ASUS® AK35

5U Tower Chassis Kit

User Guide

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Product Name:	**ASUS AK35**
Manual Edition:	**Revised edition V2 (E1235)**
Release Date:	**May 2003**

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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

IMPORTANT

- 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.

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.

Operation Safety

IMPORTANT

- Any mechanical operation on this server must be conducted by certified or experienced engineers.
- Before operating the server, carefully read all the manuals included with the server package.
- Before using the server, 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 on a stable surface.

About this guide

Audience

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

Contents

This guide contains the following parts:

1. **Chapter 1: System overview**

   This chapter describes the general features of the AK35 barebone server. 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 system components.

3. **Appendix: Troubleshooting**

   This appendix lists the common problems that you may encounter while using the AK35 barebone 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.

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.

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Support Fax:	+49-2102-9599-11	

Chapter 1

Product introduction

This chapter describes the general features of the AK35 chassis kit. It includes sections on front panel, rear panel, and internal features.

1.1 Package contents

1.1.1 ASUS AK35 chassis kit

The AK35 models are distinguished by the type of bundled HDD tray and power supply. Refer to the following table to check the items that came with the model you purchased.

Model	HDD tray type	Power supply unit(s)
AK35-SR5	SCSI	500W redundant (2 units)
AK35-SS4	SCSI	450W single
AK35-SS3	SCSI	320W single
AK35-AR5	ATA	500W redundant (2 units)
AK35-AR4	ATA	450W single
AK35-AR3	ATA	320W single

1.1.2 Standard items

1. Chassis kit including:
   - power supply unit(s)
   - SCSI backplane board
   - CD-ROM drive
   - floppy disk drive
   - hot-swap HDD trays (6 units)
   - SCSI-IDE HDD bridge board (6 units)
   - chassis fan
   - chassis roller wheels
2. Cables
   - 6-pin SMBus cable
   - BP-LED cable
   - internal SCSI cable
   - external SCSI cable
   - chassis intrusion cable
   - power cable
3. Component screws
4. ASUS AK35 Chassis Kit User Guide

1.1.3 Optional item

- ASUS AK35 5U Rackmount Rail Kit

If any of the above items is damaged or missing, contact your retailer.

1.2 Overview

The AK35 chassis kit is designed for easy configuration, flexibility, and high reliability. The chassis may be set up as standalone or rack-mount.

Flexible expansion

Front panel

Inside the stylish front bezel secured by a lock, the front panel features easily accessible drives bays:

- a floppy drive bay
  (floppy drive already installed)
- three 5.25-inch bays
  (one occupied by a CD-ROM drive)
- six 3.5-inch hard disk drive bays with externally removable trays

Rear panel

On the rear panel are slots for seven full-length expansion cards, a slot for the motherboard rear panel I/O, and a bay for two redundant power supply modules or a standard power supply module.

A slot for an external SCSI interface is also available.

Strategic interior

Inside the chassis, the SCSI backplane is installed and the appropriate cables routed. The drive and fan cages are strategically placed to ensure proper system ventilation and easy installation of components.

A plastic long-card support is provided to stabilize and hold long expansion cards in place.

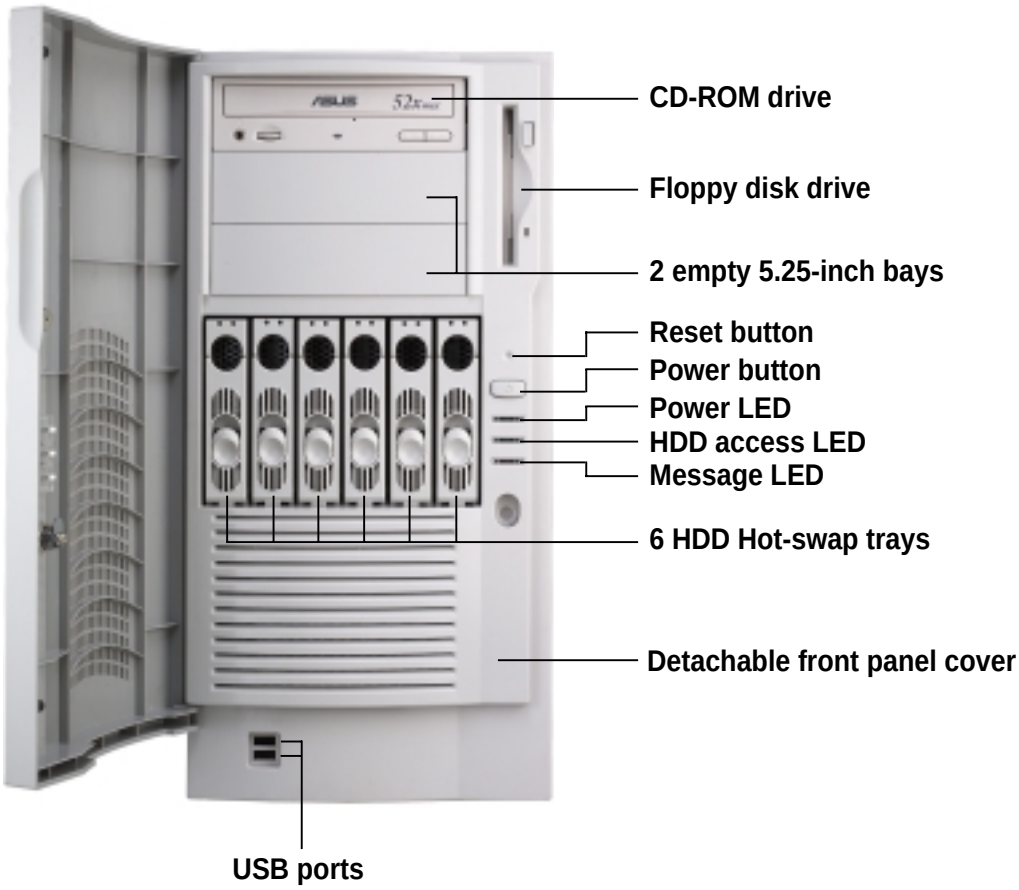
The chassis supports an extended ATX form factor ASUS motherboards. See the motherboard dimension requirements on page 2-4.

Refer to the succeeding sections for a brief description of the basic components that are pre-installed in the chassis.

1.3 Front panel features

The AK35 chassis kit displays a stylish front bezel with lock. The bezel covers the system components on the front panel and serves as security. Open the bezel to access the front panel components.

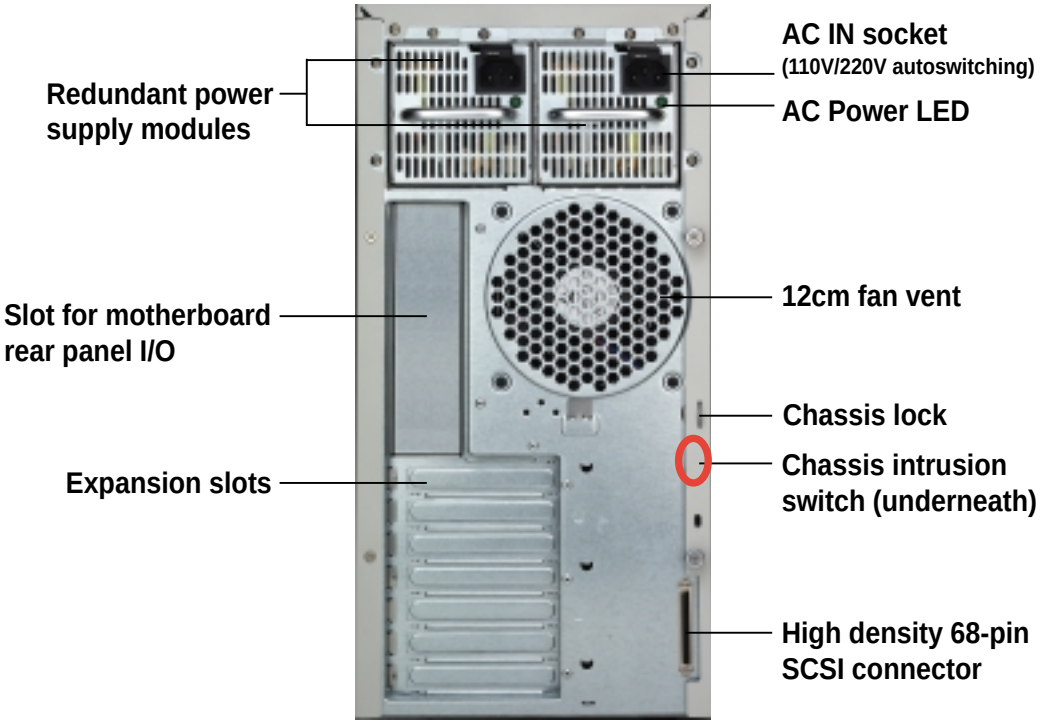
The front panel is designed to allow convenient access to the hard disk drives and other external features. The power and reset buttons, LED indicators, CD-ROM drive, floppy drive, and two USB ports are also located on the front panel. For future installation of 5.25 devices, two drive bays are available.



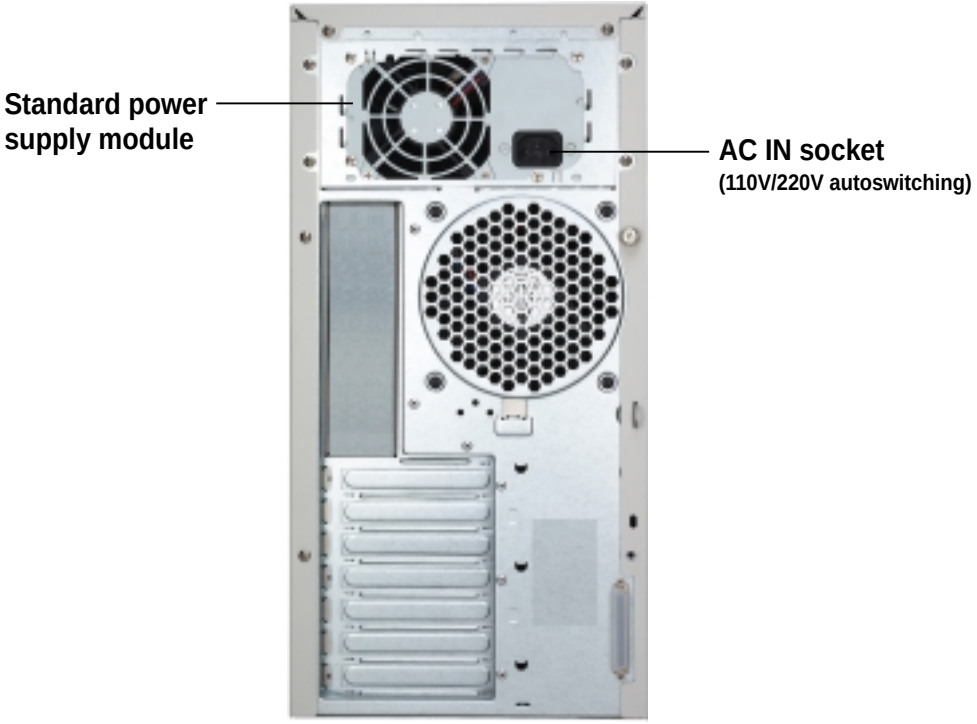
1.4 Rear panel features

The rear panel includes a slot for the motherboard rear I/O ports, seven full-length expansion slots, a chassis lock and intrusion switch, a vent for the system fan, and either two redundant power supply modules or a standard power supply module.

System with redundant power supply modules



System with standard power supply module

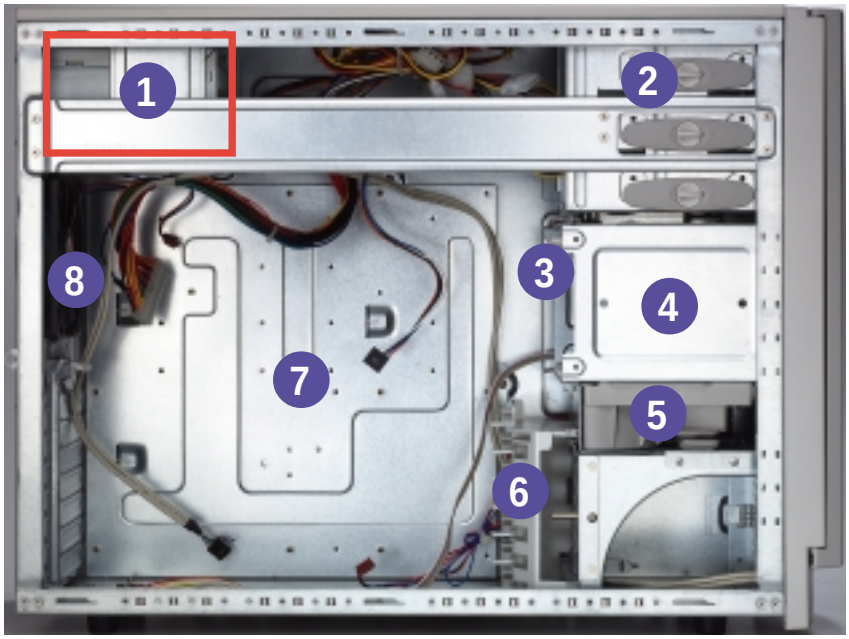


1.5 Internal features

The chassis kit includes the basic components as shown in the picture below.

The power supply area differs depending on the power supply module that came with the server you purchased.

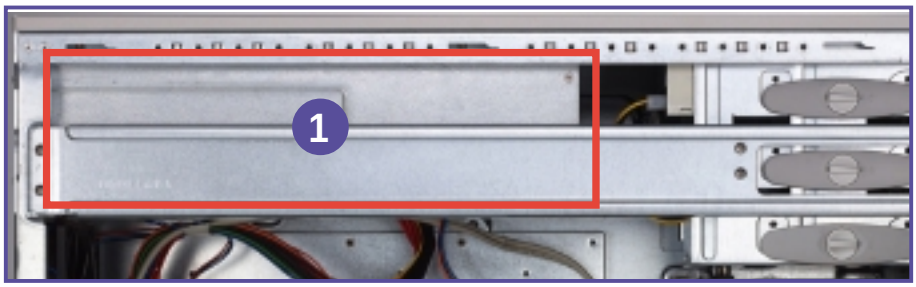
System with standard power supply module



1. **Power supply module**
2. **5.25-inch drive cage**
3. **SCSI backplane board**
4. **3.5-inch external drive cage**
5. **12-cm hard drive blower**
6. **Plastic long-card support**
7. **Motherboard metal plate**
8. **Chassis fan**

System with redundant power supply modules

The picture below shows a system redundant power supply modules. All other basic system components are the same as the above picture.



1.6 LED information

The following table describes the LED indicators on the server front and rear panels.

LED	Status	Description
Drive Status LED	Green	Installed HDD is in good condition; supplied power is sufficient
	Red	HDD fails
	Blinking red	HDD is rebuilding using the RAID card SCSI Access Fault-Tolerant Enclosure (SAFTE)
Drive Activity LED	Blinking	HDD read/write data
Power LED	ON	System power ON
	Blinking	Suspend mode
HDD Access LED	OFF	No activity
	Blinking	Read/write data into the HDD
Message LED	OFF	Normal; no incoming event
	Blinking	ASMS indicates a HW monitor event
Redundant power module LED	ON	System power supply is ON
	OFF	System power supply is OFF

Chapter 2

This chapter describes the internal hardware components and provides the installation procedures for additional system components.

Hardware setup

2.1 Preparation

Before proceeding, prepare everything that you might need to facilitate installation.

2.1.1 Tools to use

1. Phillips head screw driver
2. Flat head screw driver

2.1.2 System components and devices to install

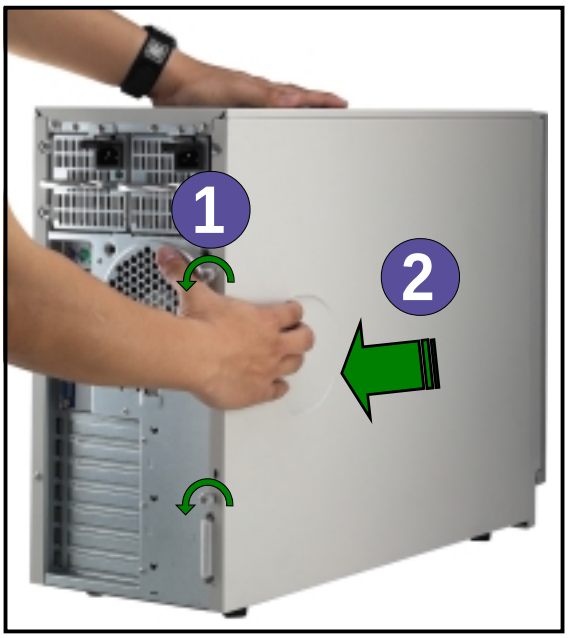
The following items are the basics that you need to install into the chassis kit. You may need to install other devices depending on your configuration.

1. Motherboard
2. Hard disk drives
3. Drive cables
4. PCI add-on cards

2.2 Removing and installing the side cover

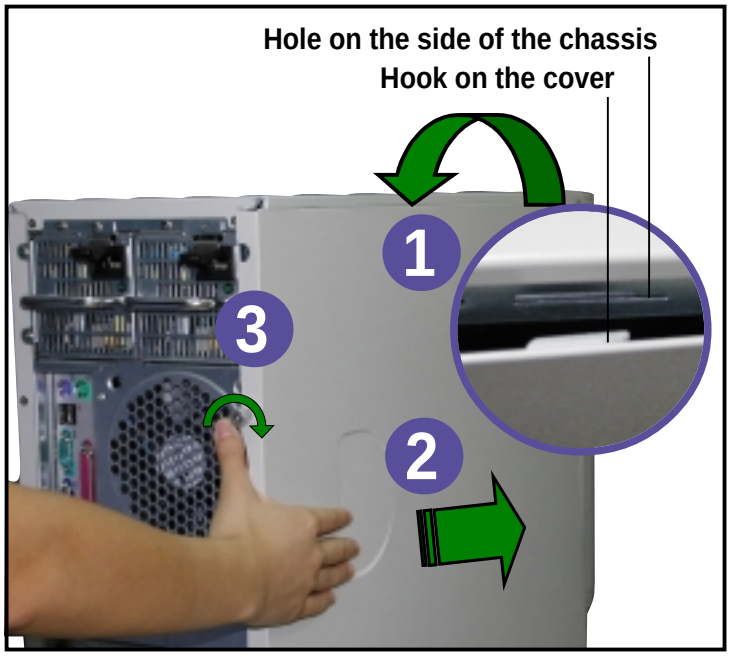
2.2.1 Removing the cover

1. Loosen the two thumb screws that secure the side cover.
2. Slide the side cover for about half an inch toward the rear until it is disengaged from the chassis.



2.2.2 Installing the cover

1. Match and insert the hooks of the cover to the elongated holes on the side of the chassis. All the six hooks (three each on the top and bottom) of the cover must properly fit the designated holes.
2. Slide the cover toward the front until it snaps in place.
3. Tighten the thumb screws to secure the cover.

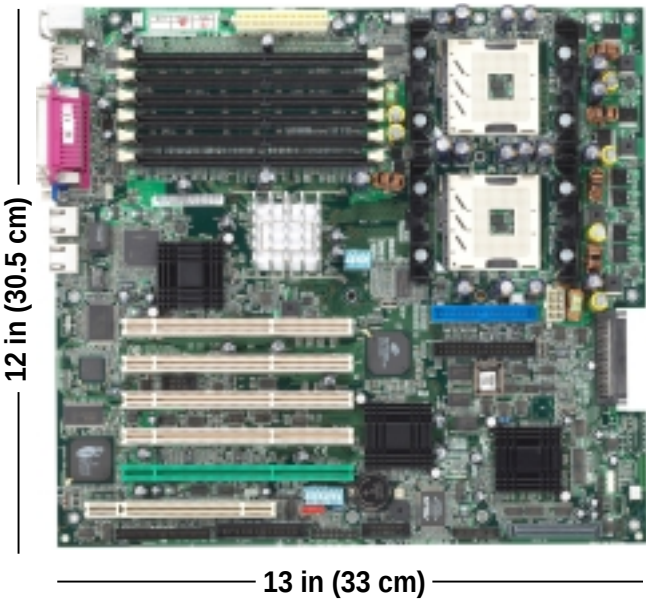


2.3 Motherboard installation

This section only describes how to install a supported motherboard into the AK35 chassis kit. Refer to the motherboard user guide for instructions on installing specific motherboard components.

2.3.1 Motherboard dimensions

This chassis kit supports an ASUS motherboard that measures 12x13 inches (30.5 x 33 cm) for SCSI models, or 12x12 inches (30.5 x 30.5 cm) for IDE models. Motherboards of smaller sizes will fit into the system chassis. Refer to the motherboard user guide for more information on the system requirements.

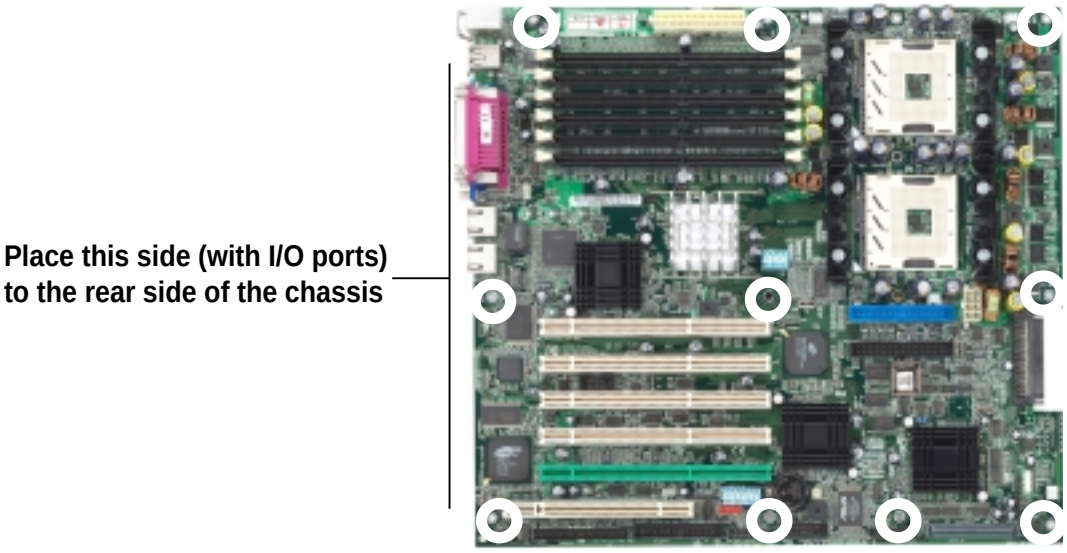


Make sure that the motherboard you intend to install into the chassis does not exceed the maximum specified dimensions. Otherwise, it will not fit into the chassis.

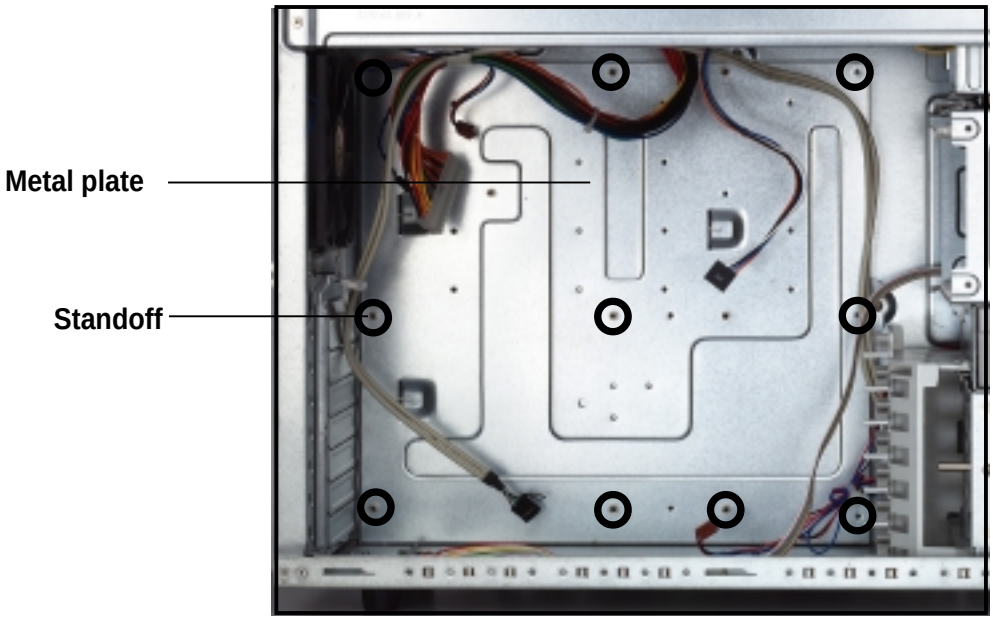
2.3.2 Placement direction and screw holes

Align the holes on the motherboard (indicated by white circles in the picture below) to the corresponding standoffs on the motherboard metal plate inside the chassis.

Place screws through the designated holes to secure the motherboard to the chassis. Refer to the motherboard user guide for the specific number of screws that you need to use.



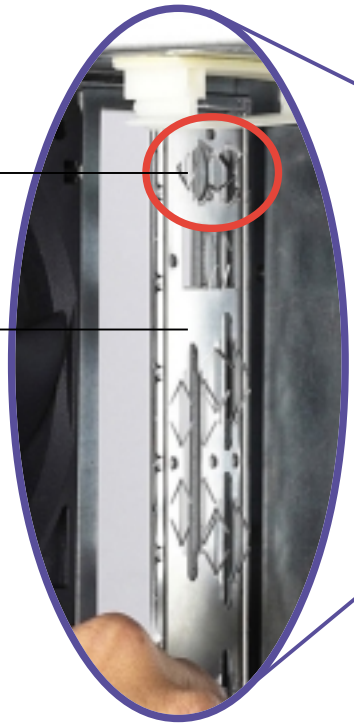
The following figure shows the specific locations of the standoffs (indicated by black circles) inside the chassis. These standoffs should match with the holes on the motherboard as pointed out above.



2.3.3 Installing the motherboard

1. Remove the temporary metal shield on the rear panel (beside the chassis fan) that covers the rear I/O slot opening.
2. Install the rear I/O shield that came with the motherboard package. Orient the I/O shield such that the openings for the mouse and keyboard ports are aligned to the top of the chassis fan.

Temporary metal shield on the I/O slot opening



Mouse/Keyboard port openings

I/O shield

3. Position the I/O side of the motherboard toward the chassis rear panel, matching the I/O ports to the openings on the I/O shield.
4. Secure the motherboard with 11 screws through the holes indicated in section 2.3.2.

2.4 Installing 5.25-inch drives

If you have previously used and powered up the system, and that it may be connected to an AC power source, 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!

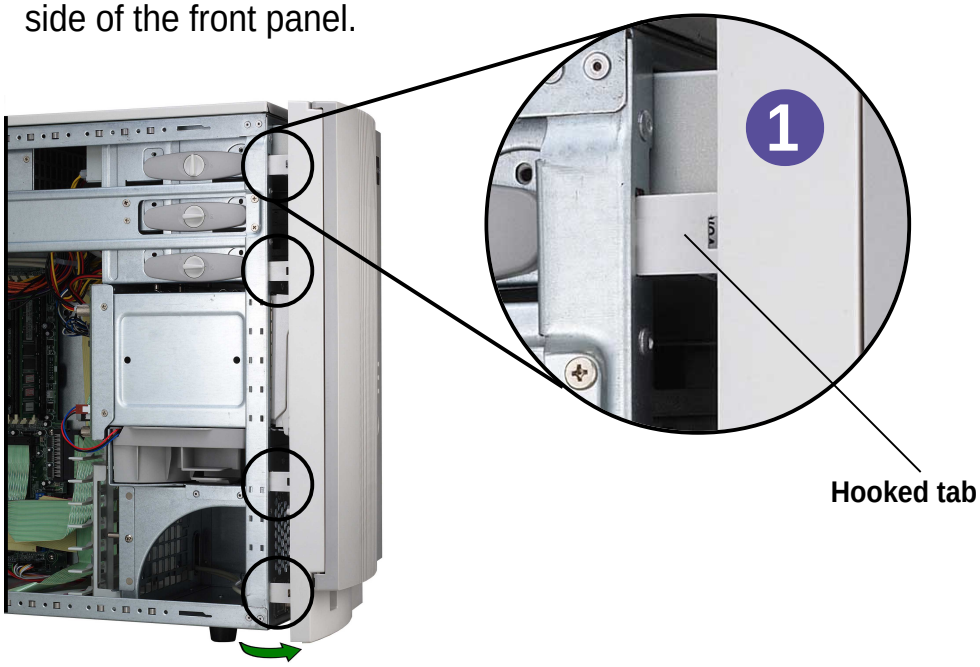
Three 5.25-inch drive bays are located on the upper front part of the chassis. A CD-ROM drive that comes standard with the system package occupies the uppermost bay *(labeled 1)*. The two lower bays *(labeled 2 and 3)* are available for additional 5.25-inch devices.

2.4.1 Removing the front panel assembly

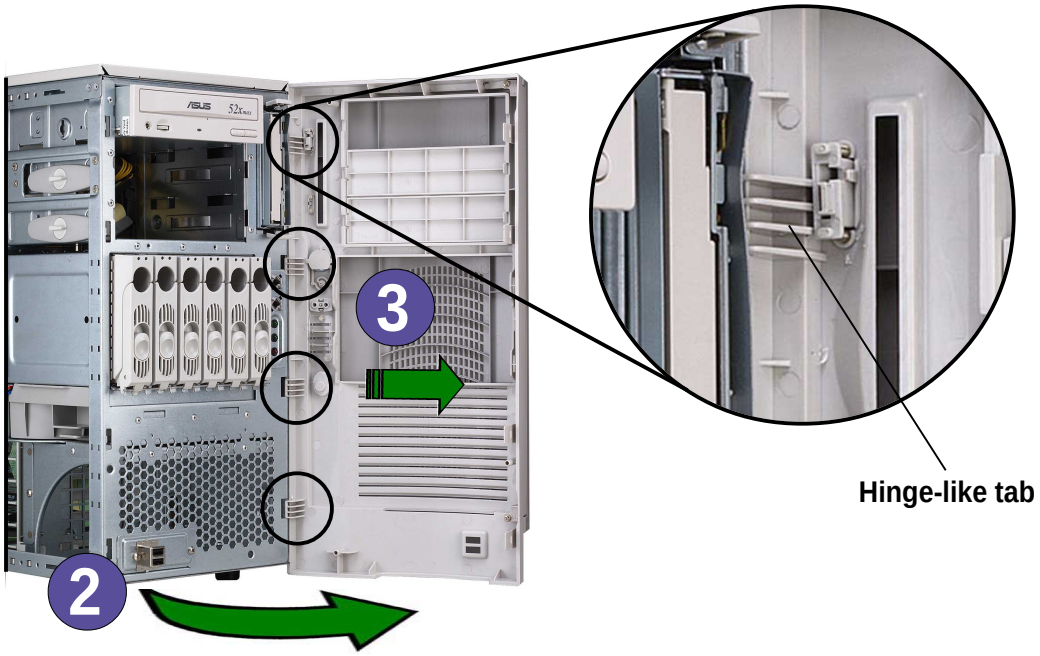
Before you can install a 5.25-inch drive, you should first remove the front panel assembly (front bezel and front panel cover). The front panel assembly is attached to the chassis through four **hooked tabs** on the left side and four **hinge-like tabs** on the right side.

To remove the front panel assembly:

1. Use a flat-head screwdriver to detach the hooked tabs from the left side of the front panel.



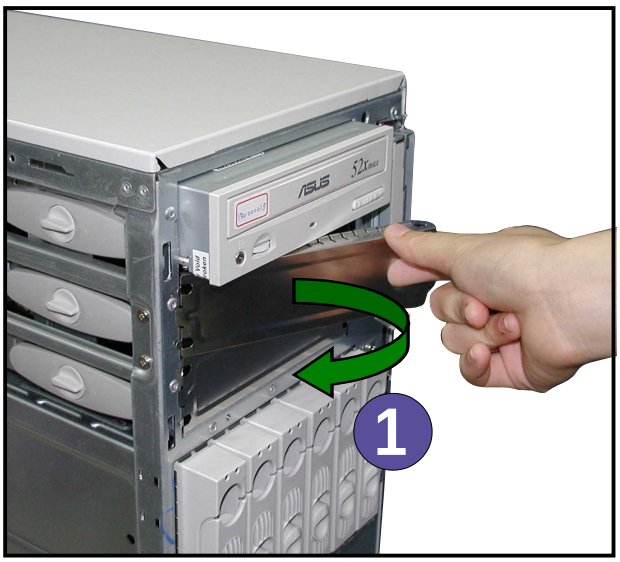
2. Pull and swing the left edge of the front panel outward.
3. Unhook the hinge-like tabs from the holes on the right side of the front panel to completely detach the front panel assembly from the chassis.



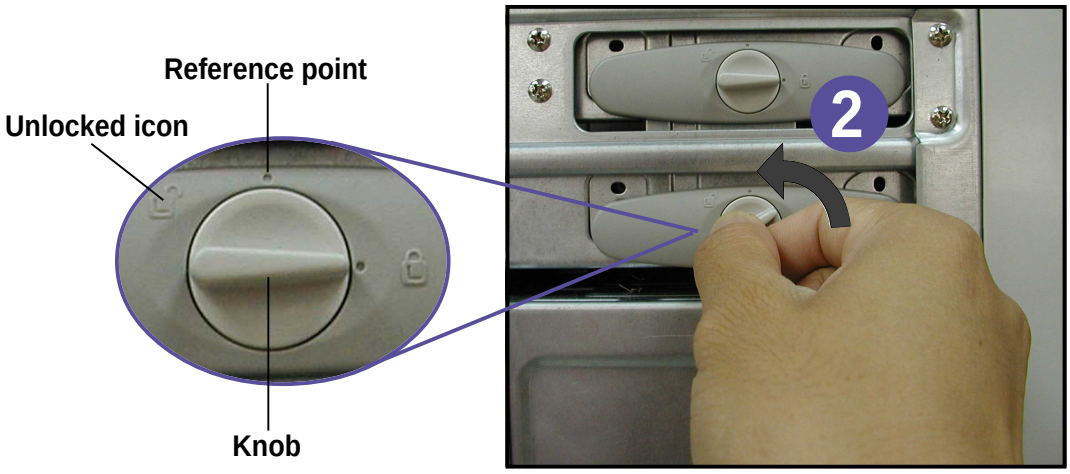
2.4.2 Installing a 5.25-inch drive

To install a 5.25-inch drive:

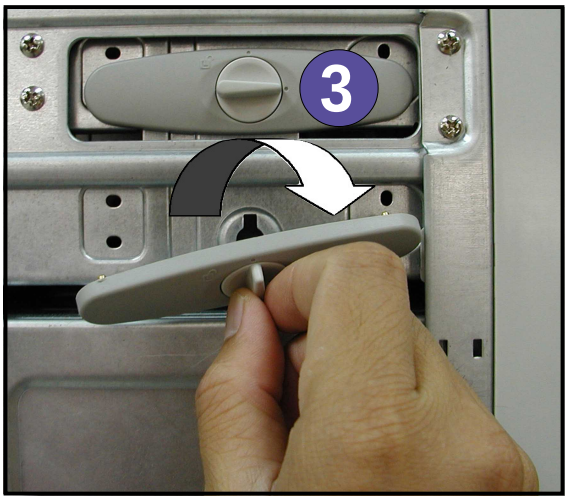
1. Remove the metal cover of the bay where you wish to install the drive by pulling the cover outward.



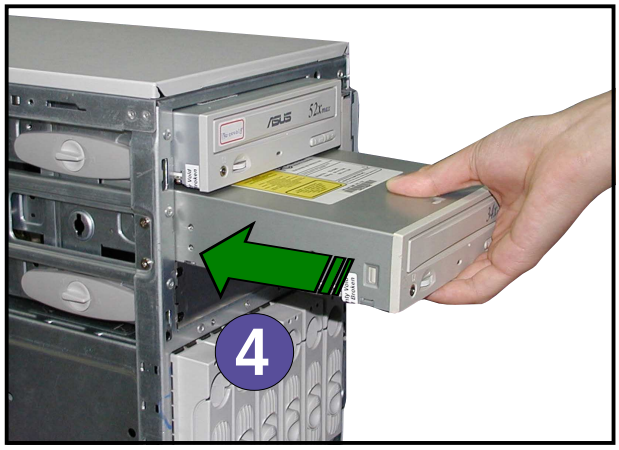
2. From the side of the drive bay, unlock and remove the screwless drive bay lock by turning the knob 45º counter-clockwise until it clicks on the reference point near the “unlocked icon.”



3. When released, pull out the drive bay lock and set it aside.

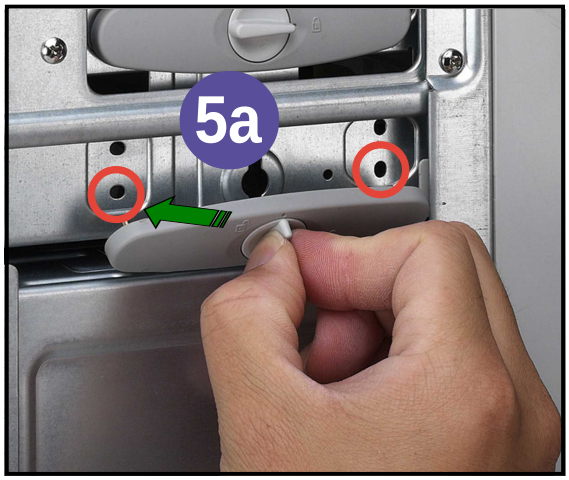


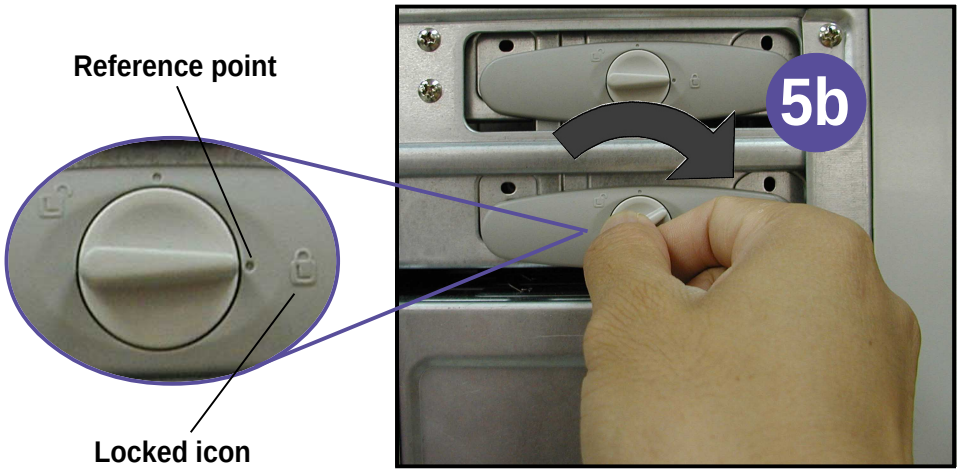
4. Carefully insert a 5.25-inch drive (such as a CD/DVD-ROM drive) into the bay until it is in place.



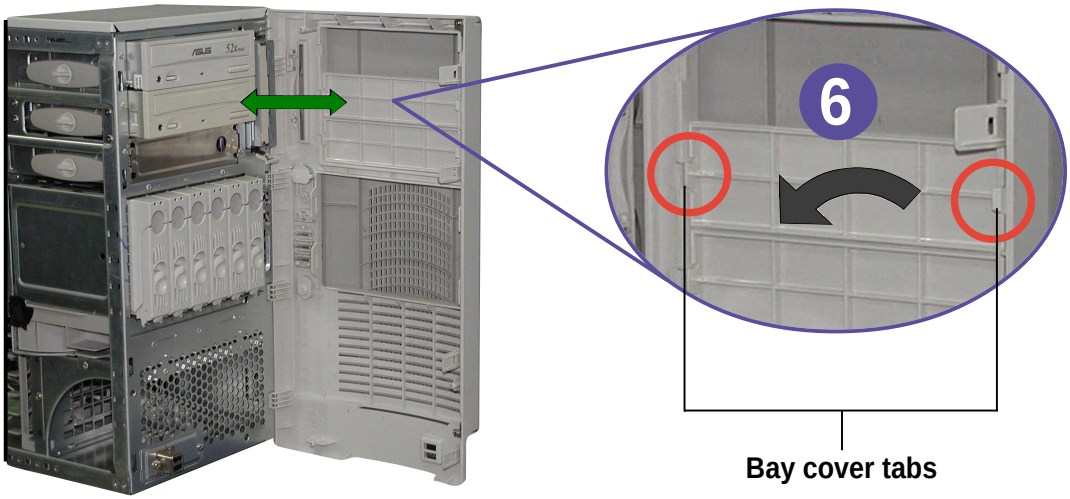
The drive is in place when the screw holes on the drive align with the holes on the side of the bay.

5. Secure the drive to the bay using the screwless drive bay lock that you removed earlier.
   a. Match the two pegs on the lock to the holes on the drive bay.
   b. Turn the knob 45º clockwise until it clicks on the reference point near the “locked icon.”

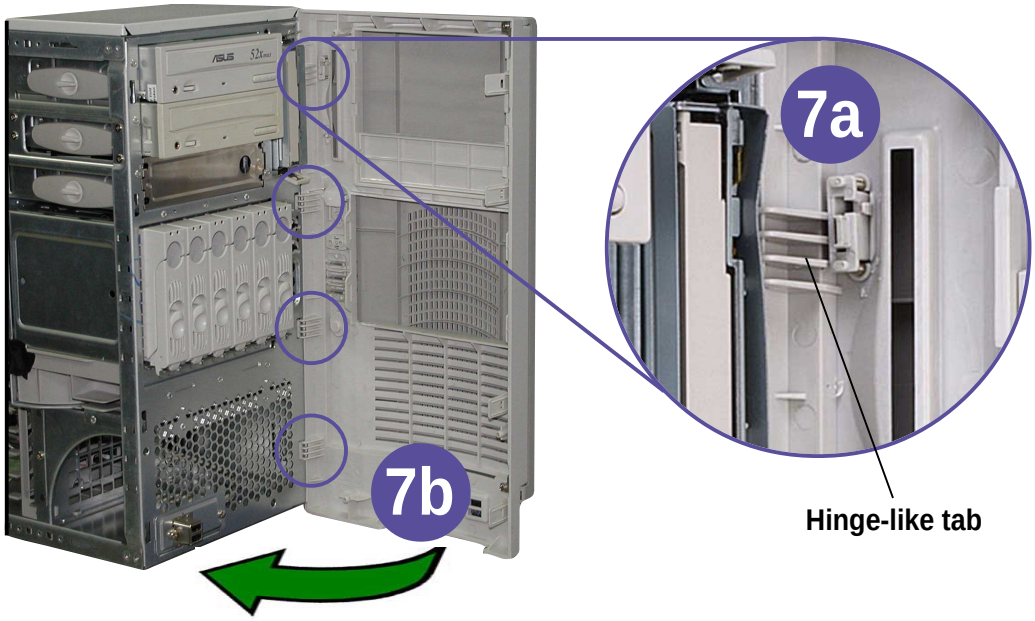




6. On the front panel assembly, detach the plastic bay cover opposite the 5.25-inch drive that you installed by pressing the two hooked tabs on each side of the bay cover.



7. Re-install the front panel assembly (front bezel and front panel cover).
   a. Insert the four hinge-like tabs to the holes on the right edge of the chassis.
   b. Swing the front panel to the left and fit the four (4) hooked tabs to the left side of the chassis until the tabs snap in place.



2.5 Installing hard disk drives

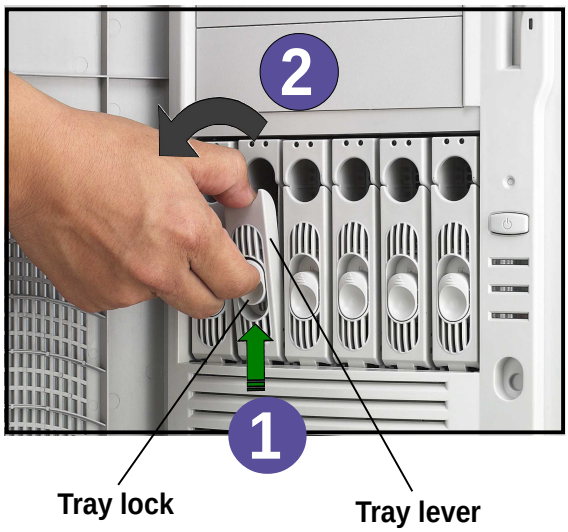
The six hard disk drive (HDD) bays on the front panel include externally removable trays for mounting either SCSI or IDE 3.5-inch hard disk drives. You can access the drive trays by simply opening the the front bezel.

1. SCSI and IDE drive trays differ in size and structure. Make sure of the type of HDD trays that came with your chassis before buying hard disks.
2. If your motherboard does not have an onboard SCSI interface, you need to install a SCSI expansion card into one of the PCI slots. Use a SCSI cable to connect the card to the SCSI backplane board to which the hard disks are connected.

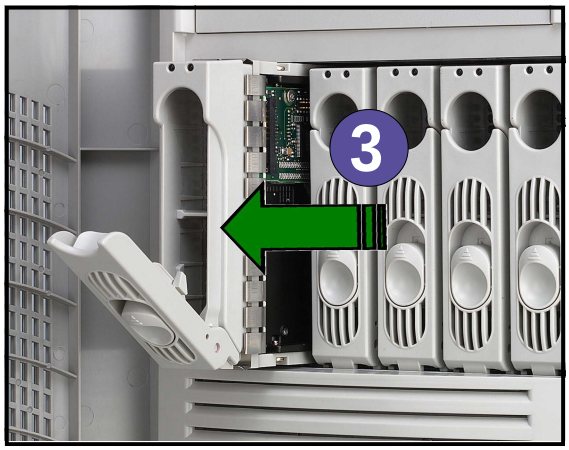
2.5.1 SCSI hard disk

To install a SCSI hard disk drive:

1. Release an HDD tray by pushing the tray lock upward
2. Pull down the tray lever until the tray pops out slightly, indicating that it is released.



3. Holding on the tray lever, pull out the HDD tray from the bay.



4. Place a hard disk drive on the tray and secure it with four screws.

5. Insert the tray with the installed HDD back into the bay.

Make sure to place the tray in the correct orientation as shown.

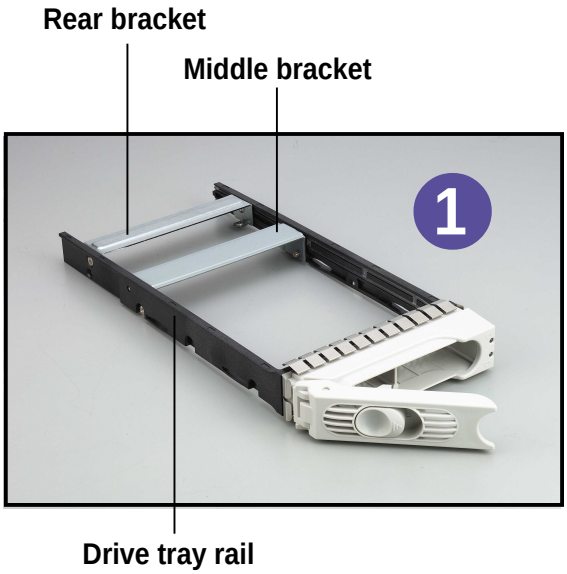
6. Carefully push the tray all the way to the depth of the bay.
7. Push the tray lever until it clicks in place. The drive tray is correctly placed when its front edge aligns with the bay edge.

The edge of the tray protrudes about 0.5 cm until you push back the tray lever.

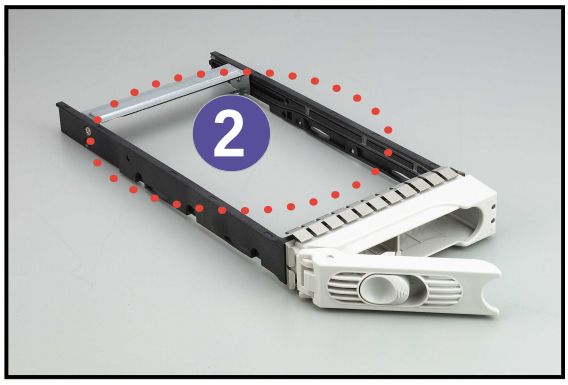
2.5.2 IDE hard disk

To install an IDE hard disk drive:

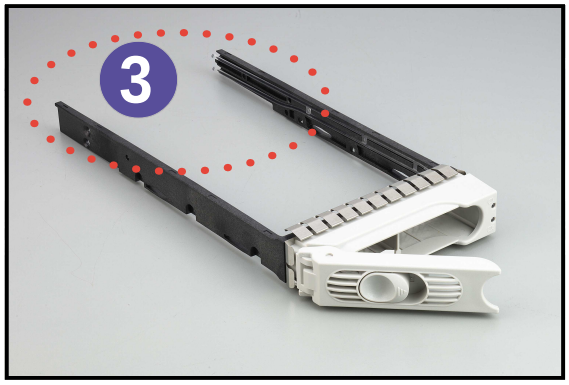
1. Place the hard disk tray on a flat clean surface.



2. Use a Phillips screwdriver to remove the screw that secures the middle bracket from the drive tray.

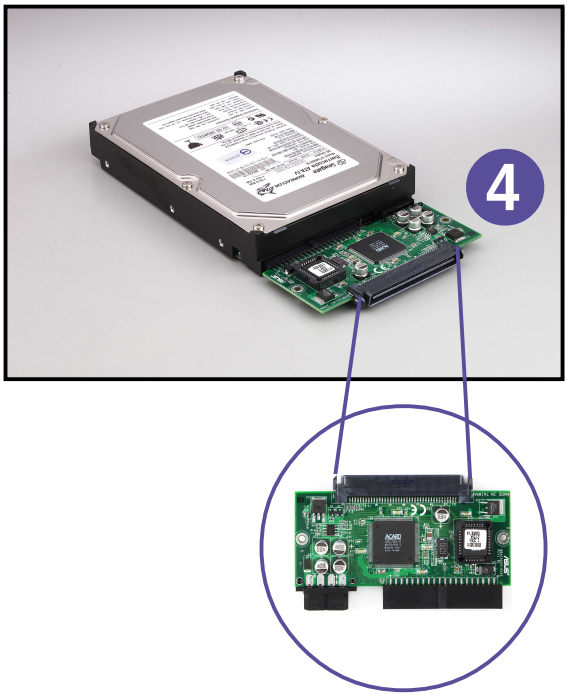


3. Remove that screw that secures the rear bracket to detach it from the drive tray.



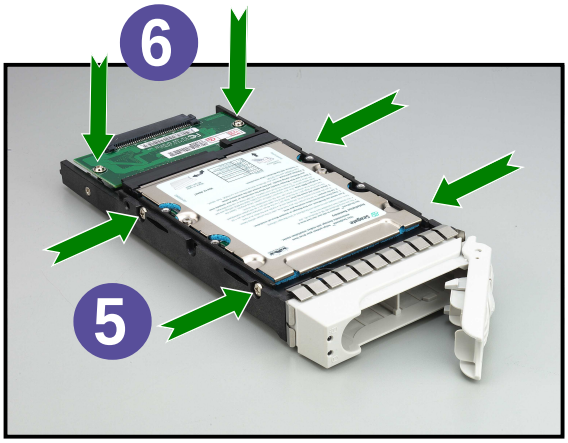
Be careful when handling the drive tray rails to avoid breaking them.

4. Prepare hard disk drive. Carefully connect the SCSI-IDE HDD bridge board to the 40-1 pin IDE connector and 4-pin power connector. Make sure that the SCSI-IDE HDD bridge is properly connected.

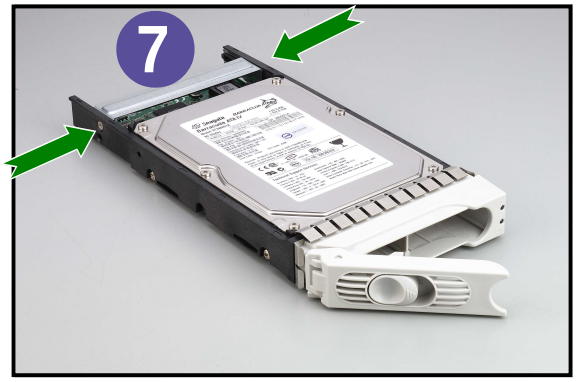


SCSI-IDE HDD bridge board

5. Carefully place the hard disk drive into the drive tray. Align the four (4) screw holes on the drive with those on the tray rails. Secure drive with four round head screws.
6. Secure the SCSI-IDE HDD Bridge to the tray with two (2) round head screws.



7. Re-attach the rear bracket and secure it with two (2) flat head screws.



Do not overtighten the screws to avoid breaking the plastic tray rails.

8. To install the tray into the bay, follow steps 5, 6, and 7 in section 2.5.1.

2.6 Installing or removing an expansion card

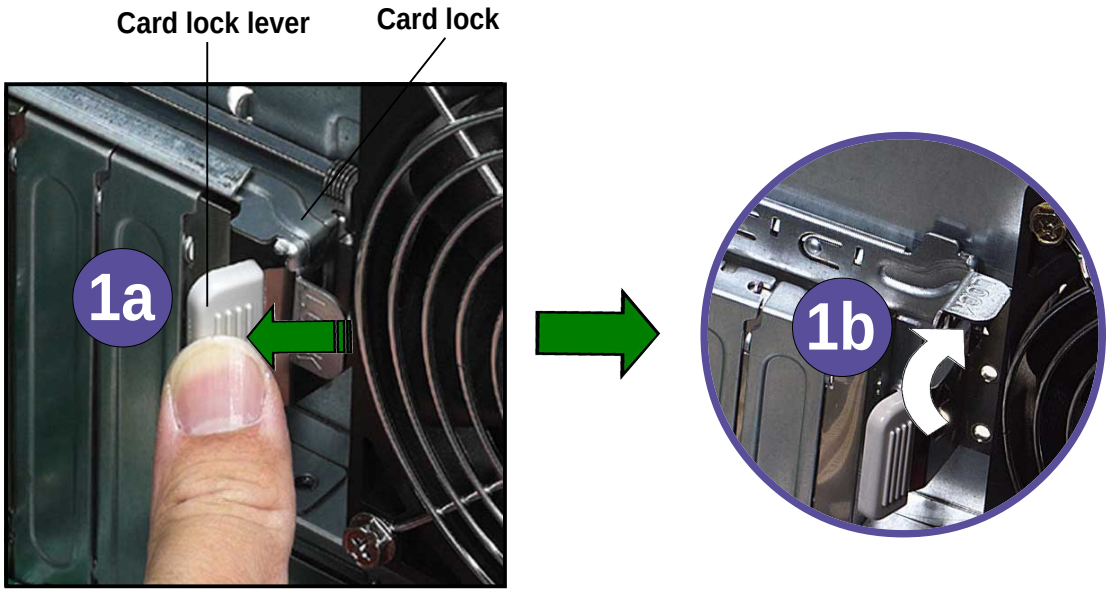
The chassis is designed with a screwless expansion slot frame on the rear panel. This design feature allows you to install or remove an expansion card in less steps.

Make sure to unplug the power cord before installing or removing expansion cards. Failure to do so may cause physical injury, and damage to the card and motheboard components!

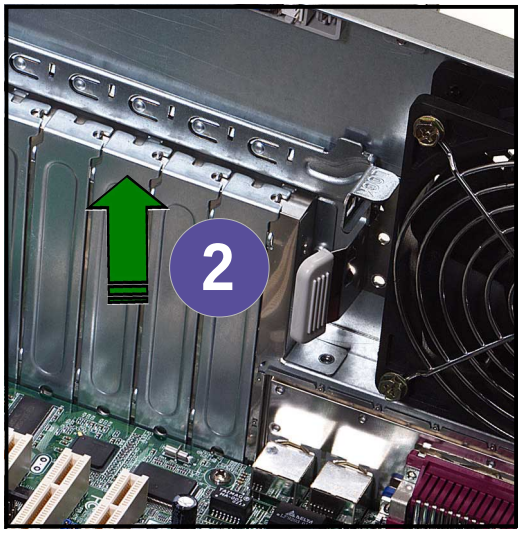
2.6.1 Installing a standard size expansion card

To install an expansion card:

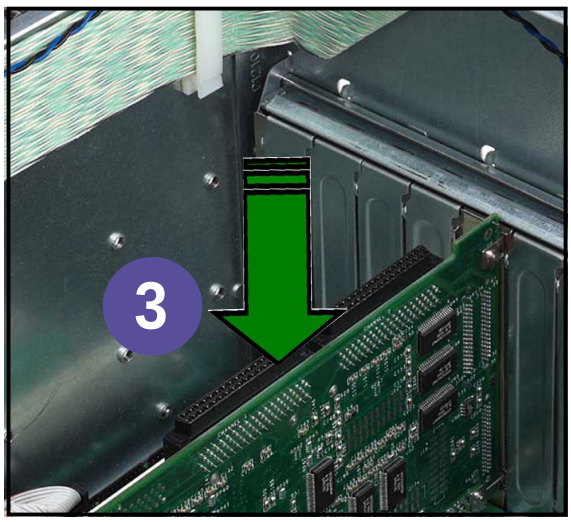
1. Release the card lock.
   a. Press the card lock lever.
   b. The card lock flips up.



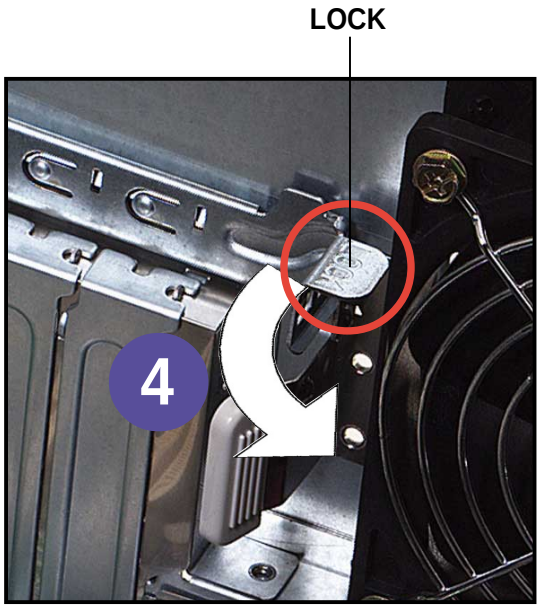
2. Slide out the metal bracket opposite the PCI slot where you wish to install the expansion card. You may use a flat-head screwdriver to easily remove the bracket.



3. Install the expansion card making sure that it is properly seated on the slot.



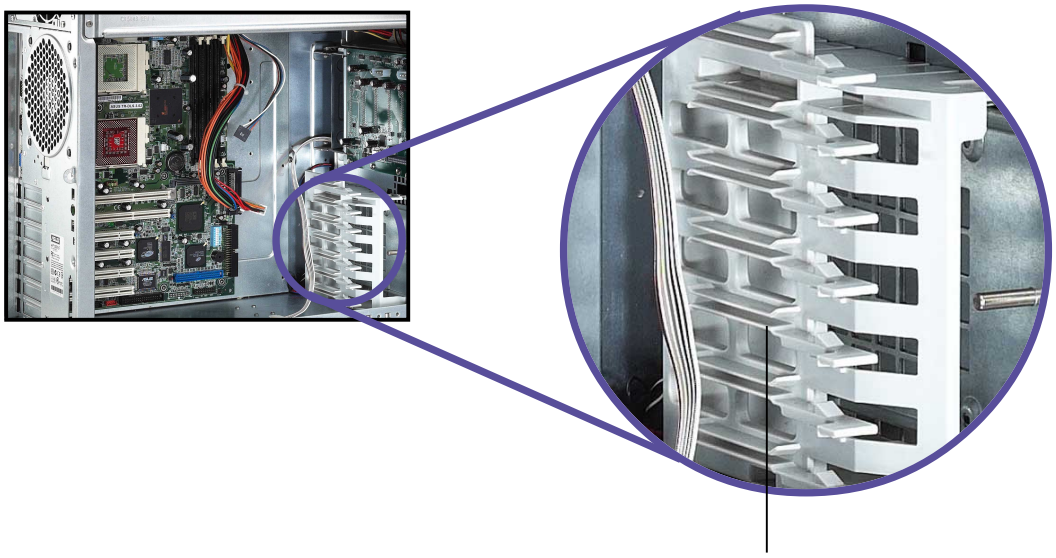
4. Press the end of the card lock marked “LOCK” to secure the card on the slot. A light click indicates that the card is locked in place.



Refer to the card documentation for the card configuration details, and to the motherboard user guide in case you need to configure any jumpers after installing the expansion card.

2.6.2 Installing a long expansion card

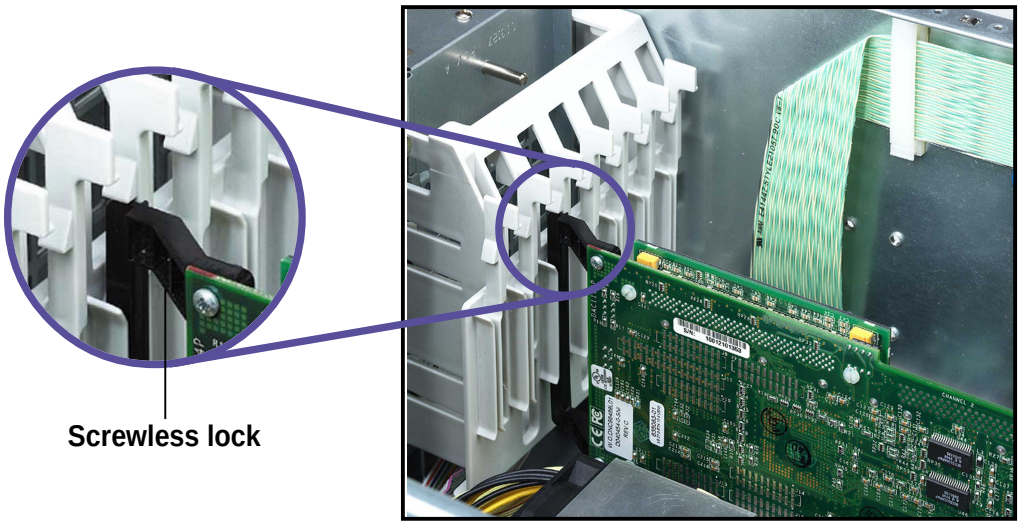
If you are installing a long expansion card, such as some types of RAID cards, use the plastic card support located near the front of the chassis (under the backplane board) to keep the expansion cards firmly seated on the slots. This card support has individual card guides that correspond to each expansion slot.



Plastic long-card support

To install a long expansion card:

1. Position the expansion card above the PCI slot that you wish to use.
2. Insert one end of the card to the card guide opposite the PCI slot, and align the bracket end of the card to the expansion slot on the rear panel.
3. Slide in the card down until it is properly seated on the slot.
4. Secure the card using the screwless lock on the card guide.

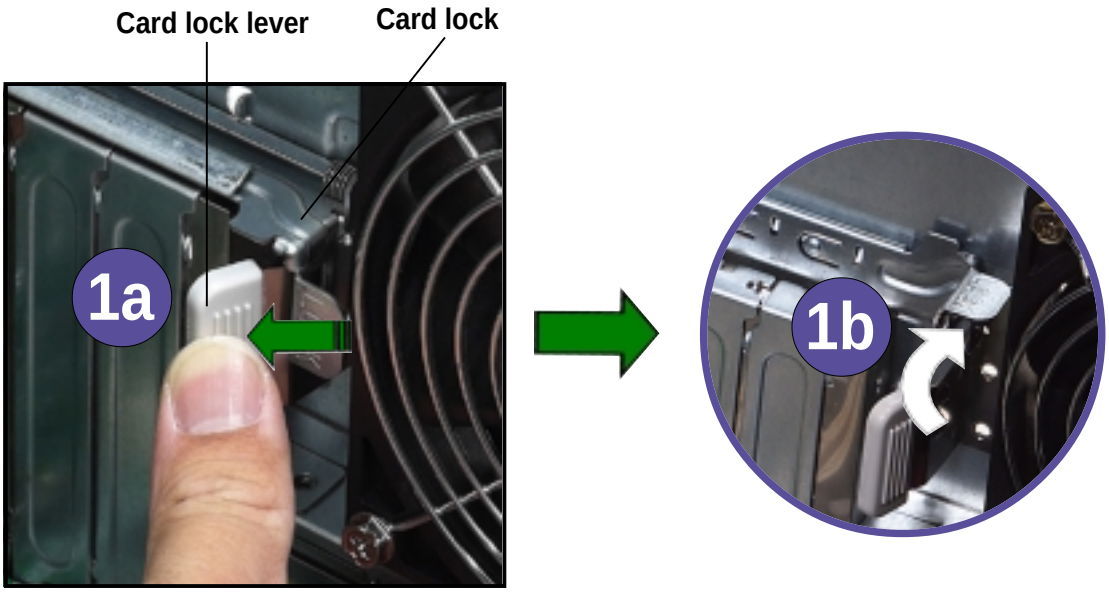


Screwless lock

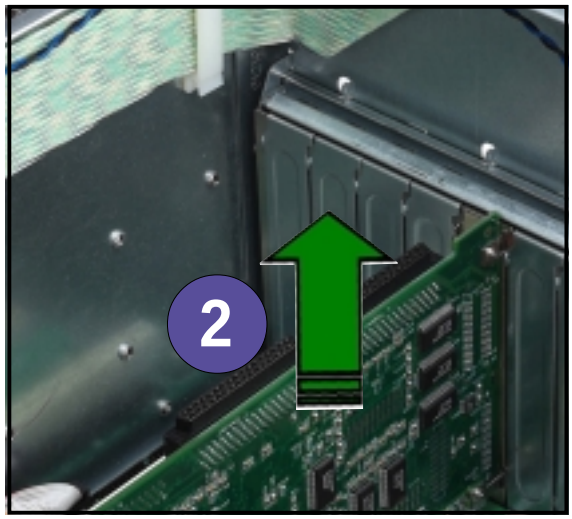
2.6.3 Removing an expansion card

To remove an expansion card:

1. Release the card lock.
   a. Press the card lock lever.
   b. The card lock flips up.



2. Pull out the card from the PCI slot.



3. Press the end of the card lock marked “LOCK” to return it in place.

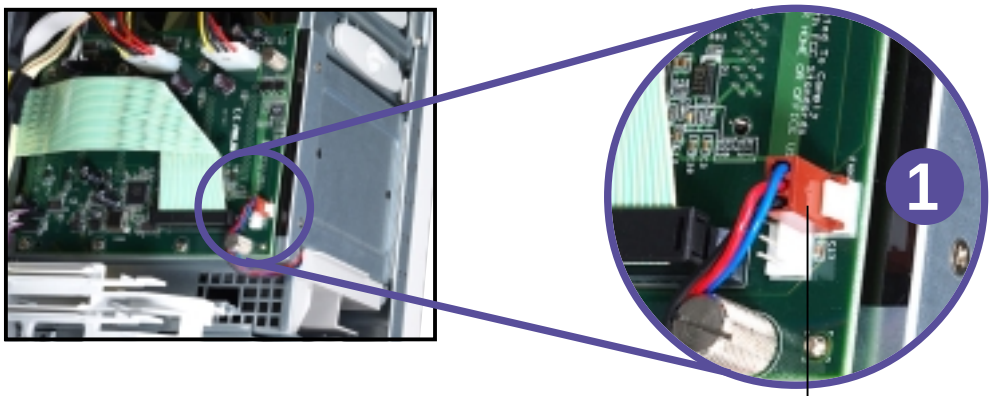
2.7 Removable components

When installing or removing system devices, you may need to remove previously installed components. This section describes how to remove these components.

2.7.1 HDD blower

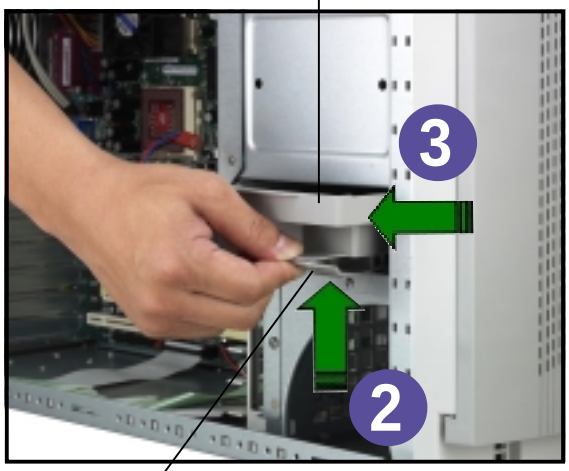
To remove the HDD blower:

1. Disconnect the 3-pin HDD blower cable from the FAN 1 connector on the SCSI backplane.



HDD blower cable

2. Press the tab at the bottom of the blower to release it from the chassis.
3. Pull out the HDD blower.

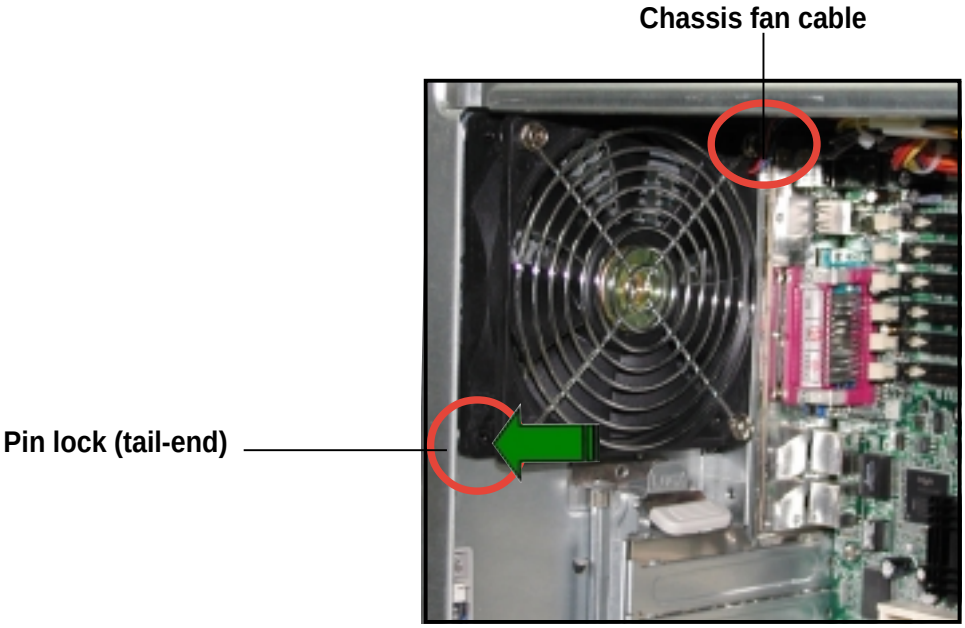


HDD blower

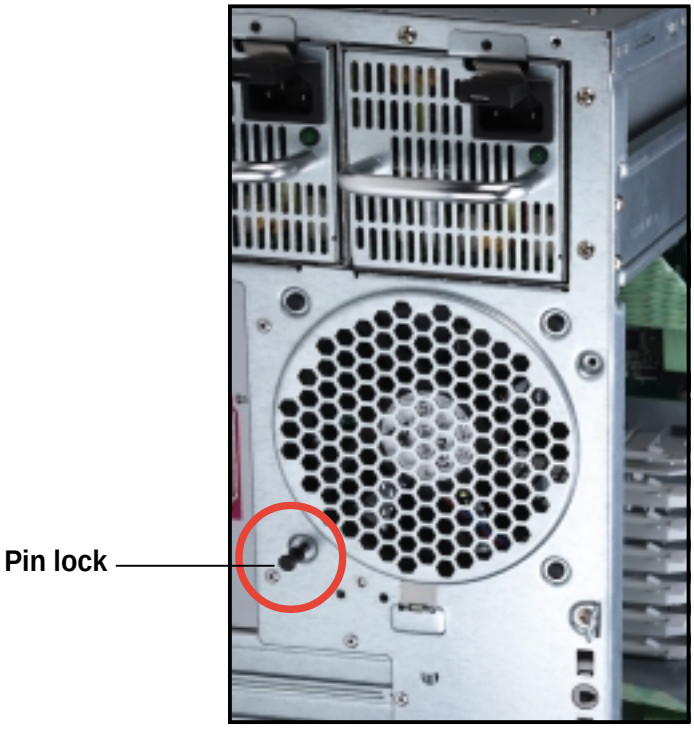
2.7.2 Chassis fan

To remove the 12-cm chassis fan:

1. Disconnect the 3-pin fan cable from the connector on the motherboard.
2. Use a flat screwdriver to push the pin locks on the four corners of the fan from the inside of the chassis.



3. Pull out the pin locks from the rear panel.
4. Remove the chassis fan.

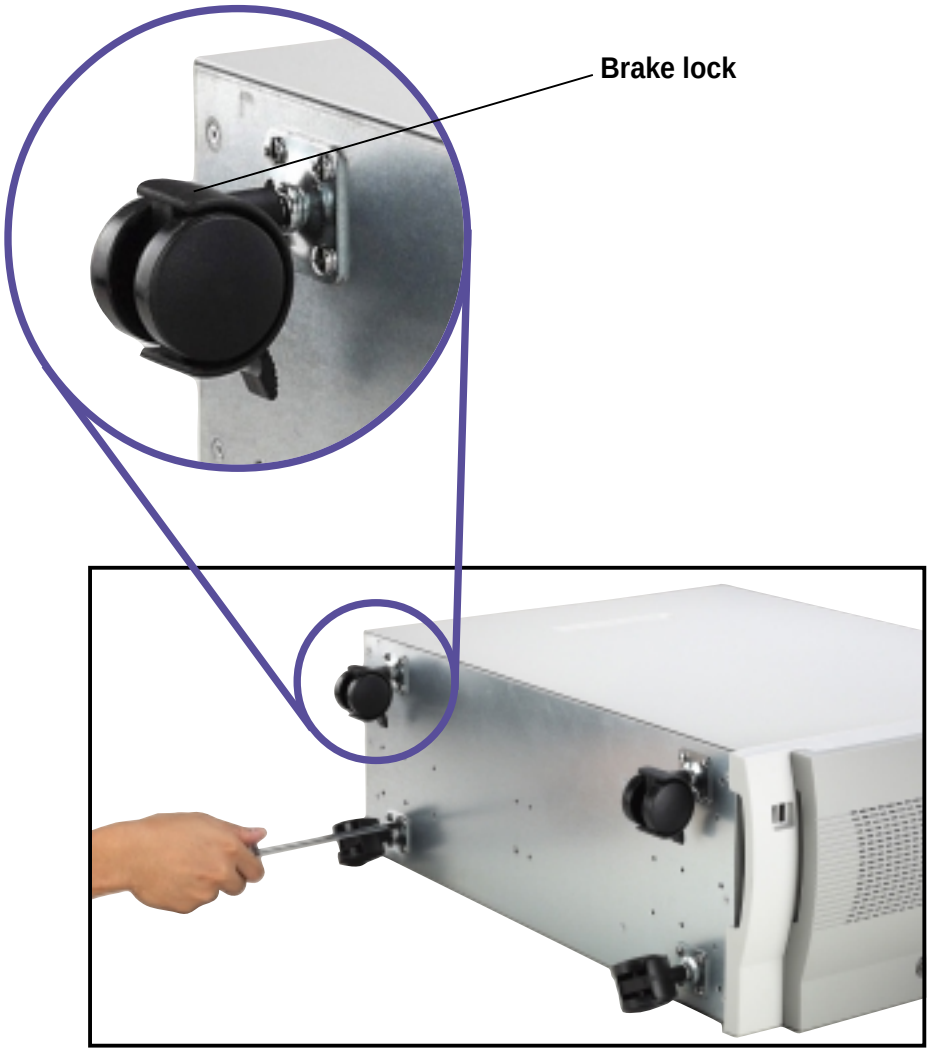


2.7.3 Roller wheels

The chassis comes with four roller wheels for convenient transport. Each wheel has a brake lock to stabilize the chassis in place.

To remove the chassis wheels:

1. Lay the chassis in its side.
2. Use a Phillips screwdriver to remove the screws that secure the wheels to the bottom of the chassis.



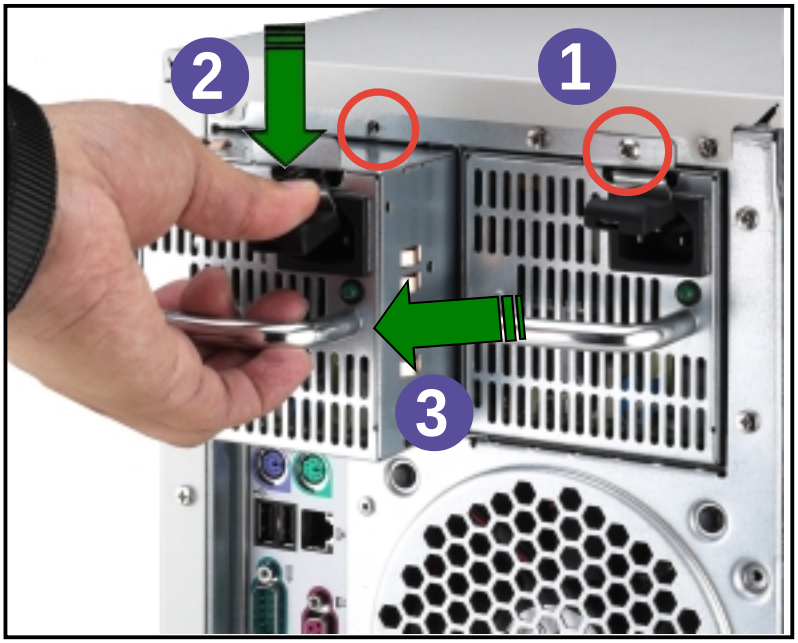
Remove the chassis roller wheels if you wish to mount the system to a rack. Refer to the Rackmount Kit manual for more information.

2.7.4 Power supply modules

The redundant power model has two power supply modules. These hot swap power modules can be removed or installed while the system is powered ON. Only one power module is necessary to provide power to the system. However, it is recommended to have two redundant power supply modules. In case one of the power modules fails, the other one keeps providing sufficient power to the system. This eliminates system down time and data loss. When two power supply modules are installed, the task of providing power to the server is shared.

To remove the redundant power supply module:

1. Remove the screw that secures the power module to the chassis.
2. Press down the rubber lever to release the power module.
3. Pull out the power module from the chassis.



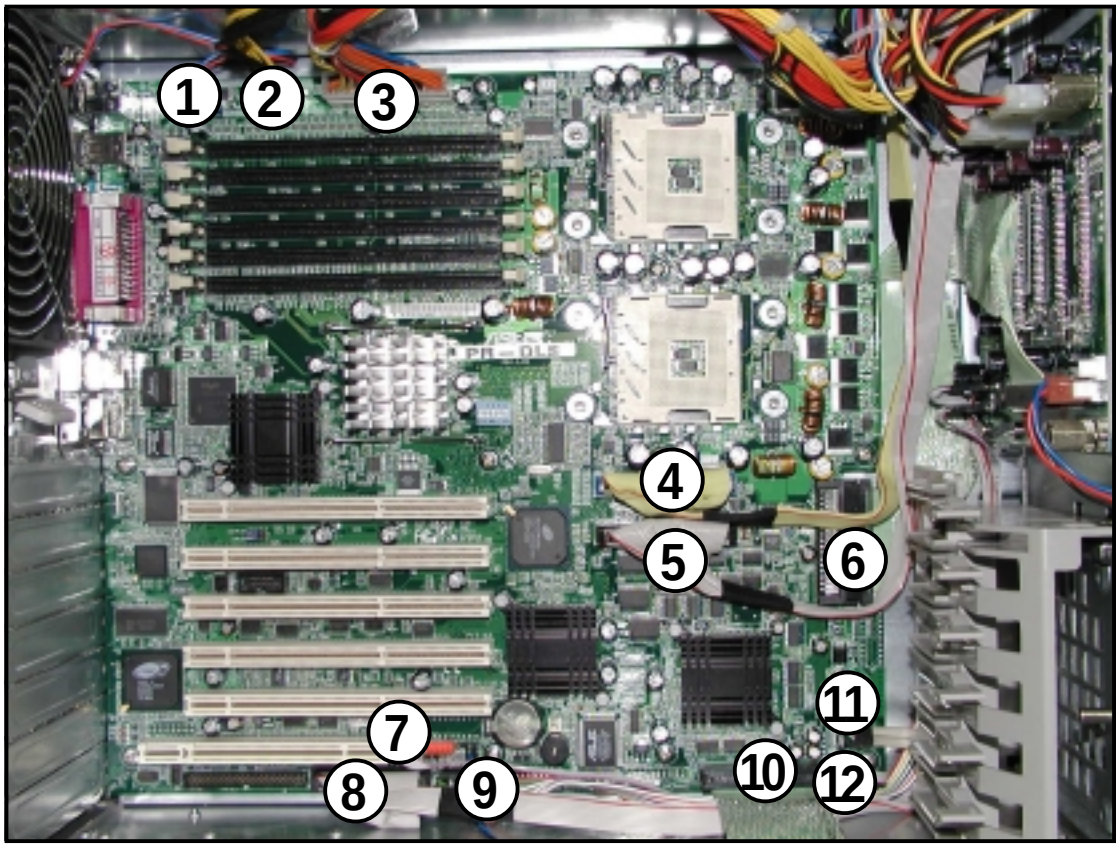
500W Redundant Power Module

2.8 Connecting the cables

2.8.1 Motherboard connections

The chassis includes power and signal cables that you need to connect to the motherboard, SCSI backplane, and to the devices that you will 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

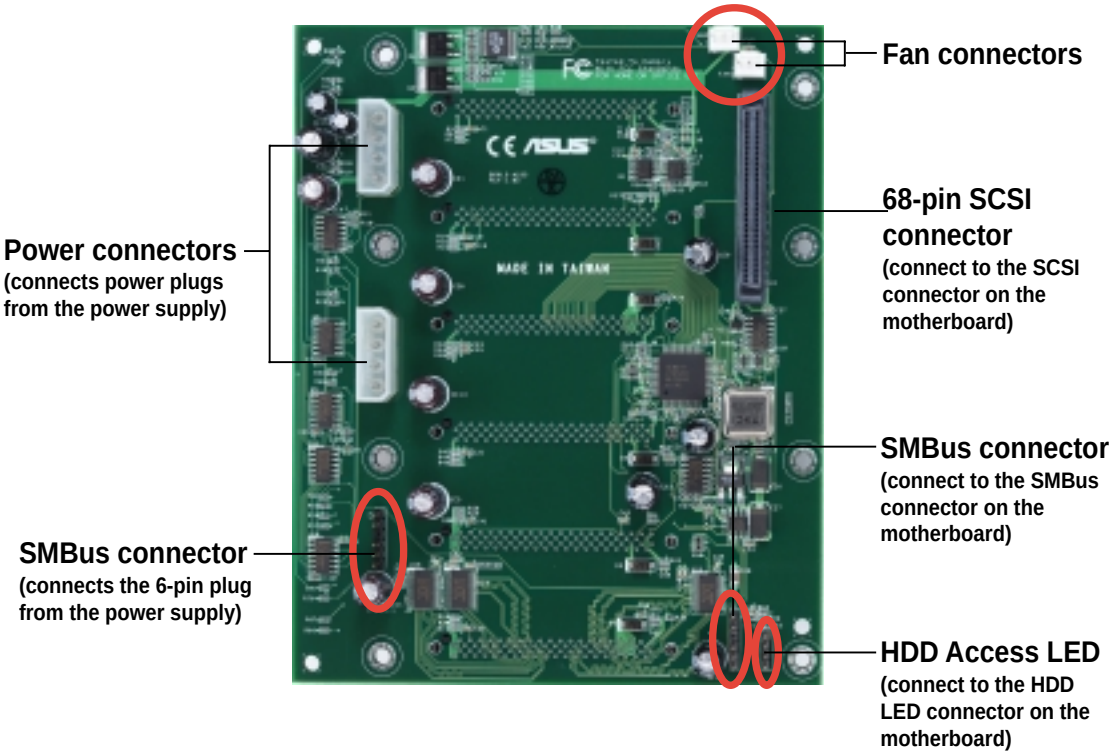
1. Chassis fan
2. 12V AUX power
3. 24-pin ATX power
4. Primary IDE
5. Secondary IDE
6. SCSI backplane
7. SMBus panel to backplane
8. Floppy disk drive
9. System front panel
10. External SCSI
11. HDD access
12. Front USB

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

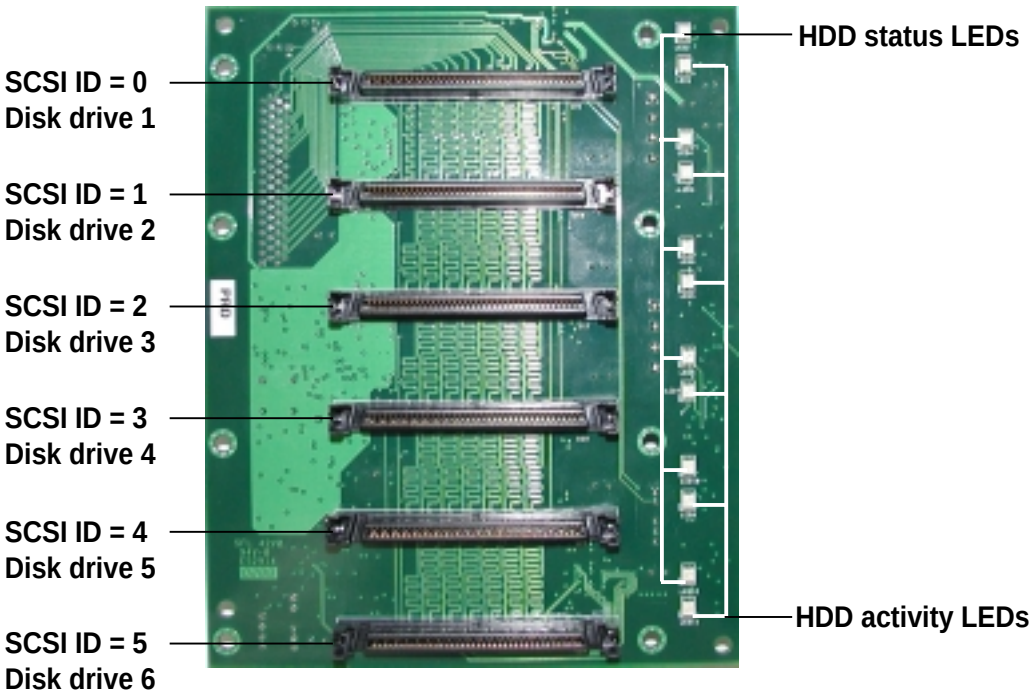
2.8.2 SCSI backplane connections

The SCSI backplane has six 68-pin SCSI connectors to support SCA SCSI hard disks. The backplane design incorporates a hot-swap feature to allow easy connection or removal of SCSI hard disks. The LED connectors on the backplane connect to the front panel LEDs to indicate HDD access, HDD failure, thermal failure, or fan failure.

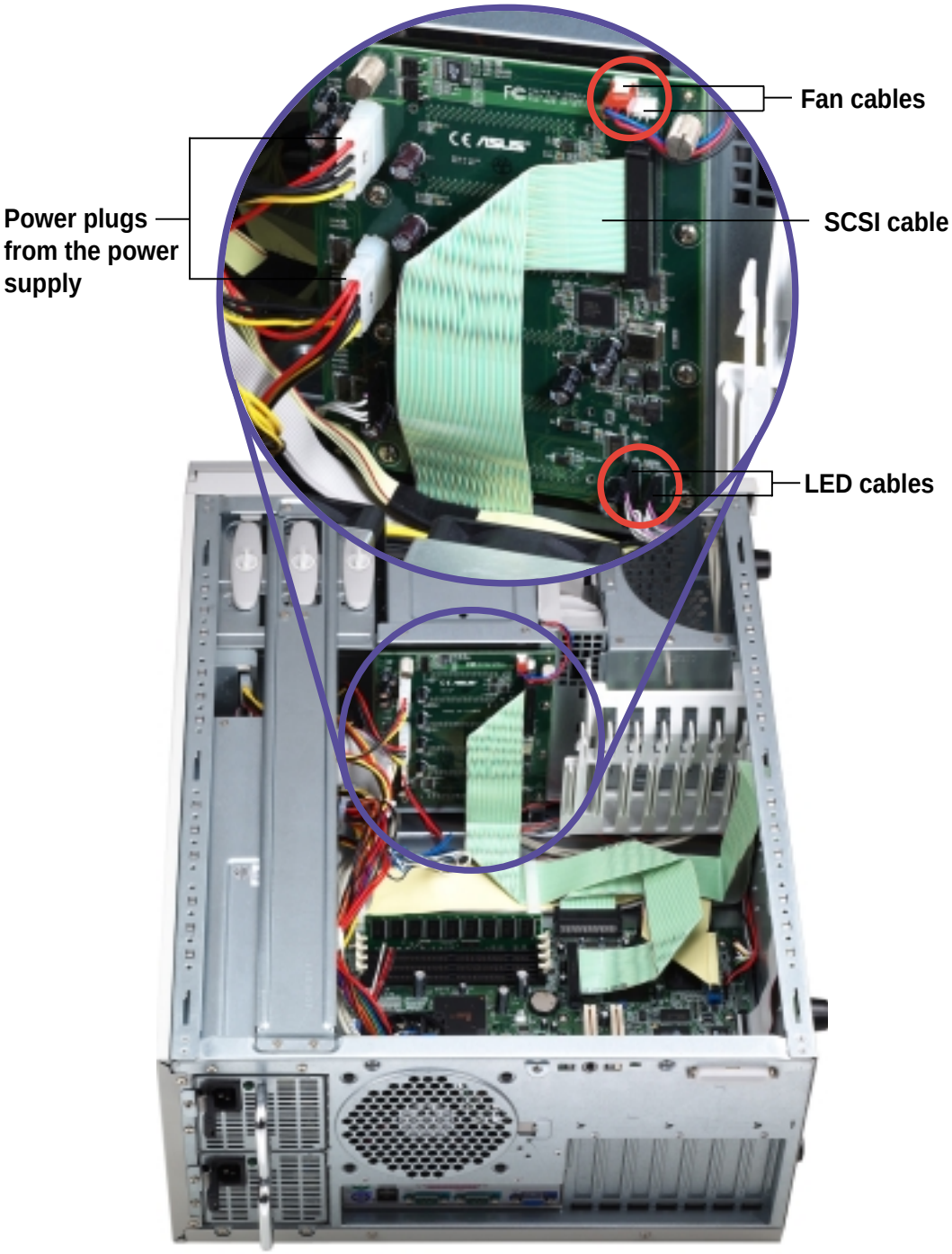
Front side



Back side



The following picture shows the SCSI backplane installed in the system and the cables connected to it.



To ensure power redundancy, it is recommended that you use power plugs from each of the redundant power supply modules.

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.

Troubleshooting

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 the power cable connection on the system rear panel if properly connected. 2. Make sure that the power cables are connected to a grounded power outlet.
The keyboard does not work	Check the keyboard cable if properly connected to the keyboard port.
The mouse does not work	Check the mouse cable if 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 the DIMMs the system supports. 2. Make sure that the DIMMs are properly installed on the sockets. 3. Check if it has a VGA ouput.
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. On SCSI models, make sure that the cables are properly connected to the SCSI connectors on the backplane.
Network connection not available	1. Make sure that the network cable is connected to the RJ-45 port on the rear panel. 2. Make sure that you have installed the LAN drivers from the support CD.