IPC-7220
Desktop/Wall mountable IPC Chassis

User's Manual

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General Information

Chapter 1   General Information
1.1   Introduction

Specifically designed for factory floors and other harsh industrial environments, the IPC-7220 is a desktop/wall-mountable IPC chassis that is ideal for system integrators or users who require a compact and rugged computing platform for industrial automation applications. Supporting ATX motherboards and up to five PCI and two ISA full-length cards, the IPC-7220 allows a wide range computing peripherals to be integrated with the chassis.

Unique alarm detection and notification to reduce system down time
The IPC-7220 comes with the unique alarm module. This module automatically detects the system operating conditions, such as power, HDD, FAN, and system temperature, and it shows the system status on the front visible LED indicators. Once any failure happens, the module also gives an audible alarm to notify users to take necessary actions.

Flexible storage options
The IPC-7220 provides abundant data storage solutions, such as two front-accessible 5.25" disk drives, one FDD and one internal 3.5" HDD. The front accessible USB and PS/2 keyboard I/O interfaces can be connected with various peripheral devices for data input, backup, and transferring.

Outstanding mechanical designs
The IPC-7220 can be placed on desktops or mounted bi-directionally, and using the supplied brackets, the IPC-7220 can be easily bottom or right-mounted onto most surfaces, such as walls or workbenches. The shock-resistant drive bay design and the rubber-buffered hold-down clamp design protect the system against harsh industrial environments or unexpected shock. The lockable front door prevents from any unauthorized access to data storage. All these outstanding features make IPC-7220 the best choices for price, performance and total cost of ownership.

1.2   Specifications

- Construction: Heavy-duty steel

- Disk drive capacity: two 3.5" (one front accessible and one internal) and two 5.25" bays

- I/O interfaces on front panel: two USB and one PS/2 ports

- I/O interfaces on rear panel: two D-SUB 9-pin openings

- Indicators on front panel: LEDs for Power, HDD, TEMP and FAN

- Switches on front panel: Power and Reset

- Air filters: one 7 cm x 12 cm filter in drive bay door and one 12 cm x 12 cm filter

- Weight: 11.5 Kg (25.3 lb) with PS-300ATX-ZB power supply

- Dimensions: 200 mm (W) x 320 mm (H) x 480 mm (D) (6.8" x 12.4" x 18.9")

1.3   Environmental Specifications

- **Temperature:**

  (Operating) 0 to 40°C (32 to 104°F)

  (Non-operating) -20 to 60°C (-4 to 140°F)

- **Humidity:**

  (Operating) 10 to 85% @ 40°C, non-condensing

  (Non-operating) 10 to 95% @ 40°C, non-condensing

- **Vibration (5 ~ 500 MHz): (Operating)** 1G rams

  (Non-operating) 2G rams

- **Shock:**

  (Operating) 10G with 11 ms duration, half sine wave

  (Non-operating) 30G

- **Acoustic Noise:** < 52dB sound pressure at 5 ~ 28°C (41 ~ 82°F)

- **Altitude:** 0 to 3,048 m (0 ~ 10,000ft)

- **Safety:** CE compliant, UL/cUL

1.4 Power Supply Options

1.4.1 300W ATX Power Supply with PFC (PS-300ATX-ZB)
- Output rating: 300 watts max.

- Input rating: 90 ~ 264 Vac @ 47 ~ 63 Hz (Full range)

- Output voltage: +5 V @ 30 A, +3.3 V @ 28 A , +12 V @ 15 A, -5 V @ 0.3 A, -12 V @ 0.8 A, +5 VSB @ 2 A

- Minimum load: +5 V @ 0.1 A, +3.3 V @ 0.3 A

- MTBF: 100,000 hours @ 25° C, full load

- Safety: UL/cUL/TUV/Nemko/FCC/CE/CB/CCC

1.4.2 300W ATX Redundant Power Supply (RPS-300ATX-Z)
- Output rating: 300 watts max.

- Input rating: 90 ~ 264 Vac @ 47 ~ 63 Hz (Full range)

- Output voltage: +5 V @ 25 A, +3.3 V @ 18 A, +12 V @ 16 A, -5 V @ 0.5 A, -12 V @ 0.5 A, +5 VSB @ 2 A

- Minimum load: +5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, +5 VSB @ 0.1 A

- MTBF: 150,000 hours @ 25° C, full load

- Safety: UL/cUL/TUV/FCC/CE/CB/CCC

1.4.3 400W ATX Power Supply (PS-400ATX-ZB)
- Output rating: 400 watts max.

- Input rating: 90 ~ 240 Vac @ 47 ~ 63 Hz (Full range)

- Output voltage: +5 V @ 35 A, +3.3 V @ 25 A, +12 V @ 30A, -5 V @ 0.8 A, -12 V @ 1.0 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

- MTBF: 100,000 hours @ 25°C, full load

- Safety: UL/cUL/TUV/FCC/CE/CB/CCC

1.4.4   400W ATX Redundant Power Supply (RPS-400ATX-Z)

- Output rating: 400 watts max.

- Input rating: 90 ~ 264 Vac @ 47 ~ 63 Hz (Full range)

- Output voltage: +5 V @ 35 A, +3.3 V @ 25 A, +12 V @ 28 A, -5 V @ 0.5 A, -12 V @ 1.2 A, +5 VSB @ 2 A

- Minimum load: +5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, +5 VSB @ 0.1 A

- MTBF: 150,000 hours @ 25°C, full load

- Safety: UL/cUL/TUV/FCC/CE/CB/CCC

1.4.5   300W ATX DC Power Supply (PS-300ATX-DC48)

- Output rating: 300 watts max.

- Input rating: -32 ~ -72 Vdc

- 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

- Minimum load: +5 V @ 0.3 A, +3.3 V @ 0.3 A, +12 V @ 0.2 A

- MTBF: 100,000 hours @ 25°C, full load

- Safety: UL/CSA/TUV/FCC/CE/CB/CCC

1.5 Dimension of IPC-7220

Figure 1-1 Dimension of IPC-7220
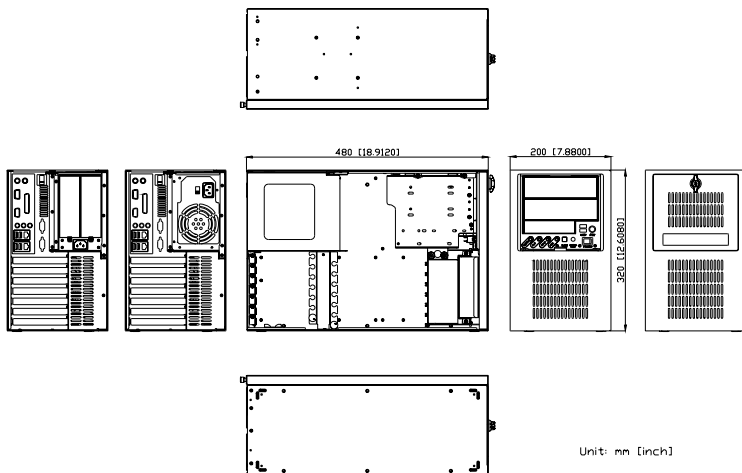
System Setup

Chapter 2   System Setup

The following procedures are provided to assist you in installing a motherboard, drives, and plug-in cards into the IPC-7220. Please also refer to the Appendix A, Exploded Diagram, for the parts naming in this manual.

2.1 Removing the cover

To remove the cover of the IPC-7220, please refer to Figure 2-1.
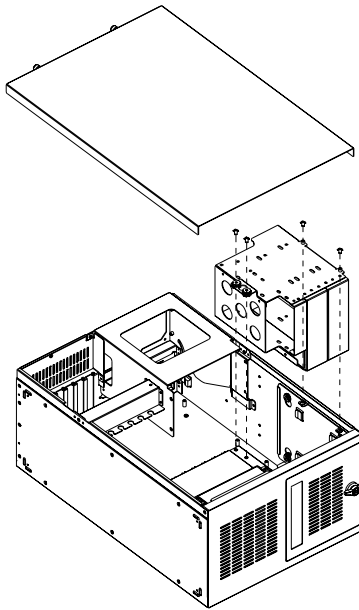
Figure 2-1 Removing the cover

2.2 Installing a motherboard

The IPC-7220 accepts both ATX and microATX motherboard. To install a motherboard, refer to Figure 2-2 and proceed as follows:

Note:
To avoid any component interfering between a motherboard and the chassis and to ensure the best air flow inside the chassis, it is highly recommended to choose a CPU cooler which is lower than 70 mm.

1. Remove three screws, which mount the power supply bracket to the chassis, then lift the power supply bracket.

2. From inside of the chassis, attach the motherboard I/O shield to the rear plate of the chassis.

3. Fix the motherboard in the chassis with screws.

4. Plug in the 20-pin ATX power connector and +12 V power connector from the power supply, also the 9-pin USB and 5 or 6-pin PS/2 connectors from the front panel of the chassis.

5. Return the power supply bracket and fasten it with screws.

PS/2 Connector

UBS Connector
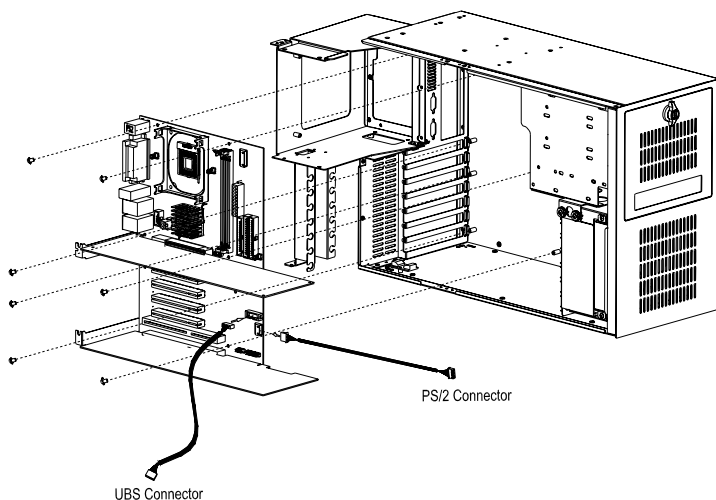
Figure 2-2 Installing a motherboard

2.3 Adding disk drives

To install a HDD or FDD, refer to Figure 2-3 and proceed as follows:

1. Remove the four outer screws, which mount the drive bay to the chassis, then take out the drive bay.

2. Remove the covers of the drive bay. Insert one drive into the proper location in the drive bay and fix it with four screws.

3. Repeat Step 2 if there is more than one drive.

4. Connect a 34-pin flat cable from the motherboard to a FDD/slim-CD-ROM, a 40-pin flat cable to an IDE HDD and a SATA cable to a SATA HDD. Insert the proper power connector into each drive.

5. Slide the drive bay back to the chassis and screw it.

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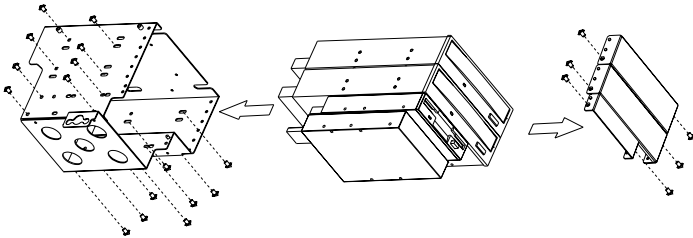
Figure 2-3 Installing the drives

2.4 Installing plug-in cards

The IPC-7220 can accept up to seven plug-in cards. To install a plug-in card, please refer to Figure 2-4 and proceed as follows:

1. Remove the two screws, which mount the hold-down clamp to the chassis, then take out the hold-down clamp.

2. Find the slot(s) which is go to be inserted a card(s), and remove the slot's blank bracket(s) attached to the rear plate of the chassis.

3. Insert a plug-in card. Make sure that the card bracket has been inserted properly and the other edge of the card has been fixed in the guide rail. Fasten the card at the top of the bracket with a screw.

4. Repeated Step 3 if there is more than one card.

5. Insert the rubber buffers into the hold-down clamp, which is attached to the power supply bracket. Buffers cushion plug-in cards from shock and vibration. The hold-down clamp has two rows of notches for the rubber buffers to be inserted, one row is for PCI cards, the other row for ISA cards. Depending on the card height, the buffers can be inserted as the narrow end face upwards or downwards.

6. After inserting the rubber buffers, return the hold-down clamp and fasten it with screws.
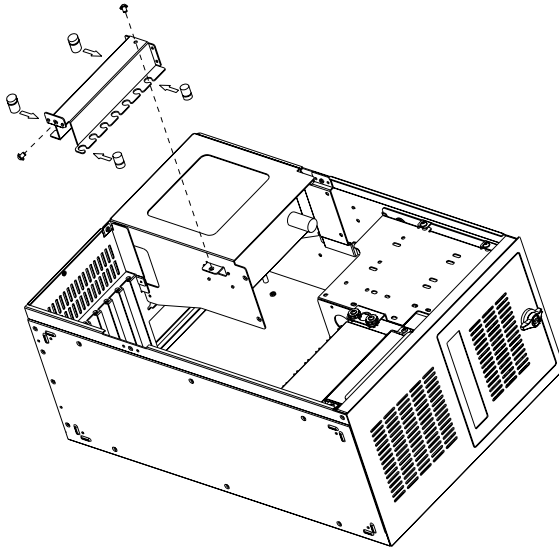
Figure 2-4 Hold-down clamp installation

2.5 Bi-directional mounting

Attached the IPC-7220 with two mounting brackets to the bottom or right side of the chassis (see Figure 2-5). These special mounting brackets allow you to mount the chassis onto most surfaces, such as wall, panel, work bench, underneath or on top of a desk or table.

153 [6.03]   153 [6.03]

230 [9.06]
215 [8.45]
200 [7.87]

350 [13.77]
334 [13.17]
320 [12.60]

480 [18.90]
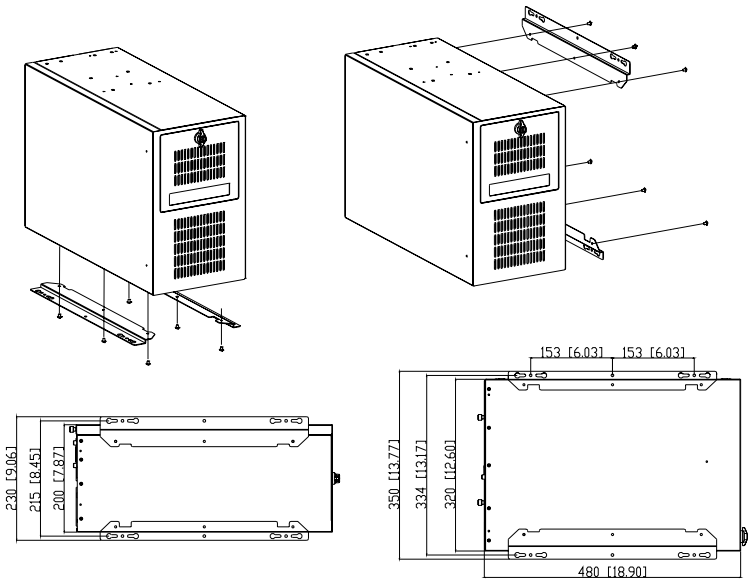
Unit: mm [inch]

Figure 2-5 Bottom and Right-side of mounting

Operation

Chapter 3   Operation

3.1 The Front Section of IPC-7220

3.1.1 Switches

Behind the drive bay door, three switches are used for system power on-off, system reset and alarm reset.

Power On-Off Switch: Use this switch to turn on/off the system power.

System Reset Switch: Press this switch to reinitialize the system.

Alarm Reset Switch: Press this switch to suppress or stop an audible alarm. Whenever a fault in the system occurs (e.g., fan failure or over high in-chassis temperature), an audible alarm is activated. Press this switch will cause the alarm to stop.

3.1.2 LED indicators

Below the drive bay, four LEDs are placed to indicate the system health. Please refer to Table 3-1 for the LED summary.

LED	Description	Green/Orange	Red
PWR	System Power	Normal	Abnormal
FAN	Cooling Fan Status	Normal	Abnormal
TEMP	In-chassis Temperature	Normal	Abnormal
HDD	Hard Drive Disk Activity	Data Access	No light

Table 3-1 System status LED summary

If the system is connected with a single PS/2 power supply (e.g., PS-300ATX-ZB), the **PWR LED** is always Green when power on.

When the **PWR LED** is RED, it indicates a redundant power supply (e.g., RPS-300ATX-Z) failure. To stop the alarm buzzer, press the **Alarm Reset** button. Then, check out the redundant power supply right away and replace the failed power supply module with a good one.

When the **FAN LED** is RED and blinking, it indicates a failed cooling fan, and the alarm buzzer is also activated. To stop the alarm buzzer,

press the **Alarm Reset** button, then replace the failed fan immediately.

If the **TEMP LED** is RED and blinking, it means that the system detects over high temperature in the chassis. An audible alarm is activated. To stop the alarm buzzer, press the **Alarm Reset** button. Inspect the fan filter and the rear section of the chassis immediately. Make sure airflow inside the chassis is smooth and not blocked by dust or other particles.

3.2 Replacing the fan

There is one fan below the drive bay of IPC-7220. To change the fan, refer to Figure 3-1 and proceed as follows:

1. Un-plug the fan power connector.

2. Remove the two screws, which mount the fan bracket to the chassis and lift it with two fingers.

3. Remove the four screws, which mount the fan to the fan bracket then take out the fan.

4. Place a new fan on the fan bracket, then fasten them with four screws.

5. Slide the fan bracket back to the chassis and fasten it with two screws.

6. Plug in the fan power connector.
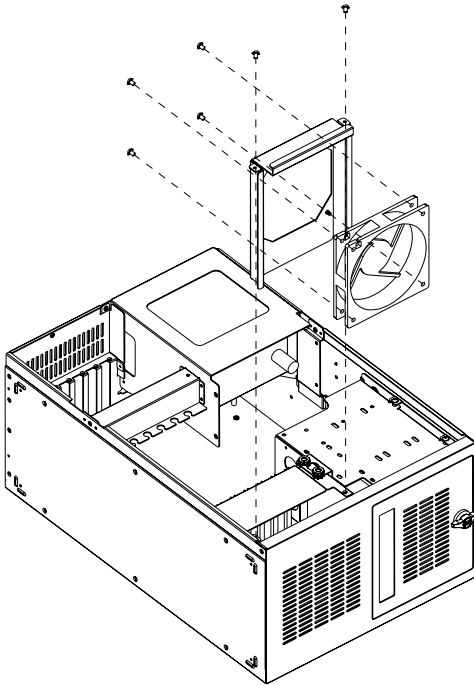
Figure 3-1 Changing the fan

3.3 Replacing the filters

There are two filters in the IPC-7220, one in front of the fan and the other in the drive bay door. To change the filters, located at the front end of the chassis, and proceed as follows:

3.3.1 Replacing the filter in the drive bay door

1. Open the drive bay door.

2. Refer to Figure 3-2. Remove the filter inside the tray of the drive bay door, and replace it with a new one.

3. Close the drive bay door

3.3.2 Replacing the filter in front of the fan

1. Open the drive bay door.

2. Refer to Figure 3-2 and lift the filter holder with two fingers.

3. Remove the filter and replace it with a new one.

4. Slide back the filter holder and close the drive door.
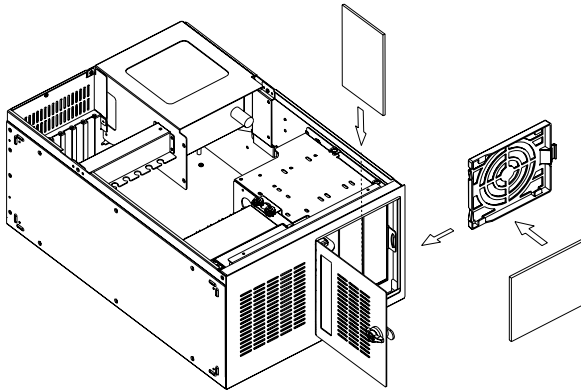
Figure 3-2 Changing the filters

3.4 Replacing the power supply

IPC-7220 supports both 300W PS/2 and 300W redundant power supply. To change the power supply, refer to Figure 3-3 and proceed as follows:

1. Un-plug the AC inlet from the power supply of IPC-7220.

2. Remove the cover of IPC-7220.

3. Remove three screws, which mount the power supply bracket to the chassis, then lift the power supply bracket.

4. Unplug the ATX power connector and +12V power connector from the motherboard, the floppy drive power connector from the floppy drive disk, and the peripheral power connector(s) from the hard drive disk(s).

5. Remove the four screws which mount the power supply to the power supply bracket, then take out the power supply.

6. Place a new power supply into the power supply bracket and fasten it with four screws.

7. Plug the ATX power connector and +12V power connector to the motherboard, also the floppy drive power connector and the peripheral power connector(s) to the proper drive disks.

8. Return the power supply bracket and fasten it.

9. Return the cover of IPC-7220 and plug in the AC inlet.

Floppy Drive Power Connector
+12V Power Connector
Peripheral Power Connector
ATX Power Connector
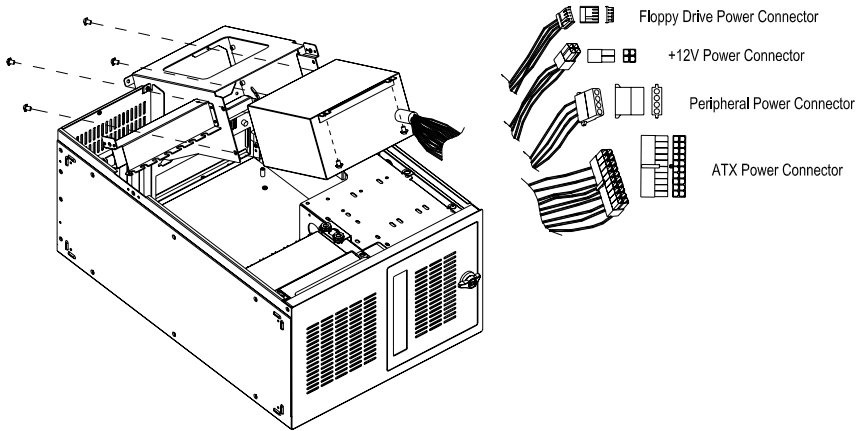
Figure 3-3 Changing the power supply

Alarm Board

Chapter 4   Alarm Board

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

> a.   Any power supply module of redundant power supply fails
>
> b.   One of the cooling fans fai1s
>
> c.   Temperature inside the chassis rises
>
> d.   A problem occurs in one of the backplane voltage levels

The detailed layout and specification of the alarm board are as follows:

4.1   Alarm Board Layout
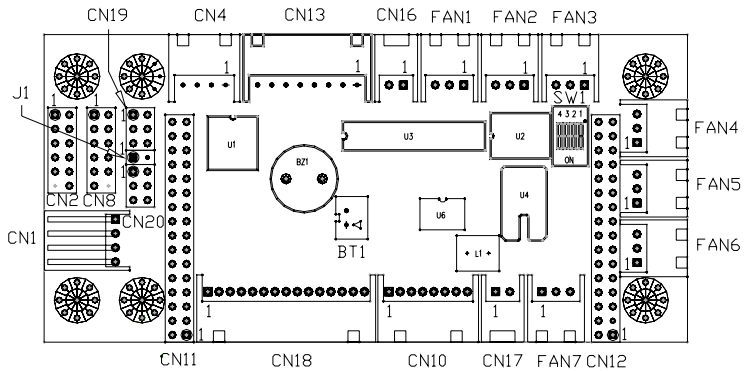
Figure 4-1 Alarm board layout

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 way)
  - ➢ One power good input
  - ➢ One alarm reset input.
  - ➢ One voltage signal connector (connect from back plane, includes ±12V, ±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 Definitions:**

Table 4-1 Pin Definitions

CN1: External Power Connector, stander mini 4 Pin power connector			
Pin 1	+12V, 2A current maximum	Pin 2	GND
Pin 3	GND	Pin 4	+5V, 2A current maximum
CN2: 10/100M LAN Connector			
Pin 1	SPLED	Pin 2	TERMPLANE
Pin 3	RX+	Pin 4	RX-
Pin 5	GND	Pin 6	LVCC
Pin 7	TX+	Pin 8	TX-
Pin 9	LILED	Pin 10	TERMPLANE

Pin 11	N/A	Pin 12	NC
CN4: I^{2}C Sensor board (LM75) Connector			
Pin 1	+5V	Pin 2	Sensor board I^{2}C bus clock
Pin 3	Sensor board I^{2}C bus data	Pin 4	GND
CN8: RS-232 Connector			
Pin 1	DCD	Pin 2	RX
Pin 3	TX	Pin 4	DTR
Pin 5	GND	Pin 6	DSR
Pin 7	RTS	Pin 8	CTS
Pin 9	RI	Pin 10	NC
Pin 11	NC	Pin 12	N/A
CN10: LCM Display Board Connector			
Pin 1	LCM I2C bus data	Pin 2	LCM I2C bus clock
Pin 3	+12V	Pin 4	GND
Pin 5	+5V	Pin 6	+5V
Pin 7	Diagnostic LED	Pin 8	GND
CN11: SNMP-1000 Daughter Board Connector (Left side)			
Pin 1	SIN	Pin 2	SOUT
Pin 3	CTS#	Pin 4	DCD#
Pin 5	RTS#	Pin 6	DTR#
Pin 7	DSR#	Pin 8	ID 0
Pin 9	ATX ON	Pin 10	DO 4
Pin 11	GND	Pin 12	DO 3
Pin 13	Watchdog IN	Pin 14	DO 2
Pin 15	Watchdog OUT	Pin 16	DO 1
Pin 17	SPLED	Pin 18	NC
Pin 19	LILED	Pin 20	NC
Pin 21	GND	Pin 22	NC
Pin 23	TX+	Pin 24	NC
Pin 25	TX-	Pin 26	NC
Pin 27	RX+	Pin 28	NC
Pin 29	RX-	Pin 30	NC
Pin 31	TERMPLANE	Pin 32	NC
CN12: SNMP-1000 Daughter Board Connector (Right side)			
Pin 1	NC	Pin 2	NC
Pin 3	Power Good A	Pin 4	NC

Pin 5	NC	Pin 6	NC
Pin 7	Diagnostic LED	Pin 8	FAN 1
Pin 9	GND	Pin 10	FAN 2
Pin 11	GND	Pin 12	FAN 3
Pin 13	VCC	Pin 14	FAN 4
Pin 15	VCC	Pin 16	FAN 5
Pin 17	VCC	Pin 18	FAN 6
Pin 19	BEEP	Pin 20	FAN 7
Pin 21	5VSB	Pin 22	NC
Pin 23	-5V	Pin 24	NC
Pin 25	+5V	Pin 26	B_SCLK
Pin 27	+3.3V	Pin 28	B_SDAT
Pin 29	-12V	Pin 30	T_SCLK
Pin 31	+12V	Pin 32	T_SDAT

CN13: Voltage Detect Input Connector

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

CN16: 4 bit Power Good Input

Pin 1	Power Good A	Pin 2	GND

CN18: LED Board Connector

Pin 1	GND	Pin 2	+5V Signal
Pin 3	+12V Signal	Pin 4	-5V Signal
Pin 5	-12V Signal	Pin 6	HDD Signal
Pin 7	Power Good Signal	Pin 8	Power Fail Signal
Pin 9	Temperature Good Signal	Pin 10	Temperature Fail Signal
Pin 11	FAN Good Signal	Pin 12	FAN Fail Signal
Pin 13	NC	Pin 14	+3.3V Signal
Pin 15	5VSB Signal		

CN19: Connector bank from CPU card

Pin 1	HDD LED Signal	Pin 2	ATX soft power switch
Pin 3	I2C CLK	Pin 4	ATX soft power switch (-)
Pin 5	I2C DATA	Pin 6	System Reset Signal

CN20: Connector bank to Chassis			
Pin 1	ATX Momentary switch	Pin 2	ATX Momentary switch (-)
Pin 3	GND	Pin 4	System Reset Signal
Pin 5	Watchdog IN	Pin 6	Watchdog OUT
J1: External Speaker			
Pin 1	Buzzer	Pin 2	+5V

4.3   Switch Settings

4.3.1 FAN Number Setting

Table 4-2 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

4.3.2 Thermal Board Temperature Setting

Table 4-3 Thermal Board Temperature 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

4.4   Thermal Sensor

There is one temperature sensor inside the chassis, See Figure 4-1.to find the location.

When the temperature rises, the temperature sensor sends a signal to the alarm board and a continuous alarm will sound.   To stop the alarm, press the Alarm Reset Switch on the Front Panel.
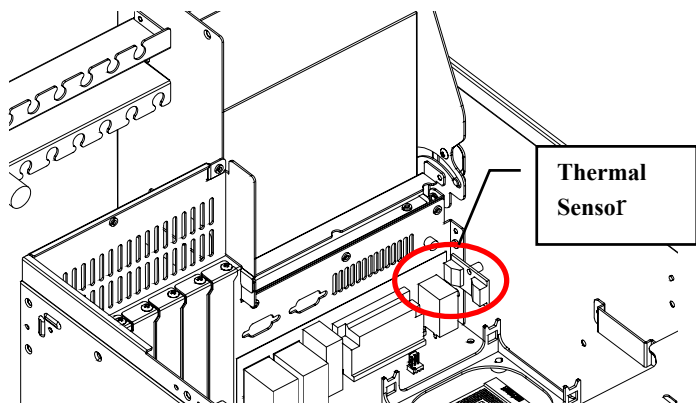

Figure 4-2 Thermal sensor
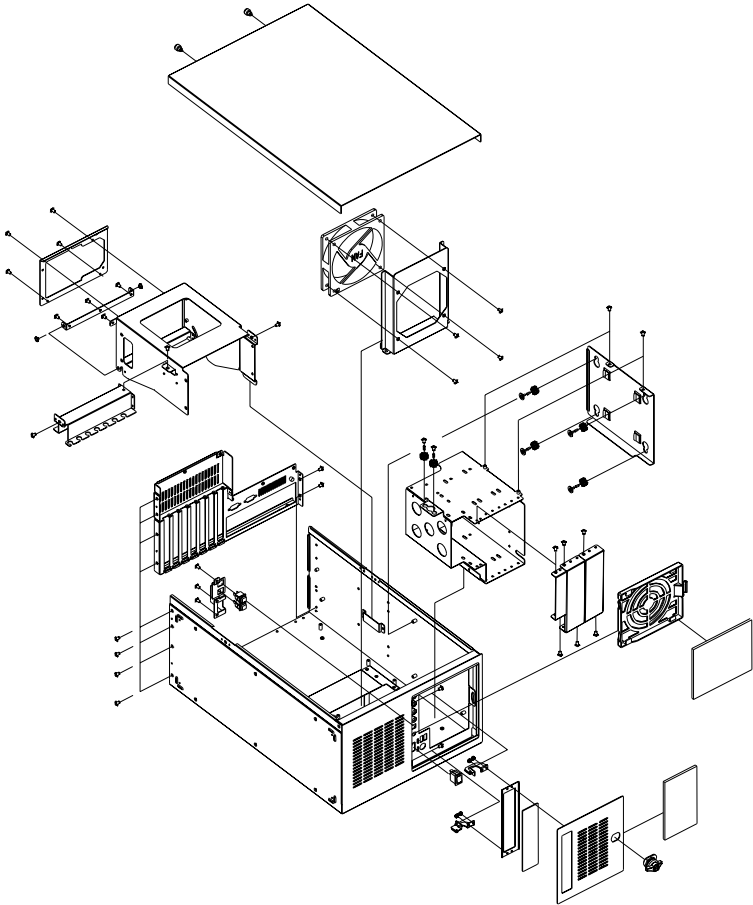
Exploded Diagram

Appendix A   Exploded Diagram

Figure A-1 Exploded Diagram

Optional Backplanes

Appendix B   Optional Backplanes

IPC-7220BP is an extension model of IPC-7220, which supports an 8-slot backplane.

B.1 Passive Backplane Options

Table B-1 Passive Backplane Options

Model Name	Segment	Slots Per Segment			
		PICMG	PICMG/PCI	PCI	ISA
PCA-6108E-0C1	1	-	-	-	8
PCA-6108P4-C	1	1	1	3	3
PCA-6108P6-0B3	1	1	1	5	1
PCA-6108P6X-0A1	1	2	-	6	-
PCA-6108P8-0A1	1	-	-	8	-

Please contact Advantech local sales representative for detailed backplane information.

B.2 Installation of IPC-7220BP

Most components and parts of IPC-7220BP are shared with IPC-7220 chassis. If you intend to transfer IPC-7220 into IPC-7220BP, please refer to Figure B-1 for installing the non-shared components.
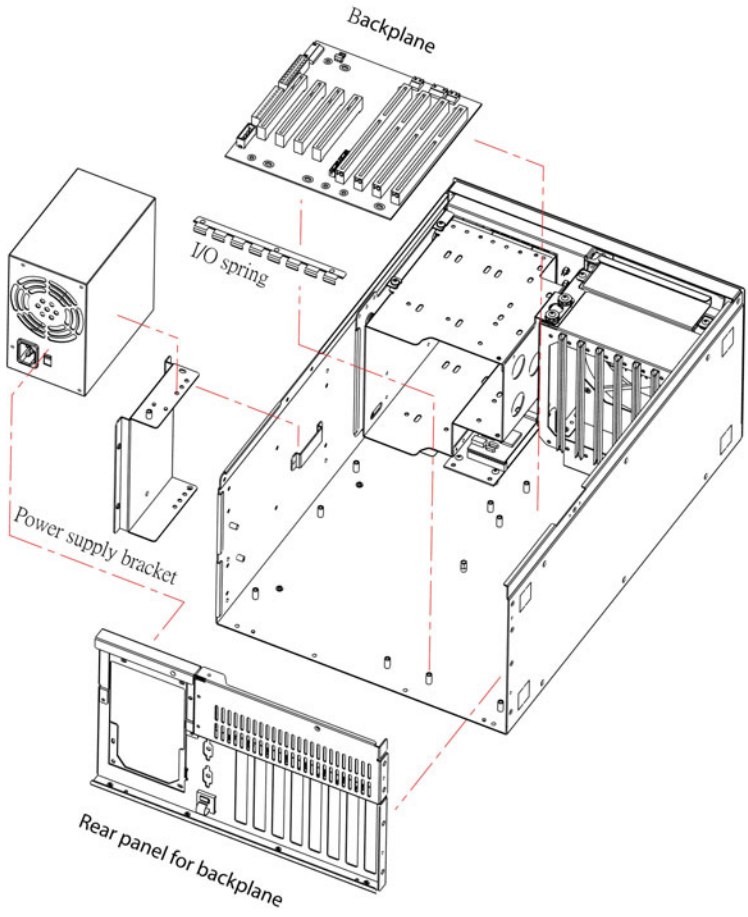
Backplane

I/O spring

Power supply bracket

Rear panel for backplane

Figure B-1: Installing of IPC-7220BP

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.1   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:

15. Netzkabel oder Netzstecker sind beschädigt.

16. Flüssigkeit ist in das Gerät eingedrungen.

17. Das Gerät war Feuchtigkeit ausgesetzt.

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

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

20. Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

21. 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.

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