

ATM-4023

**4U Height, 19" Rackmount
Industrial Chassis
with 6.4" LCD Display**

User Manual

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This manual covers the following models:

ATM-4023H0-25Z, ATM-4023H8-25Z, ATM-4023H8-A1, ATM-4023H8-A2, ATM-4023H0-B1, ATM-4023H0-B2 model numbers, and ATM-4023H0-XXXX and ATM-4023H8-XXXX extension model numbers.

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Product Warranty (1 year)

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

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

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

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

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise 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.

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

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

警告使用者

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Technical Support and Assistance

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

Packing List

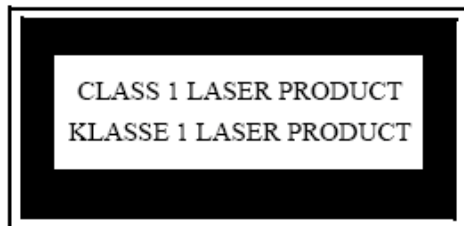
Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

1. One ATM-4023 industrial workstation with 6.4" flat panel display
2. One accessory box, including:
 - One HMI manual and drivers CD-ROM
 - Cardboard Warranty
 - Flat gray cable for 3.5. HDD and slim CD-ROM
 - Two piece slim CD-ROM holders.
 - HDD chassis bracket
 - Rack Mounting Bracket (L, R)
 - Four rubber clamp pads that are attached to hold-on clamp
 - 4 x M3*5 screw (black)
 - 2 x M3*5 screw
 - 4 x M2*4 screw
 - 4 x M6-32*6.2 screw

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User's Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - 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 user's manual.
 - e. The equipment has been dropped and damaged.
 - f. The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.



17. This product meets the IEC 60826 safety standard
18. Before you install the computer, make sure the Green/Yellow wires have a reliable connection between the metal parts of the computer and the system's grounding terminal.

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

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

Wichtige Sicherheitshinweise

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 AnschluBw-erte.
9. Verlegen Sie die NetzanschluBleitung 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 autorisiertem 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. **VORSICHT:** Explosionsgefahr bei unsachgemäßen Austausch der Batterie. Ersatz nur durch denselben oder einem vom Hersteller empfohlene-mähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.
16. **ACHTUNG:** Es besteht die Explosionsgefahr, falls die Batterie auf nicht fach-männische Weise gewechselt wird. Verfangen Sie die Batterie nur gleicher oder entsprechender Type, wie vom Hersteller empfohlen. Entsorgen Sie Batterien nach Anweisung des Herstellers.

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

Haftungsausschluss: Die Bedienungsanleitungen wurden entsprechend der IEC-704-1 erstellt. Advantech lehnt jegliche Verantwortung für die Richtigkeit der in diesem Zusammenhang getätigten Aussagen ab.

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General Information

This chapter introduces ATM-4023 and its usage.

Sections include:

- Introduction
- General Specifications
- Passive Backplane Options
- CPU Card Options
- System Regulation
- Dimensions

Chapter 1 General Information

1.1 Introduction

The ATM-4023 IA Master series is based on a 4U high, 19” rack-mount industrial workstation with a 6.4" VGA color TFT LCD display and 8 expansion slots, as well as an optional CD-ROM drawer available upon request. It is designed as all-in-one and cost-effective enhanced solution for both traditional Industrial PC use and new industrial automation control.

The ATM-4023 Rack-mount IA Master unit includes an 8-slot expansion passive-backplane, with either 8 PCI slots or 8 ISA slots, and a 250 W power supply. Its front wiring design is suitable for various application requirements. It is equipped with front accessible USB ports for easy USB device installation, a PS/2 interface for an external keyboard and mouse, an optional slim type CD-ROM drawer for easy maintenance or upgrade, front panel OSD control including LCD backlight, an On/Off switch, and a 640X480 resolution 6.4" TFT LCD screen for information displays such as charts, graphs, control panel, programming code, production data or field monitoring records.

ATM-4023 is intended as an automation testing platform for test and measurement equipment, transportation control stations, and industrial control stations.

A wide range of standard computing peripherals from the current Advantech IPC family can be integrated with the ATM-4023 series to meet application requirements in industrial environments.

1.2 General Specifications

Physical

- **Housing:** Heavy duty steel chassis
- **Paint Color:** Pantone 4C 2X Black, textured
- **Dimensions:** 482(W) x 173(H) x 266(D) mm (19" x 6.9" x 10.5")
- **Weight:** 12 kg (326.4 lb)

LCD Display

- 6.4" Color TFT LCD Panel
- 640 x 480 VGA Resolution
- Brightness: 300 nits

Power Supply: AC Input 100-240 V, 60-50 Hz, 6-3 A

Add-on Card Length: Half Size

Hard Drive Bay:

- 1 x Front accessible slim-type CD-ROM Drawer (option)
- 2 x 3.5" HDD

I/O Connectors:

- 2 x Front accessible USB ports
- 1 x 6-pin PS/2 keyboard in front panel
- 1 x 6-pin PS/2 mouse in front panel
- 1 x Power On/Off button in front panel
- 1 x Reset button in front panel

OSD Control: On/Off, Menu, Select, Auto, Right, Left (Front Panel)

LED Indicators: 1 x Power System, and 1 x HDD data accessing

Environment:

- **Cooling System:** 61.8 CFM/each cooling fan
- **Operating Temperature:** 0 ~ 50° C (32 ~ 122° F)
- **Relative Humidity:** 10 ~ 95% @ 40°C, non-condensing
- **Operating Vibration:** 5-500 Hz, 0.5 G ram, each of 3 axes
- **Altitude:** 0 ~ 3048 m (0 to 10,000 ft)
- **Safety Certifications:** CE, UL/cUL, FCC, CCC

1.3 Passive Backplane Options

PCA-6108E (rev.C1): 8 Slot PC-Bus (8 ISA) Passive Backplane

PCA-6108P8 (rev.A1):8 Slot PC-Bus (8 PCI) Passive Backplane

1.4 CPU Card Options

PCI-6872F-00A1: PIII Graded, PCI Socket 370 Slot PC

PCI-6870F-00A1: PIII Graded, PCI Socket370 815E Slot

PCA-6774F-02A1: PIII Graded, ISA Socket 370 Slot PC

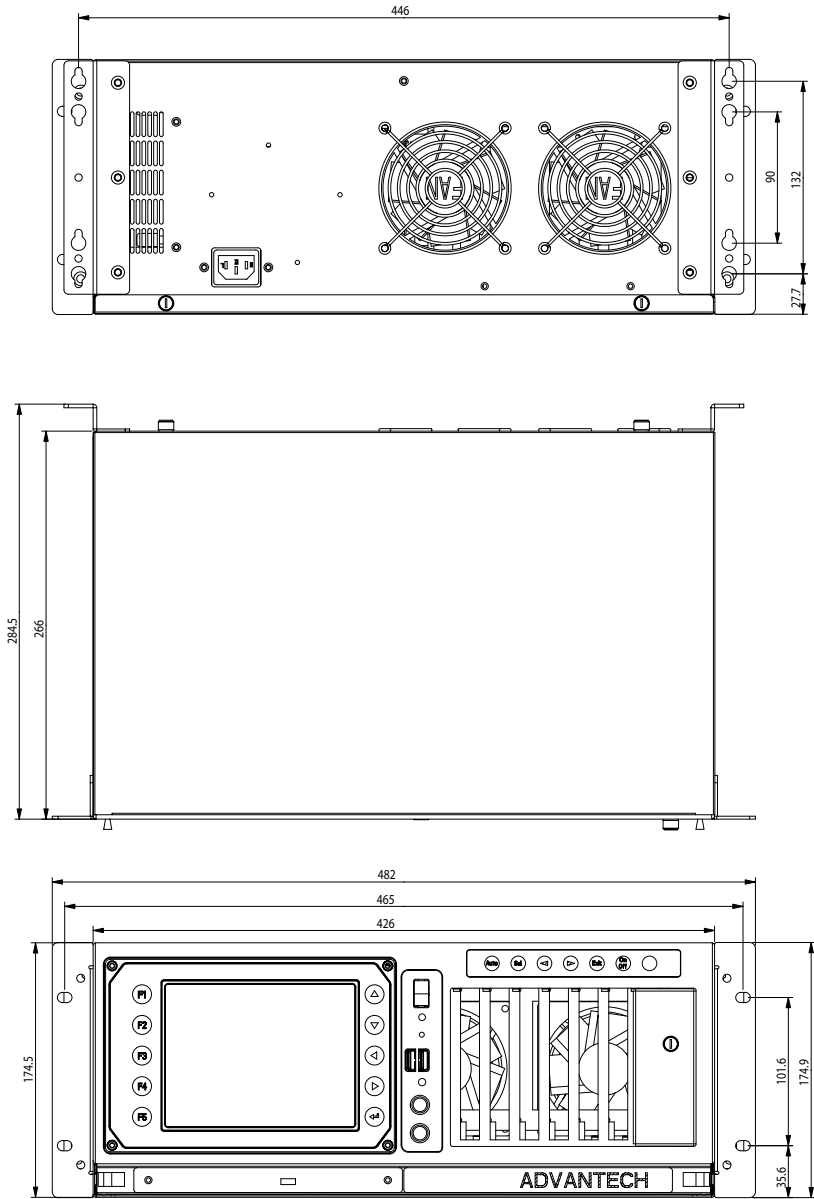
PCA-6751-F0B2: P 266, ISA 586 Slot PC

Part Number	CPU	Slot	RAM (MB)	VGA	LAN	USB	CFC	PC-104
PCI-6872F-00A1	PIII 1.26GHz	PCI	512	Y	Y	Y	Y	--
PCI-6870F-00A1	PIII/Celeron up to 1.2/1.26GHz	PCI	512	Y	Y	Y	Y	--
PCA-6774F-02A1	PIII 1.26GHz	ISA	512	Y	x 2	Y	Y	--
PCA-6751-F0B2	On board Pentium® MMX, 266MHz	ISA	256	Y	Y	Y	Y	Y

1.5 System Regulation

Model No.	Description
ATM-4023H0-2Z	8 ISA slot Industrial Automation platform with 6.4" LCD /4U /Half Size/Front Wiring/ PCA-6108E (rev.C1) / 250W
ATM-4023H8-2Z	8 PCI slot Industrial Automation platform with 6.4" LCD /4U /Half Size/Front Wiring/ PCA-6108P8 (rev.A1) / 250W
ATM-4023H8-A1	8 PCI slot Industrial Automation platform with 6.4" LCD /4U /Half Size/Front Wiring/ PCA-6108P8 (rev.A1) / PCI-6872F-00A1(PIII) / 250W
ATM-4023H8-A2	8 PCI slot Industrial Automation platform with 6.4" LCD /4U /Half Size/Front Wiring/ PCA-6108P8 (rev.A1) / PCI-6870F-00A1(PIII) / 250W
ATM-4023H0-B1	8 ISA slot Industrial Automation platform with 6.4" LCD /4U /Half Size/Front Wiring/ PCA-6108E (rev.C1) / PCA-6774F-02A1(PIII) / 250W
ATM-4023H0-B2	8 ISA slot Industrial Automation platform with 6.4" LCD /4U /Half Size/Front Wiring/ PCA-6108E (rev.C1) / PCA-6751-F0B2 (P266) / 250W

1.6 Dimensions



System Setup

This chapter shows how to setup your card and install accessories.

Sections include:

- System Installation
- Backplane
- Cooling Fans
- Installing CPU Cards

Chapter 2 System Setup

2.1 System Installation

Warning Before starting the installation process, be sure to shut down all power from the chassis. Do this by turning off the power switch, and unplugging the power cord from the power outlet. If in doubt, consult with an experienced technician.

2.1.1 Attaching the Handles

The handles for the front panel are in the accessory box. To install the handles, secure them to the front panel with the provided screws.

2.1.2 Removing the Top Cover and Backplane Holder

1. First, remove the chassis cover. The top cover is fixed to the chassis by two thumbscrews.
2. Release two thumbscrews on the rear upper location of the chassis.
3. Lift the cover.



Figure 2.1: Top Cover

2.1.3 Chassis Front and Rear Sections

Facing the front of the ATM-4023, you will find a 6.4" TFT display module that has five control keys on either side of the LCD screen. On the right, there is a cover for the cable wiring. There is also an optional slim-type CD-ROM drawer under the chassis. The front panel interface is used for system reset, power, USB port. There are also LED indicators for power, HDD data access, external keyboard/mouse, and OSD controls. Please refer to Figure 2.2.



Figure 2.2: Front View



Figure 2.3: Front Wiring

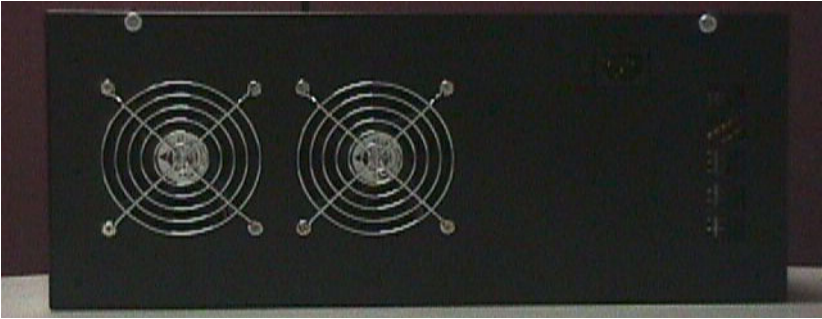


Figure 2.4: Rear View

2.1.4 I/O Interface

- **Power On/Off Switch:** Use this switch to turn on/off the system power.
- **System Reset:** Press this switch to reinitialize the system. This switch functions like a hardware reset button.
- **Power LED Indicator:** This light is on while the power is turned on.
- **HDD LED Indicator:** This light is on when the HDD is accessing data.
- **USB ports:** Use this port to connect any USB interface device to the system.
- **KB/MS IN:** Integrated PS/2 type 6-pin keyboard and mouse port.
- **OSD Controls:** LCD backlight On/Off, Menu, Select, Right, Left, Up, Down.

2.1.5 Drive Bay Installation

The Standard Drive Bay of the ATM-4023 can hold one 3.5" device.

To install a disk drive:

- a. Remove the top cover
- b. Loosen the four screws of HDD bracket and take off the bracket
- c. Insert the HDD in the bracket and secure it with the screws provided.
- d. Insert the HDD into its proper location and secure the holding bracket with the screws.
- e. Connect the disk drive power and signal cables to the HDD

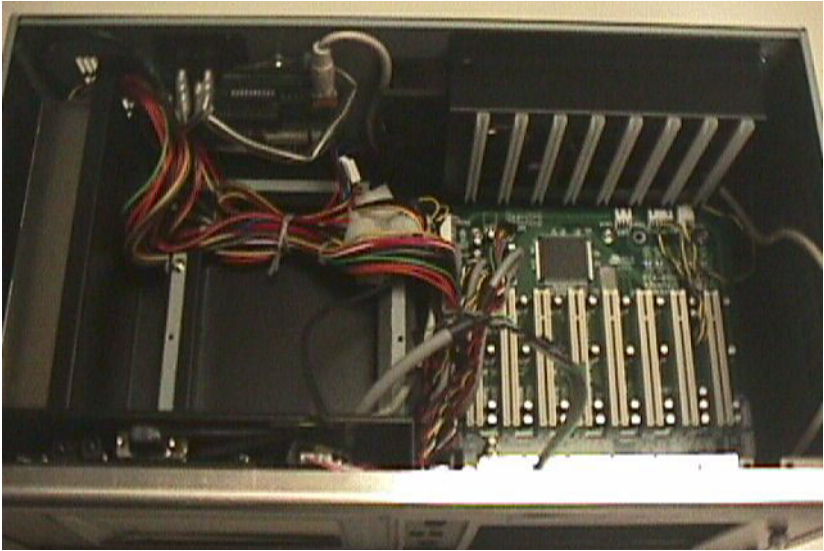


Figure 2.5: HDD Drive Bay



Figure 2.6: HDD Holding Bracket

2.1.6 Optional Slim CD-ROM Installation

ATM-4023 comes with an optional CD-ROM drawer that is located on the bottom of the chassis. The slim type CD-ROM drawer is integrated with the chassis with slide rails on both sides. The user-friendly CD-ROM drawer can be released from the chassis by pressing the two latches on both sides of the drawer. Refer the figure 2-7 to find out the location.



Figure 2.7: Place for CD-ROM Drawer

2.2 Backplane

Please refer figure 2.8 to find a suitable cable connection for a backplane

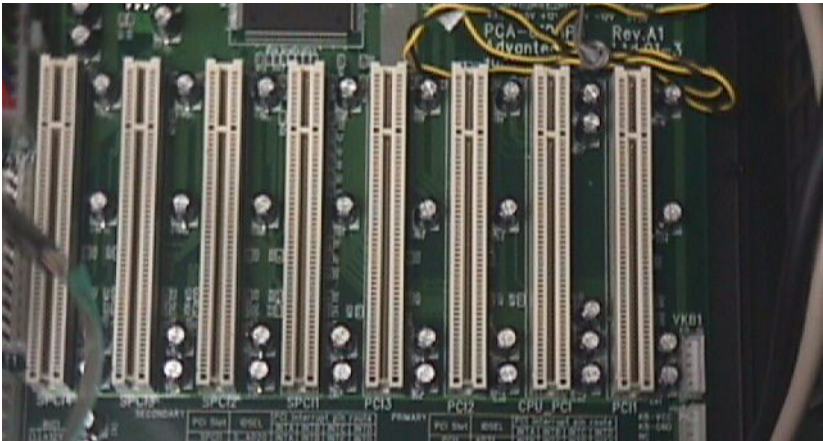


Figure 2.8: Backplane

2.3 Cooling Fans

There are two (2) cooling fans located inside the chassis. The cooling fans are easy to maintain and provide adequate cooling to the system by drawing air into the chassis.

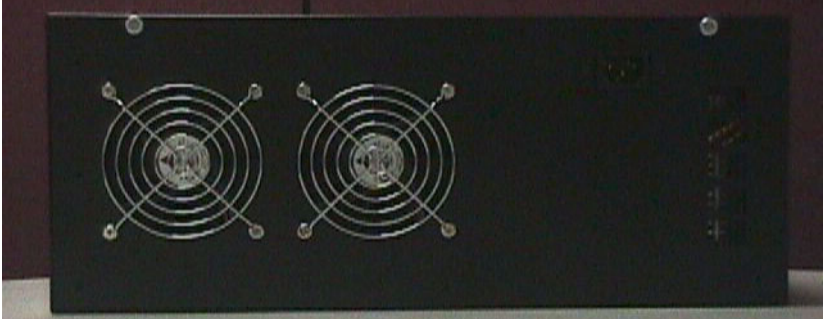


Figure 2.9: Cooling Fans

2.4 Installing CPU Cards

To install single board computers and other add-on boards:

1. Remove the chassis cover.
2. Take out the hold down clamp
3. Insert the SBC or add-on cards in a suitable location
4. Connect the cables to the CPU Card as instructed
5. Insert and tighten the screws to fix the card into position
6. Put back the top cover after fastening the hold down clamp

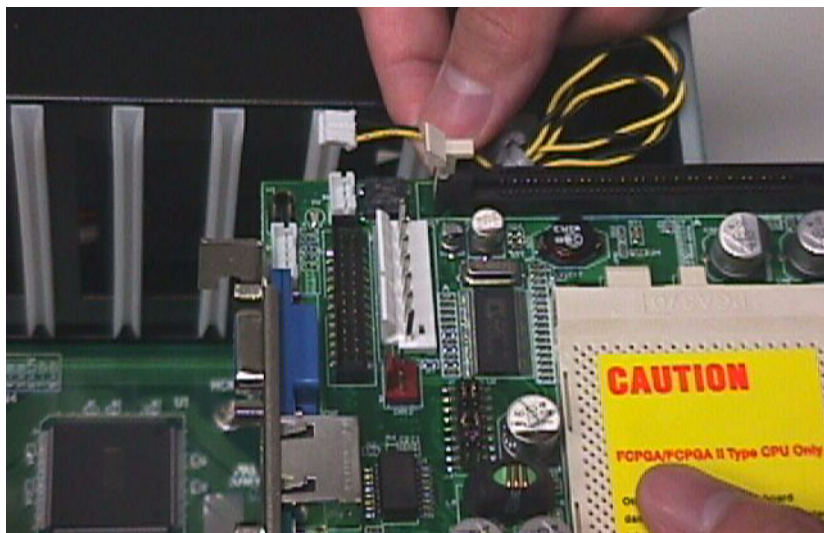


Figure 2.10: Connecting Cables for CPU Card

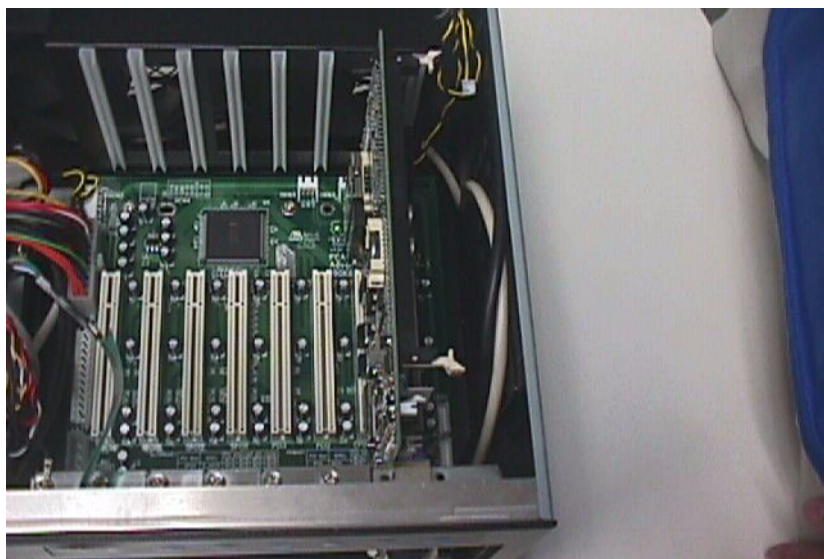


Figure 2.11: Inserted CPU Card

LCD Display Module and Accessories

This chapter provides details on the LCD Module and its accessories.

Sections include:

- LCD Module
- LCD Display Module Layout
- Indicator Board

Chapter 3 LCD Display Module and Accessories

3.1 LCD Module

Application

This product applies computer peripherals, industrial meters, image communication and multi-media.

Features

- Compatible with VGA-480, VGA-400, VGA-350 and free format
- Pixel in stripe configuration
- Slim and compact
- Display colors: 262,144 colors
- Image conversions: Up/down and left/right.
- Active area/outline area: 62.3%
- Viewing direction: 6 O'clock
- Backlight lamps are replaceable

3.1.1 Mechanical Specifications

Parameter	Specifications	Unit
Screen size	6.4 (diagonal)	Inch
Display Format	640 x R, G, B x 480	Dot
Active Area	129.6(H) x 97.44 (V)	mm
Dot Pitch	0.0675 (H) x 0.203 (V)	mm
Pixel Pitch	0.203 (H) x 0.203 (V)	mm
Pixel Configuration	Stripe	
Outline Dimensions	See mechanical drawing	mm
Weight	335	g

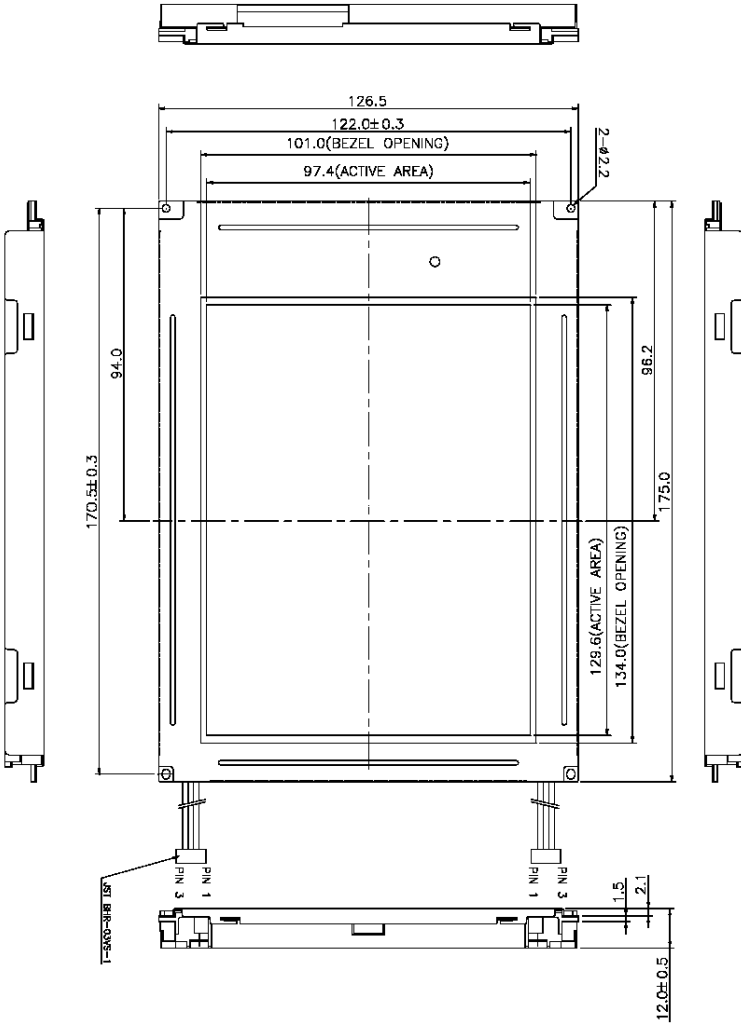


Figure 3.1: Mechanical Drawing of TFT LCD Module (part 1)

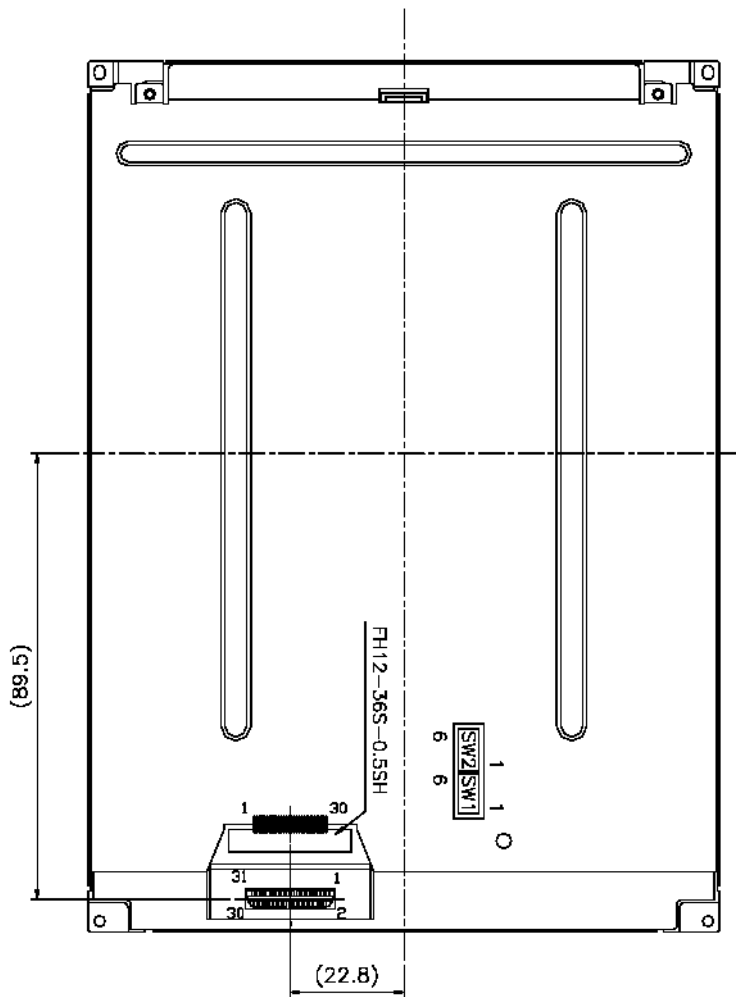


Figure 3.2: Mechanical Drawing of TFT LCD Module (part 2)

3.2 LCD Display Module Layout

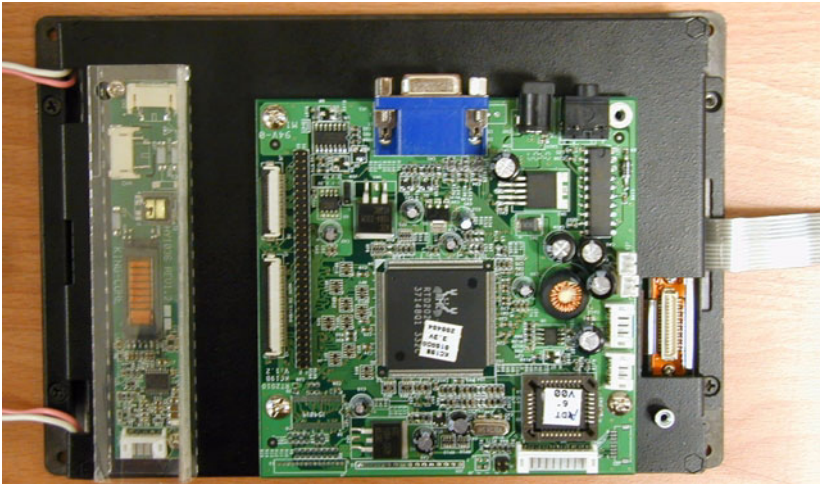


Figure 3.3: LCD Module (Rear)

3.3 Indicator Board

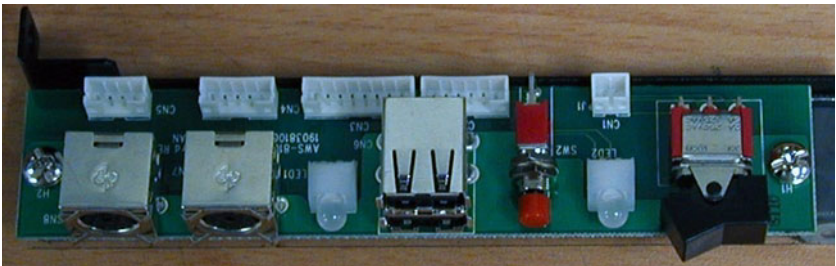


Figure 3.4: Indicator Board

APPENDIX
A

Backplane Layout

Appendix A Backplane Layout

A.1 Connectors

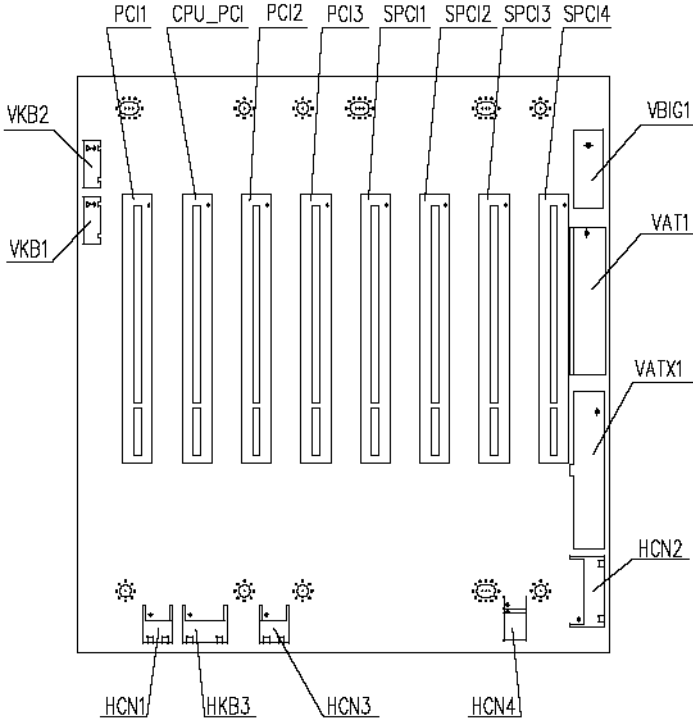


Figure A.1: PCA-6108P8-0A1: 8-slot Pure PCI backplane, 8 PCI, Rev.A101

Table A.1: Connector Descriptions

CPU_PCI(Master)	Half-size PCI connector CPU card PICMG PCI connector
PCI1~PCI3	32 bit PCI slot (Primary PCI Group)
SPCI1~ SPCI4	32 bit PCI slot (Secondary PCI Group)
VKB1	KB-In, from CPU card K/B connector
VKB2	KB-Out, 5 pin external K/B connector
HKB3	KB-Out, 5 pin external K/B connector
VBIG1	Big 4 Pin Power connector
VAT1	AT Power
VATX1	ATX Power
HCN1	PS-ON Function, to CPU card for ATX Power signal, 3 pin connector
HCN2	8 pin Alarm Board Power connector
HCN3	3 pin +5V and +12V Power connector
HCN4	3 pin +12V DC Fan connector (reserved)

A.2 Connector Pin Definitions

VAT1	
Pin	Name
1	NC
2	+5V
3	+12V
4	-12V
5	GND
6	GND
7	GND
8	GND
9	-5V
10	VCC
11	VCC
12	VCC

VKB1~VKB2,HKB3	
Pin	Name
1	KB_CLK
2	KB_DATA
3	NC
4	KB_GND
5	KB_VCC

VBI61	
Pin	Name
1	+12V
2	GND
3	GND
4	VCC

HCN1	
Pin	Name
1	PS-ON
2	GND
3	5VSB

HCN2	
Pin	Name
1	5VSB
2	GND
3	GND
4	-5V
5	+5V
6	+3.3V
7	-12V
8	+12V

HCN3	
Pin	Name
1	+12V
2	GND
3	VCC

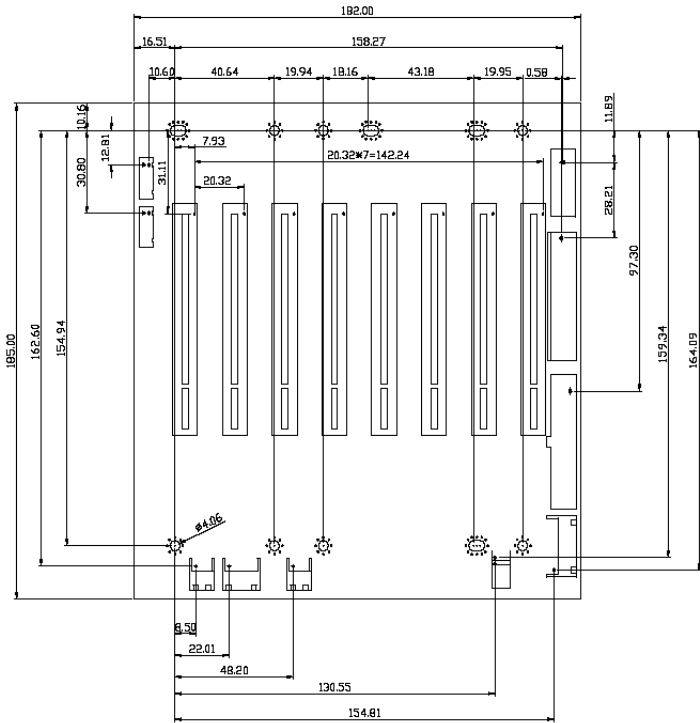
HCN4(Optional)	
Pin	Name
1	GND
2	+12V
3	NC

VATX1	
Pin	Name
1	+3.3V
2	+3.3V
3	GND
4	+5V
5	GND
6	+5V
7	GND
8	NC
9	5VSB
10	+12V
11	+3.3V
12	-12V
13	GND
14	PS-ON
15	GND
16	GND
17	GND
18	-5V
19	+5V
20	+5V

A.3 PCI Routing Table

PCI Slot	IDSEL	PCI interrupt pin route			
		INTA	INTB	INTC	INTD
PCI1	AD31	INTB	INTC	INTD	INTA
PCI2	AD30	INTC	INTD	INTA	INTB
PCI3	AD29	INTD	INTA	INTB	INTC
SPCI1	S_AD20	INTA	INTB	INTC	INTD
SPCI2	S_AD21	INTB	INTC	INTD	INTA
SPCI3	S_AD22	INTC	INTD	INTA	INTB
SPCI4	S_AD23	INTD	INTA	INTB	INTC

A.4 Mechanical Dimensions



A.5 Note

There is support for 3.3 V PCI cards when an ATX power supply is used.
No 3.3 V PCI cards are supported if an AT power supply is used.

