Figure 2.5: Installing a full-length card	9
2.5		Hold-down Clamp.....	10
		Figure 2.6: Installing rubber cushions and hold-down clamp.....	10
2.6		Installing Disk Drives.....	11
		Figure 2.7: Installing 3.5" HDD, FDD or optical disk drive	11
2.7		Attaching the Ears and Handles.....	12
		Figure 2.8: Attaching the ears and handles	12
Chapter	3	Operation.....	13
3.1		The Front Panel	14
		Figure 3.1 Front view with door closed	14
		Figure 3.2 Front view with door open	14
3.1.1		Switch, Button and I/O Interfaces	14
3.1.2		LED Indicators for System Status	15
		Table 3.1: LED indicator functions.....	15
3.2		The Rear Panel	16
		Figure 3.3 Rear panel of backplane version	16
		Figure 3.4 Rear panel of the motherboard version	16
3.3		Replacing the Cooling Fan	17
		Figure 3.5 Replacing the cooling fan	17
3.4		Cleaning the Filters	18
		Figure 3.6 Removing the filters.....	18
3.5		Replacing the Power Supply	19
3.5.1		Replacing the Single PS/2 Power Supply	19
		Figure 3.7 Replacing the single power supply	19
3.5.2		Replacing the Redundant Power Supply Module	20
		Figure 3.8 Replacing the power supply module.....	20
		Figure 3.9 Power plug orientation.....	20
Chapter	4	Alarm Board	21

4.1	Alarm Board	22
4.2	Alarm Board Layout	22
	Figure 4.1 Alarm board layout	22
4.3	Alarm Board Specifications	22
4.3.1	Connectors, Jumper and Pin Definition	23
	Table 4.1: CN1 Auxiliary external power connector, standard mini 4-Pin power connector	23
	Table 4.2: CN4 Thermal sensor (LM75) connector	23
	Table 4.3: CN13 Voltage detection input connector	23
	Table 4.4: CN16 Power good input connector	23
	Table 4.5: CN17 Alarm reset connector	23
	Table 4.6: CN18 Output connector to LED board	23
	Table 4.7: CN26 External HDD LED connector	23
	Table 4.8: FAN1~FAN7, Fan connectors	23
	Table 4.9: J1 External Buzzer	24
	Table 4.10: SW1 Fan number select switch	24
4.3.2	Switch Settings	24
	Table 4.11: SW1 Fan number setting	24
4.4	Thermal Sensor	25
	Figure 4.2 Thermal sensor location	25
	Figure 4.3 Thermal sensor module	25
	Table 4.12: CN1 and CN2 Temperature sensor connector	26
	Table 4.13: SW1 Thermal sensor I.D. no. setting	26

Appendix A Exploded Diagram & Parts List 27

A.1	Exploded Diagram & Parts List	28
	Figure A.1 Exploded diagram	28
	Table A.1: Parts List	28

Appendix B Backplane & Motherboard Options . 29

B.1	Backplane Options	30
	Table B.1: PICMG 1.3 Backplane Options	30
	Table B.2: PICMG 1.0 Backplane Options	30
B.2	Motherboard Options	31
	Table B.3: ATX Motherboard Options	31

Chapter 1

General Information

This chapter provides general information about the ACP-4010.

Sections include:

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

1.1 Introduction

ACP-4010 is a 4U-high rackmount industrial computer chassis for high-performance and high-capacity computing applications. It meets a variety of application needs for filing, printing, e-mail and web serving. This powerful computing platform is suitable for mission-critical computer telephony applications, industrial automation, and factory management. A wide range of standard computing peripherals can be integrated with the chassis to meet different application needs for operation under harsh conditions 24 hours a day, 7 days a week.

1.2 Specifications

- **Construction:** Heavy-duty steel
- **Disk Drive Capacity:** Two 5.25" disk drives and two 3.5" disk drives (one external and one internal)
- **LED Indicators on Front Panel:** Bi-color LEDs (green/red) for Power, Temperature, and Fan status; single-color LEDs (green) for HDD activity and LAN status.
- **Switch and Buttons on Front Panel:** Power switch, System Reset button and Alarm Reset button.
- **Front I/O Interfaces:** two dual USB ports and two reserved 9-pin D-SUB openings
- **Rear I/O Interfaces:** Reserved five 9-pin D-SUB and one 68-pin SCSI openings for the motherboard version; reserved one 9-pin D-SUB opening for the back-plane version
- **Security Protection:** The storage system, power switch, system reset button, alarm reset button and USB ports are all behind the lockable door.
- **Cooling System:** One 12 cm x 12 cm (85 CFM) hot-swappable cooling fan.
- **Air Filters:** Two easily maintained filters near the front of the system fan and behind the front door.
- **Weight:** 18.5 kg (40.7 lbs)
- **Dimensions (W x H x D):** 482 x 177 x 480 mm (19" x 7" x 18.9")

1.3 Power Supply Options

Table 1.1: Power supply options

Model Name	PS-300ATX-ZBE	RPS-300ATX-ZE
Watt	300 W max. (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 @ 30 A, +3.3 V @ 28 A, +12 V @ 15 A, -5 V @ 0.3 A, -12 V @ 0.8 A, +5 Vsb @ 2 A	+5 V @ 25 A, +3.3 V @ 18 A, +12 V @ 16 A, -5 V @ 0.5 A, -12 V @ 0.5 A, +5 Vsb @ 2 A
Minimum Load	+5 V @ 0.5 A, +12 V @ 0.5 A	+5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, +5 Vsb @ 0.1 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	RPS-400ATX-ZE
Watt	400 W (ATX, PFC) (single PS/2)	400 W (ATX, PFC) (1+1 redundant)
Input Rating	100 ~ 240 Vac (Full range)	100 ~ 240 Vac (Full range)
Output Voltage	+5 V @ 35 A, +3.3 V @ 25 A, +12 V @ 30 A, -5 V @ 0.8 A, -12 V @ 1 A, +5 Vsb @ 2 A	+5 V @ 35 A, +3.3 V @ 25 A, +12 V @ 28 A, -5 V @ 0.5 A, -12 V @ 1.2 A, +5 Vsb @ 2 A
Minimum Load	+5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 1 A, +5 Vsb @ 0.1 A	+5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, +5 Vsb @ 0.1 A
MTBF	91,000 hours @ 25°C	100,000 hours @ 25°C
Safety	UL/TUV/CB/CCC	UL/TUV/CB/CCC
Model Name	PS-500ATX-ZE	PS-700ATX-ZE
Watt	500 W (ATX, PFC) (single PS/2)	700 W (ATX, PFC) (single PS/2+)
Input Rating	100 ~ 240 Vac (Full range)	100 ~ 240 Vac (Full range)
Output Voltage	+5 V @ 40 A, +3.3 V @ 30 A, +12 V @ 32 A, -5 V @ 0.8 A, -12 V @ 1 A, +5 Vsb @ 2 A	+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
Minimum Load	+5 V @ 2.5 A, +12 V @ 1 A, +5 Vsb @ 0.1 A	+5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, +5 Vsb @ 0.1 A
MTBF	98,000 hours @ 25°C	72,000 hours @ 25°C
Safety	UL/TUV/CB/CCC	UL/TUV/CB/CCC

1.4 Environment Specifications

Table 1.2: Environment specifications

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

1.5 Dimension Diagram

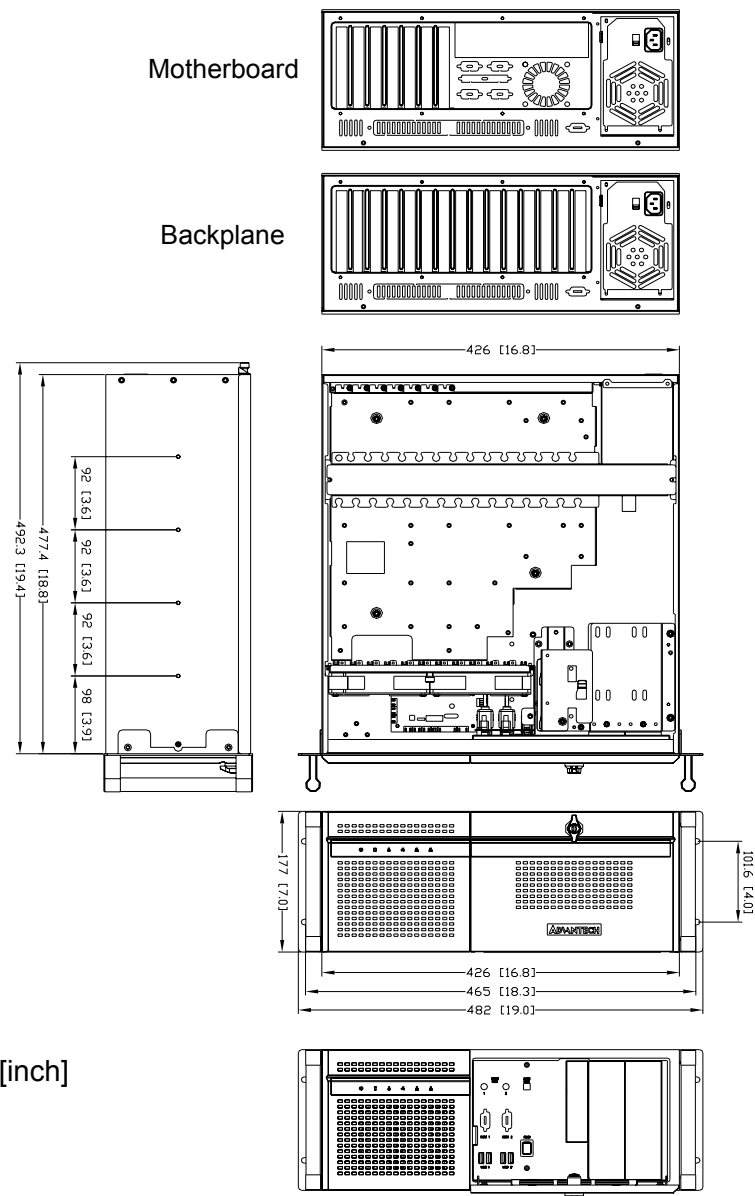


Figure 1.1 Dimension diagram

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

2.1 System Setup

The following procedures instruct users to install a backplane/motherboard, add-on cards and disk drives into the ACP-4010. Please also refer to Appendix A, Exploded Diagram, for the detailed parts of ACP-4010.

Caution! 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.



2.2 Removing the Top Cover

To remove the cover of ACP-4010, please proceed as below.

1. Loosen the two thumb screws on the rear of the top cover.
2. Pull the chassis top cover backwards and then lift it up

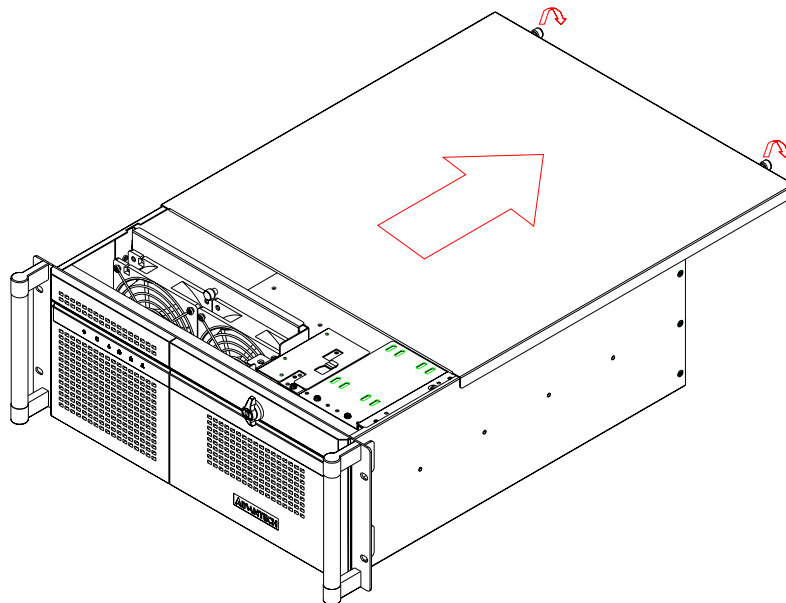


Figure 2.1: Removing the chassis top cover

2.3 Installing the Backplane or Motherboard

ACP-4010 supports either; an up to 15-slot backplane or ATX motherboard. To install the backplane or motherboard, please proceed as follows:

Caution! Use caution when installing a motherboard. It is highly recommended to integrate Advantech motherboard series with ACP-4010 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 instructions 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 +12 V 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, Power switch wire, and the System Reset switch wire from the chassis to the motherboard.
8. Connect the wire of LAN LED and 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.																																

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

Figure 2.2: Yellow label indicating copper stub locations

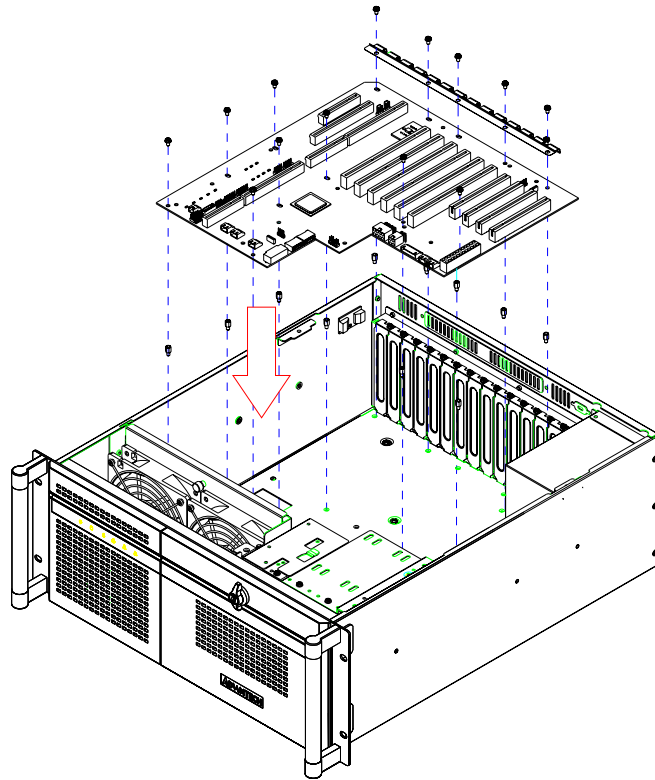


Figure 2.3: Installing the backplane

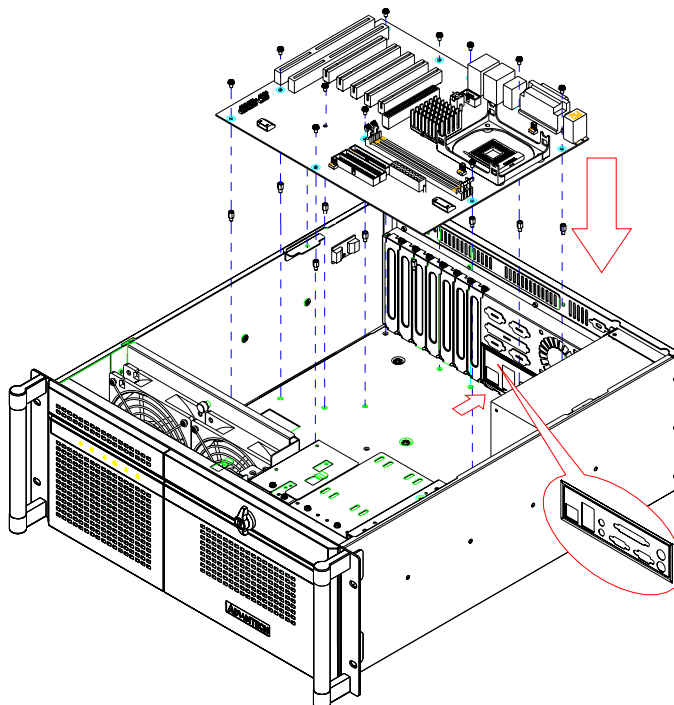


Figure 2.4: Installing a motherboard

2.4 Installing CPU Card or Add-on Card

ACP-4010 supports up to 15 cards. To install a CPU card or add-on card, 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 cards, please make sure that the card bracket has been inserted properly into the slot connector. 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, power switch wire and system reset switch wire from the chassis to the CPU card.
5. Connect the wire of LAN LED and 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.

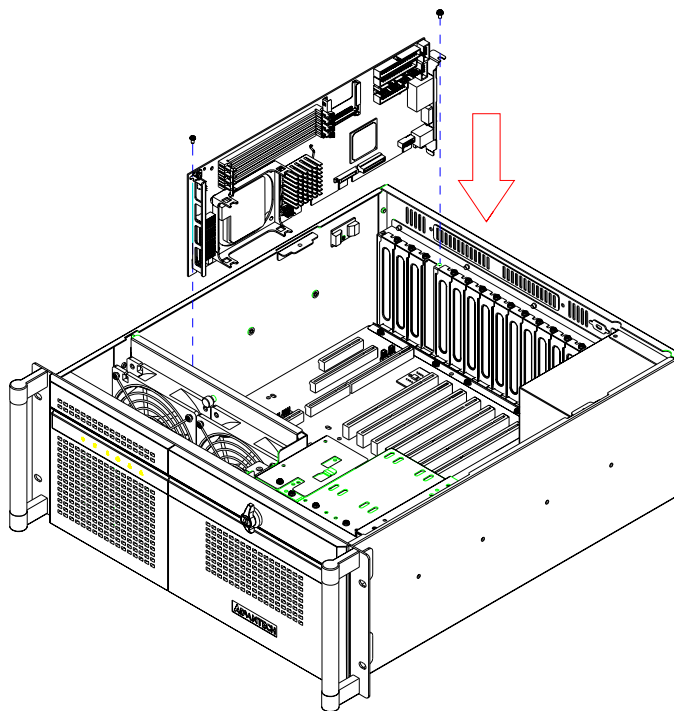


Figure 2.5: Installing a full-length card

2.5 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. 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.

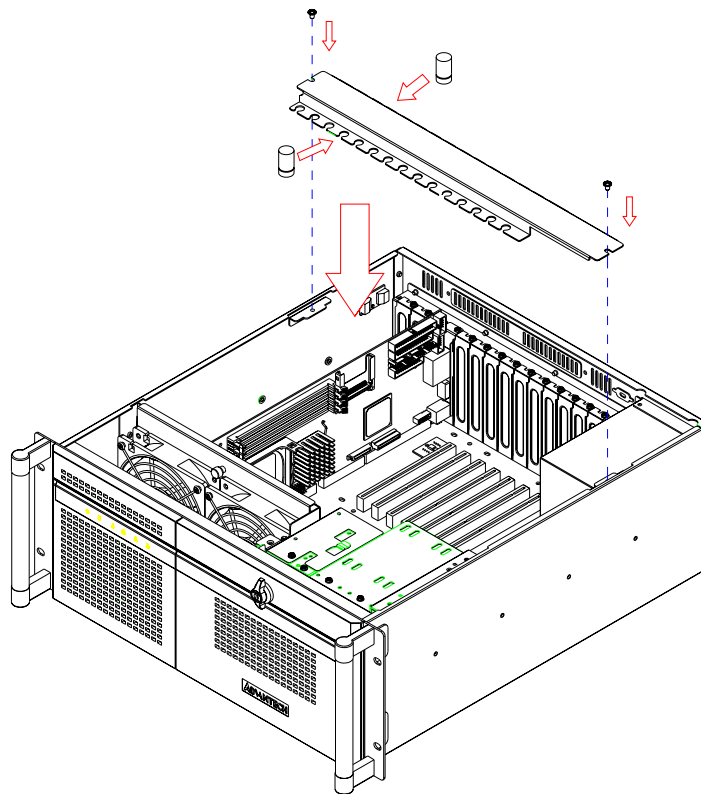


Figure 2.6: Installing rubber cushions and hold-down clamp

2.6 Installing Disk Drives

The APC-4010 supports two 5.25" disk drives, one 3.5" FDD, and one 3.5" internal HDD. Please refer to the following instructions to install the disk drives.

To install the 3.5" HDD, FDD and the optical disk drive, please follow these steps for installation and refer to Figure 2.7.

1. Release the two screws on top left of the HDD bracket and the four screws on top of the disk drive bracket.
2. Insert the 3.5" HDD, FDD, or optical disk drive into the proper location in the bracket and secure them with the screws provided.
3. Return the disk drive bracket and the HDD bracket with the disk drive in the original position and fasten it with the screws.
4. Connect the suitable cables from the CPU card or the motherboard to the 3.5" HDD, the optical disk drive, or a FDD. Then plug the power connector into each disk drive.

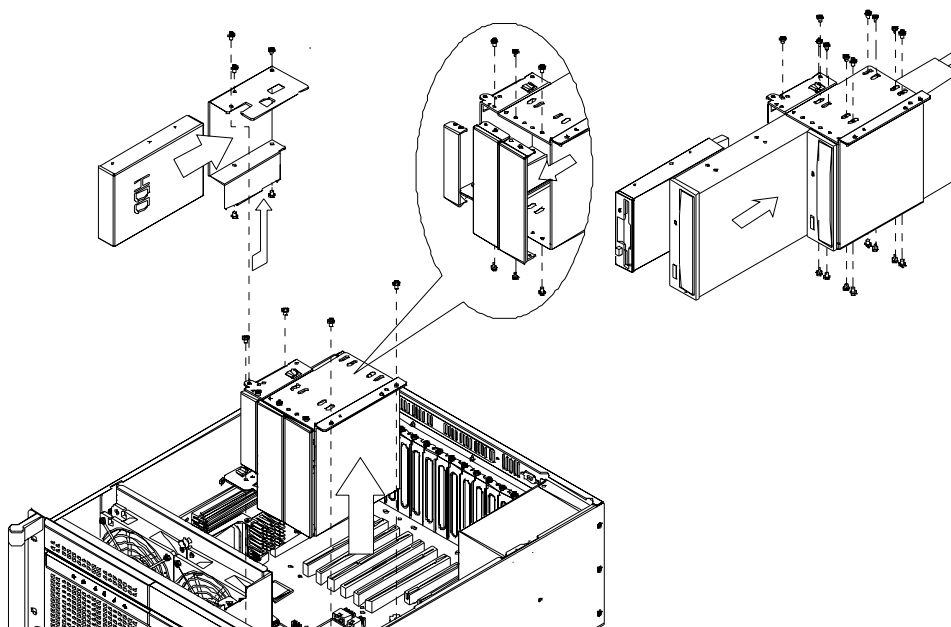


Figure 2.7: Installing 3.5" HDD, FDD or optical disk drive

2.7 Attaching the Ears and 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 four screws provided.

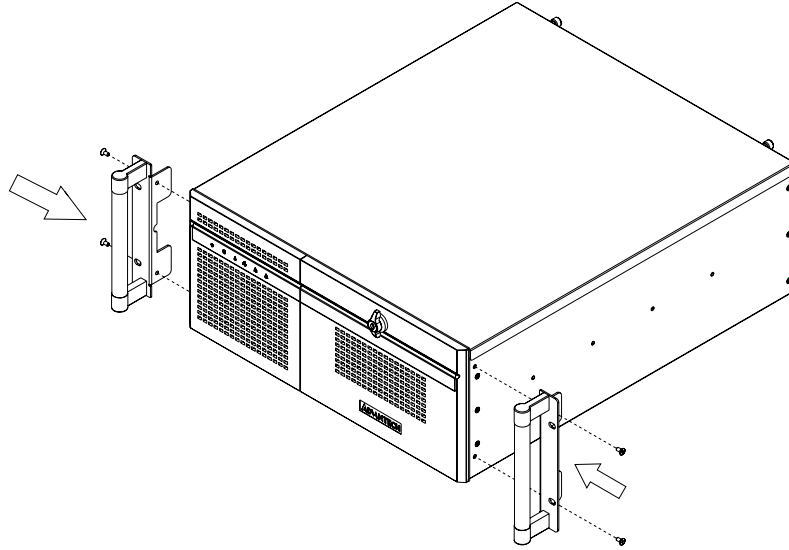


Figure 2.8: Attaching the ears and handles

Chapter 3

Operation

This chapter introduces the system operation information.

Sections include:

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

3.1 The Front Panel

The front panel features a lockable door and six LED indicators. The user can close the door with or without the key with the user-friendly rotary lock. When opening the door, there is a momentary power switch, two reserved System Reset buttons, an Alarm Reset button, two reserved 9-pin D-SUB openings, and two dual USB ports. Their individual functions are described as below.

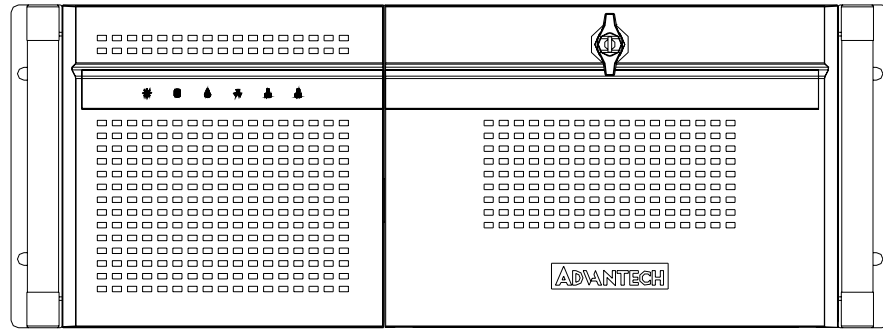


Figure 3.1 Front view with door closed

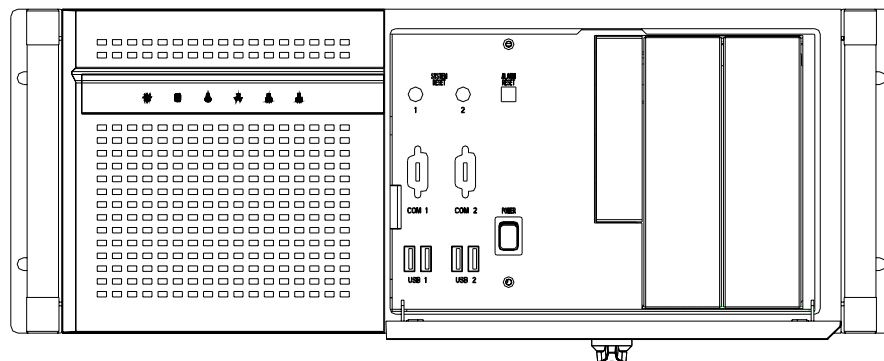


Figure 3.2 Front view with door open

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.

9-pin D-SUB openings: For connecting COM port devices.

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

3.1.2 LED Indicators for System Status

Six LEDs are placed on the left side 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
Power 	System power	Normal	Abnormal
Fan 	Cooling fan status	Normal	Abnormal
Temperature 	Temperature in the chassis	Normal	Abnormal
Hard Disk 	Hard disk drive activity	Data access	No light
LAN 	LAN1 & LAN2 status	Normal	No light
	Data transmit through LAN	Blinking	

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 is 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.

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

Note! Depending on the CPU card or motherboard specification, the chassis LAN LED may not be supported.



3.2 The Rear Panel

For the backplane version, the rear plate includes 15-slot I/O brackets and a reserved 9-pin D-SUB opening. (see Figure 3.3). For the motherboard version, the rear plate includes 7-slot I/O brackets, 5 reserved 9-pin D-SUB openings and a 68-pin SCSI opening. (see Figure 3.4).

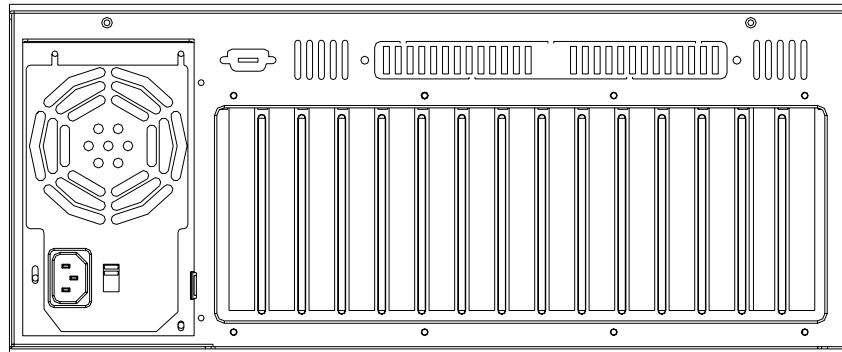


Figure 3.3 Rear panel of backplane version

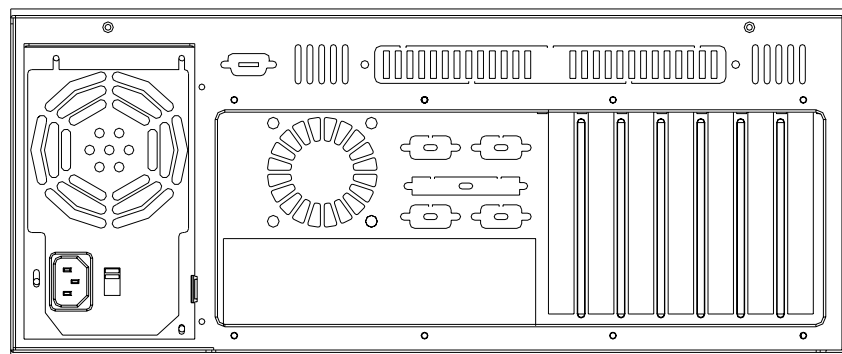


Figure 3.4 Rear panel of the motherboard version

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

3.3 Replacing the Cooling Fan

There are two cooling fans behind the front panel. They are easily maintained. The fans provide the system with ample cooling by blowing air toward the rear. 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 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 3.5)
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.

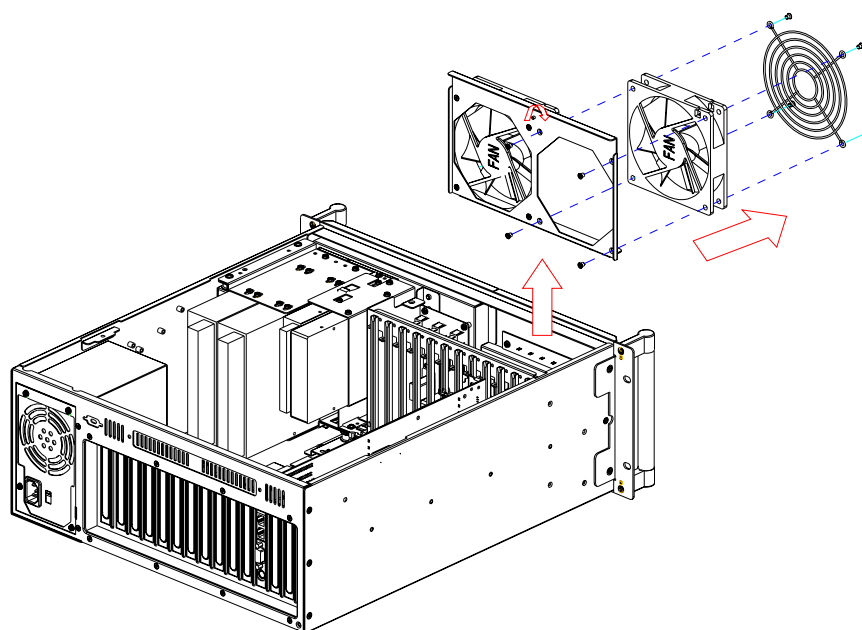


Figure 3.5 Replacing the cooling fan

3.4 Cleaning the Filters

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. There are two reusable and washable filters behind the front door and the front of the fan. To remove and clean the filter, proceed as follows.

1. Open the front door.
2. Pull out the filter behind the front door by pushing the two clips; pull out the fan filter by pushing the hook and then slide it rightwards.
3. Clean the filters with a soft brush or wash the dust away from the filter with water and then dry it. (see Figure 3.6)
4. Fit them back inside the unit.

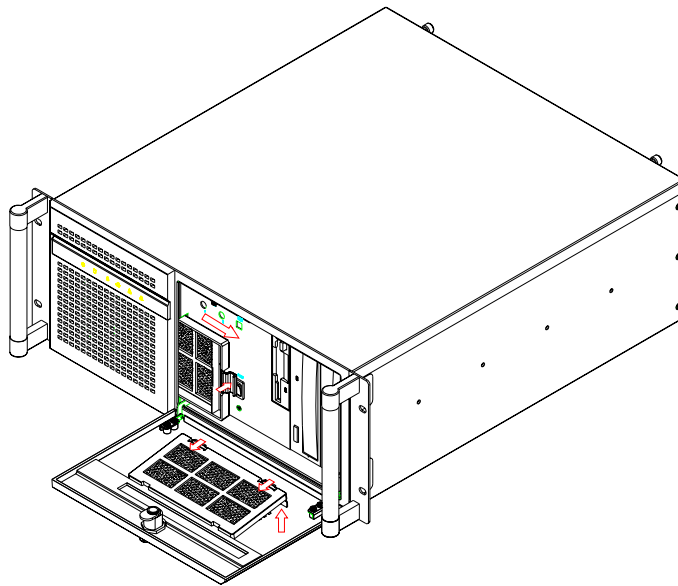


Figure 3.6 Removing the filters

3.5 Replacing the Power Supply

The ACP-4010 supports either a single PS/2 or a redundant power supply. 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 the 4-pin +12 V 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 3.7).
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 the 4-pin +12 V 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.

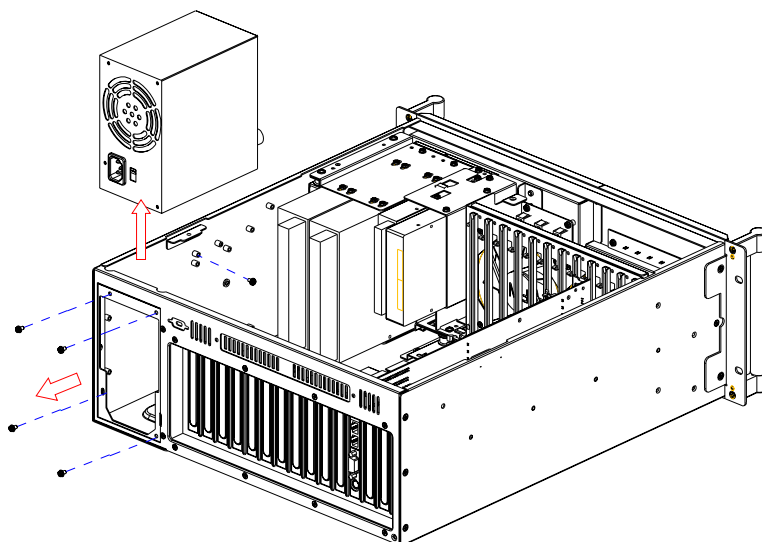


Figure 3.7 Replacing the single power supply

3.5.2 Replacing the Redundant Power Supply Module

1. Turn off the power switch of the failed power supply module.
2. Loosen the screw on the failed module and then grab the handle to gently pull it out. (see Figure 3.8).
3. Make sure that the new power supply module is the same rating as the currently installed one.
4. Slide the power supply module inward until it locks into the right position.
5. Secure the screw and replace the handle. Then turn it on.

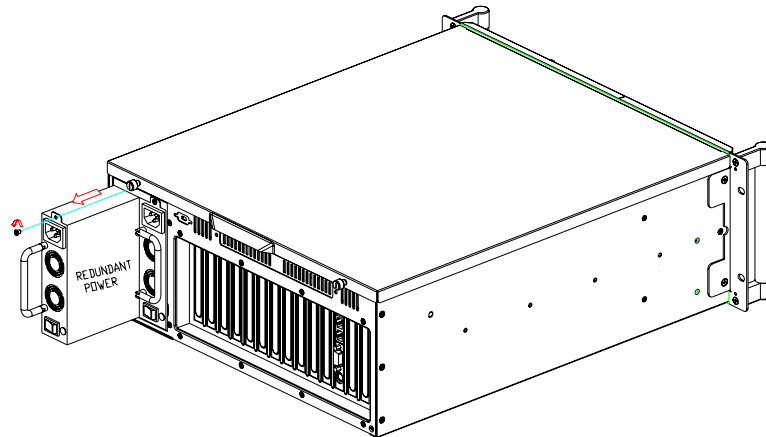


Figure 3.8 Replacing the power supply module

Note! When you plug two power cords into the same bank of sockets, please align them in the same direction (see Figure 3.9)



Figure 3.9 Power plug orientation

Chapter 4

Alarm Board

This chapter introduces the alarm board and thermal sensor specifications.

Sections include:

- Alarm board layout
- Alarm board specifications
- Thermal sensor
- Sensor I.D. number setting

4.1 Alarm Board

The alarm board is located behind the cooling fan near the middle section. The alarm board 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 beeping, simply press the Alarm Reset button on the front panel and then take the necessary action to fix it.

4.2 Alarm Board Layout

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

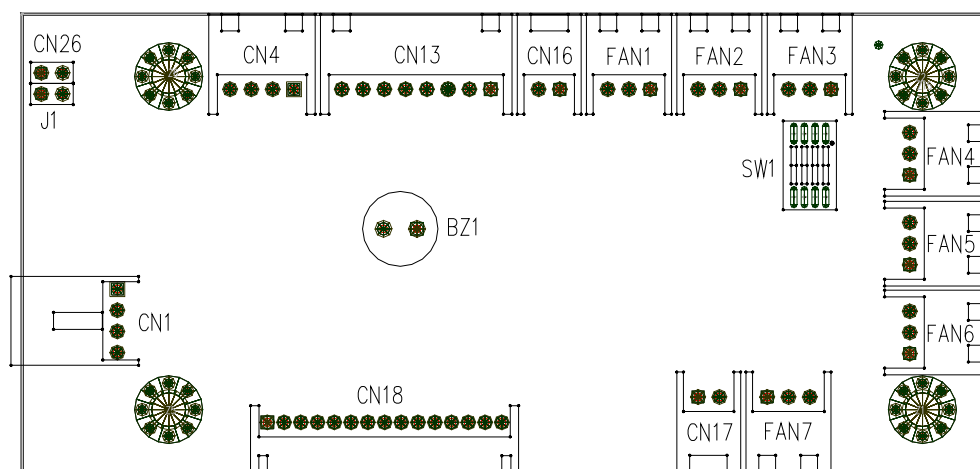


Figure 4.1 Alarm board layout

4.3 Alarm Board Specifications

Input Power: +5 V, +12 V

Input Signals:

- Seven 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: ± 12 V, ± 5 V, +3.3 V, and +5 Vsb)
- One 'hard disk LED' connector (connect from the CPU card / 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 detection input connector

Pin 1	+5 Vsb	Pin 5	+5 V
Pin 2	GND	Pin 6	+3.3 V
Pin 3	GND	Pin 7	-12 V
Pin 4	-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	Pin3	FAN_DEC
Pin 2	+12 V		

Table 4.9: J1 External Buzzer

Pin 1	Buzzer	Pin 2	+5V
-------	--------	-------	-----

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. Users 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 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-4010 is configured with a thermal sensor located at the rear plate of the chassis. (see Figure 4.2)

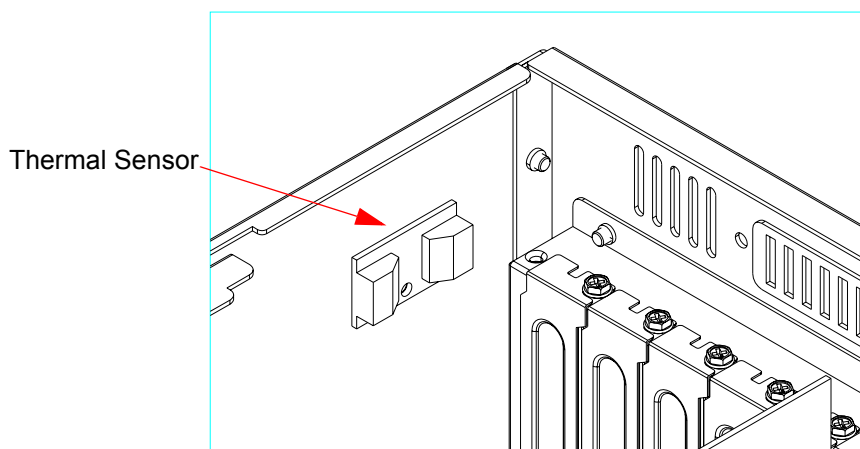


Figure 4.2 Thermal sensor location

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

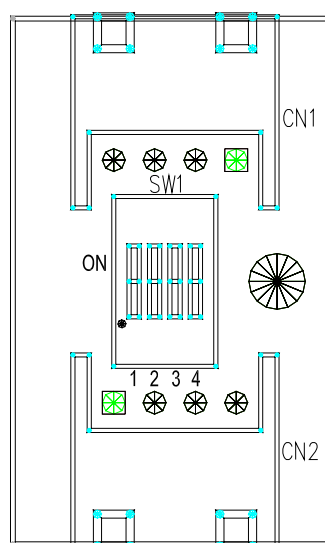


Figure 4.3 Thermal sensor module

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 and 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. no. 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 &
Parts List

A.1 Exploded Diagram & Parts List

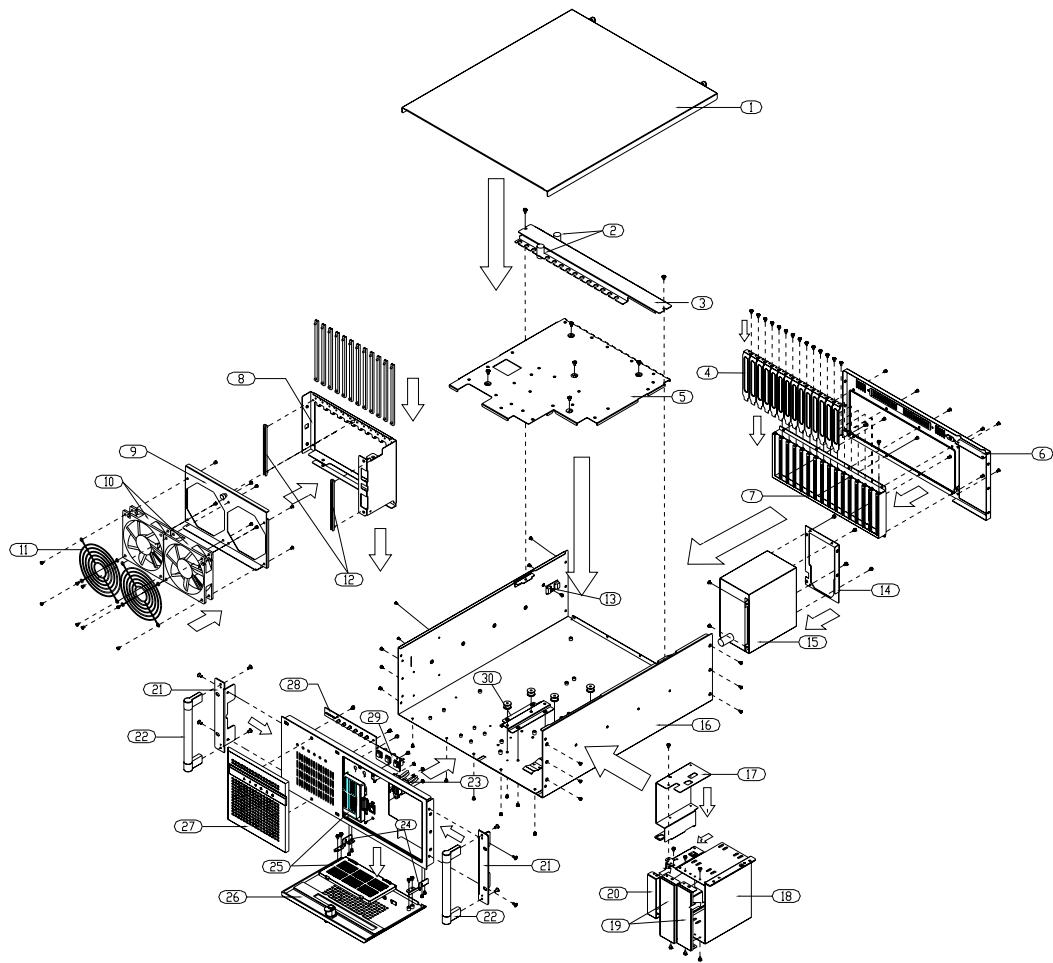


Figure A.1 Exploded diagram

Table A.1: Parts List

1	Top cover	11	12 cm fan guard	21	Rackmount ear
2	Rubber cushion	12	Guiding fillister	22	Handle
3	Hold down clamp	13	Thermal sensor	23	USB port
4	Adapter bracket	14	Power supply bracket	24	Hinge
5	Under plate	15	Power supply	25	Filter cover
6	Rear plate	16	Chassis body	26	Front door
7	I/O bracket	17	HDD bracket	27	Left front panel
8	Card guide bracket	18	Drive bay	28	LED board
9	Fan bracket	19	5.25" front cover	29	Switch bracket
10	12cm fan	20	3.5" front cover	30	Disk mounting bracket

Appendix **B**

Backplane & Motherboard Options

B.1 Backplane Options

ACP-4010 supports 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 x16	PCIe x8	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-6115	Single	-	-	-	15
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-4010 supports a variety of Advantech ATX and 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)	-	-	1 (8X)	2
	4 (PCI 32-bit)				
AIMB-750	2 (PCI-X 64-bit)	-	-	1 (4X)	2
	4 (PCI 32-bit)				
AIMB-760	1 (PCI-E 1X)	-	-	-	4
	5 (PCI 32-bit)				
AIMB-762	1 (PCIe 16X)	-	-	-	4
	1 (PCIe 4X)				
	5 (PCI 32-bit)				
AIMB-763	1 (PCIe 16X)	-	-	-	4
	1 (PCIe 1X)				
	5 (PCI 32-bit)				
AIMB-764	1 (PCIe 16X)	-	-	-	5
	1 (PCIe 4X)				
	5 (PCI 32-bit)				
AIMB-766	1 (PCIe 16X)	-	-	-	6
	2 (PCIe 1X)				
	4 (PCI 32-bit)				

www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2009

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Advantech:](#)

[ACP-4010MB-00XE](#) [ACP-4010BP-00XE](#) [RPS8-750ATX-XE](#) [RPS8-500ATX-XE](#) [ACP-4010MB-00BE](#) [ACP-4010BP-00BE](#) [RPS8-350ATX-XE](#)