AP120-E1

P4 Pedestal Server/Workstation

800MHz Front Side Bus

User Guide

E1502

First Edition V1
March 2004

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Notices

Federal Communications Commission Statement

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- 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 B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING! The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

Safety information

Electrical Safety

- Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.
- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing any additional devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your dealer.

Operation Safety

- Any mechanical operation on this server/workstation must be conducted by certified or experienced engineers.
- Before operating the server/workstation, carefully read all the manuals included with the server/workstation package.
- Before using the server/workstation, make sure all cables are correctly connected and the power cables are not damaged. If any damage is detected, contact your dealer as soon as possible.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Place the server/workstation on a stable surface.

Caution!

This product is equipped with a three-wire power cable and plug for the user's safety. Use the power cable with a properly grounded electrical outlet to avoid electrical shock.

Safety information

Lithium-Ion Battery Warning

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

CD-ROM Drive Safety Warning

CLASS 1 LASER PRODUCT

- Electrical hazard, do not remove chassis cover.
- This equipment is to be serviced by a trained personnel only.

About this guide

Audience

This user guide is intended for system integrators, and experienced users with at least basic knowledge of configuring a server/workstation.

Contents

This guide contains the following parts:

1. **Chapter 1: Product Introduction**

   This chapter describes the general features of the AP120-E1 server/workstation. It includes sections on front panel and rear panel specifications.

2. **Chapter 2: Hardware setup**

   This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

3. **Chapter 3: Installation options**

   This chapter provides information on installing and/or removing optional system components.

4. **Appendix**

   This appendix lists the common problems that you may encounter while using the AP120-E1 server/workstation. It lists the possible causes of the problems and offers solutions. You may refer to this part and try to solve simple problems before calling customer support. The appendix also contains the power supply specification for your reference.

Conventions

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Information that you MUST follow to complete a task.

NOTE: Tips and information to aid in completing a task.

References

Refer to the following sources for additional information and for product and software updates.

1. **ASUS P4P800S-E motherboard user guide**

   This guide contains detailed information on the P4P800S-E motherboard.

2. **ASUS websites**

   The ASUS websites worldwide provide updated information on ASUS hardware and software products. See the ASUS contact information on the next page.

3. **Optional documentation**

   Your product package may include optional documentations such as CD-ROM manual, warranty flyers, and others that may have been added by your dealer. These documents are not part of the standard server/workstation package.

ASUS contact information

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Web site	www.asuscom.de/news

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Fax	+9714-283-1775
Web site	www.ASUSarabia.com

Chapter 1

This chapter describes the general features of the server/workstation. This part also describes the system front and rear panels, LED indications, and internal components.

Product introduction

1.1 System package contents

Check your ASUS AP120-E1 package for the following items.

1. ASUS AP120-E1 server/workstation including:
   - ASUS P4P800S-E motherboard
   - 250W power supply
   - Optical drive
   - Floppy disk drive
   - Chassis fan
2. AC power cord
3. System screws and labels
4. AP120-E1 support CD including drivers and utilities
5. Documentation
   - ASUS AP120-E1 user guide
   - ASUS P4P800S-E user guide
6. Optional items
   - CPU fan and heatsink assembly
   - Second hard disk drive cage with retention base and screws
   - Expansion card holder

Contact your dealer immediately if any of the items is damaged or missing.

1.2 System specification

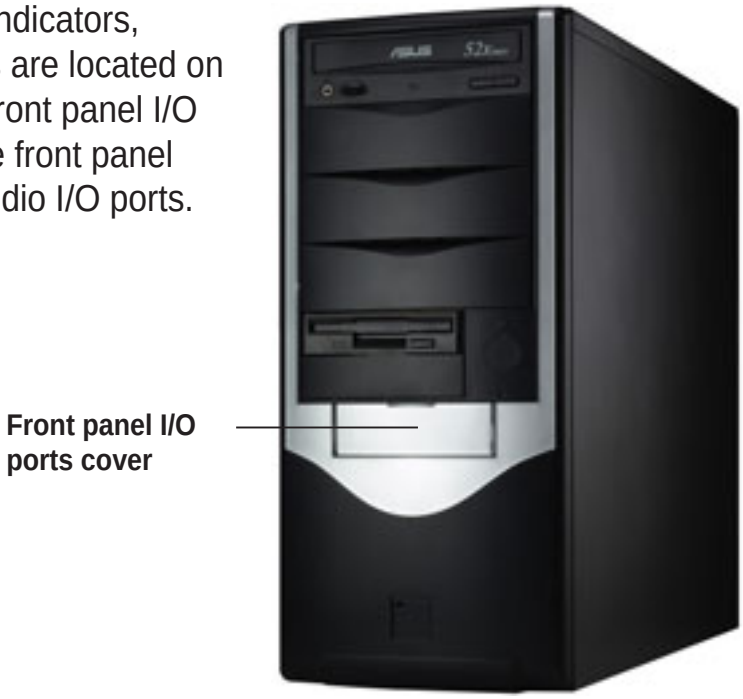
The ASUS AP120-E1 server/workstation is a stylish server/workstation system featuring the ASUS P4P800S-E motherboard. The server/workstation supports the Intel® Pentium® 4 processor in a 478-pin socket, and includes the latest I/O, LAN, and storage technologies through the chipsets embedded on the motherboard.

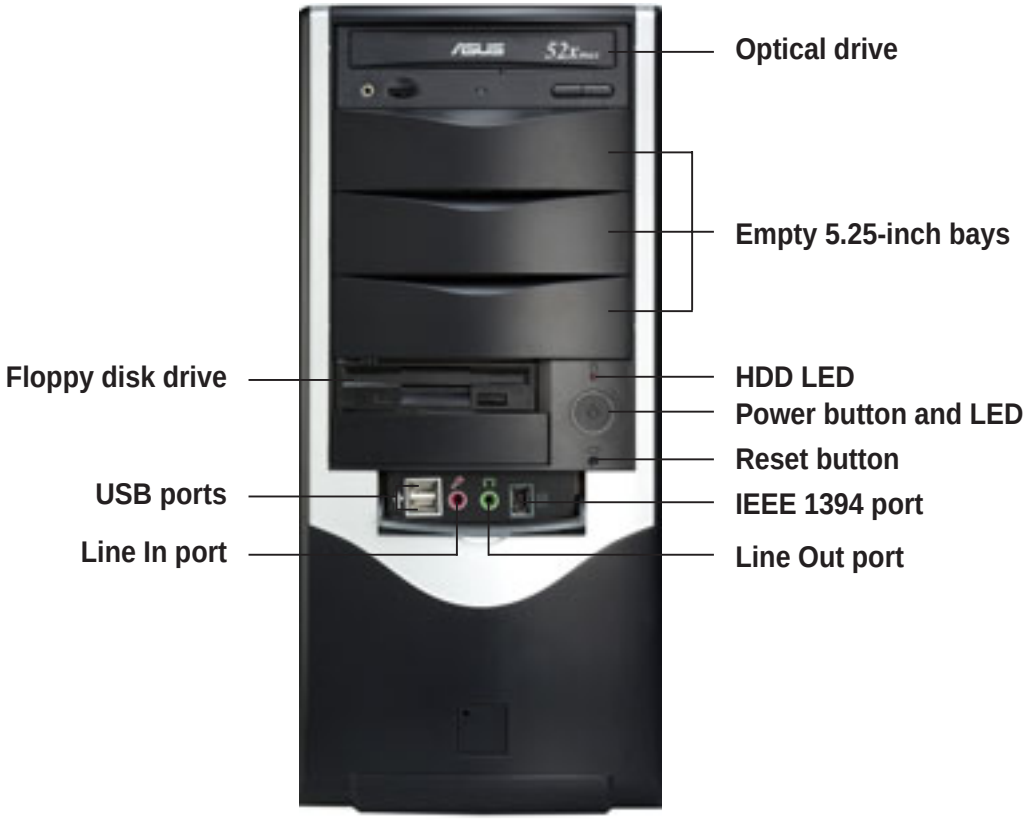
Chassis	Pedestal with front panel I/O ports
Motherboard	ASUS P4P800S-E (ATX form factor: 12in x 9.6in)
Chipset	Intel® 848P Memory Controller Hub (MCH) Intel® ICH5R
Memory	Supports three 184-pin DDR PC3200/27002100 unbuffered non-ECC DDR DIMMs for up to 2GB system memory
Processor	Supports Intel® Prescott processor with 800MHz front side bus
LAN	Intel® CSA 82547E1 1000 Gigabit Ethernet controller
Storage	2 x IDE connectors to support 4 UltraDMA100 devices 2 x Serial ATA connectors to support 2 serial ATA HDDs with RAID 0 and RAID1 function
Onboard I/O	PS/2 mouse/keyboard port, parallel port, serial port, S/PDIF out port, floppy disk drive connector, 3 x IDE connectors, 6 x USB ports (four in rear panel, two in front), LAN port, 2 x IEEE 1394 ports (one in front, one in rear), audio I/O ports
Expansion Slots	5 x PCI slots 1 x AGP slot 1 x Wi-Fi slot
Drive Bays	1 x 3.5-inch floppy disk drive bay 1 x 3.5-inch hard disk drive bay 4 x 5.25-inch optical drive bays
Chassis fan	9cm chassis fan
Hardware Monitors	Voltage, temperature, and fan speed monitoring
Power Supply	250W power supply with 20-pin ATX and 4-pin 12V plugs

1.3 Front panel features

The AP120-E1 chassis displays a black stylish front panel.

The power button, LED indicators, optical, and floppy drives are located on the front panel. Flip the front panel I/O ports cover to access the front panel USB, IEEE 1394, and audio I/O ports.





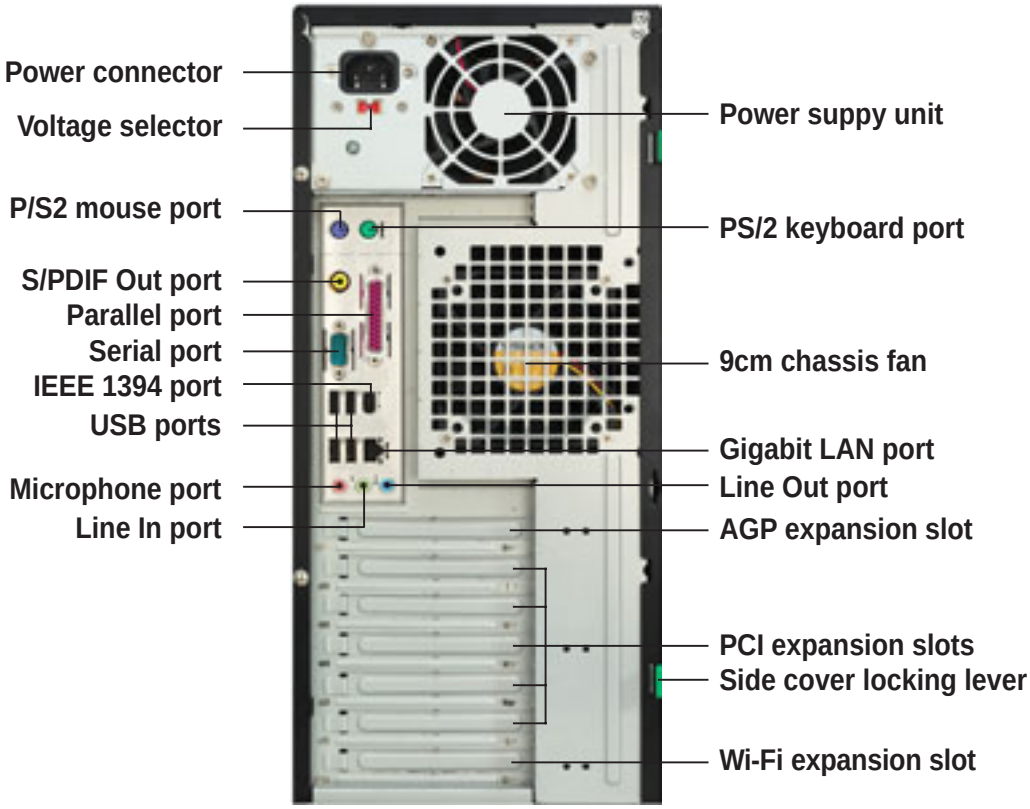
1.4 LED information

The AP120-E1 comes with two LED indicators. Refer to the picture for the LED location and the table below for LED description.

LED	Icon	Display	Description
Drive Activity LED		Blinking	Read/write data into the HDD
Power LED		ON Blinking	System power ON Suspend mode

1.5 Rear panel features

The rear panel includes a slot for the motherboard rear I/O ports, seven full-length expansion slots, chassis cover locks, a vent for the system fan, and the power supply unit.



1.6 Internal features

The AP120-E1 chassis includes the basic components as shown.

1. Power supply
2. 9cm chassis fan
3. CPU socket (under the CPU fan)
4. DDR DIMM sockets
5. IDE connectors
6. Optical drive
7. Empty 5.25-inch drive bays
8. FDD bay
9. Detachable HDD cage
10. Serial ATA connectors
11. ASUS P4P800S-E motherboard
12. AGP slot
13. PCI slots
14. Wi-Fi slot

The CPU fan and heatswink assembly and the hard disk drives are purchased separately.

Chapter 2

This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

Hardware setup

2.1 Preparation

Basic components to install

You need to install the following components to the AP120-E1 server/workstation.

1. Central processing unit (CPU)
2. Dual Inline Memory Module(s) (DIMMs)
3. Hard disk drive
4. 5.25-inch drive(s)
5. Expansion card(s)

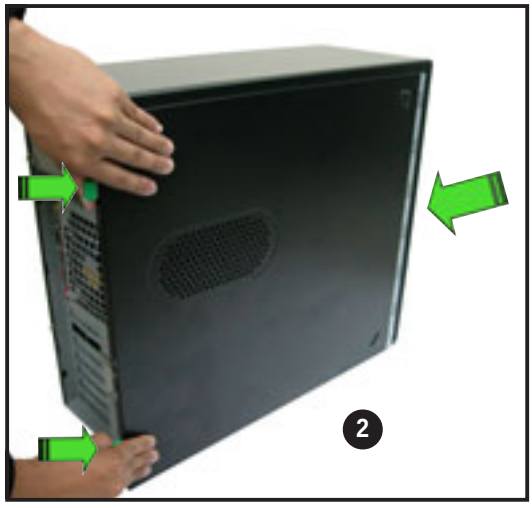
Tool

You need a Philips (cross) screw driver to install some system components.

2.2 Removing the side cover

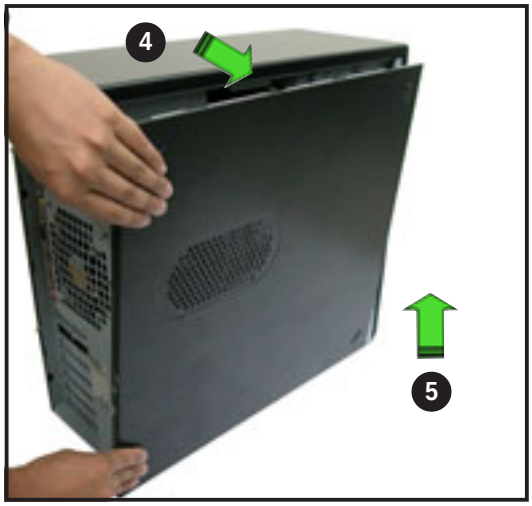
To remove the side cover:

1. Locate the two side cover locks.



2. Press the side cover locks outward, then pull the side cover toward the rear panel for about one-half inch.

4. Move the side cover to the direction of the arrow.
5. Lift the side cover, then set aside.



Viewing the internal structure

Without the side cover, the internal structure and installed components of the barebone server/workstation appear as shown in the following picture.

Perform the procedures in the succeeding sections to install the CPU, system memory, disk drives, and expansion cards.

2.3 Motherboard information

The AP120-E1 comes with the ASUS P4P800S-E motherboard that uses the ATX form factor measuring 12 inches x 9.6 inches (30.5 x 24.5 cm).

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause you physical injury and may damage motherboard components.

The motherboard is secured to the chassis by ten screws as indicated by circles in the illustration below.

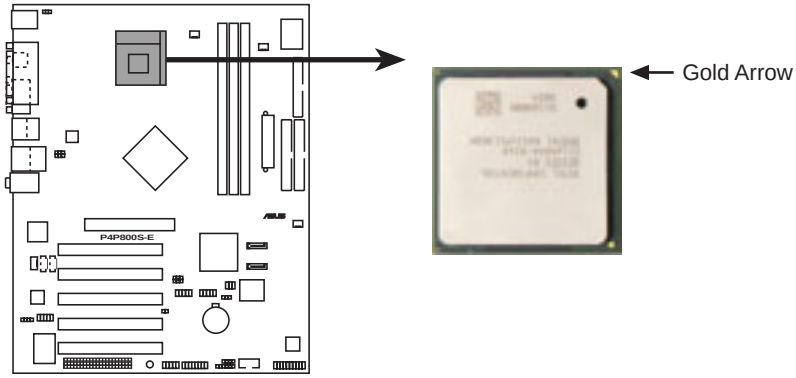
Refer to the motherboard user guide for detailed information on the motherboard.

2.4 Installing a Central Processing Unit (CPU)

2.4.1 Overview

The motherboard comes with a surface mount 478-pin Zero Insertion Force (ZIF) socket. The socket is designed for the Intel® Pentium® 4 Prescott processor in the 478-pin package with 512KB L2 cache. The motherboard supports 800/533/400MHz front side bus (FSB), and allows data transfer rates of up to 6.4GB/s.

Note in the illustration that the CPU has a gold triangular mark on one corner. This mark indicates the processor Pin 1 that should match a specific corner of the CPU socket.



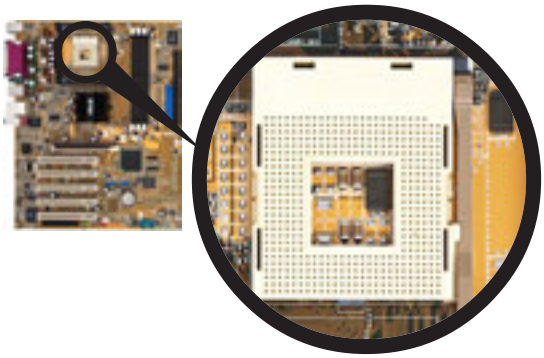
P4P800S-E Socket 478

Incorrect installation of the CPU into the socket may bend the pins and severely damage the CPU!

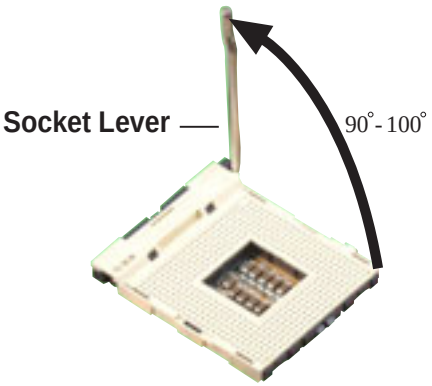
2.4.2 CPU installation

Follow these steps to install a CPU.

1. Locate the 478-pin ZIF socket on the motherboard.

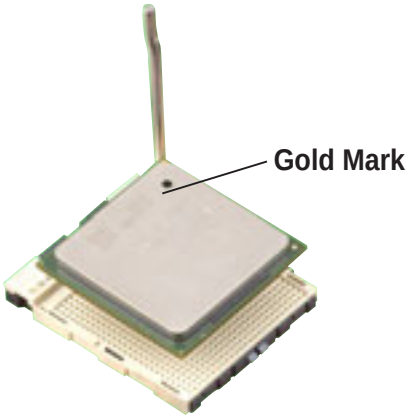


2. Unlock the socket by pressing the lever sideways, then lift it up to a 90°-100° angle.



Make sure that the socket lever is lifted up to 90°-100° angle, otherwise the CPU does not fit in completely.

3. Position the CPU above the socket such that its marked corner matches the base of the socket lever.
4. Carefully insert the CPU into the socket until it fits in place.



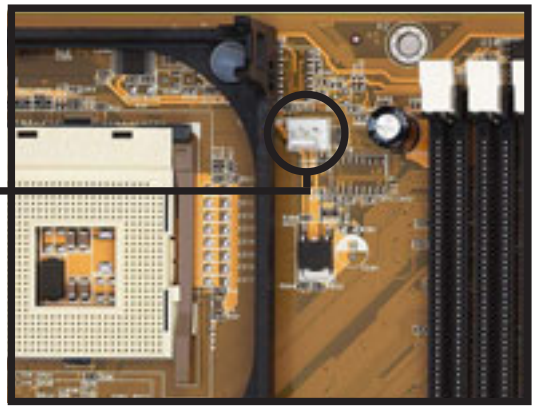
The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!

5. When the CPU is in place, push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.

6. Install a CPU heatsink and fan following the instructions that came with the heatsink package.

ASUS provides an Intel®-certified CPU fan and heatsink assembly as an optional item for your AP120-E1 system. Refer to the “Installation options” chapter for details.

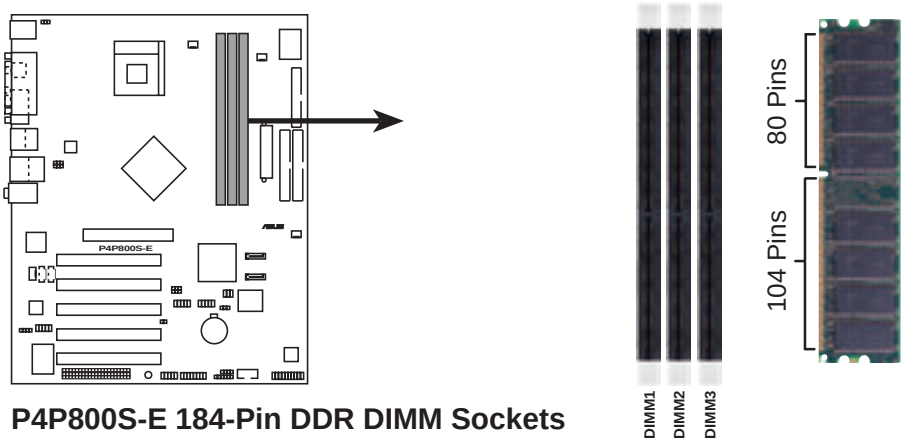
7. Connect the CPU fan cable to the CPU_FAN1 connector on the motherboard.



Don’t forget to connect the CPU fan connector! Hardware monitoring errors may occur if you fail to plug this connector.

2.5 Installing memory modules

The motherboard comes with three (3) Double Data Rate (DDR) Dual Inline Memory Module (DIMM) sockets. These sockets support up to 3GB system memory using 184-pin unbuffered non-ECC PC3200/2700/2100 DDR DIMMs. The following figure shows the location of the DDR DIMM sockets.



P4P800S-E 184-Pin DDR DIMM Sockets

Obtain DDR DIMMs only from ASUS qualified vendors to ensure system system stability. The DDR400 Qualified Vendors List (QVL) is provided below. Visit http://www.asus.com/products/server/RAMsupport.htm for the latest QVL.

2.5.1 Memory configurations

You may install 64MB, 128MB, 256MB, 512MB, and 1GB DDR DIMMs into the DIMM sockets.

Table 1: Qualified DDR400 vendors list

This table lists the memory modules that have been tested and qualified for use with this motherboard.

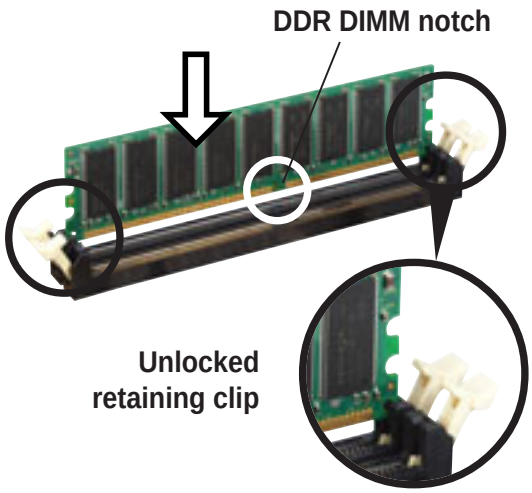
Size	Vendor	Part Number	Chip Brand	Chip Number
256MB	Apacer	77.10638.465	SAMSUNG	K4H560838D
256MB	Trancend	V58C2256804SAT75	Trancend	V58C2256804SAT75
512MB	Infineon	HYS64D64320GU-5-B	Infineon	HYB25D256800BT-5
512MB	Kingston	KVR333X64C25/512	Kingston	D3208DH1T-6

2.5.2 DIMM installation

Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

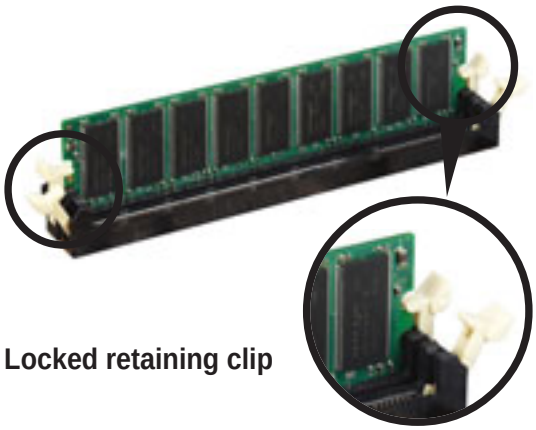
Follow these steps to install a DIMM.

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.



A DDR DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

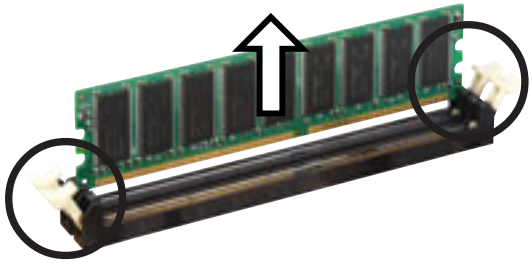
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



2.5.3 Removing a DIMM

Follow these steps to remove a DIMM.

1. Simultaneously press the retaining clips outward to unlock the DIMM.



Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

2.6 Installing a hard disk drive

The server/workstation system supports one IDE/Serial ATA hard disk drive through a detachable hard disk drive cage.

You may purchase a second hard disk drive cage to install an additional HDD. Refer to the next chapter for details.

Configure your hard disk drive as Master/Slave device before installing it to the chassis. Refer to the HDD documentation on how to set the drive as a Master/Slave device.

2.6.1 Qualified hard disk drives

The table below lists the hard disk drives tested and qualified for use with this server/workstation.

Table 2: Qualified hard disk drive vendors list

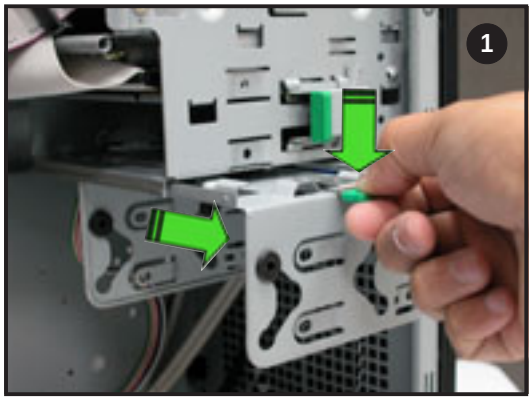
Vender	Model	Interface	Speed	Capacity
Seagate	ST380021A	IDE	7200rpm	80GB
Seagate	ST3120023A	IDE	7200rpm	120GB
IBM/Hitachi	Deskstart IC35L090AVV207	IDE	7200rpm	80GB
Maxtor	MAXTOR/6Y80L0	IDE	7200rpm	80GB
IBM/Hitachi	Deskstart IC35L120AVV207	IDE	7200rpm	120GB
Maxtor	MAXTOR/6Y160L0	IDE	7200rpm	160GB
Seagate	ST3160023A	IDE	7200rpm	160GB
IBM/Hitachi	Deskstart IC35L180AVV207	IDE	7200rpm	180GB
Seagate	ST380013AS	SATA	7200rpm	80GB
Seagate	ST3120026AS	SATA	7200rpm	120GB
Seagate	ST3160023AS	SATA	7200rpm	160GB
Maxtor	6Y080M0	SATA	7200rpm	80GB
Maxtor	6Y120M0	SATA	7200rpm	120GB

2.6.2 Hard disk drive installation

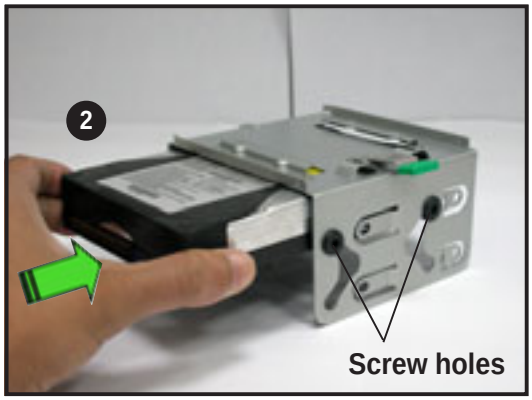
The detachable hard disk drive cage can accommodate one IDE or Serial ATA hard disk drive.

To install an **IDE** hard disk drive:

Configure your hard disk drive as Master/Slave device before installing it to the drive cage. Refer to the HDD documentation on how to set the drive as a Master/Slave device.

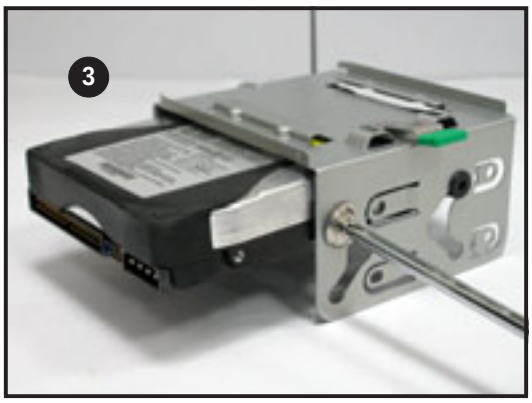


1. Press the HDD cage lock while pulling the cage out from the chassis. Place the HDD cage in a flat surface.

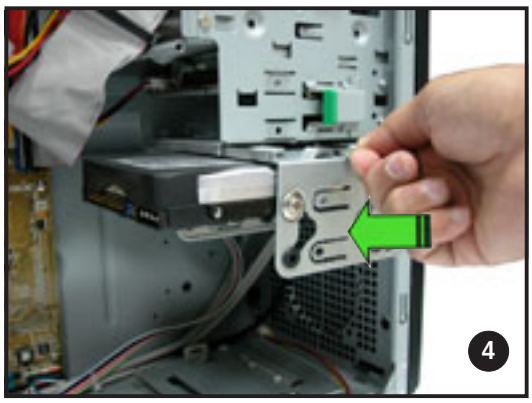


2. Insert a HDD to the upper bay of the cage. Make sure that the HDD screw holes are aligned with the HDD cage screw holes (with black rubber stoppers).

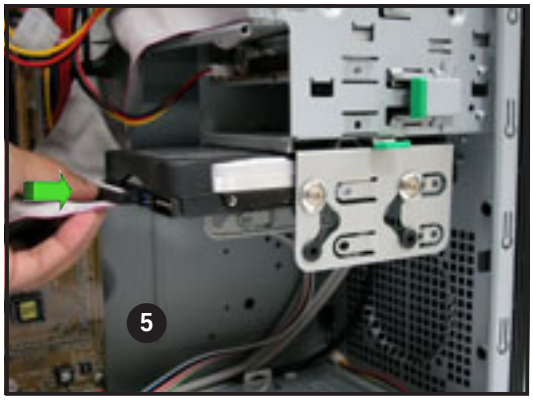
DO NOT install a hard disk drive to the lower bay of the cage.



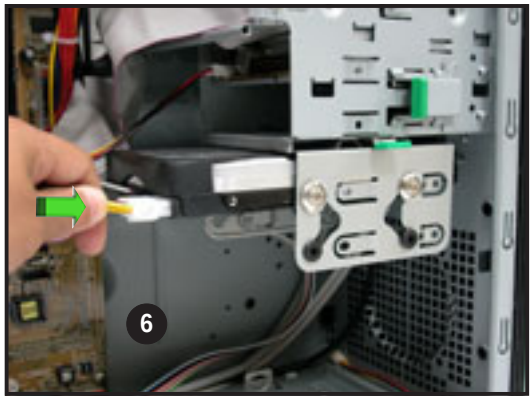
3. Secure the HDD to the cage with two screws (with metal washers) on both sides of the cage.



4. Re-install the HDD cage to the chassis. Align the HDD cage and bay assembly rails, then carefully push the HDD cage until it is flushed to the chassis.



5. Connect a 40-pin IDE cable to the IDE connector at the back of the drive.



6. Connect a 4-pin power plug from the power supply unit to the power connector at the back of the drive.

Refer to the motherboard user guide the correct IDE cable before connecting anIDE cable to the hard disk drive.

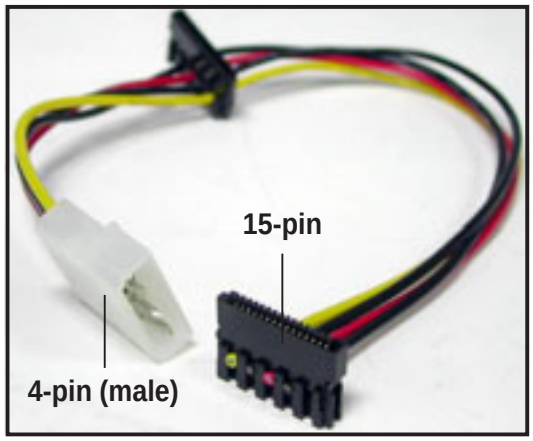
To install a **Serial ATA** hard disk drive:

1. Follow steps 1-4 of the previous section.
2. Connect one end of the supplied 7-pin SATA cable to the SATA connector at the back of the drive, then connect the other end to a SATA connector on the motherboard. See page 3-6 for the location of the SATA connectors.
3. *For Serial ATA HDDs **with** a 4-pin power connector:*

   Connect a 4-pin (female) power plug from the power supply unit (PSU) to the 4-pin (male) power connector at the back of the drive.

   *For Serial ATA HDDs **without** a 4-pin power connector:*

   Use a SATA power cable. Connect a 4-pin plug (female) from the PSU to the 4-pin (male) plug of the SATA power cable. Connect the 15-pin SATA power plug to the power connector at the back of the drive.

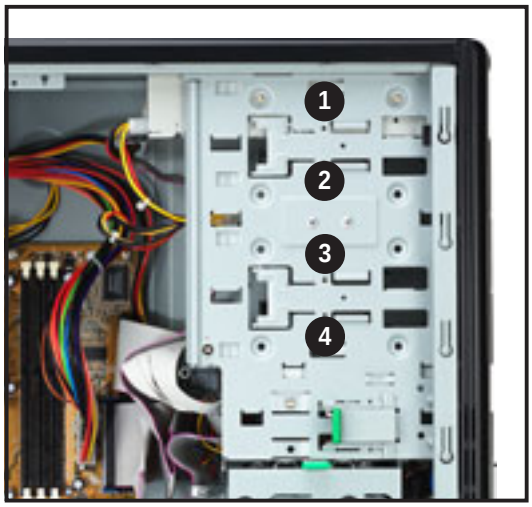


Serial ATA power cable

2.7 Installing 5.25-inch drives

Make sure to unplug the power cable before installing or removing any system components. Failure to do so may cause severe damage to the motherboard and other system components!

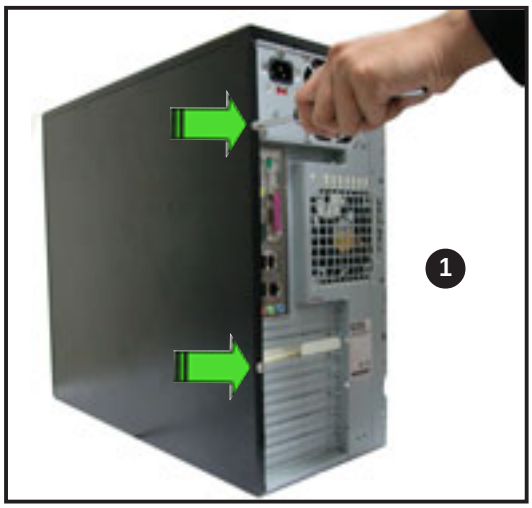
The system comes with four 5.25-inch drive bays located on the upper front part of the chassis. An optical drive that comes standard with the system package occupies the uppermost bay *(labeled 1)*. The three lower bays *(labeled 2, 3, and 4)* are available for additional 5.25-inch optical, zip, or floppy disk drives.



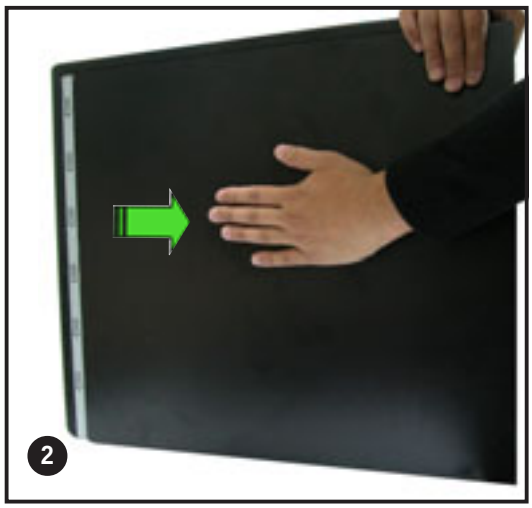
You must remove the front panel cover before installing a 5.25-inch drive(s).

2.7.1 Removing the front panel cover

To remove the front panel cover:

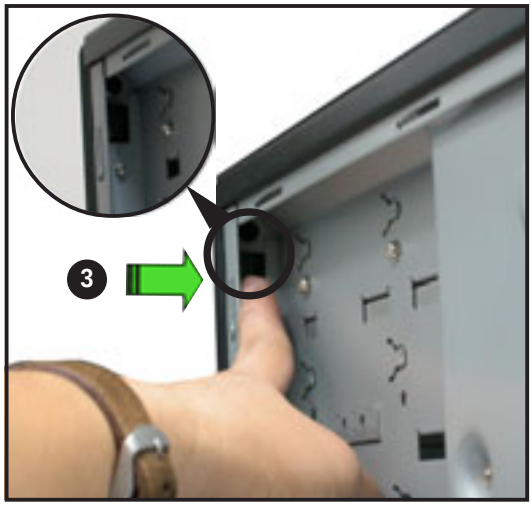


1. Locate and remove two screws that secure the left side cover to the chassis. Keep the screw for later use.

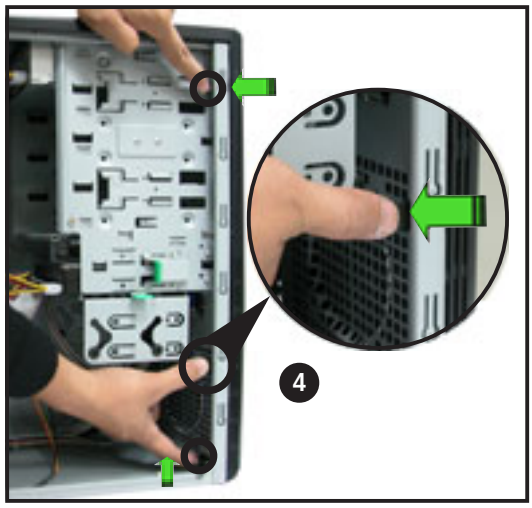


2. Slightly pull the cover toward the direction of the rear panel until it disengages from the chassis. Set the cover aside.

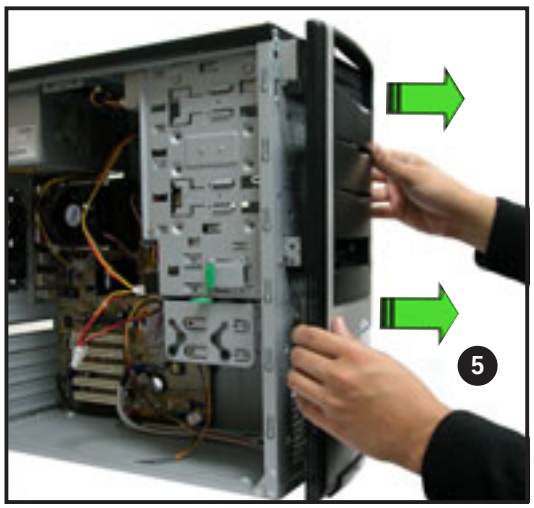
3. Press the front panel cover hook inward until it detaches from the chassis hole.



4. On the other side of the system, locate three front panel cover hooks. Press the hooks inward until the front panel cover detaches from the chassis.



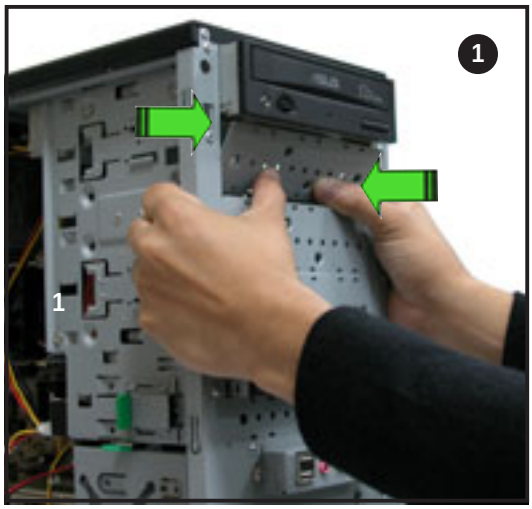
5. Carefully remove the front panel cover, then set aside.



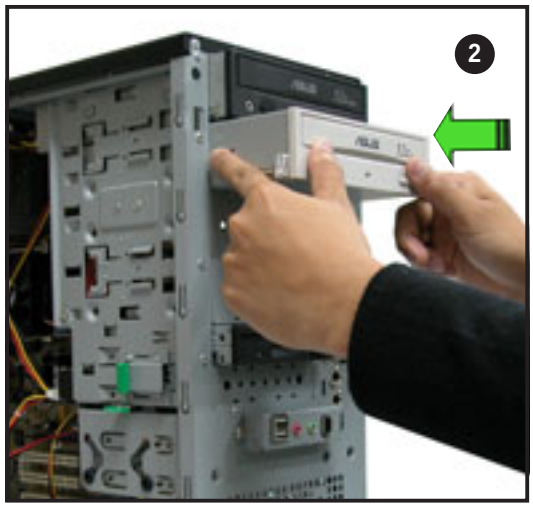
2.7.2 Installing additional optical drive(s)

Configure your optical drive as Master/Slave device before installing it to the drive bay. Refer to the optical drive documentation for details.

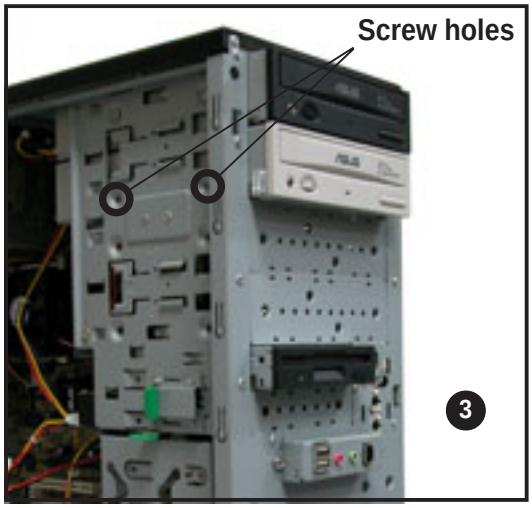
To install an additional optical drive(s):



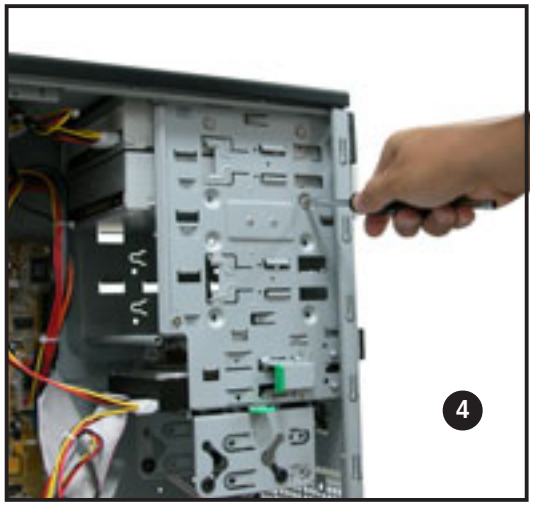
1. Select the drive bay you intend to use. Push the knock down metal cover in and out of the chassis until it is removed.



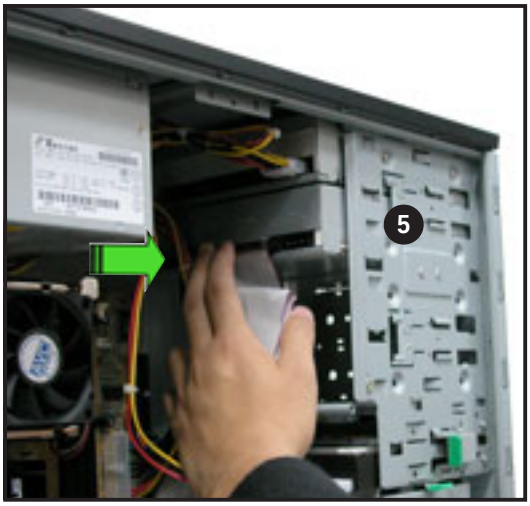
2. Carefully insert the drive to the bay, then push it inward until it is flushed to the chassis front panel.



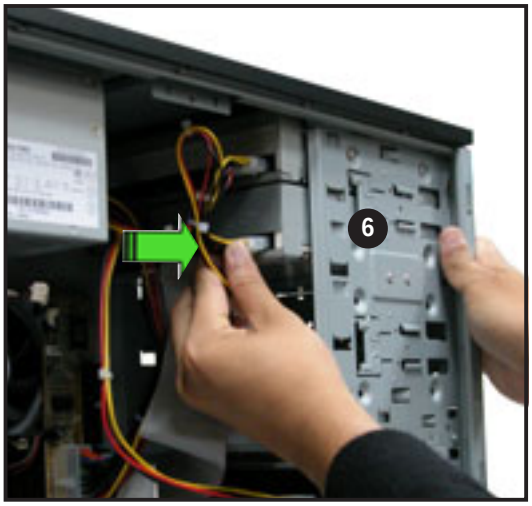
3. Align the optical drive and bay screw holes.



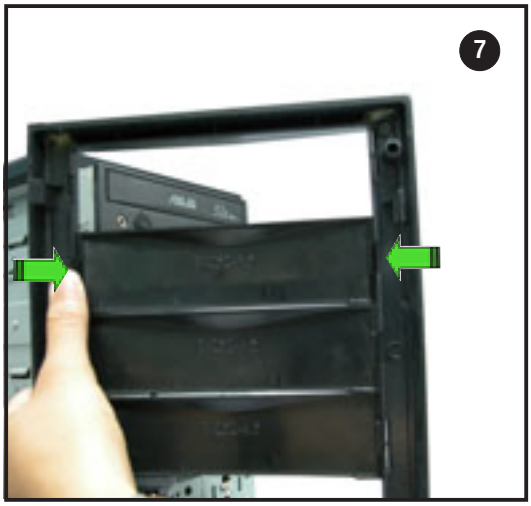
4. Secure the drive with two screws on both sides of the bay.



5. Connect a 40-pin IDE cable (from the first optical drive) to the IDE connector on the drive.

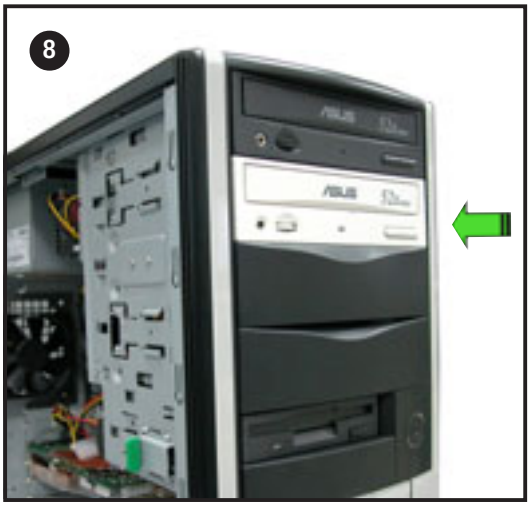


6. Connect a 4-pin power plug from the power supply unit to the drive power connector.



7. Remove the front panel bay cover opposite the drive bay you used by pressing the hooks inward.

   Follow the same procedures when installing additional optical drives.



8. Re-install the front panel and side covers when done.

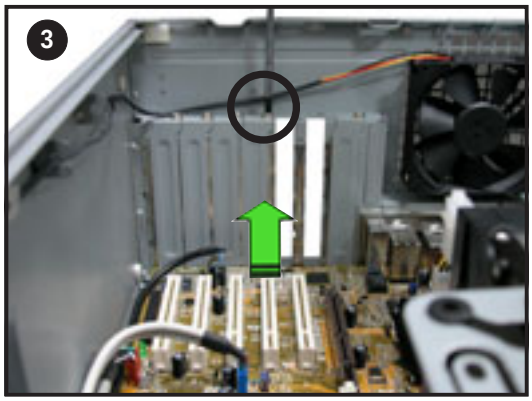
2.8 Installing expansion cards

The system comes with five PCI slots, one AGP slot, and an ASUS proprietary Wi-Fi slot for installation of expansion cards.

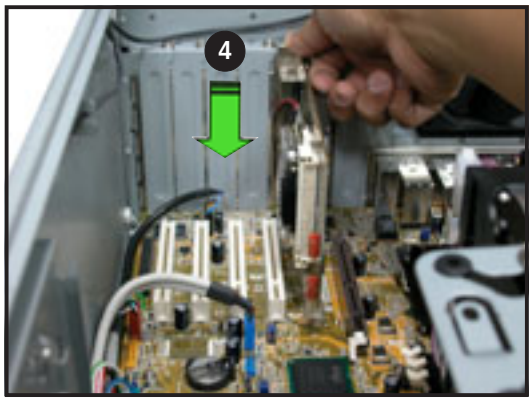
Make sure to unplug the power supply before installing or removing an expansion card(s). Failure to do so may cause severe damage to both the motherboard and the components.

To install an expansion card:

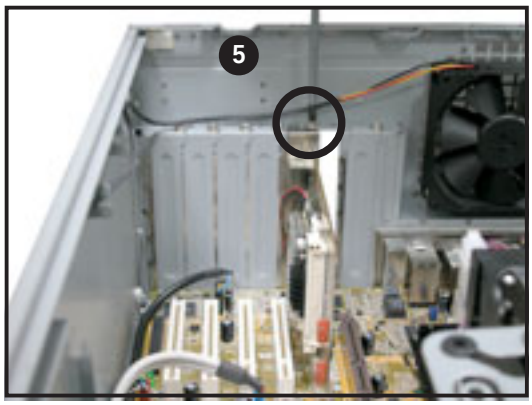
1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Lay the system on its side on a flat, stable surface.
3. Remove the metal bracket opposite the slot that you intend to use. Keep the metal bracket screw for later use.



4. Align the card connector with the slot, then press firmly until the card is completely seated on the slot.



5. Secure the card with the metal bracket screw you removed earlier.



2.9 Removing components

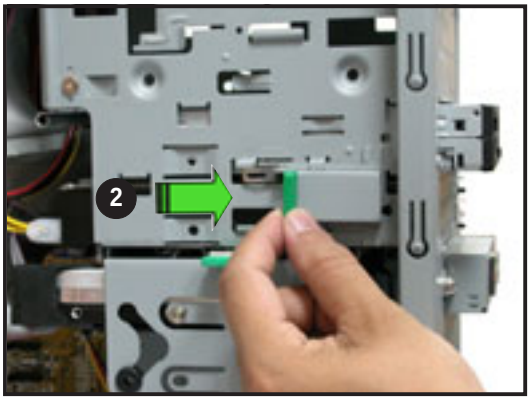
You may need to remove previously installed system components when installing or removing other system components, or when replacing a defective component. This section tells how to remove the following components:

1. Floppy disk drive (FDD)
2. System fan

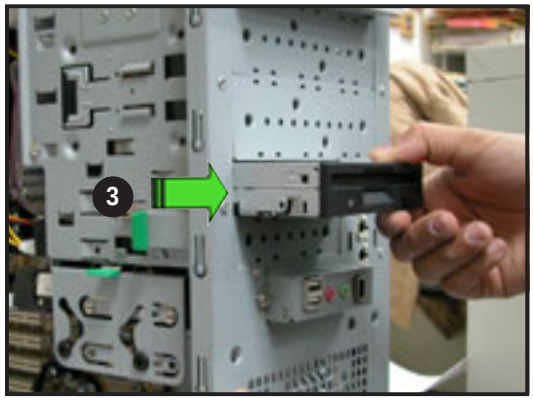
2.9.1 Removing the floppy disk drive

To remove the FDD:

1. Disconnect the FDD power plug and signal cable.



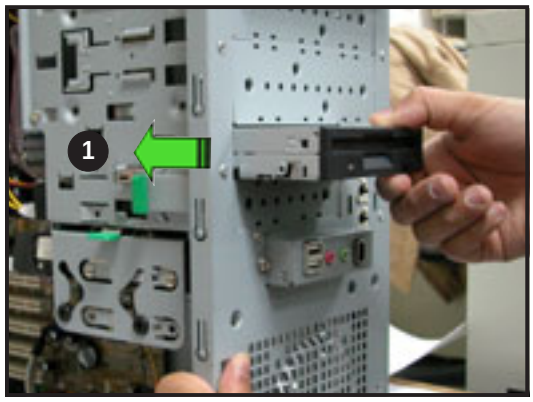
2. Unlock the FDD bay by moving the drive bay lock toward the direction of the front panel.



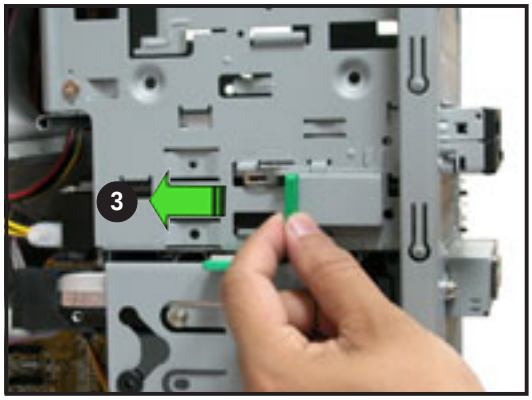
3. Carefully pull the FDD from the chassis. Set the FDD aside.

To install a floppy disk drive:

1. Insert the drive to the bay until it is flushed to the chassis front panel.
2. Align the FDD screw hole with the drive bay lock pin.



3. Move the drive bay lock toward the rear panel to secure the drive.
4. Attach the FDD power and signal cables to the connectors at the back of the drive.

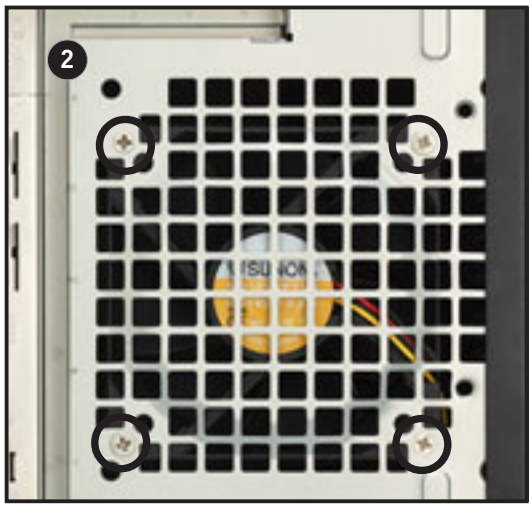


2.9.2 Removing the chassis fan

To remove the chassis fan:

1. Disconnect the chassis fan cable from the CHA_FAN1 connector on the motherboard.
2. Locate and remove four chassis fan screws at the rear panel. Keep the screws for later use.

Hold the chassis fan with one hand while removing the chassis fan screws.

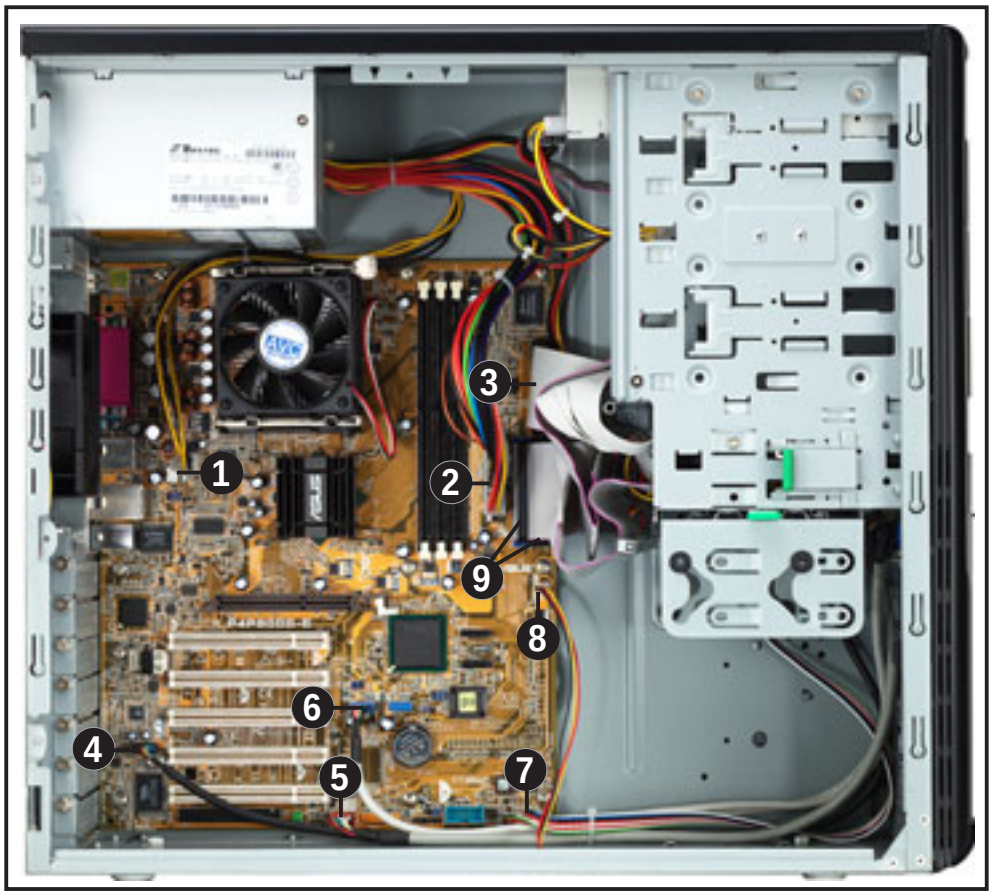


3. Remove the chassis fan, then set aside.

2.10 Connecting cables

The AP120-E1 chassis includes the power and signal cables that you need to connect to the motherboard, storage drives, and other devices that you intend to install.

Most of the cables for the chassis kit are already connected upon shipment. When installing system devices and connecting cables, make sure that all cables are routed properly for better system stability and performance. Refer to the picture below when arranging cables.



Standard cables connected to the motherboard

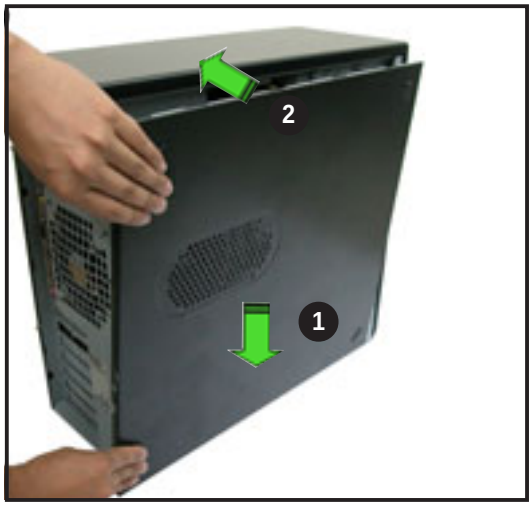
1. 4-pin ATX 12V power plug
2. 20-pin ATX power plug
3. Floppy disk drive ribbon cable
4. Front panel audio cable
5. Front panel IEEE 1394 cable
6. Front panel USB cable
7. Panel cable
8. System fan cable
9. Primary and secondary IDE cable

Refer to the motherboard user guide for detailed information on motherboard connectors.

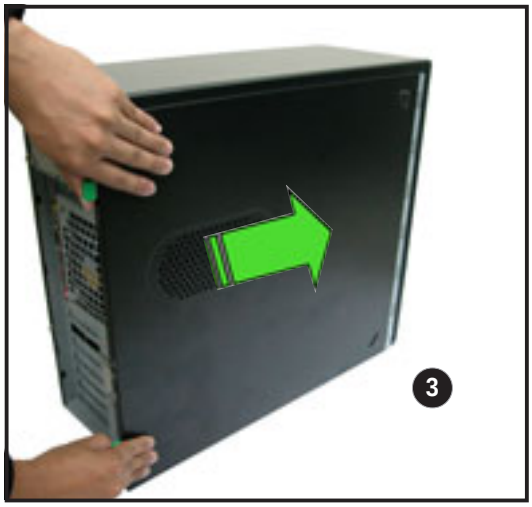
2.11 Replacing the side cover

After installing all components and re-connecting cables, replace the side cover by following these instructions.

1. Match the side cover hooks to the chassis rail on the side of the chassis.
2. Fit the side cover the cover toward the chassis until it fits.



3. Slide the cover toward the front until it snaps in place.



Chapter 3

This chapter provides information on optional and removable components you may install to or remove from the system.

Installation options

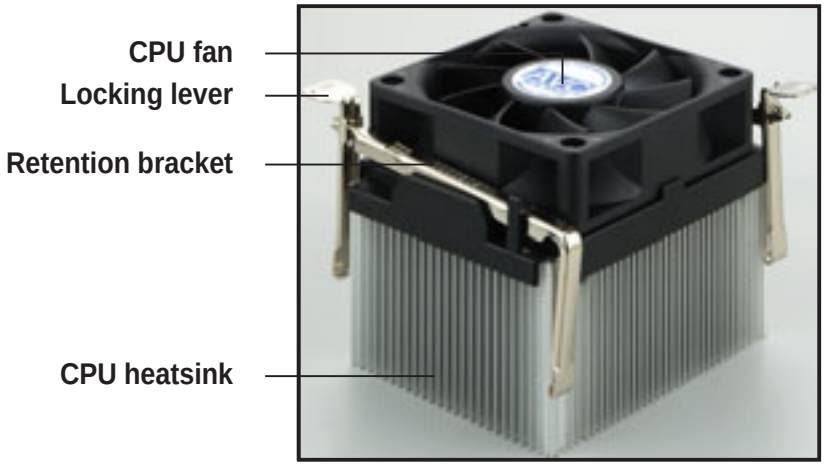
3.1 Installing optional components

You may install the following optional components to the AP120-E1 system.

1. CPU fan and heatsink assembly
2. Second hard disk drive cage
3. Expansion card holder

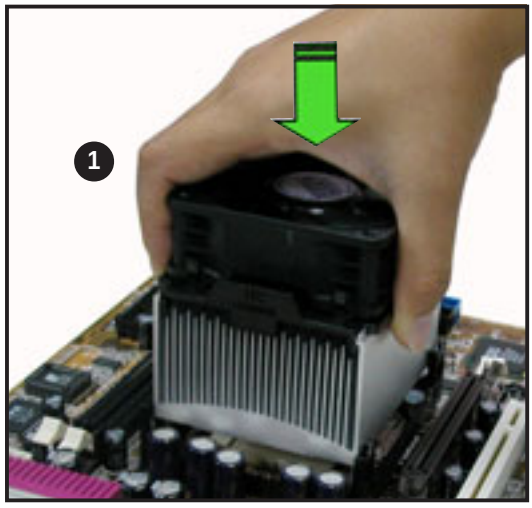
3.1.1 CPU fan and heatsink assembly

The CPU fan and heatsink assembly is specially designed for the Intel® Pentium® 4 CPU. It provides efficient cooling to the CPU for stable system performance.



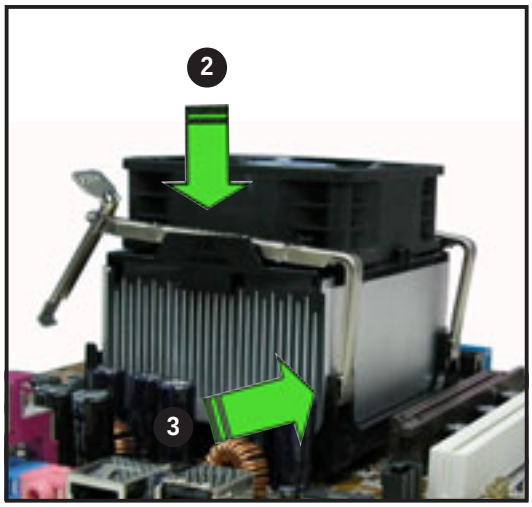
After installing the CPU, follow these instructions to install the CPU fan and heatsink assembly.

1. Position the CPU fan and heatsink assembly on top of the installed CPU.

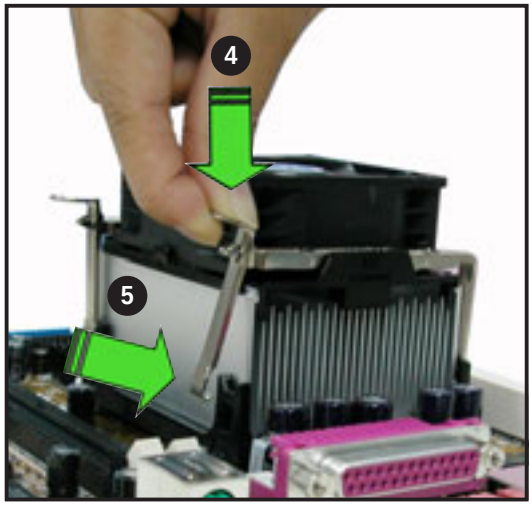


- The retention module base is already installed on the motherboard upon purchase.
- Do not remove the retention module base when installing the CPU or installing other system components.

2. Align the retention bracket with the rails on the side of the CPU fan.
3. Attach the retention bracket hook into the retention module hole.



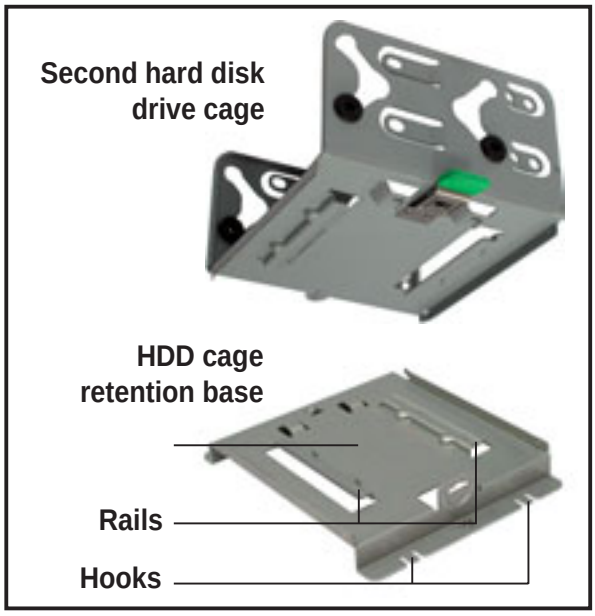
4. Carefully press down the locking lever on the other side of the retention bracket.
5. Attach the locking lever hook into the retention module hole to secure the fan and heatsink assembly in place.
6. Follow steps 2 to 5 to re-install the second retention bracket.



The illustrations are for reference only and may not exactly match the actual component.

3.1.2 Second hard disk drive cage

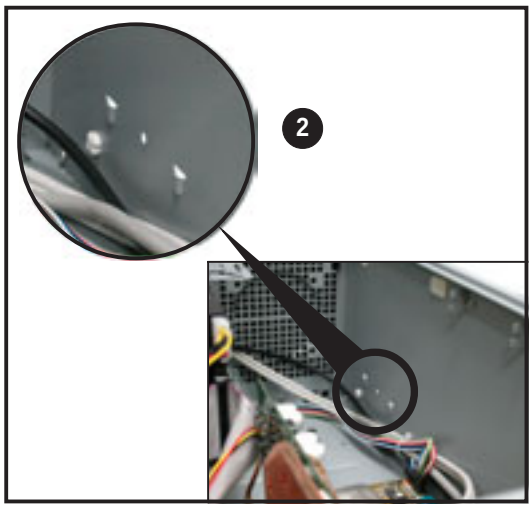
The second hard disk drive cage accommodates one IDE or Serial ATA hard disk drive.



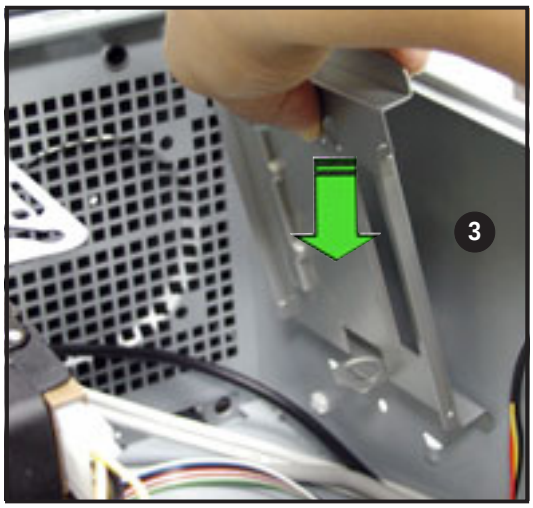
You need to install the retention base to the chassis before installing the second HDD cage.

To install the retention base:

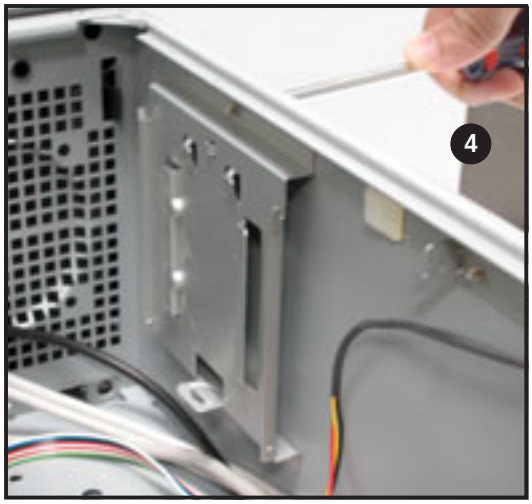
1. Lay the system on its side on a flat, stable surface.



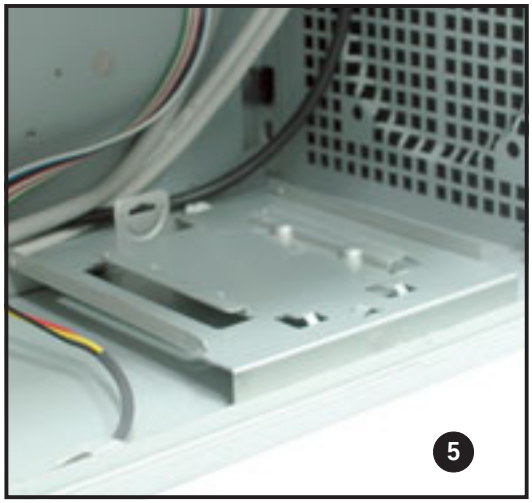
2. Locate two retention base holes on the chassis floor.



3. Insert the retention base hooks to the holes until they fit in place.

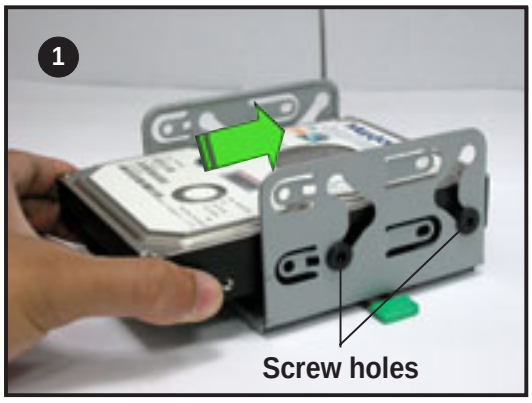


4. Secure the retention base with a screw.



5. Turn the system upright.

To install a Serial ATA hard disk drive:

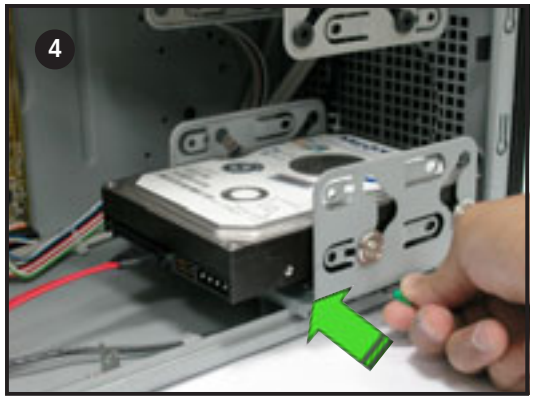


1. Insert a HDD to the lower bay of the drive cage. Make sure that the HDD screw holes are aligned with the drive cage screw holes (with black rubber stoppers).

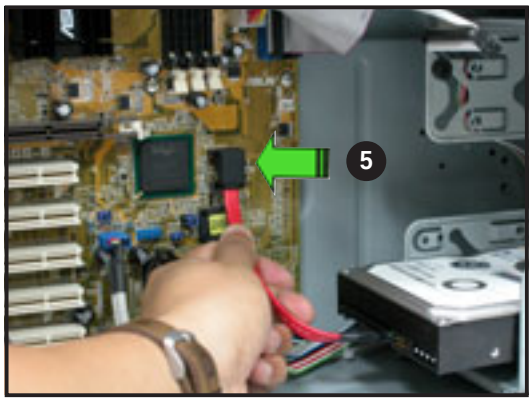
2. Secure the HDD to the cage with two screws (with metal washers) on both sides of the cage.

DO NOT install a hard disk drive to the upper bay of the cage.

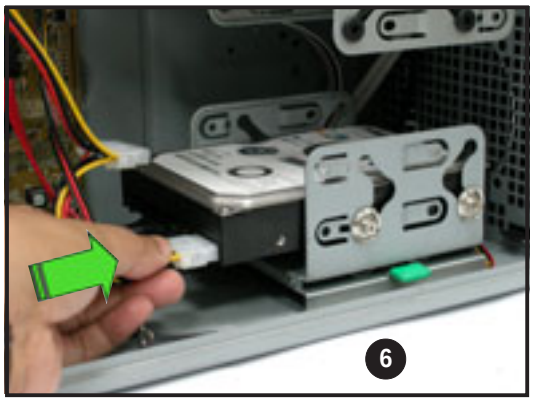
3. Connect one end of the 7-pin Serial ATA cable to the connector at the back of the drive(s).



4. Align the drive cage and retention base rails, then slightly push the cage until it clicks in place



5. Connect the other end of the Serial ATA cable to the SATA connectors on the motherboard.



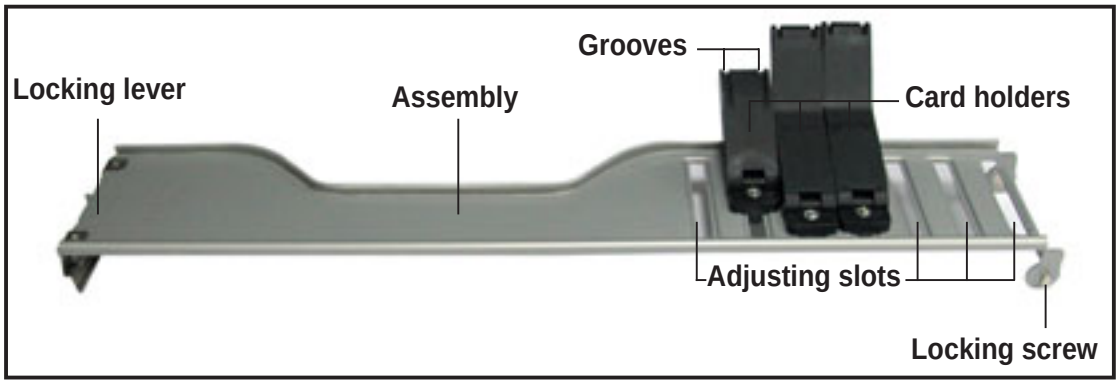
6. Connect a 4-pin power plug from the power supply unit to the power connector at the back of the drive(s).

Use a Serial ATA power cable and adapter for Serial ATA HDD(s) without a 4-pin power connector.

3.1.3 Expansion card holder

The expansion card holder provides support for long and heavy PCI and AGP cards.

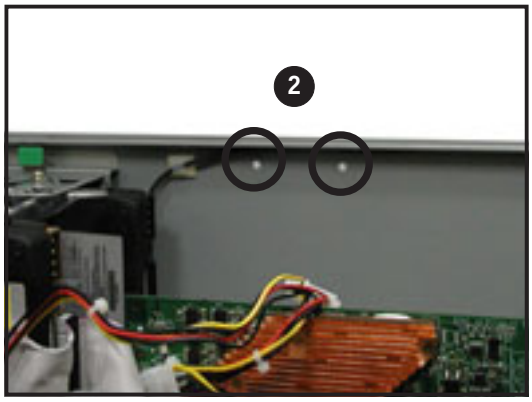
Install all necessary expansion cards before installing the expansion card holder.



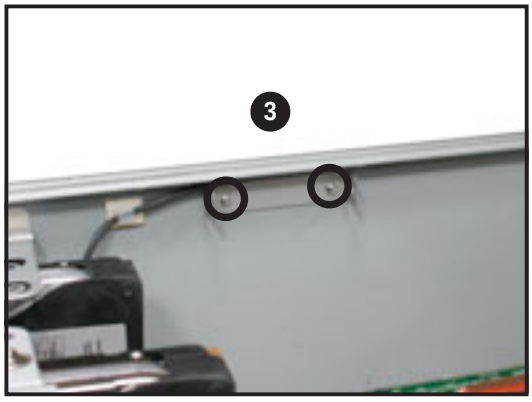
The expansion card holder comes with a retention bracket to keep the expansion card holder in place.

To install the retention bracket:

1. Lay the system on its side on a flat, stable surface.
2. Locate two retention bracket screw holes on the chassis floor.

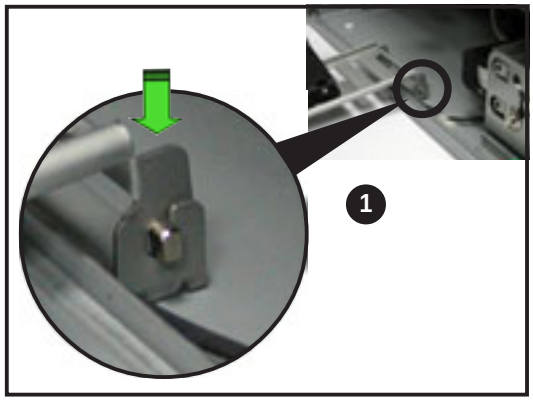


3. Place the retention bracket over the chassis floor screw holes, then secure the bracket with two screws.
4. Turn the chassis upright.

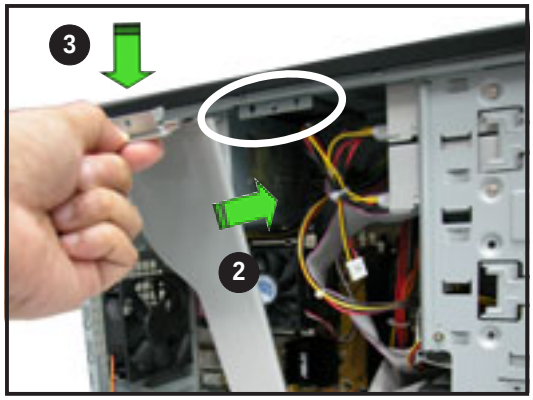


To install the expansion card holder:

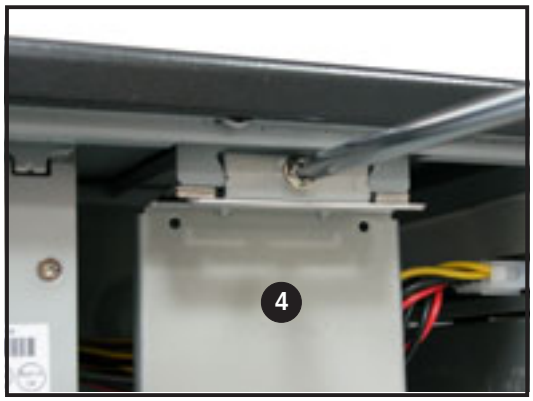
1. Insert the expansion card holder locking screw to the retention bracket notch, as shown.



2. Turn the expansion card holder upright.
3. Press the locking lever, then insert the hooks to the chassis holes.



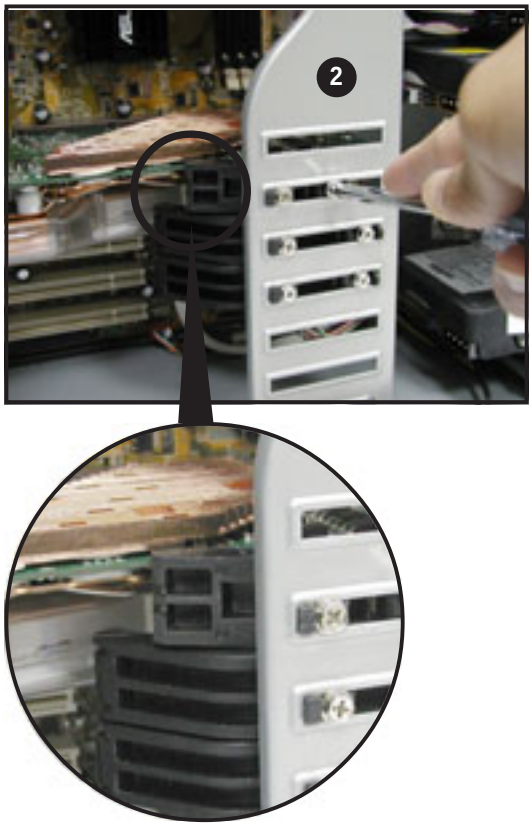
4. Secure the expansion card holder with one screw.



To hold long expansion cards:

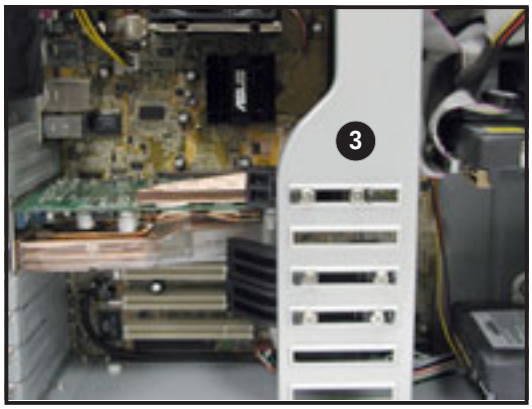
1. Place the card holder at level with the expansion card.

The smaller card holder is for long AGP cards while the other card holders are for long PCI cards.



2. Loosen the screw(s) to adjust the card holder forward or sideward until its groove fits the edge of the expansion card.

3. Fasten the card holder screw(s).
4. Follow the same steps in holding other long expansion.



Appendix

This appendix lists the common problems that you may encounter while using the server. It lists the possible causes of the problems and offers solutions. You may refer to this part and try to solve simple problems before calling customer support. The appendix also contains the power supply unit specifications for your reference.

Appendix

A.1 Simple fixes

Some problems that you may encounter are not due to defects on the system or the components. These problems only requires simple troubleshooting actions that you can perform by yourself.

Problem	Action
The power LED on the server or on the monitor do not light up	1. Check if the power cable is properly connected to the power connector in the system rear panel. 2. Make sure that the power cables are connected to a grounded power outlet. 3. Press the power button to make sure that the system is turned on.
The keyboard does not work	Check if the keyboard cable is properly connected to the PS/2 keyboard port.
The mouse does not work	Check if the mouse cable is properly connected to the mouse port.
The system does not perform power-on self tests (POST) after it was turned on	1. Check the memory modules and make sure you installed the DIMMs the system supports. 2. Make sure that the DIMMs are properly installed on the sockets.

Problem	Action
The system continuously beeps after it was turned on	1. Check the memory modules and make sure you installed supported DIMMs. 2. Make sure that the DIMMs are properly installed on the sockets.
The message “Non-system disk or disk error” appears	1. Check if a bootable HDD is active. 2. Check if the HDDs are properly installed.
Network connection not available	1. Make sure that the network cable is connected to the LAN port on the rear panel. 2. Make sure that you have installed the LAN drivers from the support CD.

A.2 Power supply specification

Input Characteristics

Input Voltage Range	Min	Nom	Max
Range 1	90V	115V	135V
Range 2	180V	230V	265V
Input Frequency Range	47 Hz to 63 Hz		
Maximum Input ac Current	9A max at 115Vac 5A max. at 230Vac, maximum load		
Inrush Current	70A max. at 115Vac, full load cold start at 25°C		
Efficiency	68% min. at nominal input, maximum load		

Output Characteristics

Output	Load Range		Regulation		Ripple
Voltage	Min	Max	Min	Max	Max
+5V	1.5A	25.0A	-5%	+5%	$50mV_{p-p}$
+12V	0.2A	8.0A	-5%	+5%	$120mV_{p-p}$
-12V	0A	0.8A	-10%	+10%	$150mV_{p-p}$
-5V	0A	0.5A	-5%	+5%	$100mV_{p-p}$
+5Vsb	0A	2.0A	-5%	+5%	$100mV_{p-p}$
+3V3	0A	14.0A	-5%	+5%	$50mV_{p-p}$

Over-Voltage Protection (OVP)

Output Voltage	Maximum Voltage
+5V	6.5V
+12V	15.6V
+3.3V	4.3V