ACP-7000 Series

7U-High Rackmount Industrial Computer Chassis with SCSI Ultra320 Mobile HDD Trays

User Manual

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A Message to the Customer

Advantech customer services

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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 Repairand Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

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

Initial Inspection

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

• ACP-700 Chassis

• User's Manual

• Warranty Card

• Accessory box with a package of screws (4 screws for fastening the slim type CD-ROM drive, 12 screws for fastening the disk drives, 6 screws for fixing the ear handles), a 68-pin SCSI flat cable, a pair of keys, 20 rubber cushions, a pair of ear handles, a big-to-small 4-pin power wire, a spare filter.

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ACP-7000 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-7000, 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.

FCC   *This device complies with the requirements in 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

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 device in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and, therefore, the user's authority to operate the equipment.

Contents

General Information

Chapter 1 General Information

1.1 Introduction

ACP-7000 is a 7U-high rackmount industrial computer chassis for high-performance and high-capacity computing platforms. It meets a variety of application needs for filing, printing, e-mails and webserving. This powerful computing server includes full disk array storage for minimizing the system downtime, especially in 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:** One slim-type CD-ROM drive bay, two 5.25" disk drive bays, and one 3.5" disk drive bay
- **RAID Storage:** Supports six 3.5" SCSI SCA 80-pin hot-swappable HDDs. Each mobile tray has a latch for protection and a pair of LEDs for displaying the HDD power and HDD activity status.
- **Security Protection:** The RAID storage system, power switch and system reset buttons are all behind the lockable door.
- **LED Indicators on Front Panel:** Bi-color LEDs (green/red) for Power, Temperature, and Fan status; single-color LEDs (green) for HDD activity and Power Singles Status (+3.3 V, +5 V, +12 V, -5 V and -12 V). For the SCSI storage, each mobile tray has a single-color LED (green) that displays HDD power and a bi-color LED (blue/red) that displays HDD status.
- **Switch and Buttons on Front Panel:** Power switch, Alarm Reset button and up to two System Reset buttons.
- **Front I/O Interfaces:** Dual USB and one PS/2 keyboard connector
- **Cooling System:** Four 92 mm x 92 mm (57 CFM) hot-swappable cooling fans and two 80 mm x 80 mm (47 CFM) cooling fans behind the SCSI backplane.

- **Air Filters:** Four filters (92 mm x 104 mm) inside of the fan modules, one filter (174 mm x 79 mm) behind the front door, and two filters (98 mm x 37 mm) on both sides of the LED panel.

- **Slide Rails:** General Device C-300 series supported

- **Weight:** 35 kg (77 lbs)

- **Dimensions (W x H x D):** 482 x 307 x 500 mm (19" x 12.1" x 19.7")

- **Chassis Color:** Black

1.3 Power Supply Options

Table 1.1: Power supply options			
Model Name	1757946010 (BP) 1757946007 (MB)	1757957002 (BP) 1757957001 (MB)	1757981000 (BP) 1757981001 (MB)
Watt	460 W (ATX, PFC) (1+1 redundant)	570 W (ATX, PFC) (2+1 redundant)	810 W (ATX, PFC) (3+1 redundant)
Input rating	100 ~ 240 Vac (Full range)	115 ~ 230 Vac (Full range)	115 ~ 230 Vac (Full range)
Output voltage	+5 V @ 42 A, +3.3 V @ 20 A, +12 V @ 14 A, -5 V @ 1 A, -12 V @ 1 A, +5 V_{SB} @ 0.75A	+5 V @ 50 A, +3.3 V @ 40 A, +12 V @ 34 A, -5 V @ 1 A, -12 V @ 1 A, +5 V_{SB} @ 1.2 A	+5 V @ 75 A, +3.3 V @ 60 A, +12 V @ 51 A, -5 V @ 1.5 A, -12 V @ 1.5 A, +5 V_{SB} @ 1.6 A
Mini-mum load	+5 V @ 2 A, +3.3 V @ 0.2 A, +12 V @ 0.5 A +5V_{SB} @ 0.1 A	+5 V @ 6 A, +3.3 V @ 2 A, +12 V @ 3 A, -12 V @ 0.1 A, -5 V @ 0.1 A, +5 V_{SB} @ 0.1 A	+5 V @ 9 A, +3.3 V @ 3 A, +12 V @ 4.5 A, -12 V @ 0.15 A, -5 V @ 0.15 A, +5 V_{SB} @ 0.15 A
MTBF	100,000 hours @ 25° C	100,000 hours @ 25°C	100,000 hours @ 25°C
Safety	UL/TUV/CB	UL/TUV/CB	UL/TUV/CB

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	1G rms	2G
Shock	10G with 11 ms duration, half sine wave	30G
Altitude	0 to 3,048 m (0 ~ 10,000 ft)	
Safety	CE compliant, UL/cUL approved	

1.5 Dimension Diagram
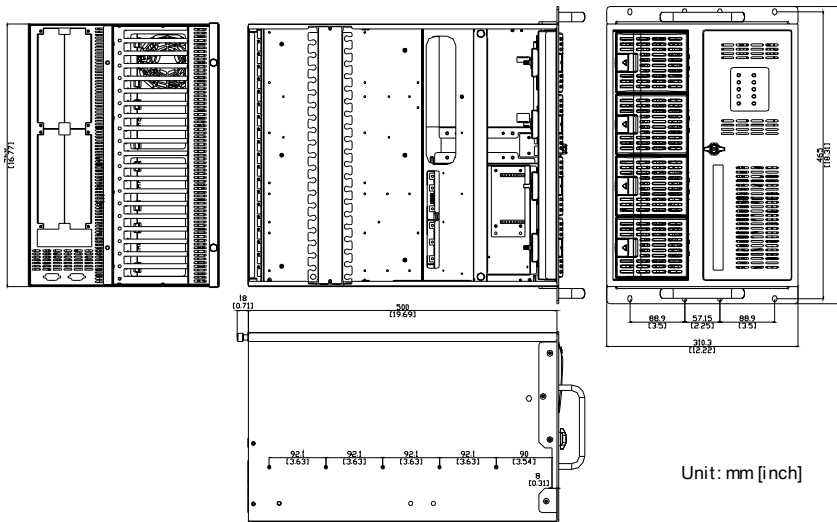
Unit: mm [inch]

Figure 1.1: Dimension diagram

1.6 Safety Precautions

Warning!   *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. Only experienced electronics personnel should open the PC chassis.*

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.*

System Setup

Chapter 2 System Setup

The following procedures guide users to install the backplane, add-on cards, and disk drives into the ACP-7000 chassis. Please refer to Appendix A, Exploded Diagram, for all the detailed part names of the ACP-7000.

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 Chassis front and rear panel

2.1.1 The front panel

1.   A SCSI disk drive housing with six mobile HDD trays is located on the front left. For IDE devices, there is one slim-type CD-ROM drive bay, two 5.25" disk drive bays, and one 3.5" disk drive bay on the right side.

2.   Four easily maintained and hot-swappable fan units are located on the upper front.

3.   Front door with LED panel and user-friendly rotary lock. Users can close the door with or without the key.

4.   A pair of ear handles which users can simply fasten to the front-right and left edges of the chassis with the six screws provided.

5.   Filters are located behind the front door and integrated with the fan units.

Figure 2.1: Front panel 1
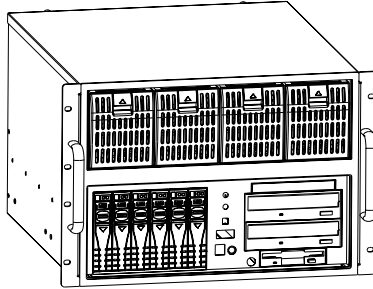
Figure 2.2: Front Panel 2

2.1.2 The rear panel

There are two reserved 9-pin D-SUB openings and dual AC inlets on the rear panel. For the B/P version, it includes the B/P rear plate with 20-slot I/O brackets (Figure 2.3). For the M/B version, it includes the M/B rear plate with 7-slot I/O brackets and a ATX M/B I/O cover (Figure 2.4).
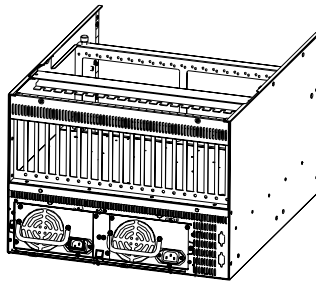
Figure 2.3: Rear panel of backplane version
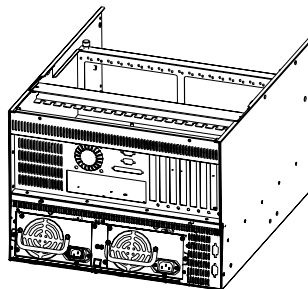
Figure 2.4: Rear panel of motherboard version

2.2 Removing the chassis covers

Please refer to Figure 2.5 and proceed as follows.

1.   Detach the two thumb screws on the upper edge of the rear panel.

2.   Remove the top cover.

Figure 2.5: Removing the top chassis cover

2.3 Installing the Backplane

ACP-7000 supports backplanes with up to 20 slots. To install the back-plane, please refer to Figure 2.6 and proceed as follows:

1.   Remove the top chassis cover, and then dismantle the hold-down clamp by removing the four screws.

2.   Put the backplane in the proper location and then fasten it onto the chassis.

3.   Connect the 20-pin ATX power connector from the power supply to the backplane.

4.   Replace the hold-down clamp and fasten them to the chassis.

5.   Return the top chassis cover and fasten it.
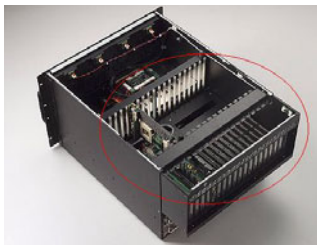
Figure 2.6:   Installing the backplane

2.4 Installing CPU Card & Add-on Cards

ACP-7000 supports up to 20 add-on cards. To install a CPU card or add-on card, please proceed as follows:

1. Remove the top chassis cover, and then dismantle the hold-down clamp by removing the two screws.

2. Select a vacant PICMG slot for a 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.

3. Insert the CPU card or add-on card vertically into the proper slot (See Figure 2.7). For full-length cards, 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 card with the screw on top of the I/O bracket.

4. Connect the +5Vsb and PS_ON wires from the power supply to the CPU card.

5. Repeat Step 2 and 4 if there is more than one add-on card.

6. There are two rows of notches on both sides of the hold-down clamp for inserting rubber cushions into. 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.

7. Put back the hold-down clamp and then screw it in place.

8. Replace the top chassis cover and fasten it.

+5Vsb/PS_ON wires connect to CPU card
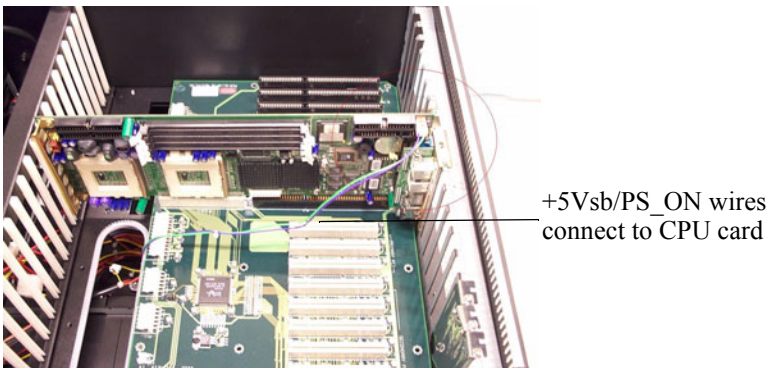
Figure 2.7: Installing a full-length CPU card

2.5 Hold-down clamp

The hold-down clamp protects all the cards from vibration and shock.
After installing all the cards, re-fasten the hold-down clamp. Please refer
to the following steps.

1.   After plugging in the CPU card and add-on cards, please insert the
     rubber cushions provided into the notches of the hold-down clamp,
     and adjust them to the placement of the cards. The cushions offer
     these cards the protection against shock and vibration.

2.   Put the hold-down clamp back into its original position. Please note
     that the circle hole on the hold-down clamp faces towards the rear
     panel. (See Figure 2.9).

3.   Secure the hold-down clamp to the chassis with the four screws.

Figure 2.8: Installing hold-down clamp
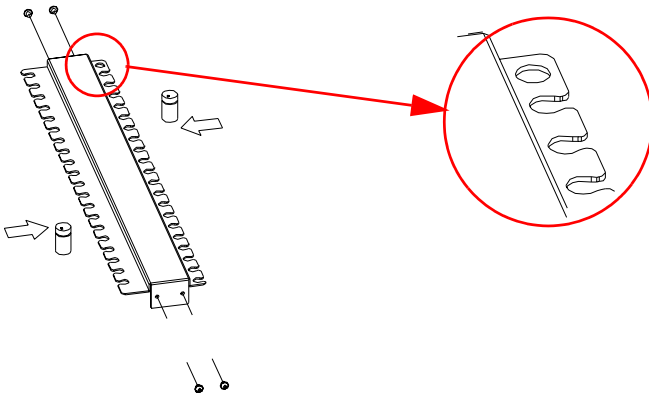
Figure 2.9: The circle hole should face the rear panel

2.6 Installing Disk Drives

APC-7000 supports both IDE and SCSI storage devices. We will introduce the IDE disk drive installation procedure here. For installing a SCSI HDD, please refer to Chapter 5 for detailed SCSI information and installation procedure.

The IDE disk drive housing supports one slim type CD-ROM drive, two 5.25" and one 3.5" disk drive devices. Please follow these steps for installation.

1.   Remove the top chassis cover

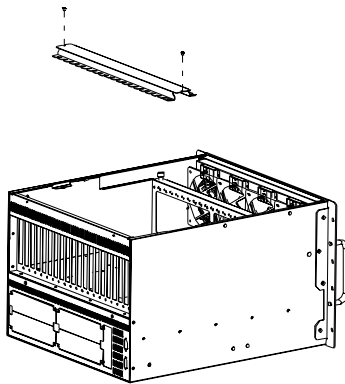2.   Release two thumbscrews to draw out the backplane holder until there is enough space to take out the disk drive housing (See Figure 2.6).

3.   Undo the four screws of the cushions and lift up the IDE disk drive housing (See Figure 2.9).

4.   To install the slim type CD-ROM drive, just simply fix it to the housing with the four screws provided. And plug the small convert board attached with the two screws provided.

5.   Insert other disk drives into the proper location in the disk drive housing and secure them with the screws provided (See Figure 2.10).

6.   Connect a 40-pin flat cable to the slim-type CD-ROM drive and HDD (or CD-RW drive or DVD-ROM drive, etc.) or a 34-pin flat cable to a FDD. Then plug the 4-pin power connector into the disk drive(s).

7.   Put the disk drive housing back in the correct position and fasten it with the screws.

8.   Return the backplane holder and fasten it with the two thumb screws.

9.   Replace the top chassis cover and fasten it
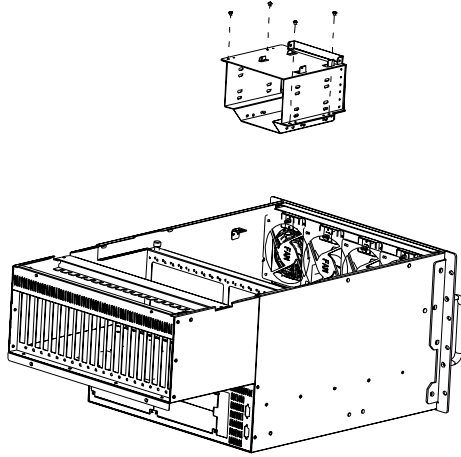
Figure 2.10: Removing the disk drive bay
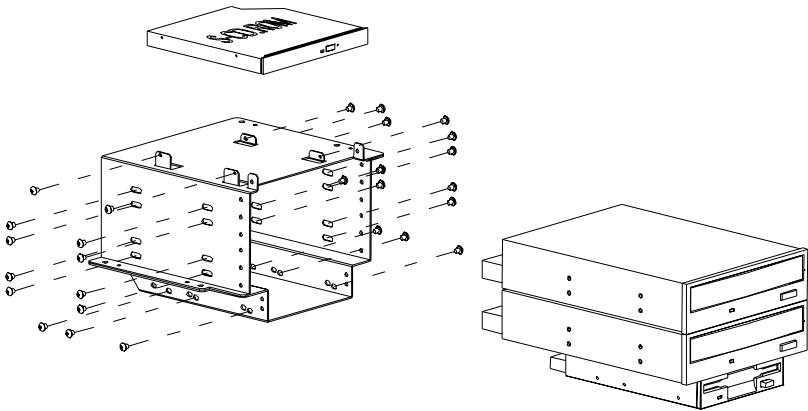
Figure 2.11: Installing IDE disk drives

Operation

Chapter 3 Operation

3.1 The Front Panel of ACP-7000

In the middle of the front panel, there is one On/Off Power switch, two System Reset buttons, one Alarm Reset button, a dual USB port, and a PS/2 connector. There are nine LED indicators on the lockable front door. Their individual functions are described below.

3.1.1 Switch, Buttons, and I/O Interfaces

Momentary Power switch: Press this button 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.

Alarm Reset button: Whenever a fault occurs in the system (e.g., fan failure or the temperature in the chassis is too high), the audible alarm will be activated. Pressing this button will stop the alarm from beeping.

System Reset button: Press the button to reboot the system (up to two systems).

Dual USB port: Connect USB devices to the system with this port.

PS/2 connector: Connect a PS/2 keyboard to this connector

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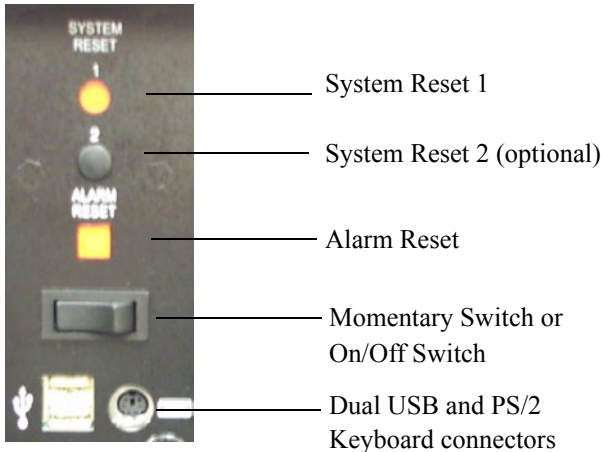
Figure 3.1: Switch, buttons and front I/O interfaces

3.1.2 LED indicators for System Status

The LED display on the front door shows a series of indicators that are grouped into two categories for System Status and Power Status.

Figure 3.2: Front LED panel

The following table describes the LED indicators for System Status.

Table 3.1: LED indicators for System Status			
LED	**Description**	**Green**	**Red**
PWR	System power	Normal	Abnormal
HDD	Hard disk drive activity	Data access	No light
TEMP	Temperature in the chassis	Normal	Abnormal
FAN	Cooling fan status	Normal	Abnormal

When the system power is on, the **PWR LED** is always **Green**. When the **PWR LED** is **RED**, it indicates a redundant power supply module failure. To stop the alarm beep, 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 beep, press the **Alarm Reset** button and then replace the failed fan with a good one immediately.

If the **TEMP LED** is **RED**, it means that the inside of the chassis has overheated. 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.

3.1.3 LED indicators for Power Status

The following table is of the individual LEDs which indicate the status of the backplane voltage signals.

Table 3.2: LED indicators for Power Status			
LED	Description	LED on	LED off
+3.3V	+3.3V signal	Normal	Abnormal
+5V	+5V signal	Normal	Abnormal
+12V	+12V signal	Normal	Abnormal
-5V	-5V signal	Normal	Abnormal
-12V	-12V signal	Normal	Abnormal

When an **LED** fails to light up, it means there is a problem with one of the voltage signals. Please check if the power supply connector is properly attached to the backplane. If the problem persists, consult with an experienced technician.

3.2 Replacing the Cooling Fan

There are four cooling fans with filters located on the front top of the chassis. Each cooling fan is hot-swappable and very easy to maintain. There are two cooling fans located behind the SCSI backplane which are mentioned in Chapter 2.1.1. The fans provide the system with ample colling by blowing air towards the rear. Once any of the fans fail, the alarm will beep. To stop the alarm, simply press the **Alarm Reset** button on the front panel and replace the failure fan right away. Please proceed according to the instructions below.

### 3.2.1 Replacing the front cooling fan
1. Push down the latch on the fan unit located on upper front to unlock it.

3. Replace the cooling fan with a new one.

4. Fix the new cooling fan unit in place.

5. Move up the latch to lock the fan unit.

Figure 3.3: Replacing the cooling fan

3.2.2 Replacing the fan behind SCSI backplane

1. Remove the top front chassis cover.

2. Remove the backplane bracket and pull it out so that there is enough room for your hand to reach the fan behind the SCSI backplane.

3. Depress the tab on top of the fan unit so that the fan detaches from the fan enclosure. *Figure 3.4 b* is another view to show users how to remove the fan. By this way, you need to remove the whole SCSI disk drive housing first. It is not necessary to take out the SCSI housing to replace the fan.

4. Unplug the fan wire on the alarm board.

5. Put a new fan into the fan enclosure carefully until it is locked by the tab. Be sure to install it securely in the enclosure.

6. Plug the fan wire into the alarm board.

7. Return the backplane bracket to its original location and fasten it.

8. Replace the top chassis cover and then fasten it.
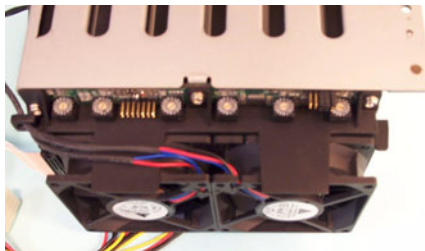
(a) Depress the tab on top of the fan unit

(b) Another way to replace the fan

Figure 3.4: Replacing the SCSI backplane fan

3.3 Replacing the Filter

The filter blocks dust and particles from the work environment and extends the longevity of the system. The filter should be replaced periodically. There are three filters behind the front door and four filters integrated with the front fan units. To replace the filter, please proceed as follows.

3.3.1 Replacing the front door filter

1.   Open the front door.

2.   Loosen the screws located on the filter cover.

3.   Replace the filter with a new one.

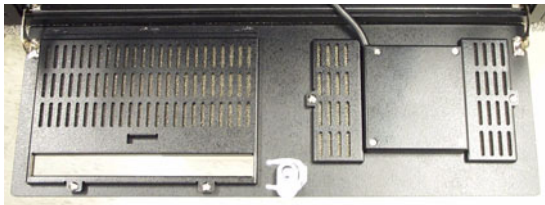4.   Fasten the filter cover.

Figure 3.5: Replacing the front door filter

3.3.2 Replacing the fan filter

1.   Push down the latch on the fan unit on the upper front to unlock it.

2.   Open the filter bracket and simply take out the filter.

3. Replace the filter with a new one and then replace the fan bracket.

4. Return the fan unit to its original place and then lock it by push up the latch

Figure 3.6: Replacing the fan filter

3.4 Replacing the power supply

The ACP-7000 supports various power supply models. To replace the power supply module, please proceed as follows:

1. Turn off the failed power supply module.

2. Loosen the screw on the failed module and then gently pull the module out by the handle (see *Figure 3.7-a and Figure 3.7-b*).

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, then tighten the screws.

5. Return the handle to its original place.
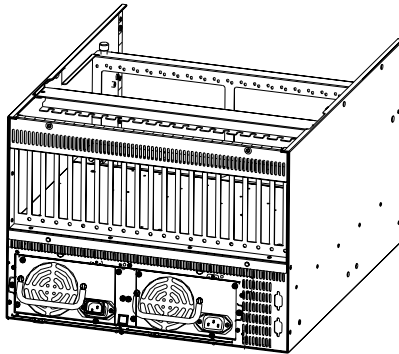
(a) power supply module of 460W

(b) power supply module of 570W/810W

Figure 3.7: Replacing the power supply module

Note:	When you plug the two power cords into the socket (for 570W and 810W models), please make them the same orientation (See Figure 3.8).

Figure 3.8: Power cord plugs orientation on the socket

Alarm Board

Chapter 4 Alarm Board

The alarm board is located on the right side near the rear section. The alarm board makes an audible alarm when:

1. Any power supply module or redundant power supply fails
2. One of the system cooling fans or blowers fails
3. Internal temperature of the chassis reaches 50°C (default setting)

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

4.1 Alarm Board Layout

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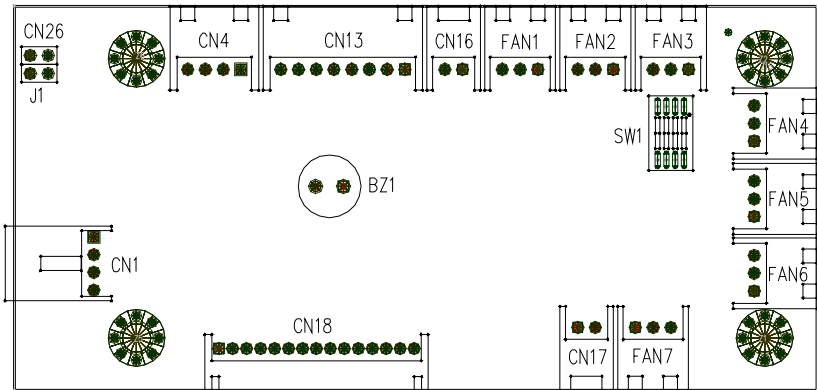

Figure 4.1: Alarm board layout

4.2 Alarm Board Specifications

Input Power: +5V, +12V

Input Signals:

- • 7 FAN connectors
- • One thermal board connector (can connect up to 8 thermal boards in series)
- • One power good input

- One alarm reset input
- One voltage signal connector (connect from backplane, includes $\pm$ 12V, $\pm$ 5V, +3.3V)
- One Hard Disk LED connector (connect from CPU card)

Output Signals:

- One LED board connector
- One LCM board connector
- One Buzzer output

Pin Definition

CN1: Auxiliary External Power Connector, standard mini 4-Pin power connector			
Pin 1	+12V	Pin 3	GND
Pin 2	GND	Pin 4	+5V

CN4: Temperature Sensor (LM75) Connector			
Pin 1	+5V	Pin 3	T_SDAT
Pin 2	T_SCLK	Pin 4	GND

CN13: Voltage Detection Input Connector			
Pin 1	$5V_{SB}$	Pin 5	+5V
Pin 2	GND	Pin 6	+3.3V
Pin 3	GND	Pin 7	-12V
Pin 4	-5V	Pin 8	+12V

CN16: Power Good Input			
Pin 1	Power Good A	Pin 2	GND

CN17: Alarm Reset Connector			
Pin 1	ALARM RESET	Pin 2	GND

CN18: LED Connector			
Pin 1	GND	Pin 9	Temperature Good LED
Pin 2	Power Good +5V	Pin 10	Temperature Fail LED
Pin 3	Power Good +12V	Pin 11	FAN Good LED
Pin 4	Power Good -5V	Pin 12	FAN Fail LED
Pin 5	Power Good -12V	Pin 13	N/A
Pin 6	HDD_1	Pin 14	Power Good +3.3V
Pin 7	Power Good LED	Pin 15	Power Good +5V$_{SB}$
Pin 8	Power Fail LED		

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

J1: External Buzzer			
Pin 1	Buzzer	Pin 2	+5V

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 Switch Settings

Table 4.1: Fan number setting				
FAN NUMBER	SW 1-1	SW 1- 2	SW 1- 3	SW 1- 4
1	OFF	OFF	ON	OFF
2	OFF	ON	OFF	OFF
3	OFF	ON	ON	OFF
4	ON	OFF	OFF	OFF
5	ON	OFF	ON	OFF
6	ON	ON	OFF	OFF
7	ON	ON	ON	OFF

4.4 Thermal Sensor

There is a thermal sensor located on the rear plate of the chassis. It is attached to the upper left corner of the chassis back plate.

When the inner temperature of the chassis is too high, the thermal sensor sends a signal to the alarm board to trigger a continuous alarm. To stop the alarm beep, press the **Alarm Reset** button on the front panel. Please refer to *Figure 4.2* for the thermal sensor module layout. Users can refer to the following temperature setting by adjusting the switch.
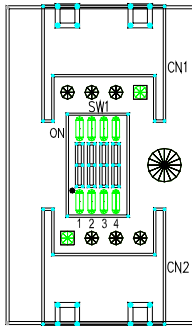

Figure 4.2: Thermal sensor module

Table 4.2: Connector pin sefinition			
CN1: Temperature Sensor Connector			
Pin 1	+5V	Pin 3	T_SDAT
Pin 2	T_SCLK	Pin 4	GND
CN2: Temperature Sensor Connector			
Pin 1	+5V	Pin 3	T_SDAT
Pin 2	T_SCLK	Pin 4	GND

Table 4.3: Thermal switch setting				
TEMP INDEX	**SW 1 -1**	**SW 1 - 2**	**SW 1 - 3**	**SW 1 - 4**
TEMP 1	OFF	OFF	OFF	ON
TEMP 2	OFF	OFF	ON	ON
TEMP 3	OFF	ON	OFF	ON
TEMP 4	OFF	ON	ON	ON
TEMP 5	ON	OFF	OFF	ON
TEMP 6	ON	OFF	ON	ON
TEMP 7	ON	ON	OFF	ON
TEMP 8	ON	ON	ON	ON

SCSI Storage

Chapter 5 SCSI Storage and RAID

There is a SCSI SCA backplane fixed behind the SCSI disk drive housing. This backplane provides six 80-pin SCSI connectors, so users can install up to six 80-pin SCSI HDDs. Please see the relevant details below.

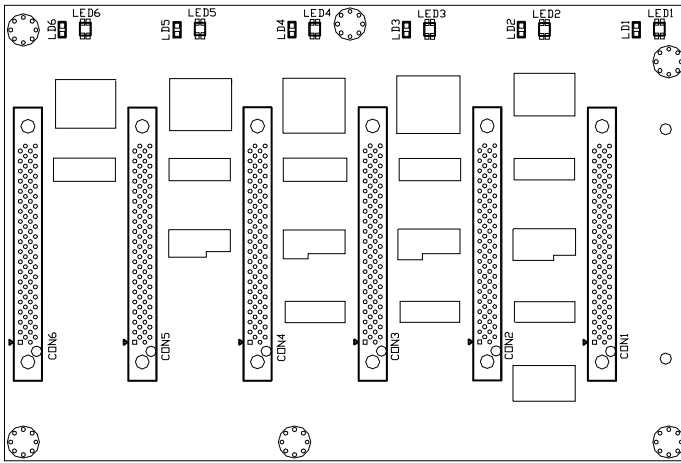## 5.1 6-slot SCSI SCA Backplane

5.1.1 SCSI Backplane Layout
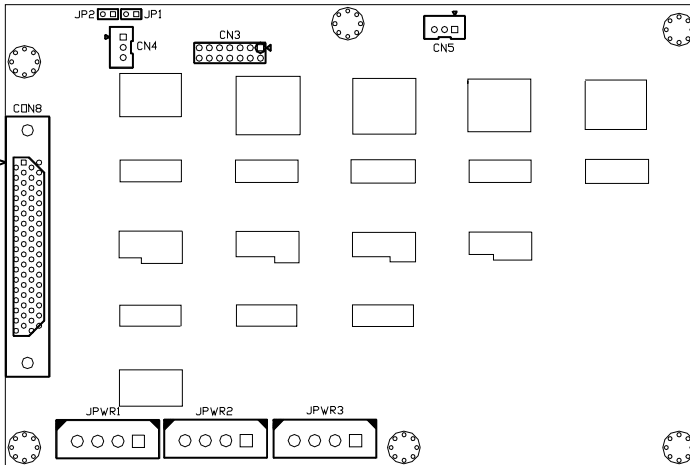

*Figure 5.1: **Front side layout of the SCSI backplane***

Figure 5.2: Back side layout of the SCSI backplane

5.1.2 Connectors and Jumpers

Table 5.1: Connectors and jumpers	
CON1 ~ CON6	80-pin Ultra320 SCSI connector
CON8	68-pin Ultra320 SCSI connector
JPWR1 ~ JPWR3	4 Pin Power Connector
CN3	For SCSI HDD status alarm function: Pin 1, 3, 5, 7, 9, 11 are the status signals for HDD1 ~ HDD6; Pin 2, 4, 6, 8, 10, 12 are the alarm signals for HDD1
CN4 ~ CN5	Fan Connectors

LD1 ~ LD6	SCSI HDD0 ~ HDD5 power LED(green)
LED1 ~ LED6	SCSI HDD0 ~ HDD5 Bi-Color LED (blue/red) HDD Activity (Blue) HDD Fault (Red) Rebuild (Blink pink) No error: Off Blink (1/sec) Identify: Fast blink (~3/sec)

HDD spin up options	JP1	JP2
Spin up when power is applied	Open	Open
Spin up after delay	Open	Close
Spin up on command mode	Close	Open
Reserved	Close	Close

5.2 SCSI Disk Drive Housing

The SCSI HDD usually stores the important system data. So please avoid damaging the data if you need to take out the SCSI disk drive housing from the chassis. Please be careful to disconnect all the relevant wires/ cables and fans behind the IDE disk drive and the SCSI disk drive housing, as well as the SCSI mobile trays first, or you may damage the system data or be difficult to take the housing out. When in doubt, please consult with an experienced technician.

The procedure for taking out the SCSI disk drive housing is as follows:

1. Open the top chassis cover and release the two thumb screws in order to pull out the backplane holder until you can remove the SCSI disk drive housing easily.

2. Disconnect the two fan wires on the alarm board and the three power wires and the SCSI flat cable on the SCSI backplane.

3. Undo the four screws of the alarm board first and then move it away.

4. Loosen the four screws of the cushions and then take out the SCSI disk drive housing carefully.
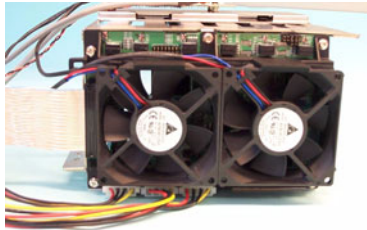

Figure 5.3: SCSI disk drive housing and wires

5.3 Wires & Cables of the SCSI Storage

There is one 68-pin SCSI flat cable in the accessory package. This cable is for connecting the add-on SCSI RAID card/controller and the SCSI backplane. The power wires of the dual fans should be connected to the alarm board. The three 4-pin power connectors on the rear side of the SCSI backplane are for connecting the power wires from the power supply.

Note:	Please be sure to plug in these wires and cables well before you install any SCSI HDD. When you have to take out the SCSI disk drive housing from the chassis, please disconnect the wires and cables first

5.4 Installing SCSI HDD

5.4.1 Installing the SCSI HDD

Note: *There are various types of 3.5" SCSI HDDs on the market. You should choose the SCSI SCA-2 80-pin 3.5" HDD. If you're not sure which type to choose, please contact a local sales representative.*

Please follow the installation procedures below.

1. Open the front door by turning the rotary lock.

2. Push up the latch on the mobile tray (See *Figure 5.4)*.

3. Press down the handle of the mobile tray and pull it out as far as it will go. Then completely take out the tray (Refer to *Figure 5.5)*.

4. Install a 3.5" x 1" high SCSI SCA 80-pin HDD to the tray by fastening the four screws (See *Figure 5.6*).

5. Return the mobile tray with SCSI HDD to the disk drive housing and push it in by the handle until it is locked into the original position.
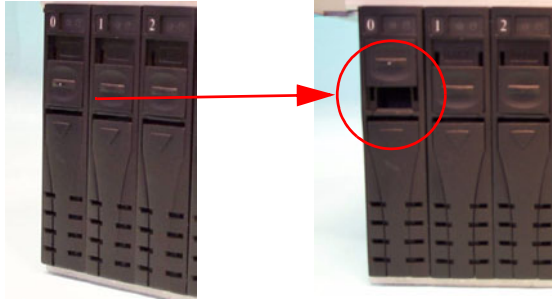
6. Push down the latch to lock the tray in place.
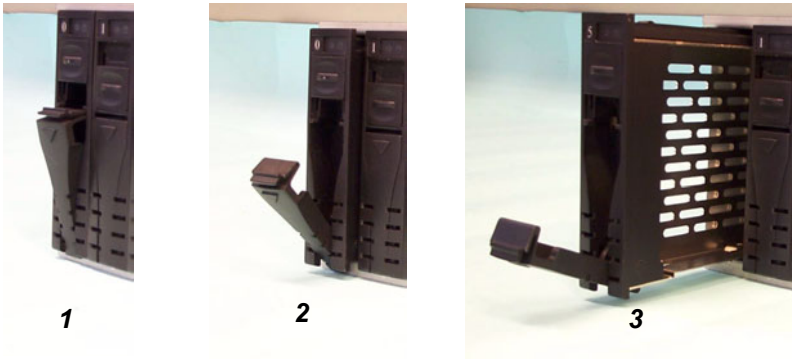
Figure 5.4: Pushing up the latch

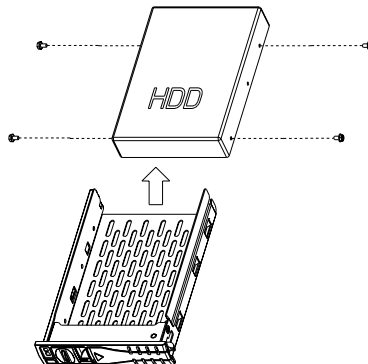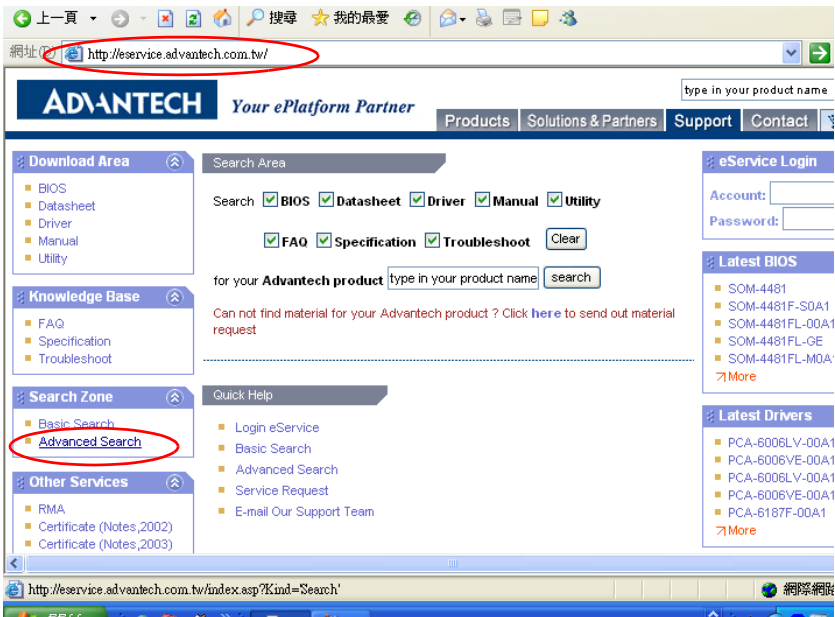1
2
3

Figure 5.5: Removing the mobile tray

Figure 5.6: Installing a SCSI SCA-2 80-pin HDD

5.4.2 Installing GEM318 Driver

Users can usually install the SCSI HDD well without a driver. But if you use Windows 2000 OS and would like it to recognize GEM318 SCSI device, you can install the driver from Advantech's website. Please follow the steps below to download the GEM318 driver and install it to your system.

1.   Advantech's eService website: http://eservice.advantech.com.tw

Click on the **Advanced Search**.

Type "*GEM 318*" under the **Keyword** field. Then click on (Search)

The specific driver will show on the **Service Request** section.

2. Click the driver and you will see 2 files. The file **GEM-install.doc** is the installation guide, and the file **gem318.inf** is the driver you need to install.

3. Please be sure to follow the installation steps given in **GEM-install.doc** in order to successfully complete the installation.

5.5 SAF-TE

SAF-TE stands for SCSI Accessed Fault-Tolerant Enclosure. The SCA backplane with built-in GEM318 chipset supports SAF-TE. It provides a standard, non-proprietary way for third party disk and RAID controllers to be fully integrated with peripheral packing that supports status signals (LED, audible alarm, LCD, etc), hot-swappable Ultra320 SCSI HDDs, and monitoring of enclosure components, such as disk drives, power supplies, thermal sensors, fans, etc. For ACP-7000, the GEM318 chipset checks the disk status only, for others, such as fans, temperature, power supply, and voltage, they are monitored by an alarm board.

5.6 RAID Application

RAID stands for Redundant Array of Inexpensive/Independent Disks. The ACP-7000 can be integrated with a SCSI RAID card, such as AMI (LSI), Adaptec, Intel or Mylex RAID card to perform Disk Array functions. The SCSI RAID controller is another suitable option to integrate with the ACP-7000. Please note the length limitation of the SCSI RAID controller - the maximum length of your RAID controller must be less than **240 mm** (See *Figure 5.7*)

When you install an add-on SCSI RAID card or a SCSI RAID controller as a RAID system, please refer to the following steps:

1.   Open the top chassis cover and find the 68-pin Ultra320 SCSI connector on the rear side of the SCSI backplane.

2.   Connect the provided Ultra320 SCSI 68-pin flat cable from the SCSI backplane to the add-on SCSI RAID card or controller.

3.   You can install up to six SCSI SCA-2 80-pin HDDs. Please follow the instructions of the SCSI RAID card or controller to implement your RAID system.

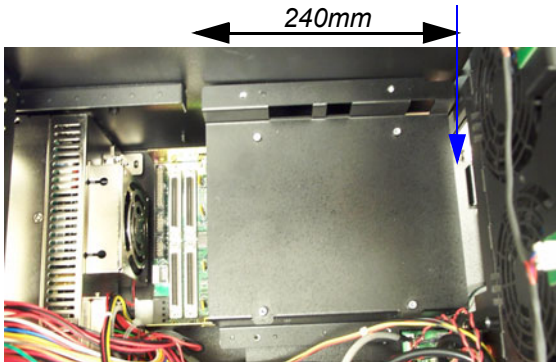| Table 5.2: SCSI HDD power and activity status LEDs					
LED	**Description**	**Green**	**Blue**	**Red**	**Blue & Red**
PWR	power of HDD	HDD power on	N/A	N/A	N/A
Status	Status of HDD	N/A	Data access	HDD failure	Data rebuild or construction

240mm

Figure 5.7: Length for RAID card or controller

Exploded Diagram

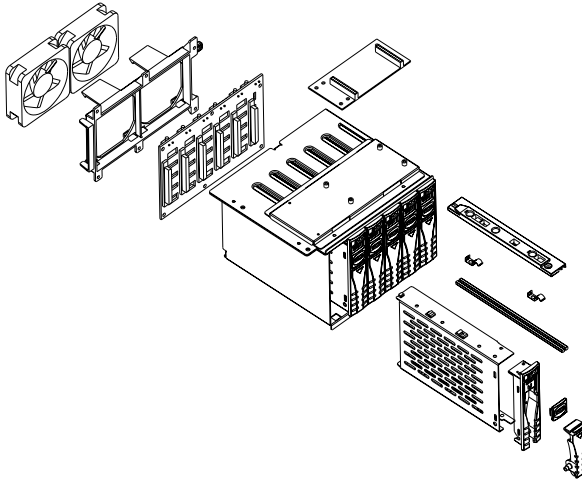# Appendix A Exploded Diagram

A.1   Exploded Diagrams

Figure A.1: Exploded Diagram 1

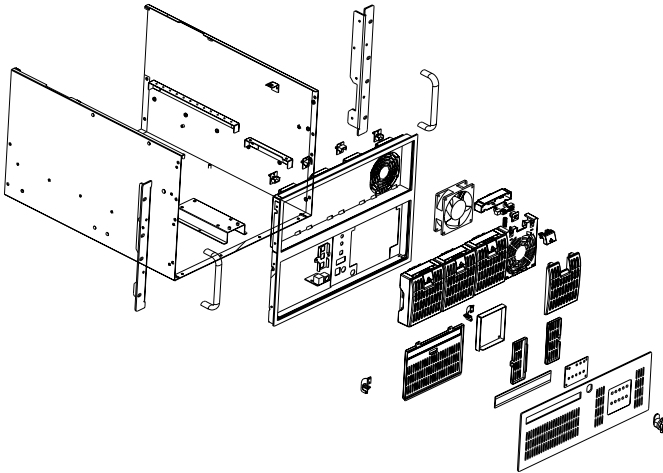*Figure A.2: Exploded Diagram 2*
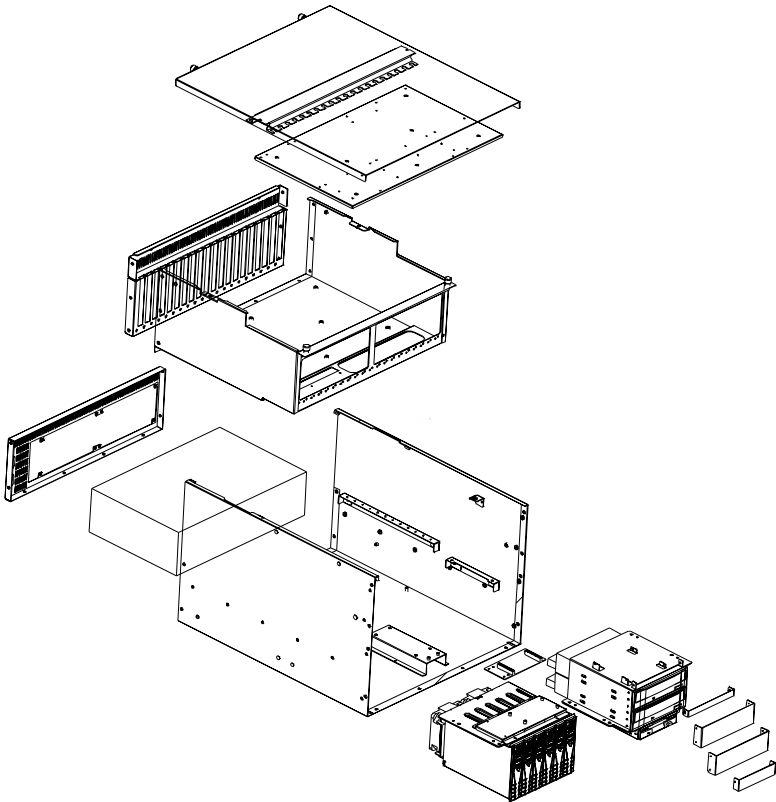
Figure A.3: Exploded Diagram 3

Optional Backplanes and Motherboards

Appendix B Optional Backplanes and Motherboards

B.1 Backplane Options

The ACP-7000 supports a variety of backplanes. Users can contact a local sales representative for information and detailed specifications.

Table B.1: Backplane options					
Model Name	**Segment**	**Slots Per Segment**			
		PICMG	**PICMG/PCI**	**PCI**	**ISA**
PCA-6120-0B1	Single	--	--	--	20
PCA-6120P4-0B1	Single	2	--	4	14
PCA-6120P12-0A1	Single	1	1	11	7
PCA-6120P18-0A1	Single	1	1	17	1
PCA-6119P7-0B1	Single	2	--	7	10
PCA-6119P16X	Single	2	--	16	1
PCA-6119P17-0B1	Single	1	1	16	--
PCA-6120D-0B1	Dual	--	--	--	20
PCA-6120DP4-0B1	Dual	4	2	6	7
PCA-6118DP7-0B1	Dual	3	--	14	1
PCA-6120Q-0B1	Quad	--	--	--	20
PCA-6116QP2-0B1	Quad	7	--	8	1

B.2 Motherboard Options

The ACP-7000 supports a variety of Advantech ATX motherboards as listed below. You can contact a local sales representative for detailed information.

Table B.2: Motherboard options					
Model Name	**Bus**				
	PCI	**PCI/ISA**	**ISA**	**AGP**	**SATA**
AIMB-740	4 (32-bit)	1	1	--	--
AIMB-741	4 (32-bit)	1	1	1 (4X)	--
AIMB-742	4 (32-bit)	1	1	1 (8X)	2
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 (4X)	2
AIMB-760	1 (PCIe 16X) 2 (PCIe 1X) 5 (PCI 32-bit)	--	--	--	4

APPENDIX **C**

Safety Instructions

Appendix C Safety Instructions

C.1 English

1. Read these safety instructions carefully.

2. Keep this installation reference guide for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.

4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.

7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.

12. Never pour any liquid into an opening. This could cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If any of the following situations arises, get the equipment checked by service personnel:

a. The power cord or plug is damaged.

b. Liquid has penetrated into the equipment.

c. The equipment has been exposed to moisture.

d. The equipment does not work well, or you cannot get it to work according to the installation reference guide.

e. The equipment has been dropped and damaged.

f. The equipment has obvious signs of breakage.

15. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS MAY DAMAGE THE EQUIPMENT.

The sound pressure level at the operator's position according to IEC 704-1:1982 is equal to or less 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.

C.2   German - Wichtige Sicherheishinweise

1.   Bitte lesen sie Sich diese Hinweise sorgfältig durch.

2.   Heben Sie diese Anleitung für den späteren Gebrauch auf.

3.   Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.

4.   Die Netzanschlußsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.

5.   Das Gerät ist vor Feuchtigkeit zu schützen.

6.   Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.

7.   Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.

8.   Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.

9.   Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.

10. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.

11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.

12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw elektrischen Schlag auslösen.

13. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.

14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:

a.   Netzkabel oder Netzstecker sind beschädigt.

b.   Flüssigkeit ist in das Gerät eingedrungen.

c.   Das Gerät war Feuchtigkeit ausgesetzt.

d. Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.

e. Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.

f. Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

15. Bitte lassen Sie das Gerät nicht unbehehrt hinten unter -20° C (-4° F) oder oben 60° C (140° F), weil diesen Temperaturen das Gerät zerstören könten.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weiger.

DISCLAIMER: This set of instructions is provided according to IEC704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.