AW1500-I5

Intel® Xeon Tower/5U Rackmount Workstation
with 533MHz FSB support

User's Manual

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Federal Communications Commission

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

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.

Contents

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 an authorized 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.

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.**

Introduction

About this guide

“About This Guide” introduces the contents of this document. This part includes the target audience, chapter description, and conventions used. It also lists other sources of information that are not contained in this manual.

Audience

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

Contents

This guide contains the following parts:

1. Introduction: About this guide

This part introduces the contents of this document. It includes the target audience, chapter description, and conventions used. It also lists other sources of information that are not contained in this manual.

2. Chapter 1: System overview

This chapter describes the general features of the AW1500-I5 system workstation. It include sections on front panel and rear panel specifications.

3. Chapter 2: Hardware setup

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

4. Appendix A: Optional Chassis Roller-wheels

This appendix contains the installation procedure for the optional chassis roller-wheel units for the AW1500-I5 workstation system.

5. Appendix B: Redundant Power Modules

This appendix contains detailed hardware operation and specifications of the AW1500-I5 redundant power modules.

6. Appendix C: Troubleshooting

This appendix lists the common problems that you may encounter while using the AW1500-I5 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.

Conventions

Symbols

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 PP-DLW Motherboard User's Manual**
   This manual contains detailed information about the PP-DLW motherboard.

2. **ASUS Websites**
   The ASUS websites worldwide provide updated information on ASUS hardware and software products. The ASUS websites are listed in the ASUS Contact Information on page iii.

3. **Optional Documentation**
   Your product package may include optional documentation such as a CD-ROM manual, warranty flyers, and others that may have been added by your dealer. **NOTE:** These documents are not part of the standard server package.

System Package Contents

The following checklist enumerates the components included in the standard system package.

1) ASUS AS-35 Tower/5U Rackmount chassis
2) ASUS PP-DLW motherboard
3) 450W power supply
4) Backplane board (BP6LS-AS35)
5) ASUS 16x DVD-ROM drive (1 piece)
6) Floppy disk drive (1 piece)
7) Special heatsink with fan assembly (2 sets)
8) Hot swap IDE hard disk drive tray (6 units)
9) ASUS BBATA 2U3 ATA 133 IDE to Ultra 160 SCSI HDD bridge board (1 piece)
10) AC power cord (1 piece)
11) Support CD that include drivers, utilities and the PC-cillin anti-virus software
12) ASUS PCI-SCU3 Ultra160 SCSI controller support CD
13) Motherboard user guide
14) System user guide
15) LSI SCSI controller user guide
16) Chassis roller wheels (4 sets)
17) ASUS PCI-SCU3 Ultra160 Dual Channel SCSI Card in standard packing; LSI MegaRAID 320-1 U320 Single Channel SCSI Card in alternative packing.
18) Keys for system door x 2
19) Screws and labels

Optional:

1) ATA133 IDE to Ultra160 SCSI HDD bridge board (5 pieces)
2) ASUS AS-35 5U rackmount rail kit
3) ASUS PXL-S30 U320 LSI 1030 SCSI Card
4) ASUS PXI-G45 Gb LAN card
5) ASUS AGP8X V9280 graphics card

If any of the above items is missing, contact your dealer.

Chapter 1

System Overview

This chapter describes the general features of the AW1500-I5 system workstation. It includes the sections of the front panel, rear panel and internal specifications.

1.1 System Features

The ASUS AW1500-I5 workstation is a stylish server system featuring the ASUS PP-DLW motherboard. The server supports the Intel® Xeon™ processor in a 604-pin socket, and includes the latest I/O, LAN, and video technologies through the chipsets embedded on the motherboard.

The following are highlights of the workstation's many features:

Chassis

Pedestal or rackmount 5U with removable front door bezel and chassis foot stand or roller-wheels.

Motherboard

ASUS PP-DLW

Chipset

North Bridge:	Intel® E7505 North Bridge (Placer)
South Bridge:	Intel® 82801DA South Bridge (ICH4)
64-bit PCI-X Bridge:	Intel® 82870P2 (P64H2)

System Memory

Memory Capacity:	4 x 184-pin PC2100 DDR RAM sockets. Each RAM supports registered ECC/ unbuffered DDR DIMMs for a total of 2GB up to 8GB maximum capacity

Processor

Dual Intel® Xeon™ processor up to 3.06 GHz frequency. (Socket 604 Prestonia x 2) with 533Mhz FSB support with 35º ambient and 85% CPU utilization.

Expansion Slots

AGP Slot:	1 x AGP 8X (1.5V)
64-bit PCI slot:	1 x PCI-X 133MHz slot 3 x PCI-X 66MHz slots
32-bit PCI slot:	1 x 32-bit 33MHz 5V PCI slot

Integrated Audio

Analog AD1885 AC'97 codec audio controller

SCSI/RAID Controller

U160 SCSI:	ASUS PCI-SCU3 Dual channel Ultra 160 LSI® 53C1010R 32-bit/33MHz SCSI controller
U320 RAID:	LSI® MegaRAID 320-1 U320 Single channel 64-bit/66MHz RAID controller

Integrated Super I/O

Supports 2 x External serial ports, 1 x Parallel port, 1 x Floppy port, 1 x PS/2 keyboard port, 1 x PS/2 mouse port, 2 x front USB ports, 4 x rear USB ports (6 x USB 2.0 ports)

Integrated PCI/ISA IDE Bridge

Two channel bus master IDE port supports Ultra DMA 100 and PIO mode 3/4

Drive Bay

Available drive includes: 1 x 1.44MB FDD, 1 x 16X ASUS DVD-ROM, 2 x 5.25 device empty space, 6 x hot-swap HDD bay with SCSI backplane support safety function

IDE to SCSI solution

IDE HDDs:	6 x 1" Parallel ATA100 IDE HDDs
IDE to SCSI Bridge:	1 x ASUS BBATA2U3-AR35; ATA100 IDE to Ultra160 SCSI bridge board (max. 6 pcs)
SCSI BP:	1 x ASUS BP6LS-AS35, 6 bay Ultra320 SCSI backplane

System Management Functions

Failure Detection:	Voltage variation, thermal, operating system watchdog timer and fan failure
Even Logging:	Nonvolatile memory to log system failure events

Hardware Management

NT Performance Monitor Extension Counter:
Provides User to view system health monitor object from Windows® 2000 built-in utility

System Health Monitor:
Temperature, voltage, cooling fan speed, CPU and memory utilization, storage capacity, ASR (Automatic Server Restart when OS hangs) and remote reboot

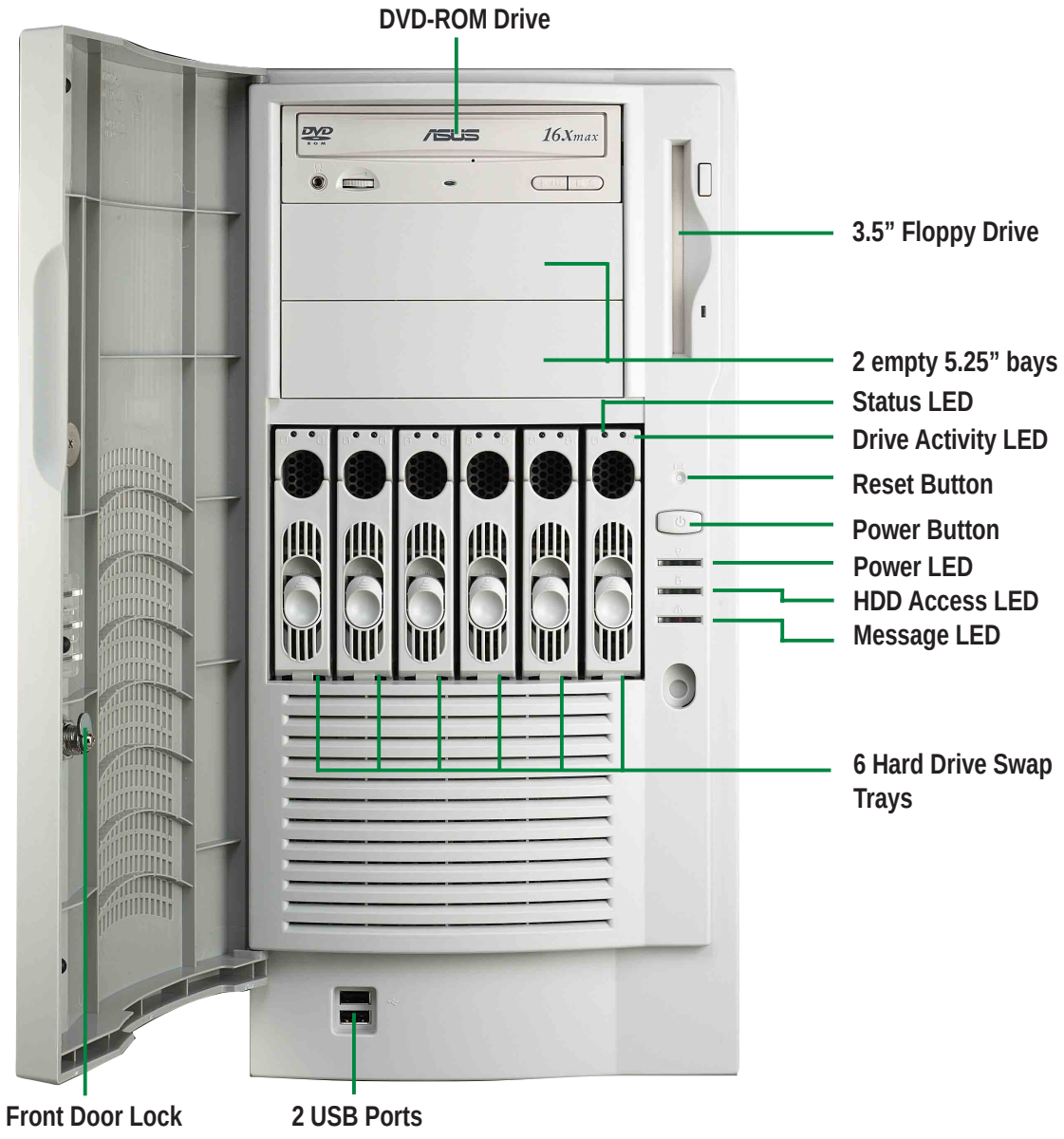
ASUS SCA SCSI Back Plane Health Monitor:
IDE HDD access and power status with the ASUS SCSI back plane

Alert Notification:
SNMP® trap, record into NT Event Log and Linux System Log

Critical Event Actions:
When the system overheats, the system can be shutdown or rebooted depending on setting.

1.2 Front Panel Features

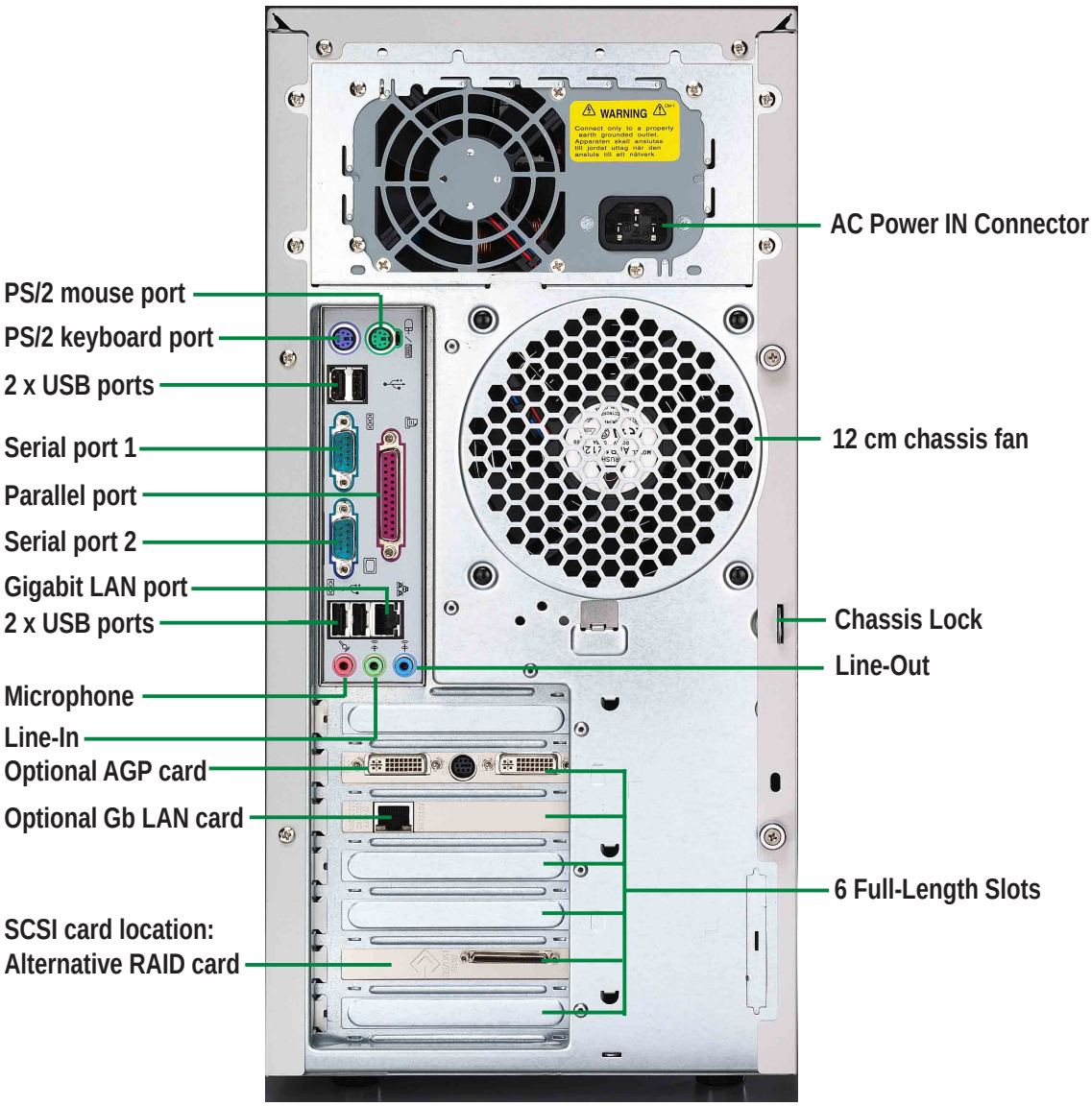
The front panel allows easy access to the hard disk drives. The power and reset buttons, LED indicators, optical drive, floppy drive and two USB connectors are also located on the front panel. For future installation of 5.25 devices, there are two drive bays available. The front panel of the server is protected by a door and lock for added security.



For more detailed information of each LED display, refer to “1.5 LED Table” on page 1-8.

1.3 Rear Panel Features

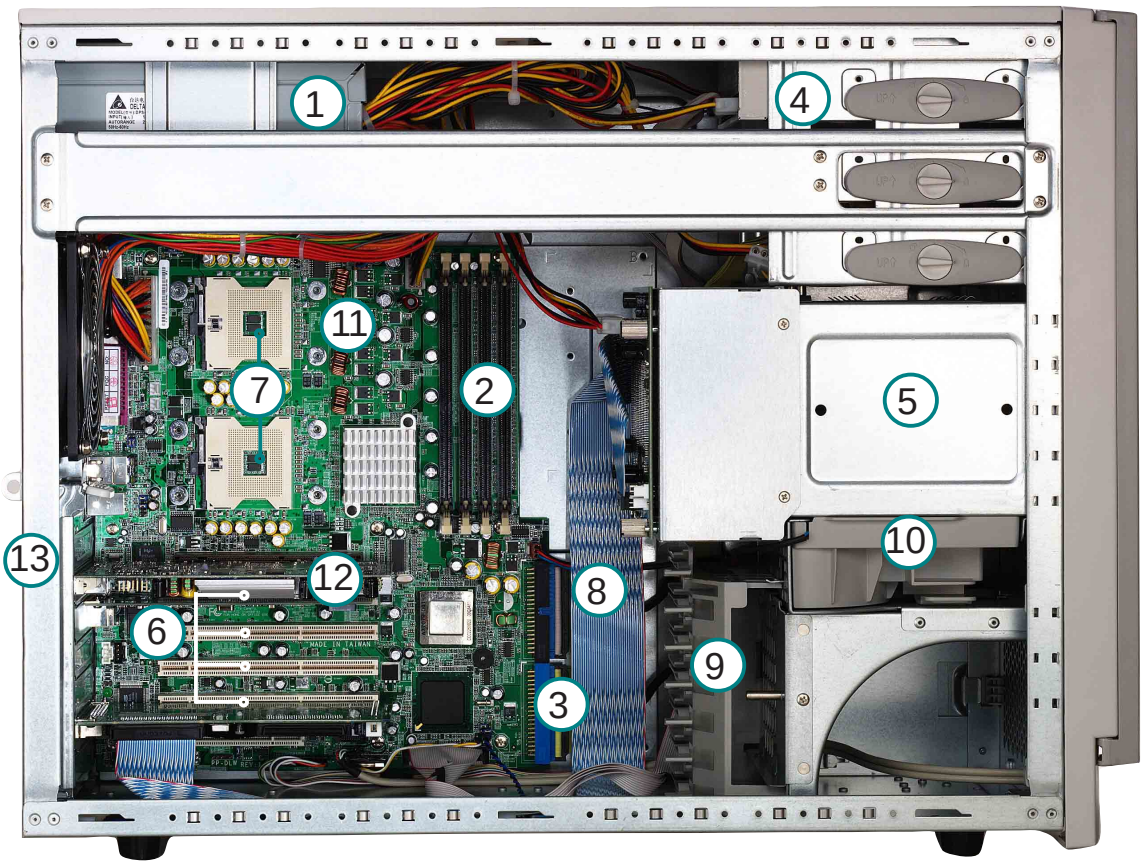
The server rear panel includes the connectors, the system devices, a chassis lock and six full-length expansion cards slot. The following shows the features on the rear side of the workstation.



You may secure the chassis lock with an additional padlock or other security device for added server system security.

1.4 Internal Features

The standard components inside the system workstation include the motherboard, power supply, floppy and DVD-ROM drives, and cables. The picture below shows the standard components of the system workstation.



1. 450W power supply
2. 4 x DDR DIMM sockets
3. 2 x IDE cable
4. 5 1/4" DVD-ROM drive
5. HDD hot swap modules
6. 4 x 64 bit 3V PCI-X slots
7. CPU sockets
8. Internal 68-pin SCSI cable
9. PCI Long Card support guide
10. 12 cm hot swap module blower
11. PP-DLW motherboard
12. AGP slot
13. Chassis intrusion sensor

1.5 LED Table

The following table describes the LED display found on the front panel and rear panel of the AW1500-I5 server system.

Icon		LED	Display	Description
1		Drive Status LED	Green	Bridge board connected to SCSI backplane
			Red	Bridge board failure
1		Drive Activity LED	Blinking	HDD Read/Write data
2		Power LED	ON	System power ON
			Blinking	Suspend Mode
3		HDD Access LED	OFF	No activity
			Blinking	Read/Write data in HDD
4		Message LED	OFF	Normal/No incoming event
			Blinking	ASMS indicate HW monitor event

Chapter 2

Hardware Setup

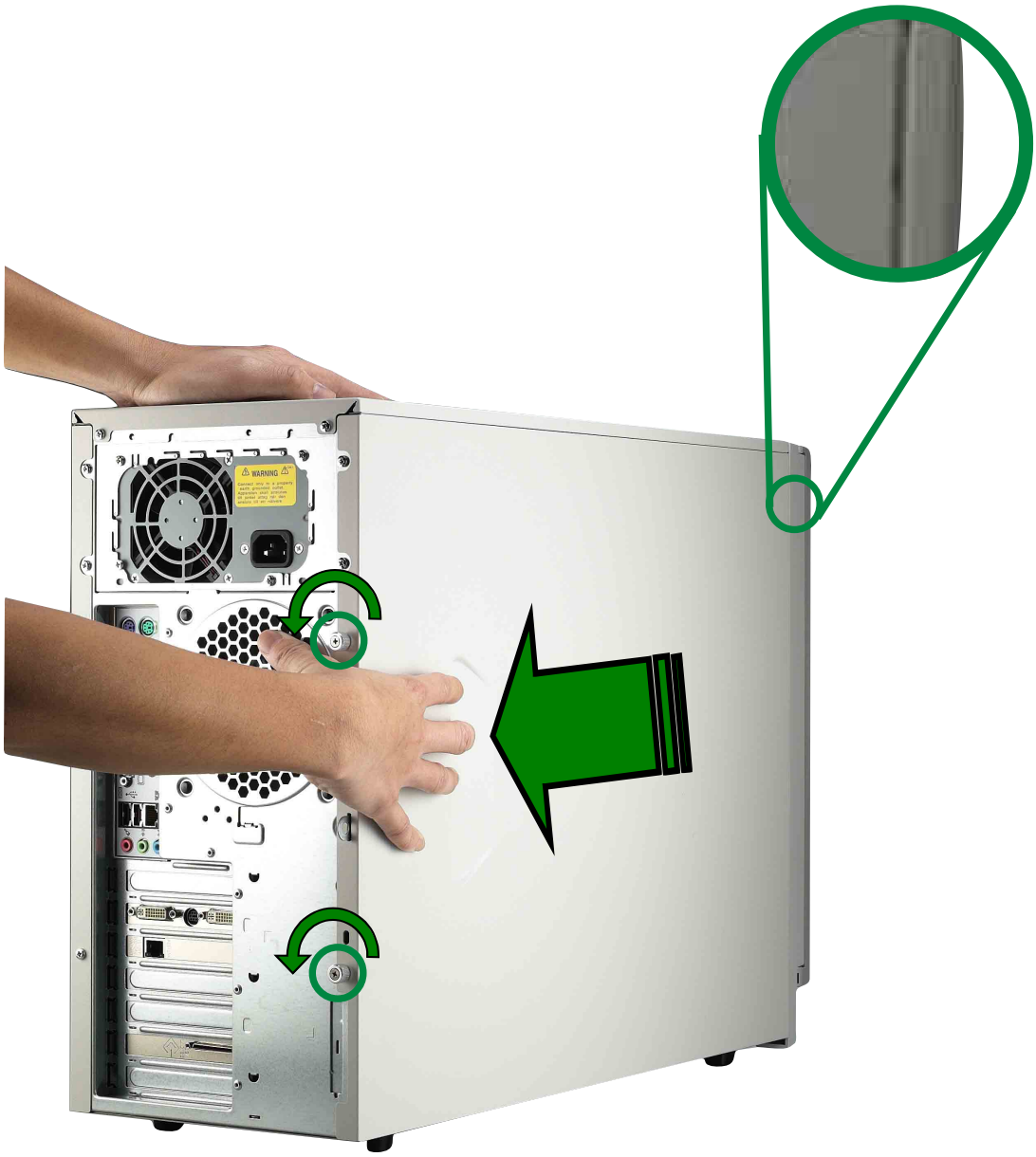
This chapter lists the hardware setup procedures that you have to perform when installing system components.

2.1 Removing and installing chassis cover

The chassis is designed for easy assembly and disassembly, making the installation of internal components very convenient.

2.1.1 Removing the chassis cover

1. The side chassis cover is held by two large thumb screws. Loosen the screws.
2. Slide the chassis cover for about half an inch.
3. Release the cover from the chassis.



2.1.2 Installing the cover

1. Align the side chassis guide hooks.
2. Slide the chassis cover for about half an inch towards the front until it fits in place.
3. Tighten the thumb screws.

There are six (6) chassis guide hooks located on the upper side and lower side of the chassis cover, make sure all six are aligned properly in place. Improper chassis installation can cause the chassis intrusion detector to alarm during POST.

2.2 Motherboard placement

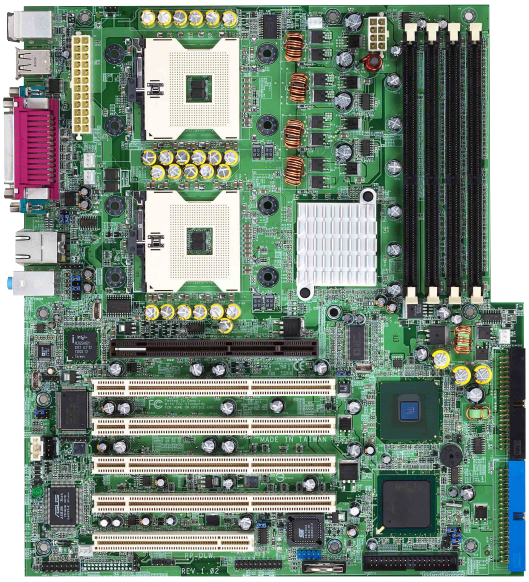
Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it. The PP-DLW uses the extended ATX form factor that measures 12 inches x 10.5 inches (30.5 x 26.67 cm).

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

Placement direction

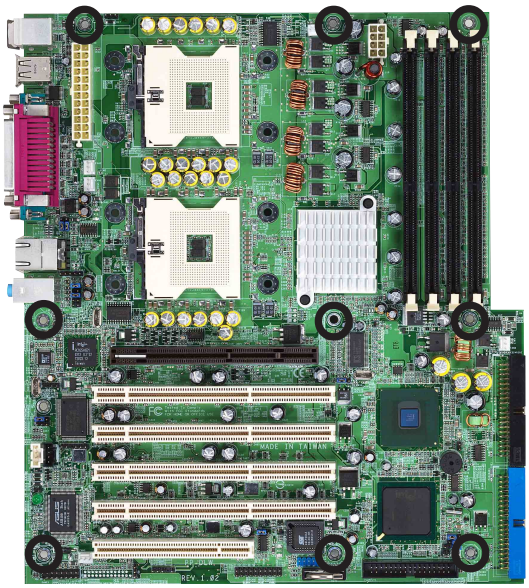
When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

Place this side towards the rear of the chassis



Motherboard Screws

Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.Do not overtighten the screws! Doing so may damage the motherboard.

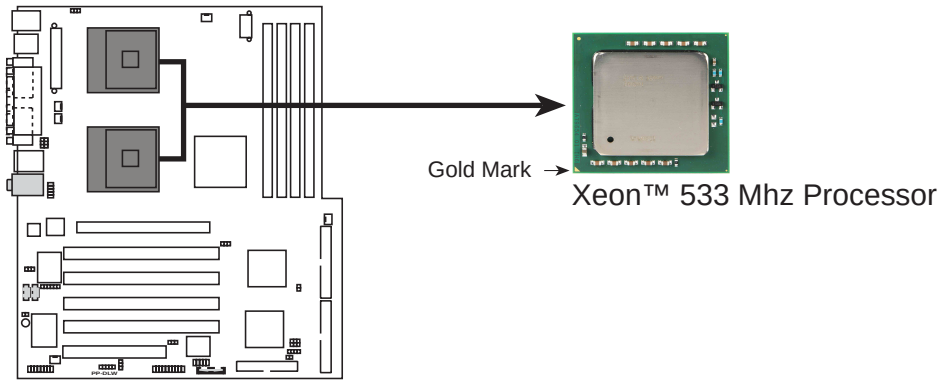


2.3 Installing the Central Processing Unit (CPU)

In the event of conflict between this instruction and other references cited herein, instructions in this system manual takes precedence.

2.3.1 Overview

The motherboard comes with dual surface mount 604-pin Zero Insertion Force (ZIF) sockets. The sockets are designed for the Intel Xeon Processor in the 604-pin package with 512KB L2 cache. The processor includes the Intel® NetBurst™ micro-architecture that features the hyper-threading technology, rapid execution engine, 533MHz system bus, and execution trace cache. Together, these attributes improve system performance by allowing higher core frequencies, faster execution of integer instructions, and data transfer rate of up to 4.26 GB/s.

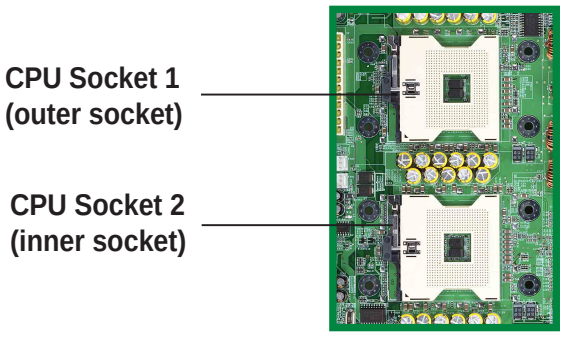


PP-DLW Socket 604

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.

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

1. The motherboard supports either one or two CPUs. If you are installing only one CPU, you MUST install it in CPU socket 1. Otherwise, the red motherboard LED will light up as warning.
2. Use Prestonia CPUs with the same FSB speed when installing on both CPU sockets.

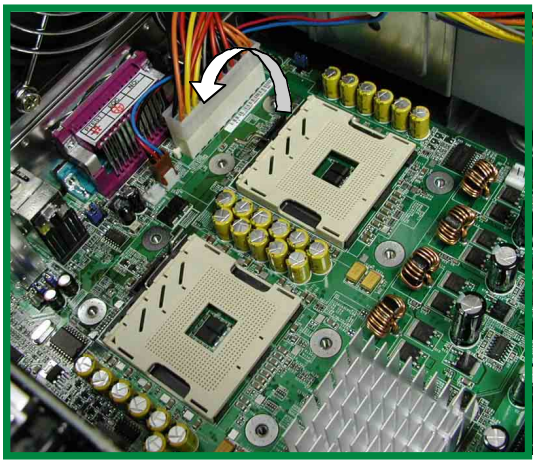


2.3.2 Installing the CPU

If you are installing only one CPU, install in CPU socket 1.

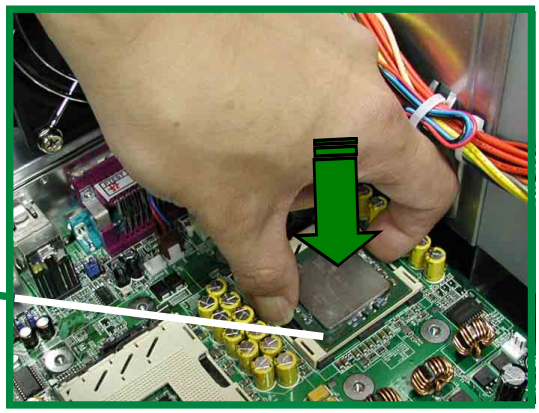
Follow these steps to install a CPU.

1. Locate the 604-pin ZIF sockets on the motherboard. Unlock the socket by pressing the lever sideways, then lift it up to at least 115° angle.



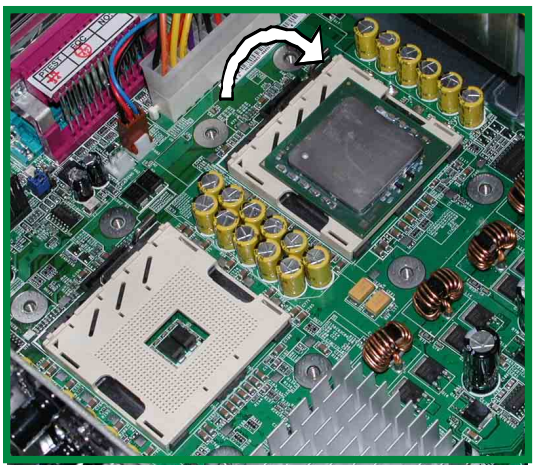
Make sure that the socket lever is lifted up to at least 115° angle, otherwise the CPU does not fit in completely.

2. Position the CPU above the socket as shown.
3. 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!

4. When the CPU is in place, press it firmly on the socket while you push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.



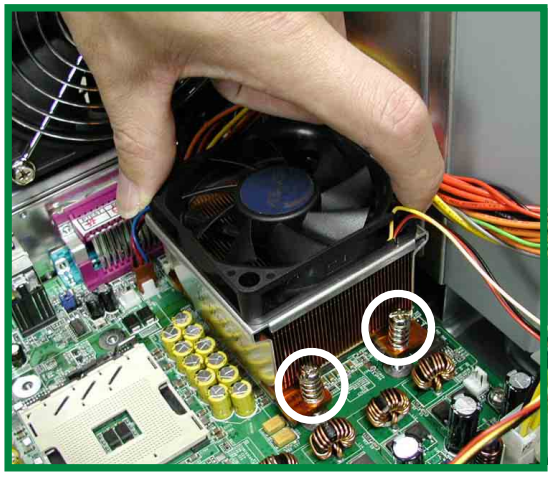
2.3.3 Installing the CPU heatsink with fan assembly

The Intel® Xeon™ processors require especially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

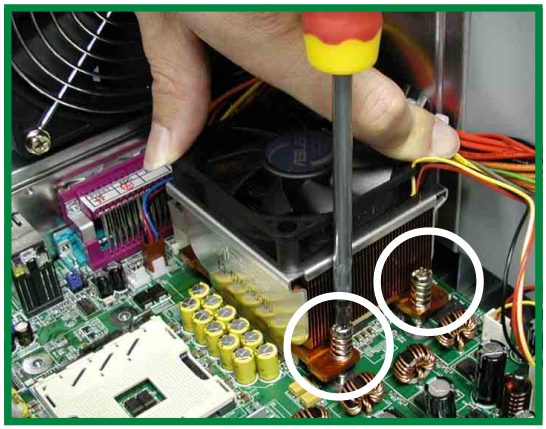
Make sure that the heatsink with fan assembly is properly installed on the motherboard. A tilted or improperly installed heatsink with fan assembly can cause damage to motherboard CPU socket and/or CPU. Follow these steps to install the CPU heatsink and fan.

Follow these steps to install the CPU heatsink and fan.

1. Place the heatsink and fan assembly on top of the installed CPU, making sure that it fits in the screw holes of the heatsink bracket found at the bottom of the CPU socket. (The heatsink bracket comes factory installed with the motherboard.)

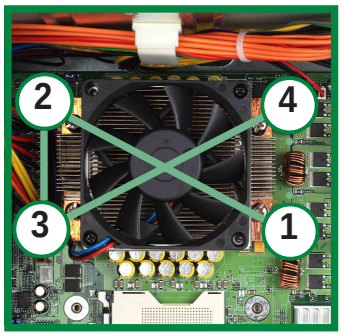


2. Tighten all four (4) screws. Make sure all screws fit properly in place.



Take caution in tightening screws. Do not over-tighten screws, doing so may damage the motherboard!

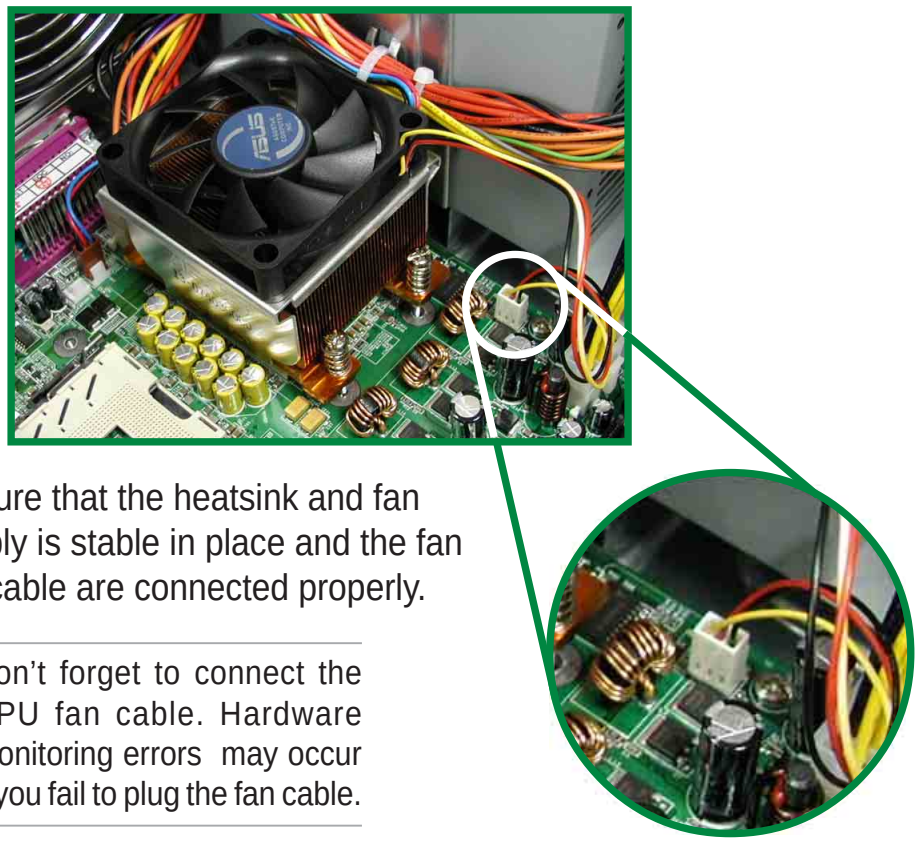
TIP: Follow the sequence shown: half-tighten the screw on one corner of the heatsink and fan, then the next screw on the other corner and so on, making a cross pattern. Repeat until all four screws are tightened properly.



Make sure heatsink with fan assembly is mounted properly on the CPU to avoid burning the CPU and/or CPU socket.

3. When the heatsink and fan assembly is in place, connect the fan cable to the fan connector on the motherboard labeled CPUFAN1.

The fan cable plug is slotted so it fits only in one orientation. If it doesn't fit completely, try reversing it.



4. Make sure that the heatsink and fan assembly is stable in place and the fan power cable are connected properly.

Don't forget to connect the CPU fan cable. Hardware monitoring errors may occur if you fail to plug the fan cable.

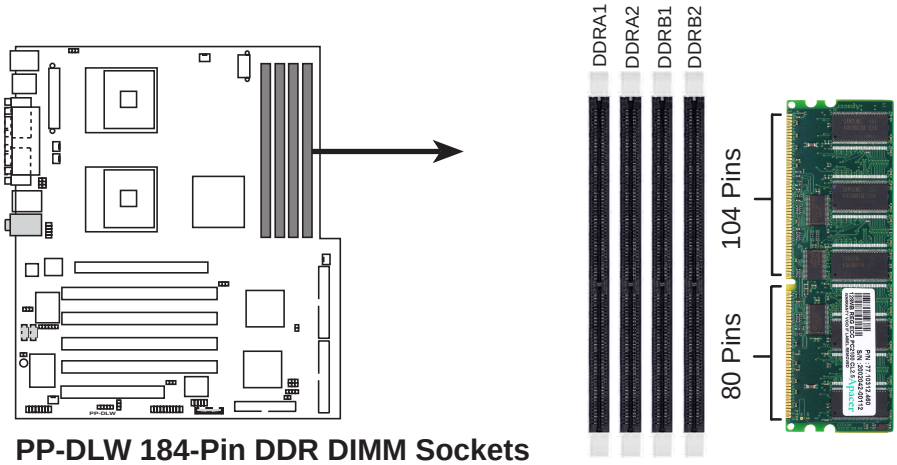
5. If you wish to install two CPUs, repeat the same steps for CPU socket 2.

6. Use CPUFAN2 connector for the second CPU heatsink and fan assembly cable.

2.4 System memory

2.4.1 Overview

The motherboard comes with four Double Data Rate (DDR) Dual Inline Memory Module (DIMM) sockets. These sockets support up to 8GB system memory using 184-pin registered PC2100 DIMMs with Serial Presence Detect (SPD) and Error Check and Correction (ECC).



PP-DLW 184-Pin DDR DIMM Sockets

- 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.
- Only PC2100 supports 533MHz Front Side Bus (FSB); PC1600/PC2100 supports 400MHz FSB.

The DDR SDRAM technology evolved from the mainstream PC66, PC100, PC133 memory known as Single Data Rate (SDR) SDRAM. DDR memory however, has the ability to perform two data operations in one clock cycle, thus providing twice the throughput of SDR memory. For example, a 200MHz DDR DIMM will support a 100MHz memory bus, and a 266MHz DDR DIMM will support a 133MHz memory bus.

DDR Data Transfer Rate		DDR Base Frequency
266MHz	→	133MHz
200MHz	→	100MHz

A DDR DIMM has the same physical dimensions as an SDR DIMM, but it has a 184-pin footprint compared to the 168-pin of the SDR DIMM. Also, a DDR DIMM is single notched while an SDR DIMM is double notched. Therefore, a DDR DIMM is not backward compatible with SDR, and should be installed only in a socket specially designed for DDR DIMMs.

2.4.2 Memory Configurations

The motherboard supports system memory of up to 8GB in a two-way interleaved configuration. As a rule, this configuration requires that you install identical DDR DIMMs (exactly the same type and size) in pairs. For example, if you installed a 512MB module into DDRA1, you must install the same type of 512MB module into DDRA2. The same rule applies to pairs DDRB1/DDRB2 and DDRC1/DDRC2.

The only exception to the above rule allows you to install one DIMM into DDRA1 socket (the socket closest to the ATX power connector). Installing a single DIMM into any other socket would not work.

The following table lists the DIMM socket pairs and the memory modules that you can install.

Memory configuration table

DIMM Socket	184-pin ECC DDR DIMM		Total Memory
DDRA1	SDRAM 128MB, 256MB, 512MB, 1GB, 2GB	x1	
DDRA2	SDRAM 128MB, 256MB, 512MB, 1GB, 2GB	x1	
DDRB1	SDRAM 128MB, 256MB, 512MB, 1GB, 2GB	x1	
DDRB2	SDRAM 128MB, 256MB, 512MB, 1GB, 2GB	x1	
Total System Memory (Max. 8GB)		**=**	

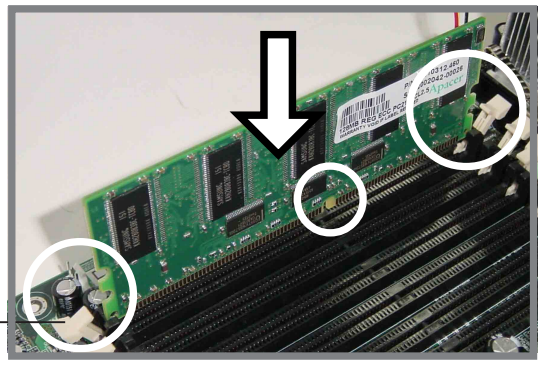
The system chipset only supports PC2100 unbuffered and registered non-ECC DIMMs. Make sure to use only the specified DIMM types for stable system operation.

2.4.3 Installing a DIMM

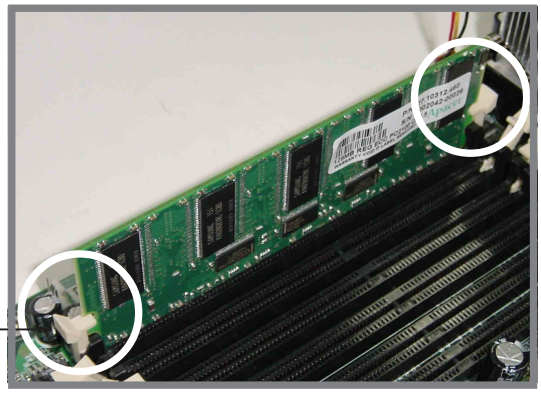
Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

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.



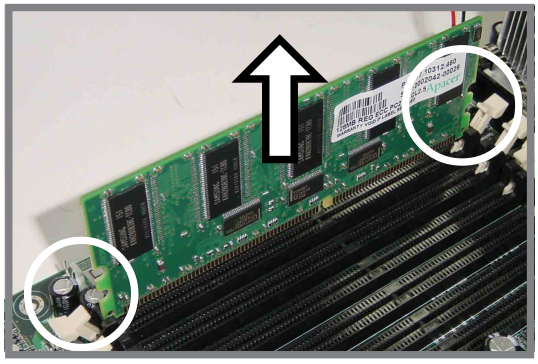
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



2.4.4 Removing a DIMM

Follow these steps to remove a DIMM.

1. Simultaneously press the retaining clips outward to unlock the DIMM.
2. Remove the DIMM from the socket.

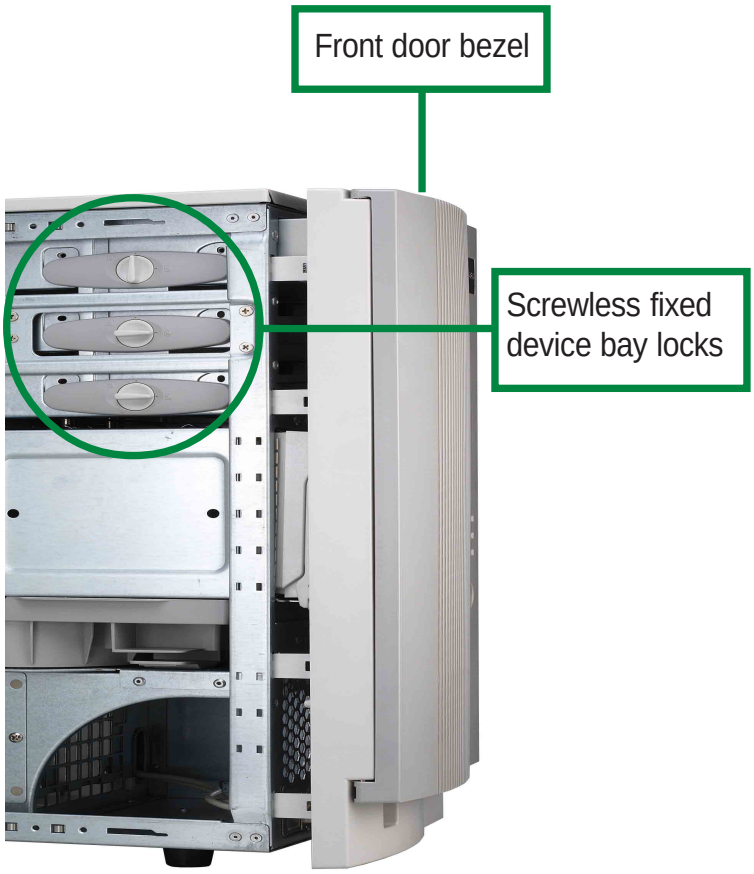


Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2.5 Fixed Device Bays

2.5.1 Overview

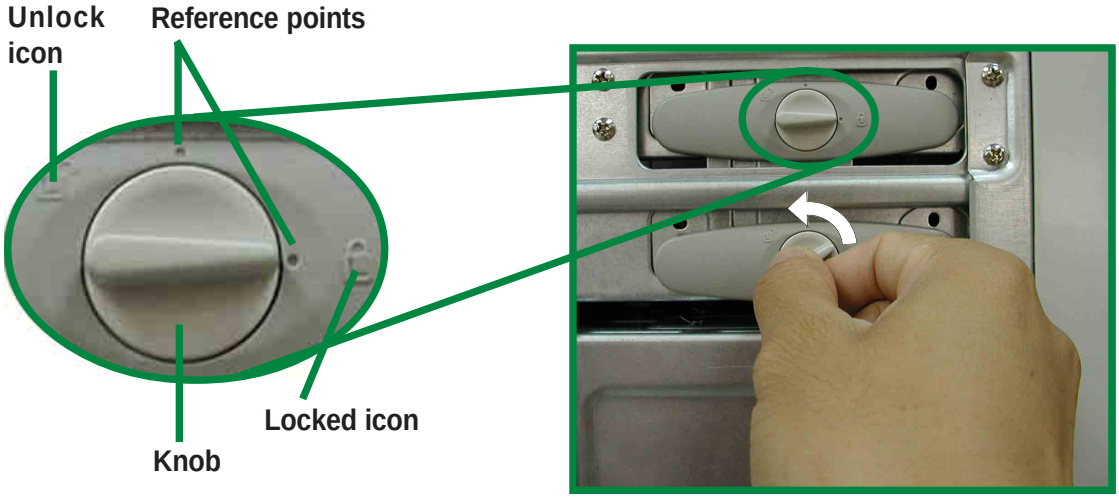
The fixed device bay are cinched by screwless locks for device placement convenience. An IDE DVD-ROM drive is installed on the uppermost bay and two free bays are available for installation of additional storage devices like optical disc drives or tape drives.



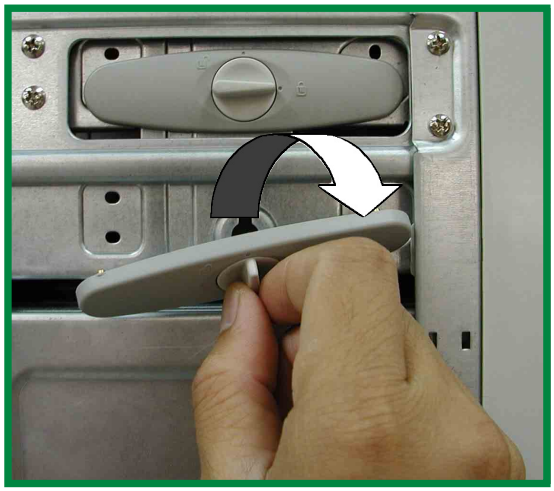
2.5.2 Installing a 5.25 device

Make sure to unplug the AC power supply before adding or removing any 5.25 fixed device or other system components. Failure to do so may cause severe damage to both the motherboard and the system components.

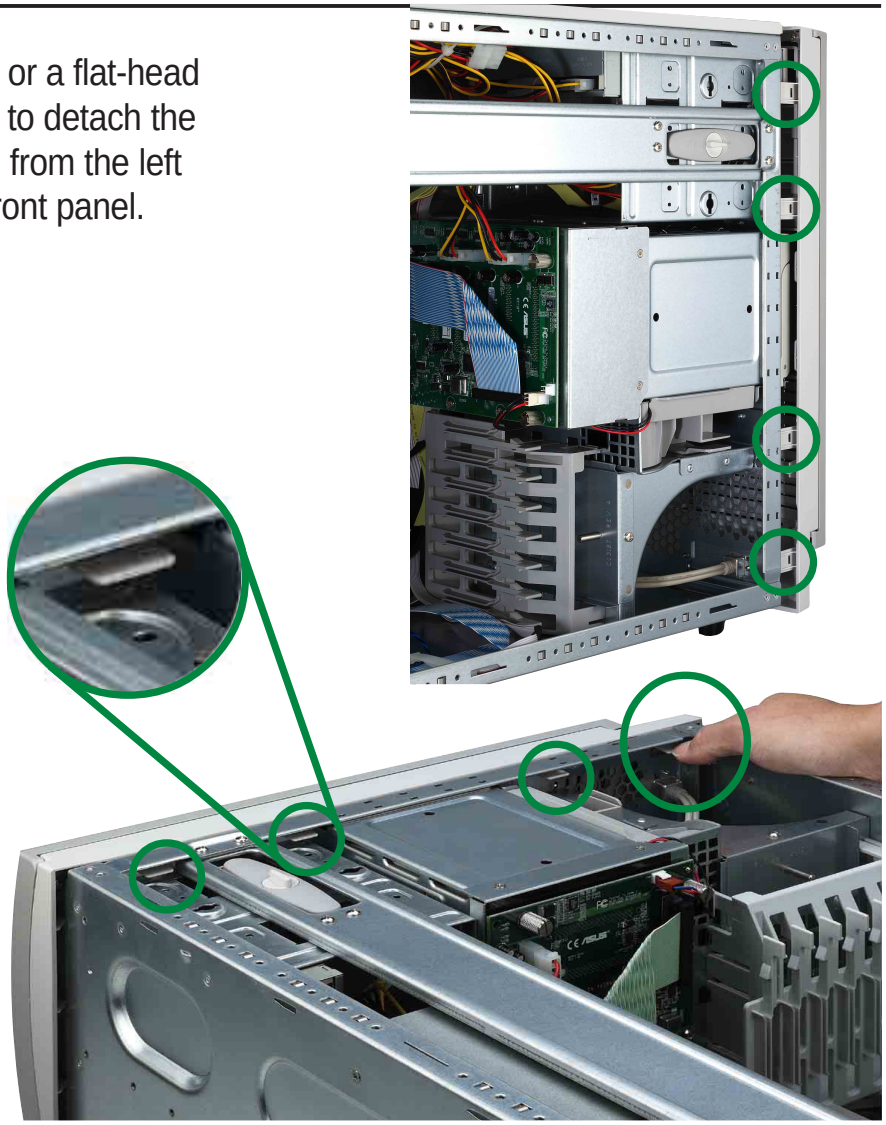
1. From the side of the drive bay, unlock and remove the screwless drive bay lock by turning the knob 45º counter-clockwise until it clicks on the reference point near the “unlocked icon”.



2. When released, pull- out the lock and set it aside.



3. Use thumbs or a flat-head screw driver to detach the hooked tabs from the left side of the front panel.



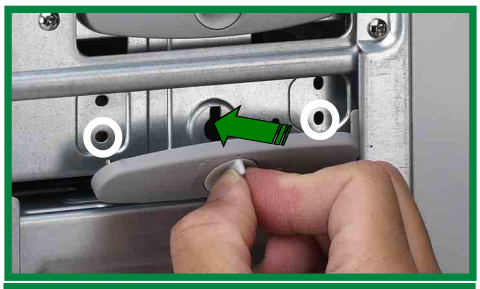
Take caution in removing the front panel cover. Do not use too much force when installing or removing items.

4. Remove the appropriate metallic bay panel cover of the bay slot you want to install your device.

5. Carefully insert device (such as CD/DVD-ROM drive) into the selected bay.

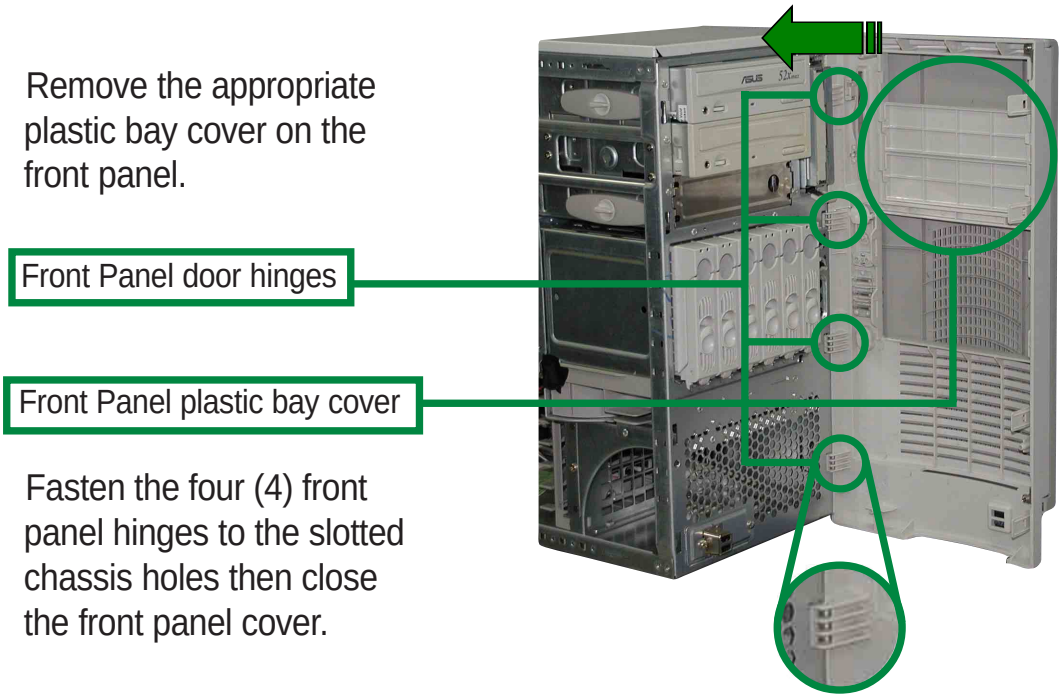
6. Secure the drive to the bay using the screwless drive bay lock that you removed earlier.

   6.a Match the two pegs on the lock to the holes on the drive bay.



   6.b Turn the knob 45º clockwise until it clicks on the reference point near the “locked icon”.

7. Remove the appropriate plastic bay cover on the front panel.



8. Fasten the four (4) front panel hinges to the slotted chassis holes then close the front panel cover.

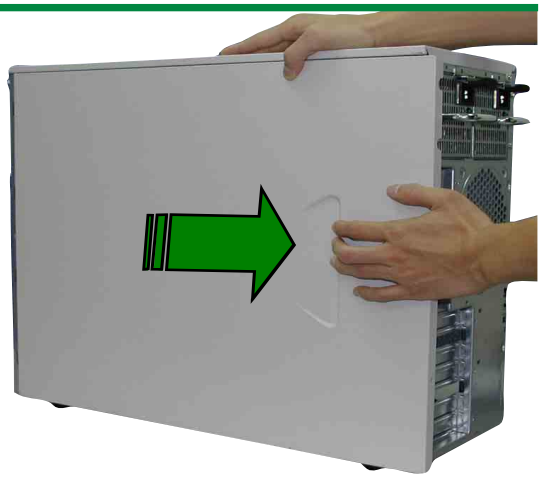
2.5.3 Removing floppy disk drive tray

The following procedures describe how to remove the floppy disk drive tray.

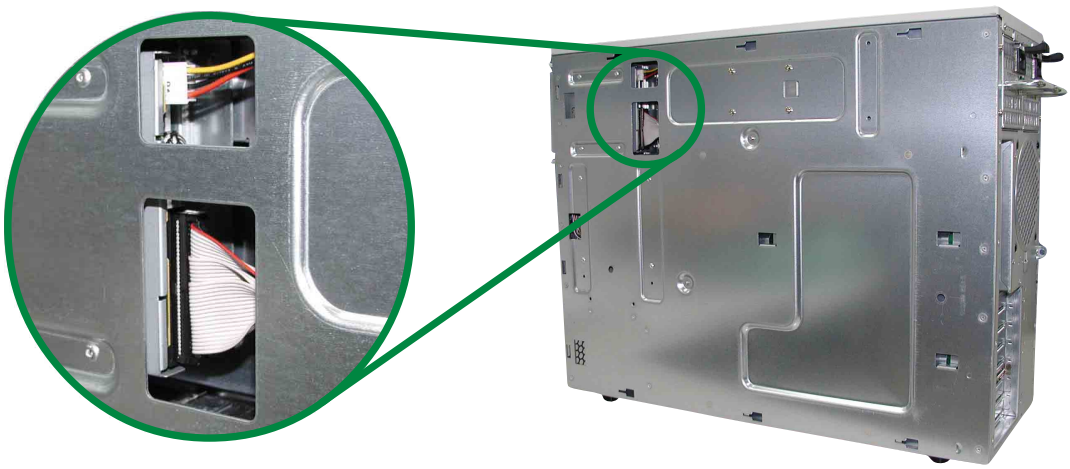
1. Remove the front cover panel. Perform steps #1, #2 and #3 in section "2.5.2 Installing a 5.25 device" on page 2-13.

2. Remove the two screws that secure the right side chassis cover.

3. Pull out and detach the right side chassis cover and set aside.



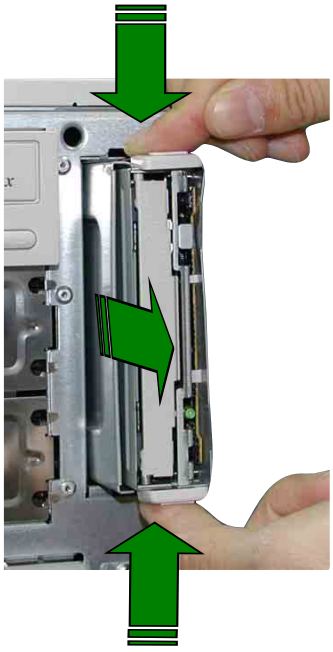
4. Locate the floppy disk drive cable and power connectors.



4.a Carefully detach the floppy disk drive cable.

4.b Carefully detach the floppy disk drive power cable.

5. Pull out the floppy disk drive tray while squeezing the two tabs together.



Floppy disk drive tray

2.6 Installing a Hard Disk Drive

The server comes with six externally accessible drive bays. In each of the drive bays is a removable tray for mounting an SCA SCSI hard disk drive.

To release the drive bay, follow these steps.

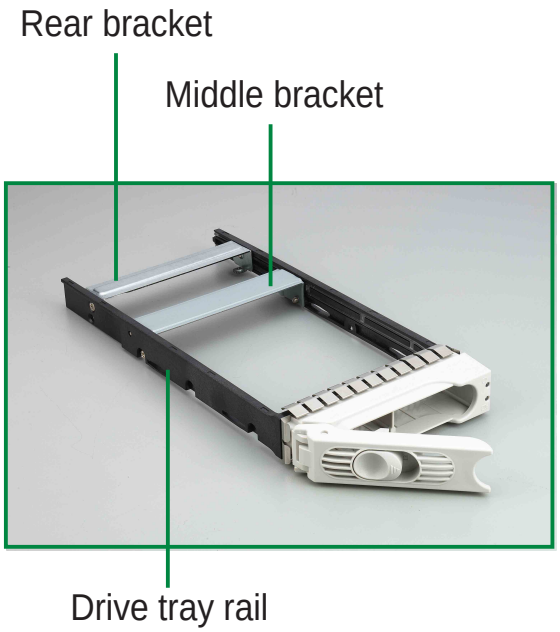
1. Lift the spring lock upwards, then pull the tray lever outwards.

2. When the tray lever is pulled down, the tray will eject slightly. Pull the tray outwards on the tray lever.

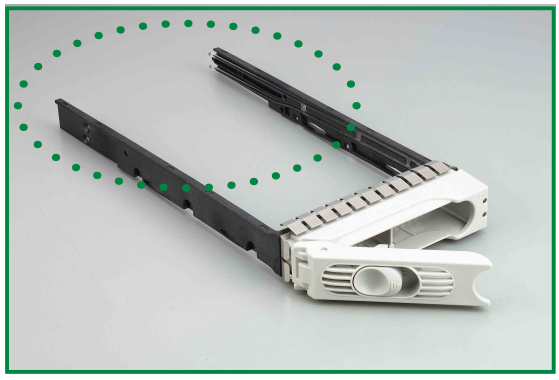
2.6.1 Placing an ATA133 IDE hard disk drive to tray

The following steps describe the installation of a hard disk drive into the drive tray.

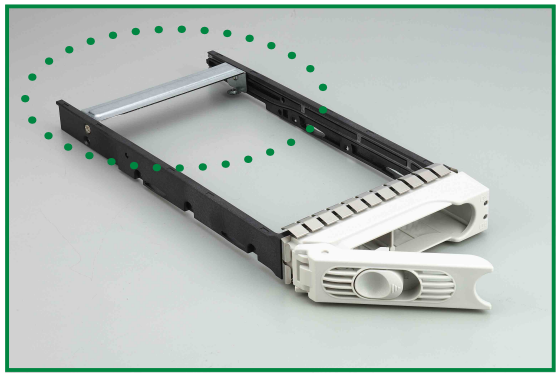
1. Place the hard disk tray on a flat clean surface. Prepare Philips (cross) screwdriver.



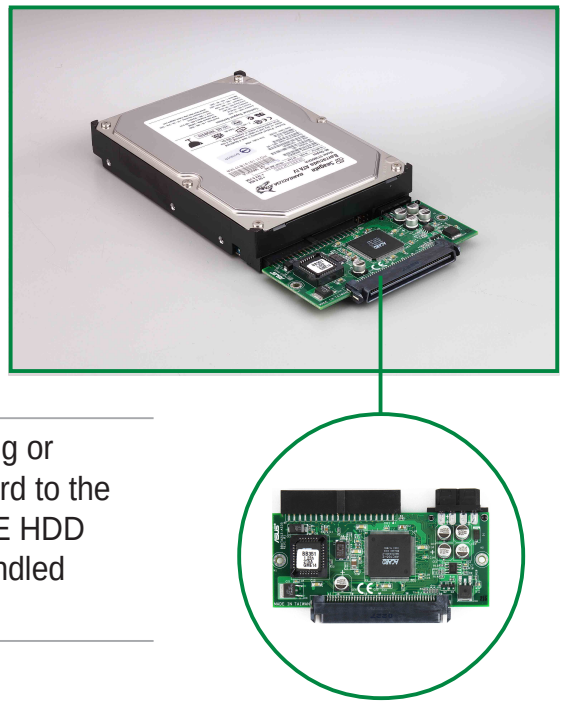
2. Remove middle bracket. To release from pin, unscrew rear bracket and slowly detach middle bracket. Take caution in handling the drive tray, the plastic drive tray rail may break.



3. Replace the rear bracket and fasten with screws.



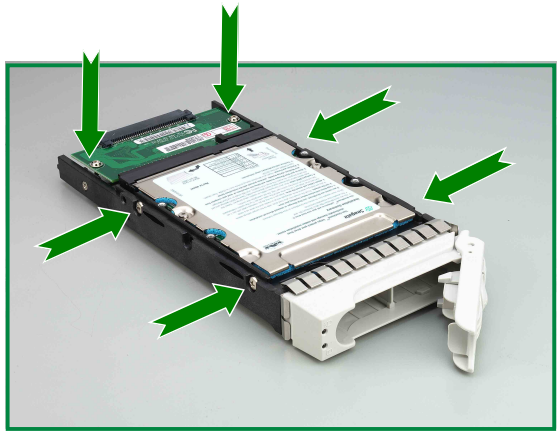
4. Prepare hard disk drive. Carefully insert the SCSI-IDE HDD bridge to the hard drive's 40-1 pin IDE connector and 4-pin power connector. Make sure the SCSI-IDE HDD bridge is slotted properly and placed firmly in place.



Take caution when assembling or disassembling the bridge board to the hard disk drive. The SCSI-IDE HDD bridge board may break if handled improperly.

SCSI-IDE HDD Bridge

5. Carefully place the hard disk drive into the drive tray. Align the hard drive's four (4) screw holes with the hard drive tray rails. Secure hard drive with four (4) round head screws.



6. Secure the SCSI-IDE HDD Bridge to the tray with two (2) round head screws.

Do not overtighten the screws, the plastic drive tray rails may break.

2.6.1.1 Qualified Hard Disk Drive List

Name	Model
IBM	DTTA-350840
Hitachi	IC35L090AVV207
Hitachi	IC35L120AVV207
Hitachi	IC35L180AVV207
Seagate	ST320011A
Seagate	ST360021A
Seagate	ST380021A
Seagate	ST3120023A
Seagate	ST3160023A
Seagate	ST340016A

Make sure to use only the tested and qualified hard disk drives listed above. Other hard disk drives manufactured by other vendors may not be suitable for this system workstation. Visit the ASUS website (www.asus.com) for the latest qualified hard disk drive list.

2.6.2 Placing a hard disk drive to hotswap bay

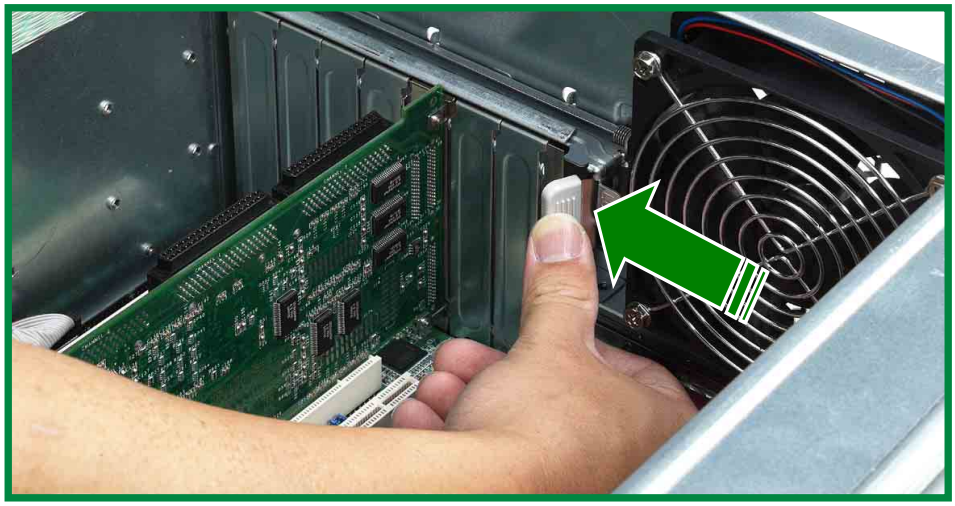
1. After the drive is secured to the tray, carefully insert the drive into the bay.
2. Push the tray all the way to the depth of the bay until it fits.
3. Push the tray handle back into place.

Make sure that the HDD tray is completely in place before you push the handle back to avoid damaging the drive and the tray.

2.7 Screwless Expansion Card Slot

The AW1500-I5 chassis is designed with a screwless expansion card slot for Personal Computer Interface (PCI) card installation convenience.

To add or remove expansion cards, follow these steps:

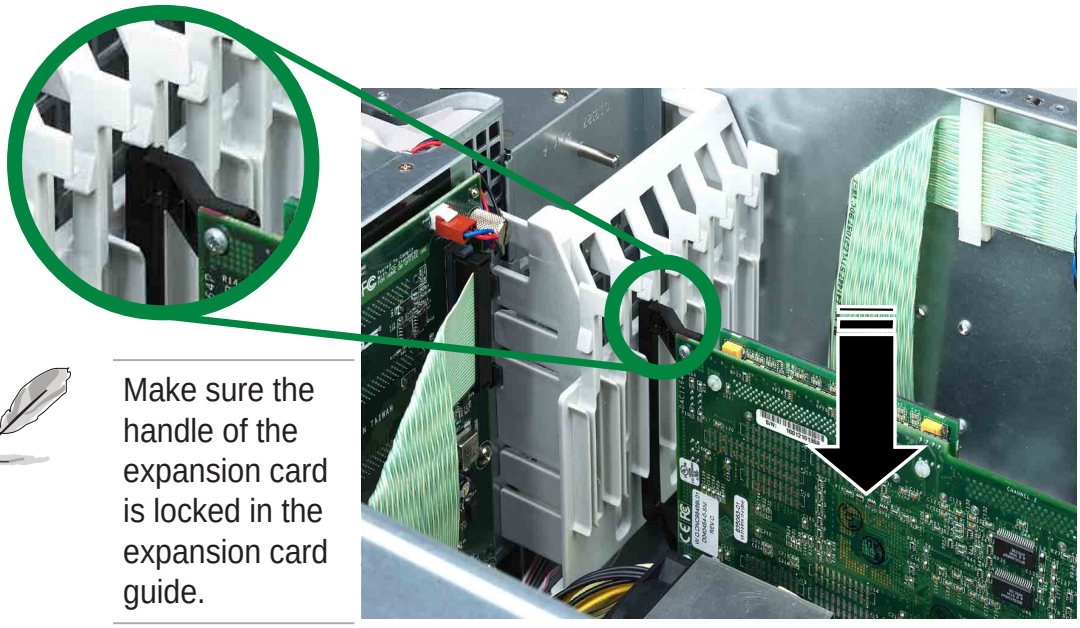


1. To open, push the lever to the left using your thumb to release the spring lock.

2. To lock, make sure that all expansion cards are properly inserted in the slots, then pull the spring lock lever to fasten the expansion cards in place.

2.8 Long Card Support Guide

The long card support guide secures that long expansion cards are positioned firmly in place.



Make sure the handle of the expansion card is locked in the expansion card guide.

To install a long expansion card, follow these steps.

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings.
2. Remove the system chassis cover.
3. Remove the bracket opposite the PCI slot. Refer to “2.7 Screwless Expansion Card Slot” on page 2-23 for more details.
4. Align the long card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis by locking the expansion card slot screwless lock. Refer to “2.7 Screwless Expansion Card Slot” on page 2-23 for more details.
6. Replace the chassis cover.
7. Set up the BIOS if necessary.
8. Install the necessary software drivers for your expansion card.

Make sure to unplug the power cord before installing or removing expansion cards from the slot. Failure to do so may cause you physical injury, damage the expansion card or other motherboard components.

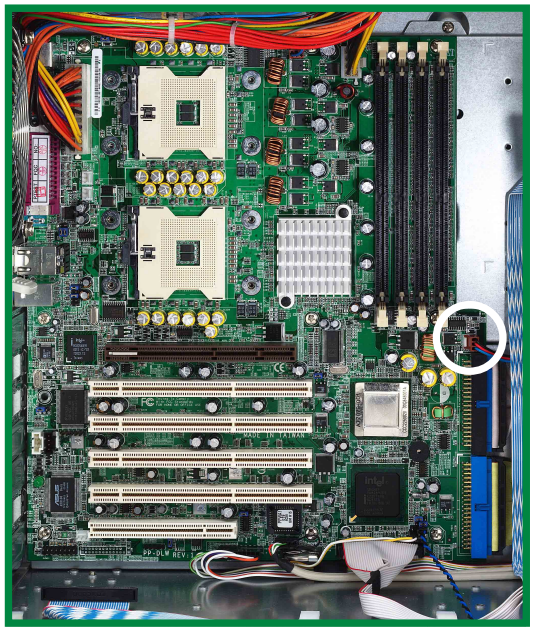
2.9 Hard Drive Blower

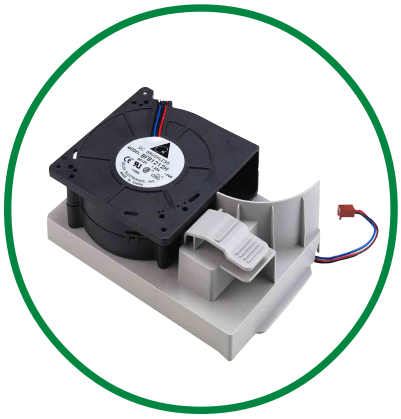
The hard drive array is cooled by a blower mounted under the hot swap bays.

2.9.1 Removing the hard drive blower

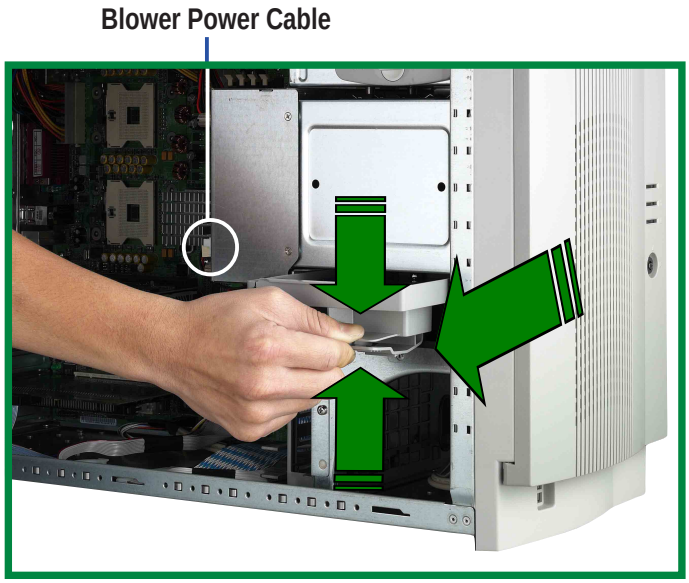
To remove the hard drive blower, follow these steps.

1. Remove the hard drive blower 3-pin power cable (FAN4) from the motherboard.





2. Pull out the blower housing while squeezing the two tabs together.



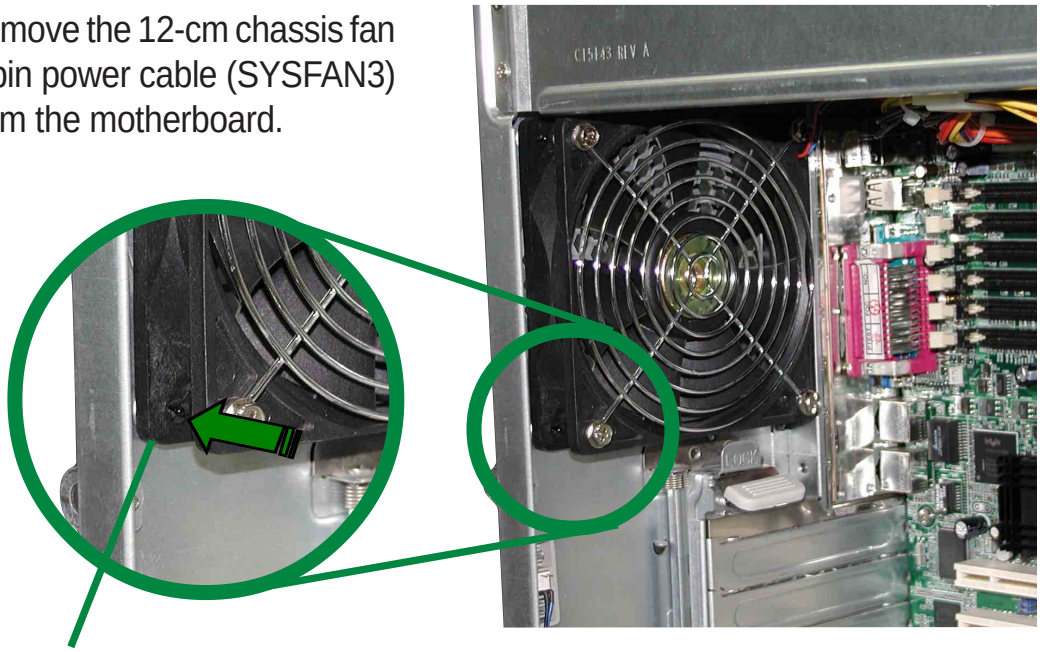
2.10 Chassis Fan

The chassis is cooled by a 12-cm chassis fan mounted at the rear panel.The chassis fan status can be monitored remotely through the ASUS® Server Management Software (ASMS).

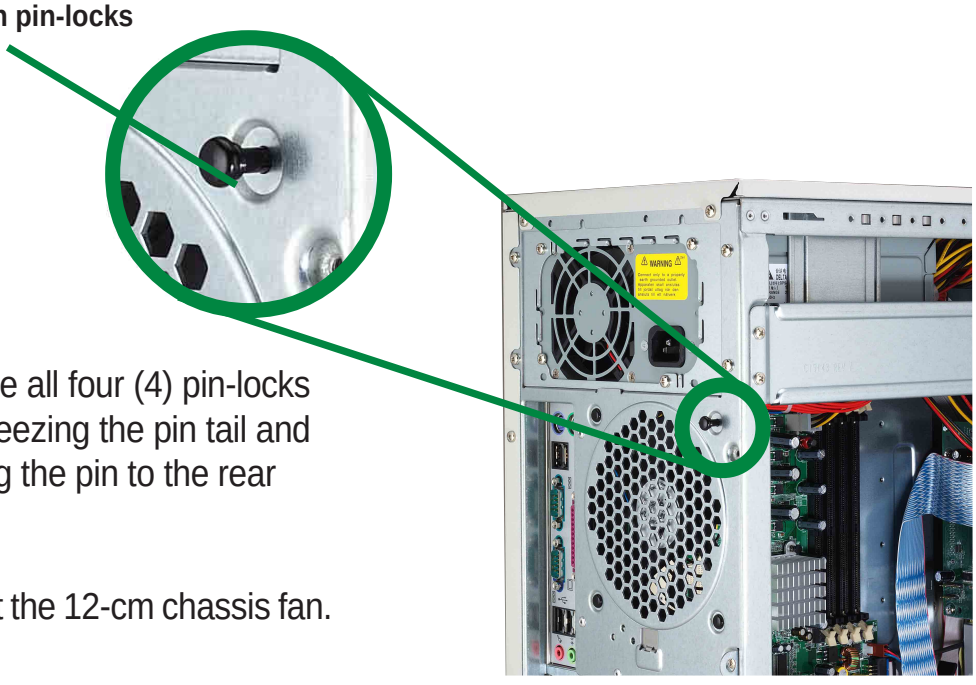
2.10.1 Removing the 12-cm chassis fan

To remove the 12-cm chassis fan, follow these steps.

1. Remove the 12-cm chassis fan 3-pin power cable (SYSFAN3) from the motherboard.



chassis fan pin-locks

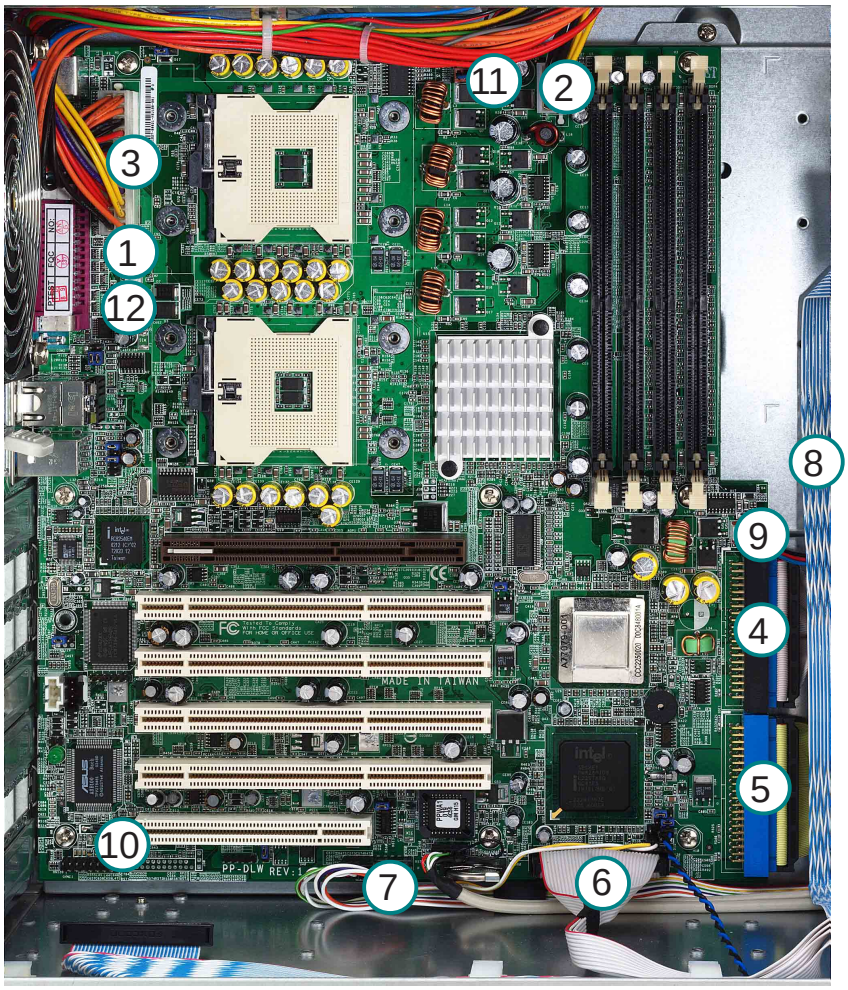


2. Release all four (4) pin-locks by squeezing the pin tail and pushing the pin to the rear panel.

3. Pull out the 12-cm chassis fan.

2.11 Connecting Cables

Most of the cables in the workstation are already pre-connected to their respective connectors. The following illustrates the corresponding components that are connected to these connectors.



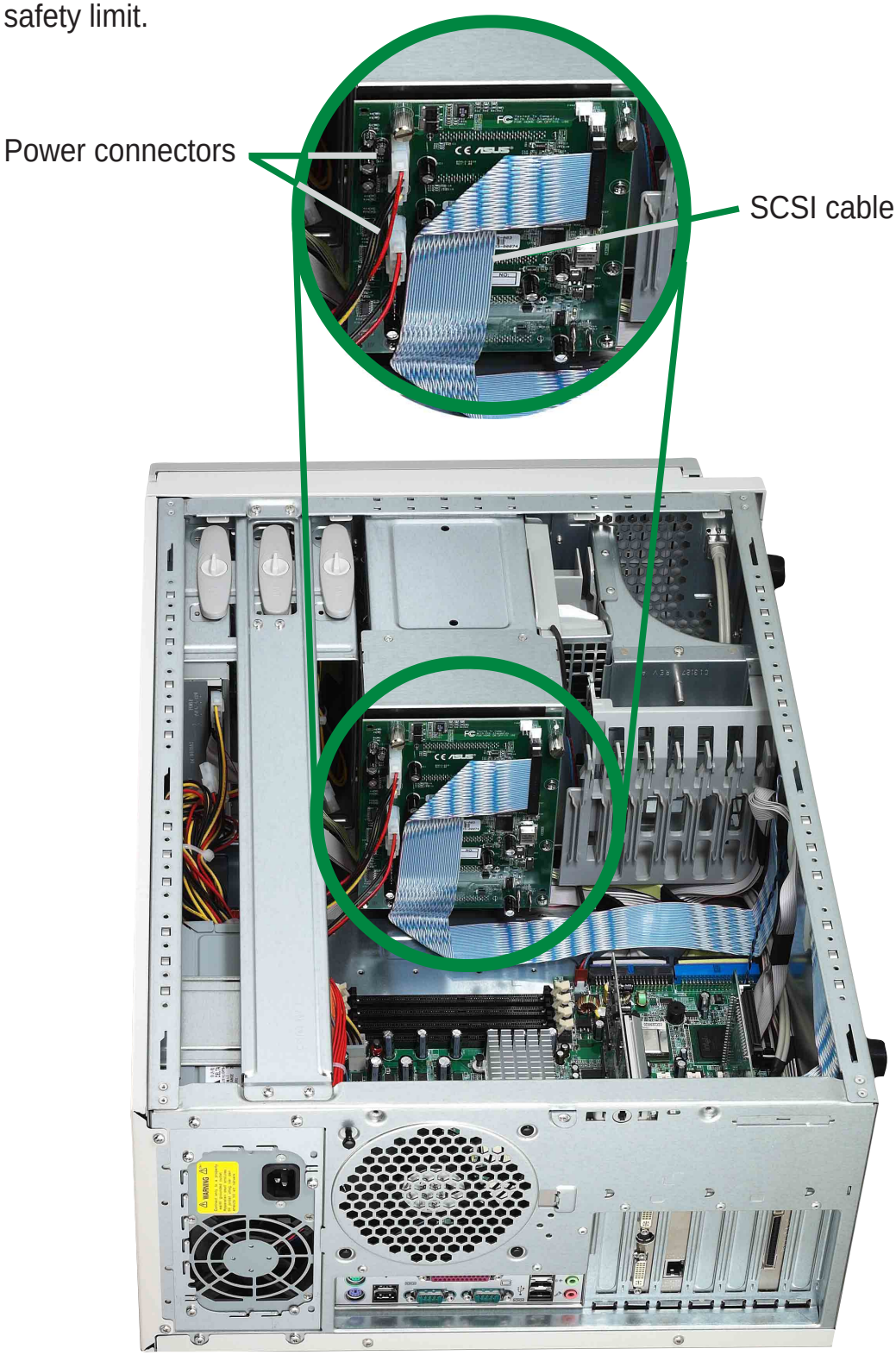
1. Chassis fan (SYSFAN3)
2. 8-pin 12V AUX Power
3. 24-pin ATX Power
4. Secondary IDE
5. Primary IDE
6. Floppy Disk Drive
7. 20-pin system panel cable
8. 68-pin HDD Access cable
9. Hard drive blower connector
10. Front 12 cm fan
11. CPU Socket 1 fan (FAN1)
12. CPU Socket 2 fan (FAN2)

These are not the names of the connectors. Refer to the motherboard user's manual for detailed information on the motherboard connectors.

2.12 SCSI Backplane

2.12.1 Overview

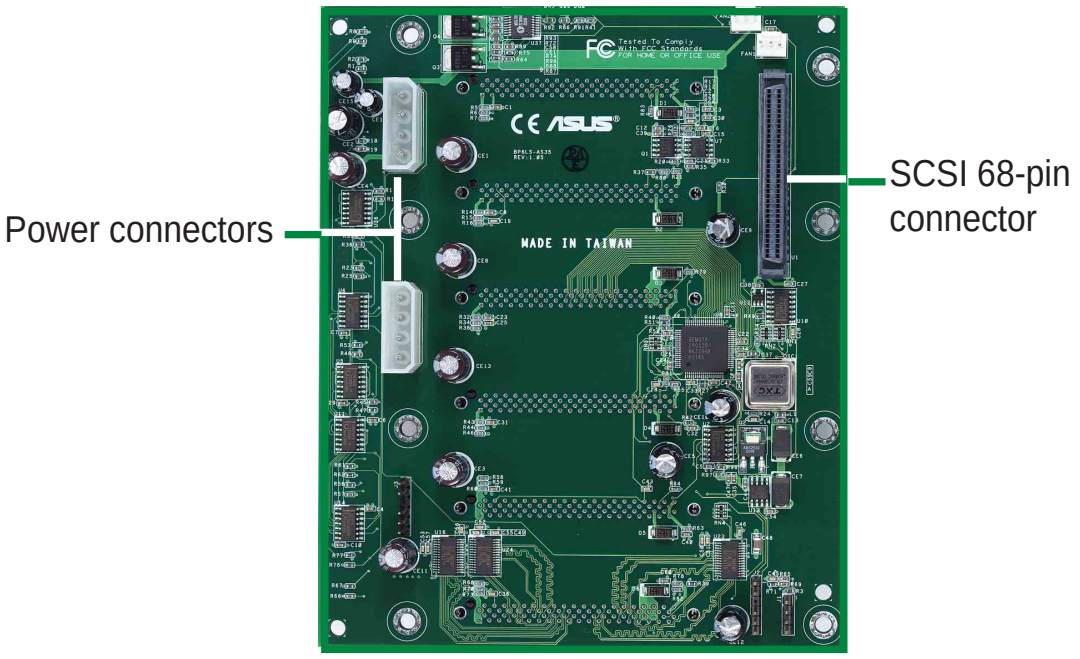
The SCSI backplane assembly defines the distribution of power and signals to the system and its peripherals. Also, the SCSI backplane provides physical and electrical protection in case the current output tipped over the safety limit.



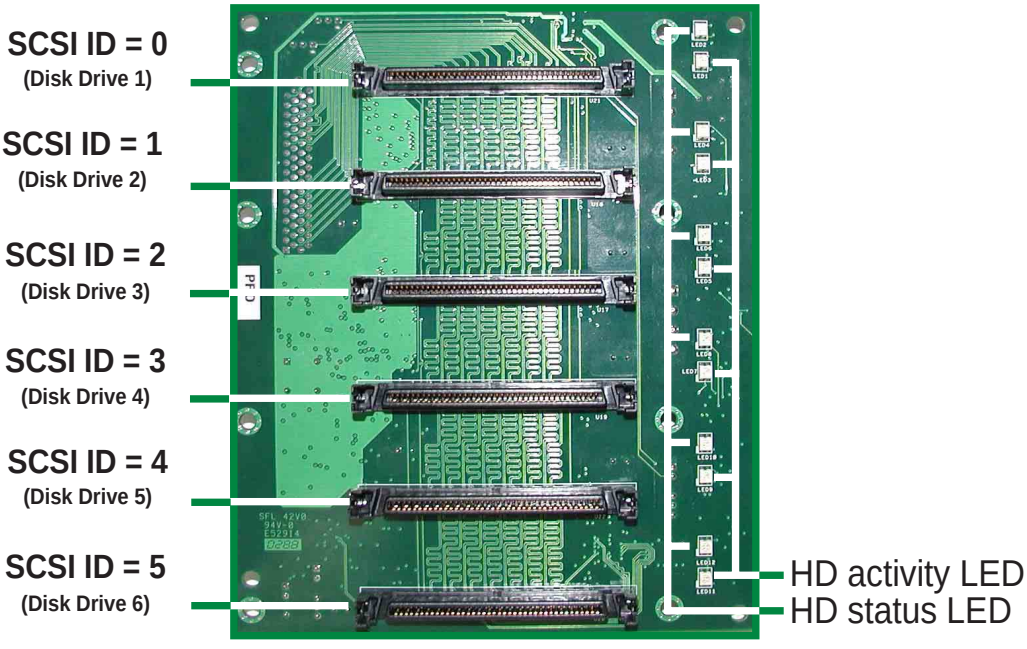
2.12.2 SCSI Backplane frontside and backside

The SCSI backplane assembly of this server is comprised of one SCSI board (BP6LS-AS35) with 68-pin SCSI connector, two 12V power inputs, two fan connectors (FAN1, FAN2) and three jumper connectors (J1, J2, J3). This configuration allows SCA SCSI hard disk drives to be docked into the server.

A. SCSI Backplane Frontside



B. SCSI Backplane Backside



Refer to “1.5 LED Table” on page 1-8, for detailed SCSI Backplane LED display descriptions.

Appendix A

Chasis Roller-wheel

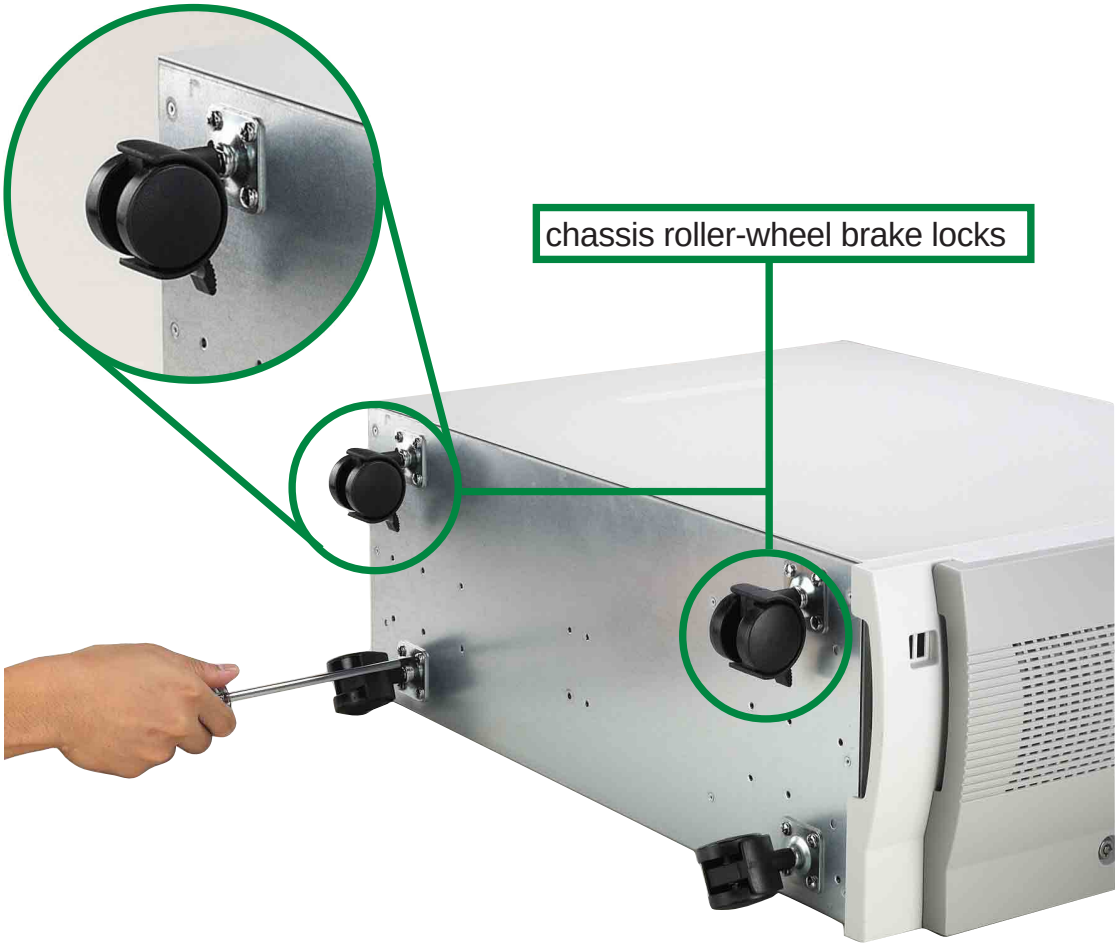
This appendix contains the installation procedure for the optional chassis roller-wheel units for the AW1500-I5 server system.

Chassis Roller-wheel Installation

The AW1500-I5 comes with an optional roller-wheel for the chassis for server transport convenience. Follow these easy steps to mount the chassis roller-wheels.

To install the roller-wheels, follow these steps.

1. Lay chassis on a side-lying position.
2. Remove the four (4) rubber foot stands.
3. Affix each plastic rubber wheel unit by mounting its screws on designated slots at the bottom of the chassis.
4. Make sure the screws are tightened accordingly.



All the chassis roller-wheels can be locked individually with its built-in chassis-roller wheel brake locks.

Appendix B

Power Modules

This appendix contains detailed hardware operation and specifications of the AW1500-I5 power modules.

Power Supply Specifications

Output Voltage Regulation

Output Voltage	Min (V)	Nom (V)	Max (V)	Ripple/Noise
+3.33V	3.16	3.30	3.46	50mV$_{p-p}$
+5V	4.8	5.00	5.25	50mV$_{p-p}$
+12V	11.52	12.00	12.60	120mV$_{p-p}$
-12V	-11.4	-12.20	-13.08	120mV$_{p-p}$
+5VSB	4.8	5.00	5.25	50mV$_{p-p}$

Output Current Capacity

Output Voltage	Min (A)	Max (A)	Max. Load (W)
+3.33V	0.5	24.0	79.0
+5V	2.0	20.0	100.0
+12V	4.0	30.0	360.0
-12V	0.0	0.5	6.0
+5VSB	0.1	2.0	10

Over-Voltage Protection (OVP)

Voltage	Min (V)	Max (V)
+3.33V	3.9	4.5
+5V	5.7	6.5
+12V	13.3	15.0
+12V	-13.3	-15.0
+5Vsb	5.7	6.5

Removing Power Supply Case

The power supply module is secured in a power supply cradle that connects to various power supply connectors on the SCSI backplane, the motherboard, IDE, floppy and CD-ROM drives.

To remove the power supply, follow these steps:

Make sure that the power suppy cable is unplugged before performing this procedure.

1. Remove the six (6) chassis bar screws to release chassis bar.

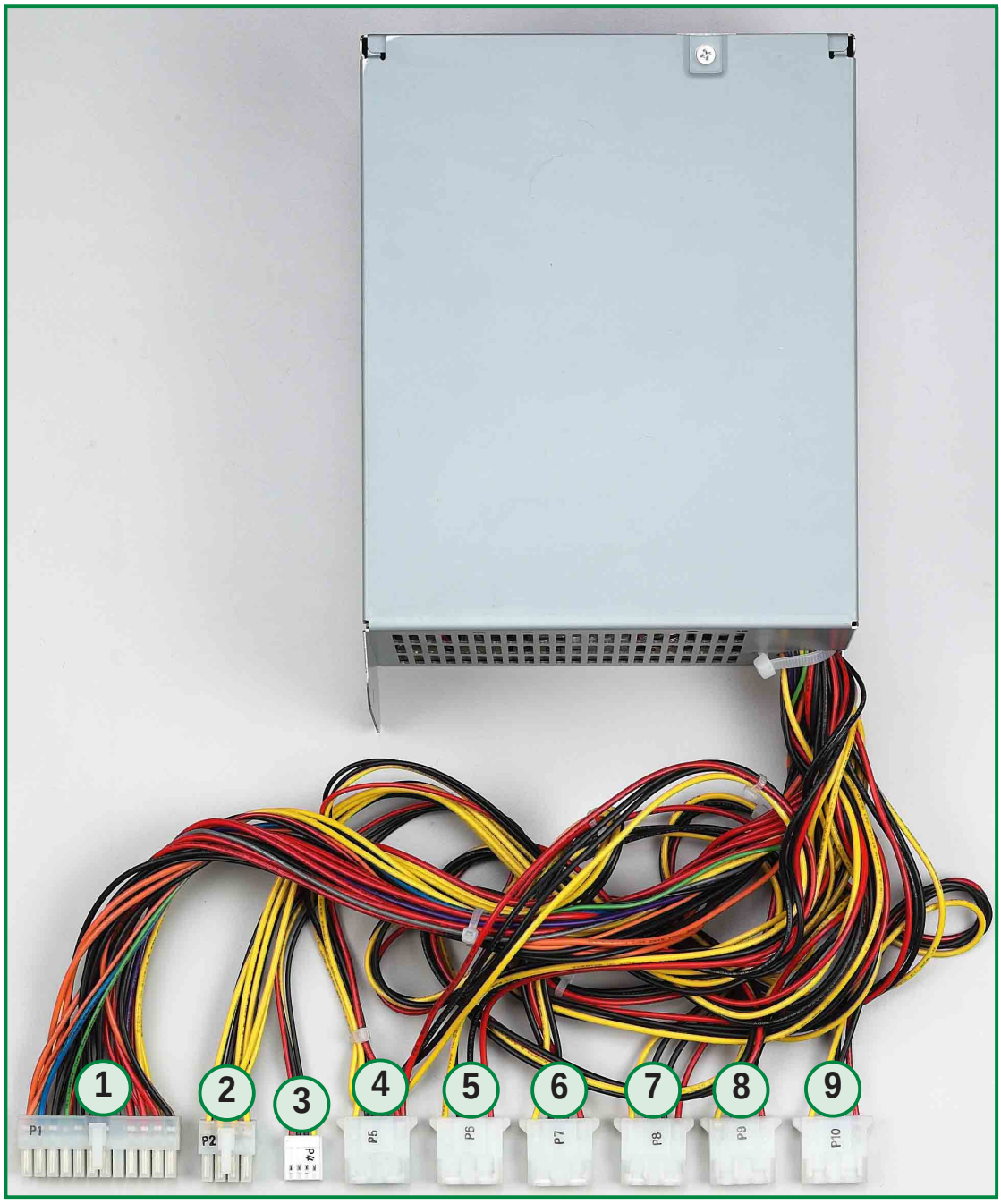
2. Disconnect all power cables connected to the floppy disk drive, the CD-ROM drive(s), the IDE drive(s), the ATX power connected to motherboard and SCSI backplane. Make sure all power cable connections are disconnected before proceeding to next step.

3. Remove the four (4) screws that secures the power case to the chassis.

4. Push power case into chassis to release power case from cradle, then pull-out case from the side of the chassis.

Take caution when pulling-out the power supply case, the power case may accidentally drop and cause damage to the other components of the system.

Power case top view



1. 24-pin to motherboard ATX connector
2. 12V 8-pin to motherboard connector
3. Floppy disk drive
4. reserved
5. reserved
6. DVD-ROM
7. SCSI Backplane
8. SCSI Backplane
9. reserved

Appendix C

Troubleshooting

This appendix lists the common problems that you may encounter while using the AW1500-I5 server system. It lists possible causes of the problems and offers solutions. You may refer to this part and try to solve simple problems before calling customer support.

NOTE

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 and/or 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. 3. Press the power button to make sure that the system is turned on.
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 correct 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 correct DIMMs the system supports. 2. Make sure that the DIMMs are properly installed on the sockets. 3. Check if it has VGA output.
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 and connected to the SCSI connectors on the backplane.
Network connection not available	1. Make sure the network cable is connected to the RJ-45 port on the rear panel. 2. Make sure that you have installed the network drivers from the system support CD.