

ASUS[®] AP1710-E1

Dual Intel[®] Xeon[™] Pedestal/5U Rackmount Server
800 MHz Front Side Bus



E1779

**First Edition V1
November 2004**

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Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. 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 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.



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.

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

Heavy System

CAUTION! This server system is heavy. Ask for assistance when moving or carrying the system.

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: Product Introduction

This chapter describes the general features of the server, including 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 describes how to install optional components into the barebone server.

4. Chapter 4: Motherboard information

This chapter gives information about the motherboard that comes with the server. This chapter includes the motherboard layout, jumper settings, and connector locations.

5. Chapter 5: BIOS information

This chapter tells how to change system settings through the BIOS Setup menus and describes the BIOS parameters.

6. Appendix: Reference information

This appendix gives information on the standard or redundant power supply that came with the barebone server. This section also provides a troubleshooting guide for solving common problems when using the barebone server.

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: Instructions that you **MUST** follow to complete a task.



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

Reference

Visit the ASUS websites worldwide that provide updated information for all ASUS hardware and software products. Refer to the ASUS contact information for details.

Chapter 1

This chapter describes the general features of the barebone server, including sections on the front panel and rear panel specifications.



ASUS AP1710-E1

Product introduction

1.1 System package contents

Check your ASUS AP1710-E1 package with the items on the following table. The package contents vary for the following configurations:

- **AS8** (eight hot-swap SCSI hard disk drives)
- **AS4** (four hot-swap SCSI hard disk drives)
- **AA4** (four hot-swap SATA hard disk drives)
- **A14** (four internal SATA/IDE hard disk drives)

Item Description	Configurations			
	AS8	AS4	AA4	A14
ASUS AK25 5U rackmount chassis with:	●	●	●	●
• ASUS NCLV-D (A) motherboard	●	●	●	●
• 600 W single/dual/redundant power supply	●	●	●	●
• SATA backplane board			1	
• SCSI backplane board	2	1		
• ASUS U320 SCSI card and cable	●	●		
• 52x CD-ROM or DVD-ROM drive	●	●	●	●
• Floppy disk drive	●	●	●	●
• Air duct	●	●	●	●
• Chassis fan	●	●	●	●
• HDD blower	2	1	1	
• Hot-swap HDD trays (including HDD screws)	8	4	4	
• Internal HDD rails (4 pairs)				●
• Chassis roller wheels (4 sets)	●	●	●	●
• Front I/O board	●	●	●	●
• SATA signal cable (4 sets)			●	●
• SATA power cable				●
• SMBus cable	●	●	●	●
• Dummy covers		4	4	8
• Parallel port cable	●	●	●	●
AC power cable	●	●	●	●
System screws and cables	●	●	●	●
System keys (2 pcs.)	●	●	●	●
Bundled CDs				
• AP1710-E1 support CD with ASWM*	●	●	●	●
• Computer Associates® eTrust™ anti-virus CD	●	●	●	●
Documentation				
• ASUS AP1710-E1 user guide	●	●	●	●
• ASUS ASWM 2.0 user guide	●	●	●	●
Optional items				
• ASUS AK25 rackmount rail kit	●	●	●	●
• ASUS AK25 300 W power module for redundant power supply**	●	●	●	●

*ASUS System Web-based Management

** This optional item is available only if you purchased a 600 W dual power supply.

1.2 System specifications

The ASUS AP1710-E1 is a barebone server system featuring the ASUS NCLV-D(A) motherboard. The server supports dual Intel® Xeon™ processors in 604-pin sockets, and includes the latest technologies through the chipsets embedded on the motherboard.

Chassis	Pedestal or rackmount 5U with removable front door bezel and chassis foot stand or roller-wheels.
Motherboard	ASUS NCLV-D (A) (E-ATX form factor: 12 in x 10.5 in)
Chipset	Northbridge: Intel® E7320 Memory Controller Hub (MCH) Southbridge: Intel® 6300ESB I/O Controller Hub (ICH)
Processor	Dual 604-pin sockets for Intel® Xeon™ processors with Extended Memory 64-bit Technology (EM64T) Supports Intel® Hyper-Threading Technology
Front Side Bus	800 MHz
Memory	Dual-channel memory architecture 4 x 184-pin DIMM sockets support registered ECC 333 MHz DDR memory modules Supports 256 MB up to 8 GB of system memory Ready for 4 GB DDR DIMMs for up to 16 GB of system memory
LAN	Dual Gigabit LAN controller <ul style="list-style-type: none">• Broadcom BCM5721 Gigabit LAN controller<ul style="list-style-type: none">- PCI Express 1.0a specifications compliant• Broadcom BCM5705E Gigabit LAN controller<ul style="list-style-type: none">- PCI 2.3 specifications compliant
RAID	Intel® 6300ESB Southbridge supports: <ul style="list-style-type: none">- 2 x Serial ATA with RAID 0, RAID 1 configuration and Intel® Matrix Storage Technology Adaptec AIC-8130 PCI-X SATA-II controller (for AA4 models only) supports: <ul style="list-style-type: none">- 4 x SATAII 300 with RAID 0, RAID 1, and RAID 0+1 configuration- Zero-Channel RAID (optional)

(continued on the next page)

1.2 System specifications

Expansion slots	1 x PCI Express x8 slot (PCI Express 1.0a, x4 Link) 1 x PCI-X 66 MHz/64-bit slot (PCI-X 1.0) 1 x PCI-X 66 MHz/64-bit slot (supports ZCR, PCI-X 1.0)* 2 x PCI 33 MHz/32-bit/5V (PCI 2.3) 1 x Mini-PCI socket for the ASUS Server Management Board
Drive bays	1 x 3.25-inch FDD bay 3 x 5.25-inch drive bays
Front panel	2 x USB ports
Rear panel	1 x Serial port 1 x Parallel port 1 x PS/2 keyboard port 1 x PS/2 mouse port 2 x LAN (RJ-45) ports 2 x USB ports 1 x VGA port
Management	ASUS Server Web-based Management (ASWM) 2.0
Hardware monitors	Voltage, temperature, CPU and memory utilization, and fan speed monitoring Automatic Server Restart (ASR) feature
Power supply	600 W single/dual/redundant power supply <i>(with 24-pin and 8-pin power plugs)</i>



- Only models with the optional Serial ATA controller support Zero Channel RAID (ZCR).
- *In AS8/AS4 models, the ASUS U320 SCSI card occupies one 64-bit PCI-X slot.
- Refer to “Chapter 4 Motherboard information” for details on the internal connectors.

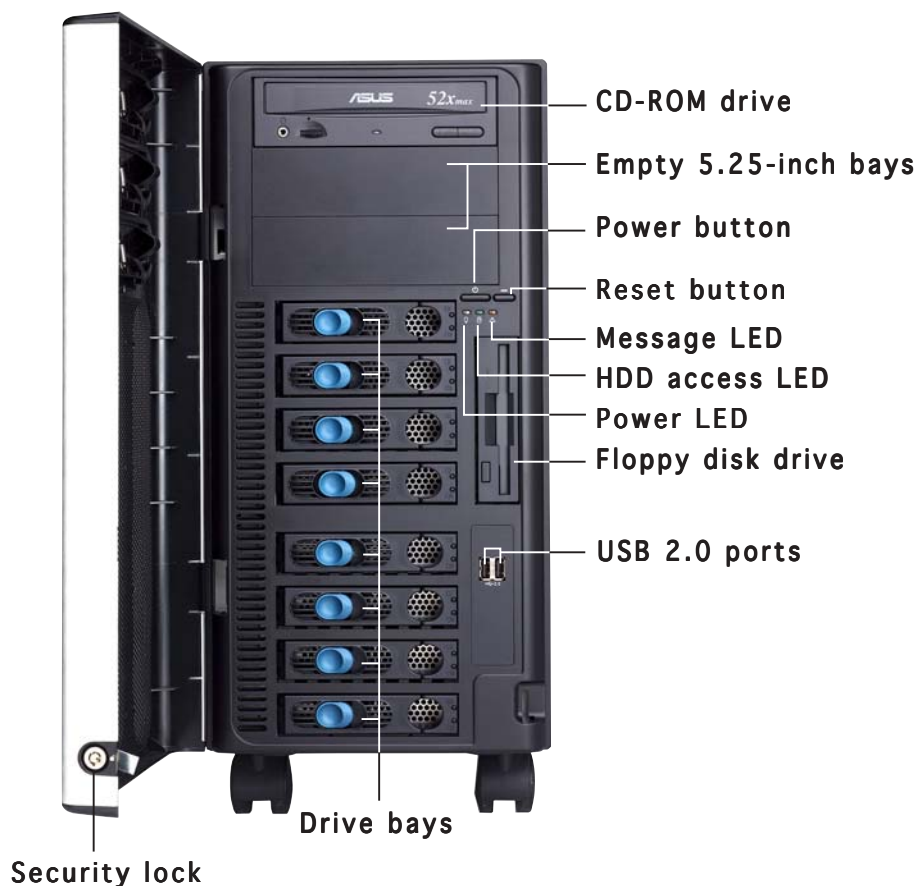
1.3 Front panel features

The AP1710-E1 chassis 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.

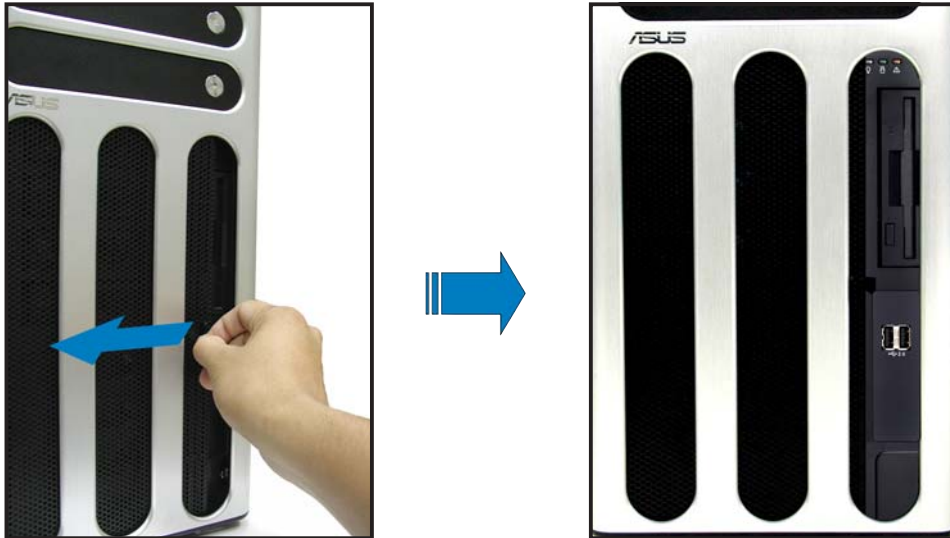
The drive bays, power and reset buttons, LED indicators, CD-ROM drive, floppy drive, and USB 2.0 ports are located on the front panel. For future installation of 5.25-inch devices, two drive bays are available.



(AS8)



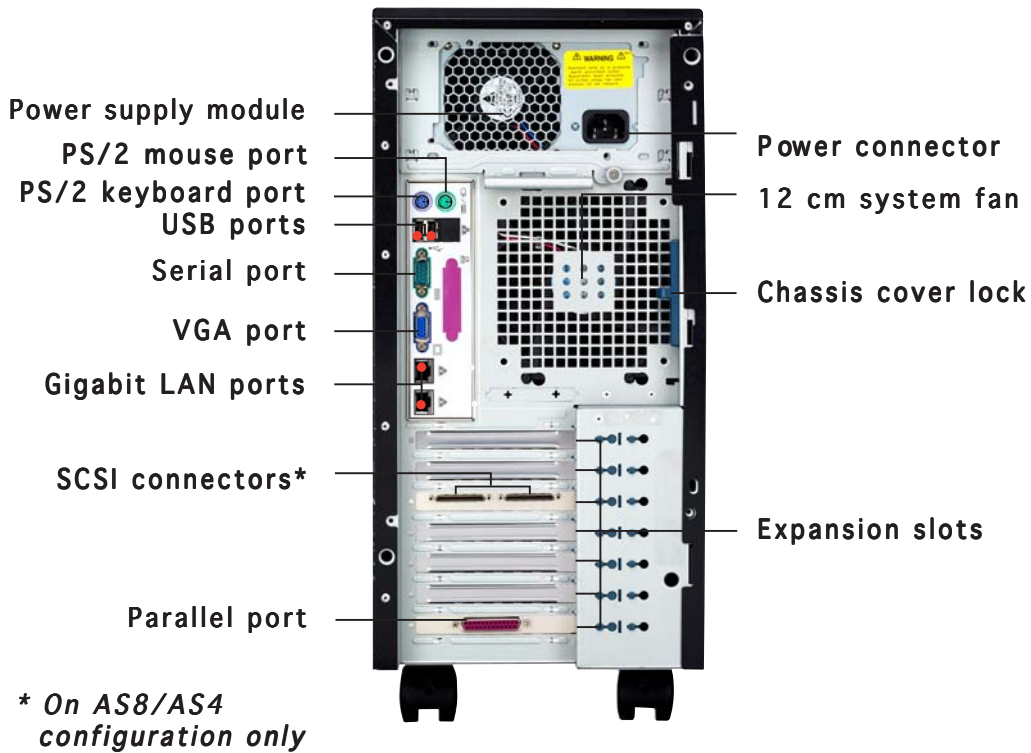
To access front I/O ports and floppy disk drive without opening the bezel, hold the tab and move the sliding panel (rightmost panel) to the left as shown.



1.4 Rear panel features

The rear panel includes a slot for the motherboard rear I/O ports, expansion slots, a chassis lock and intrusion switch, a vent for the system fan, and power supply module.

Single power supply model



Redundant power supply model



1.5 Internal features

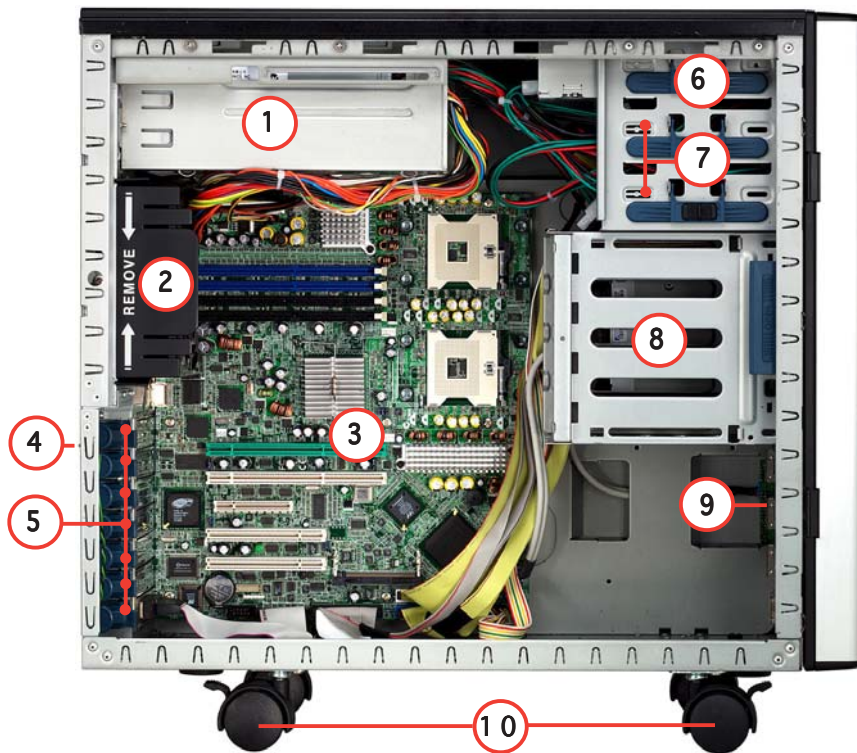
The barebone server system includes the basic components as shown. The photo below shows the AP1710-E1 with its air duct and hard disk drive blowers installed. The air duct provides cool air from the outside through the chassis side cover vent for the system to maintain optimum thermal performance. The HDD blowers circulate cool air within the system.



1. Air duct
2. HDD blowers

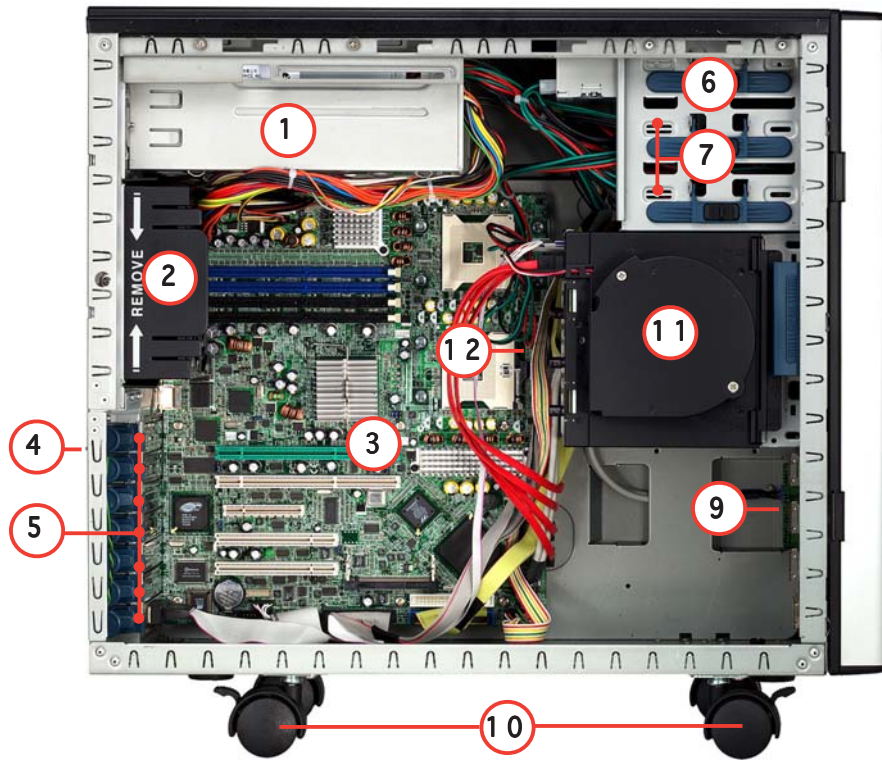
The succeeding photos show the system without its air duct installed to reveal the internal components.

AI4 (four internal IDE/SATA configuration)

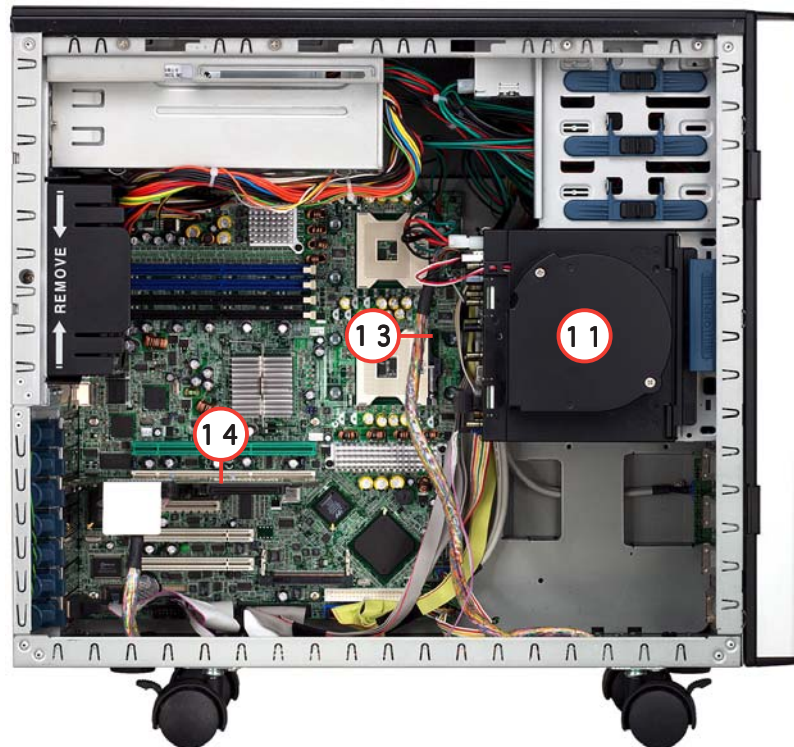


- | | |
|-----------------------------|-----------------------------|
| 1. Power supply cage | 6. CD-ROM drive |
| 2. Chassis fan | 7. 2 x 5.25-inch drive bays |
| 3. NCLV-D (A) motherboard | 8. Hard disk drive cage |
| 4. Chassis intrusion switch | 9. Front I/O board |
| 5. Expansion card locks | 10. Chassis roller wheels |

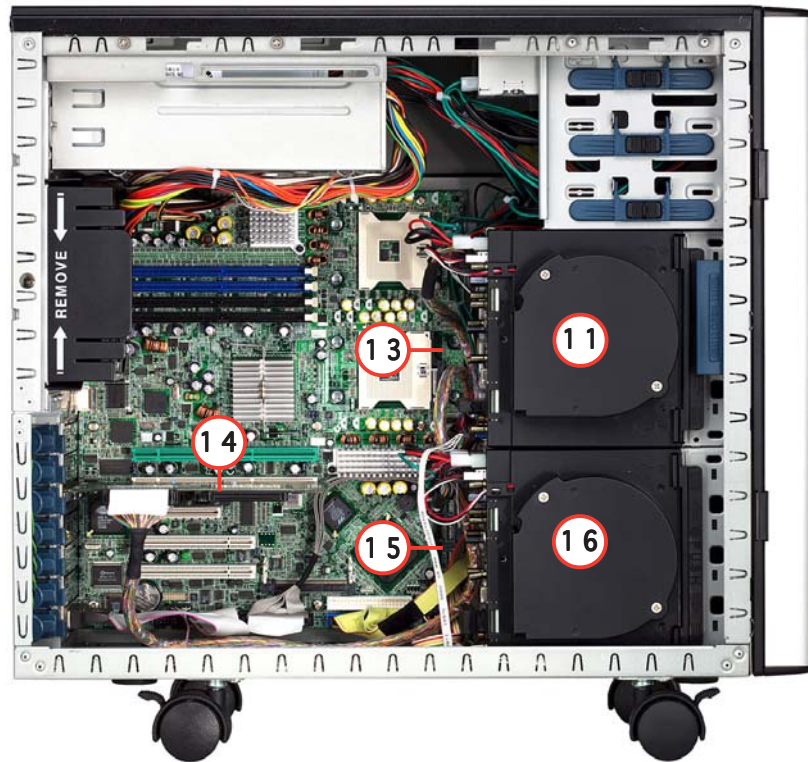
AA4 (four hot-swap SATA configuration)



AS4 (four hot-swap SCSI configuration)



AS8 (eight hot-swap SCSI configuration)



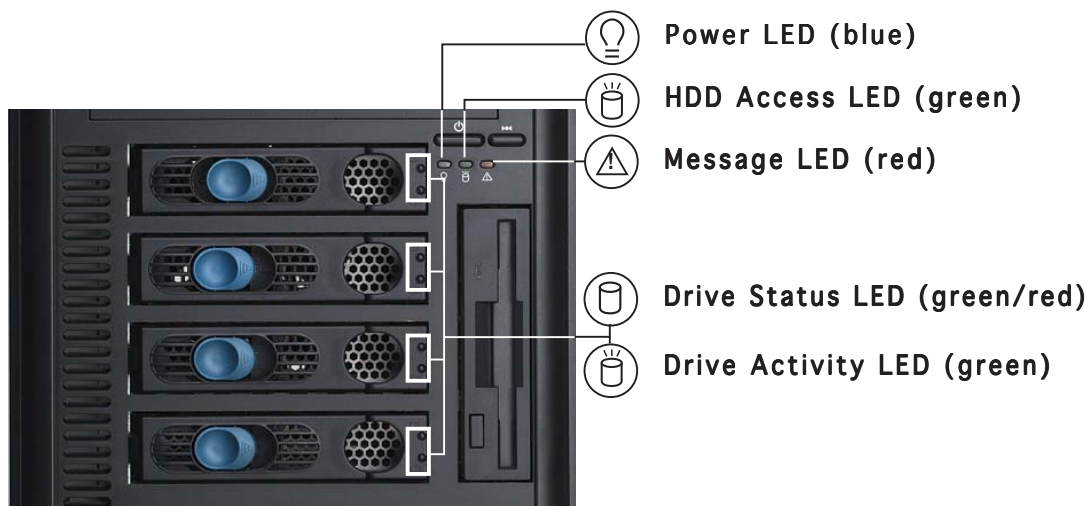
1. Power supply cage
2. Chassis fan
3. NCLV-D (A) motherboard
4. Chassis intrusion switch
5. Expansion card locks
6. CD-ROM drive
7. 2 x 5.25-inch drive bays
8. Hard disk drive cage
9. Front I/O board
10. Chassis roller wheels
11. HDD blower*
12. SATA backplane (hidden)
13. SCSI backplane (hidden)
14. ASUS U320 SCSI card
15. Second SCSI backplane (hidden)
16. Second HDD blower*






* The hard disk drive cage is behind the blower.

1.6 LED information

The barebone system comes with five LED indicators. Refer to the following table for the LED status description.

1.6.1 System and HDD LED



LED	Icon	Display status	Description
System			
Power LED		ON Blinking	System power ON System is in suspend mode
HDD Access LED		OFF Blinking	No activity Read/write data into the HDD
Message LED		OFF Blinking	System is normal; no incoming event ASMS indicates a HW monitor event
Hard disk drives			
Drive Status LED		Green	Bridge board connected to backplane Installed HDD is in good condition
		Red	HDD failure
		Green/Red - Blinking	HDD rebuilding using the RAID card SAF-TE* function
Drive Activity LED		Blinking	Read/write data into the HDD

*SCSI Access Fault-Tolerant Enclosure (on AS4 and AS8 models only)



- The Power, HDD Access, and Message LEDs are visible even if the system front bezel is closed.
- For AA4 configuration:
 1. The Drive Activity LEDs do not light up.
 2. The Drive Status LEDs only light up green to indicate that the installed Serial ATA HDD is in good condition.

1.6.2 Dual/redundant power supply LED

Display status	Description
Red	Standby (Power cords plugged)
Green	Power on
Power off	Power cords unplugged



Chapter 2

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



ASUS AP1120-E1

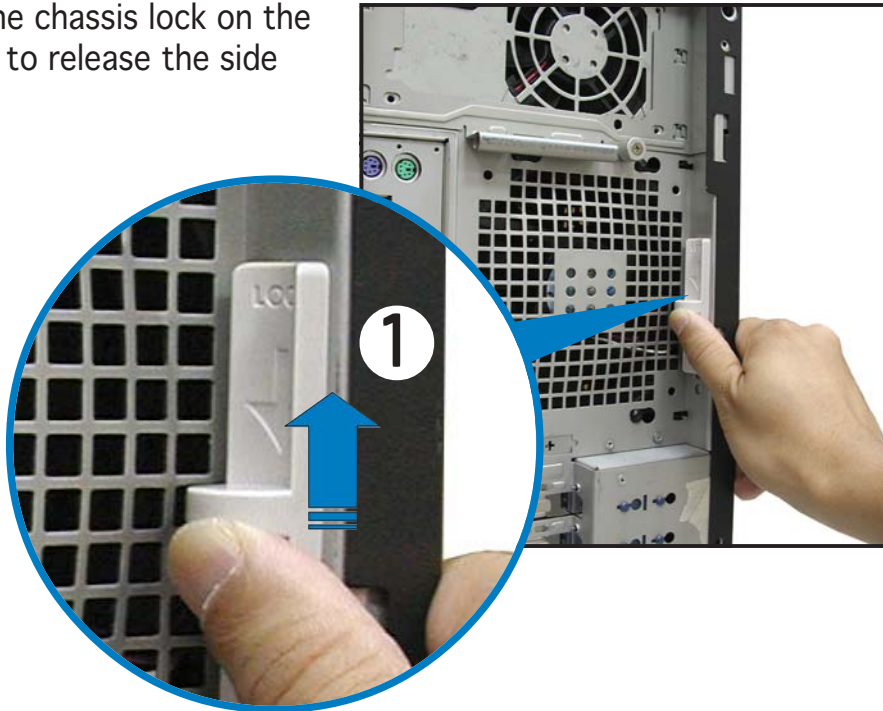
Hardware setup

2.1 Chassis cover

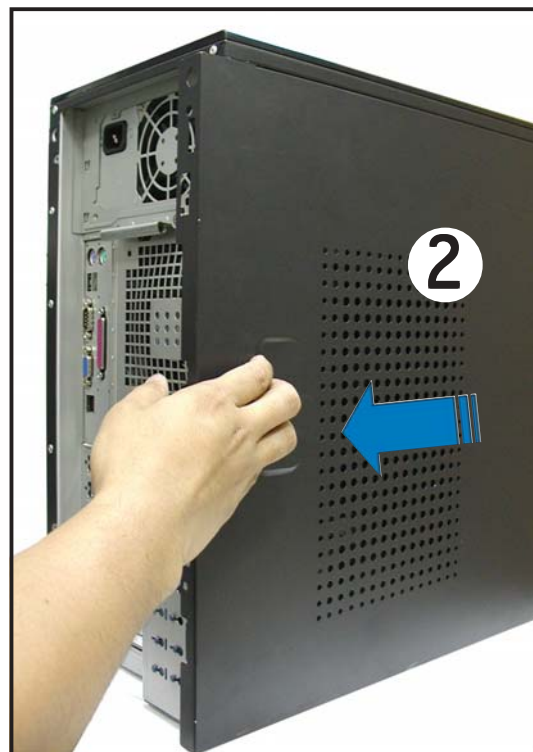
The chassis features a “screwless design” that allows convenient assembly and disassembly. You can simply push or slide mechanical bolts and locks to remove the cover.

2.1.1 Removing the side cover

1. Push up the chassis lock on the rear panel to release the side cover.



2. Slide the side cover for about half an inch toward the rear until it is disengaged from the chassis.



Viewing the internal structure

Without the side cover, the internal structure and installed components of the barebone server vary depending on the model you purchased. Refer to section “1.5 Internal features” for the different model configurations.

Perform the procedures in the succeeding sections to install the CPU, system memory, disk drives, and expansion cards; replace fans and power supply; and connect the system cables.

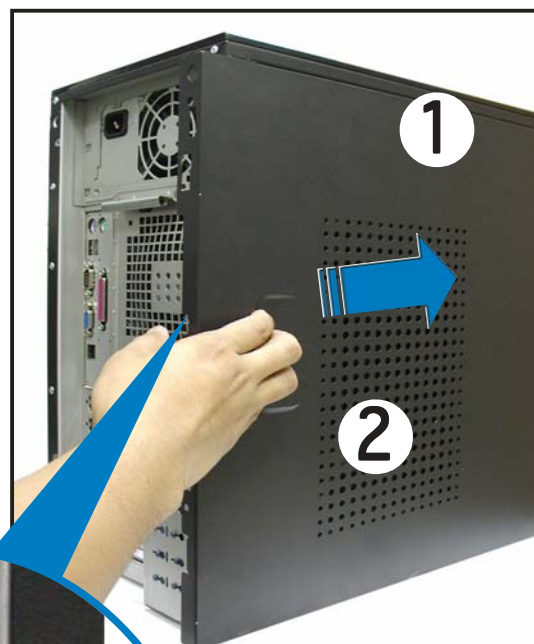


You may need to remove some of the installed components to access the DIMM sockets and internal connectors. Refer to section “2.10 Removable components” for instructions.

2.1.2 Reinstalling the side cover

To reinstall the side 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. Push down the chassis lock to secure the side cover.



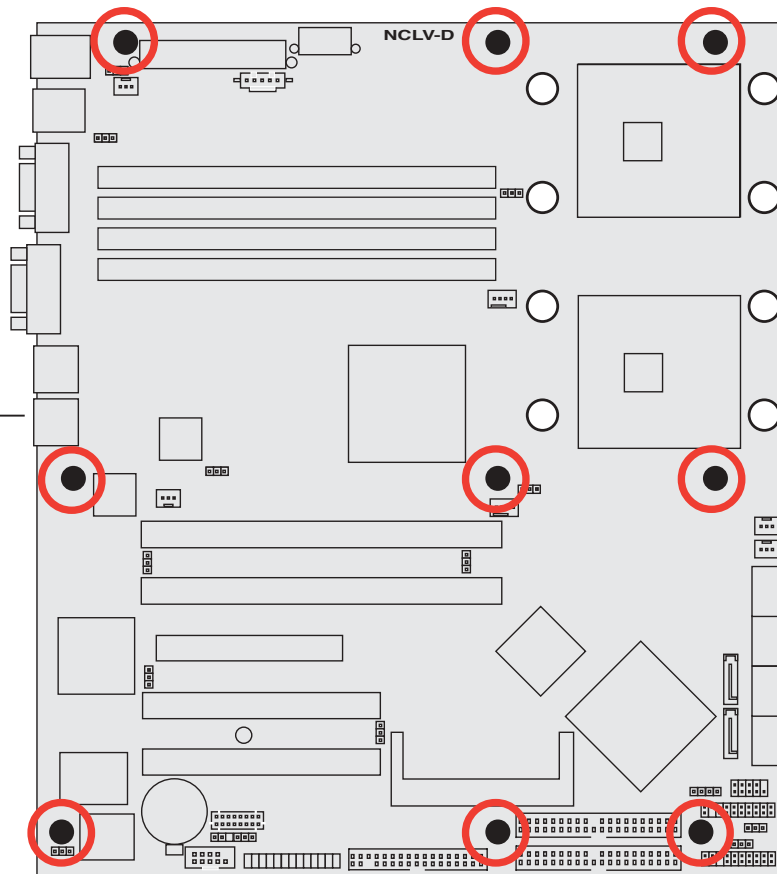
2.2 Motherboard information

The barebone server comes with the NCLV-D(A) motherboard already installed. The motherboard is secured to the chassis by nine (9) screws as indicated by the circles in the illustration below.



Refer to “Chapter 4 Motherboard information” for detailed information on the motherboard.

Place this side towards the rear of the chassis

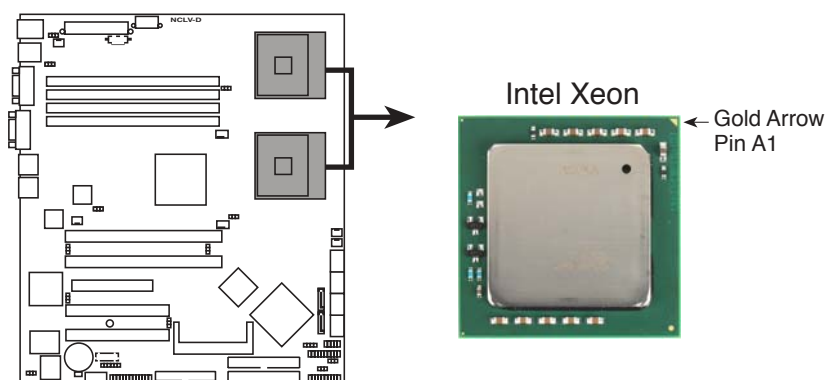


Make sure to unplug the power cord before installing or removing any motherboard component or connection. Failure to do so may cause you physical injury and may damage motherboard components.

2.3 Central Processing Unit (CPU)

2.3.1 Overview

The motherboard comes with surface mount 604-pin Zero Insertion Force (ZIF) sockets. The sockets are designed for the Intel® Xeon™ processor in the 604-pin package with 1 MB L2 cache. The new generation Xeon™ processor supports 800 MHz system bus and Extended Memory 64-bit Technology (EM64T).



NCLV-D CPU Socket 604



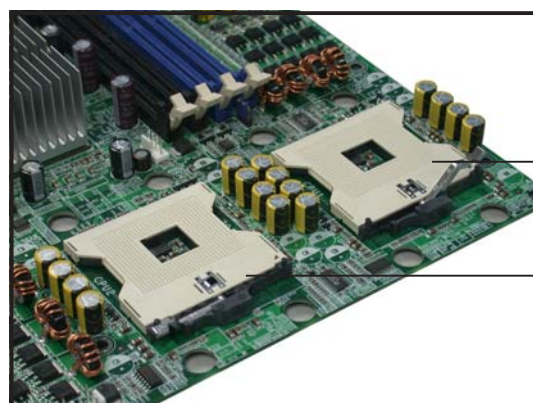
Before installing the CPU, remove the chassis fan attached to the inner side of the rear panel to allow enough space for the installation. Refer to section “2.10 Removable components” for details.

2.3.2 Installing the CPU

Note in the above 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.



If installing only one CPU, use the socket CPU1.



Socket for CPU1

Socket for CPU2



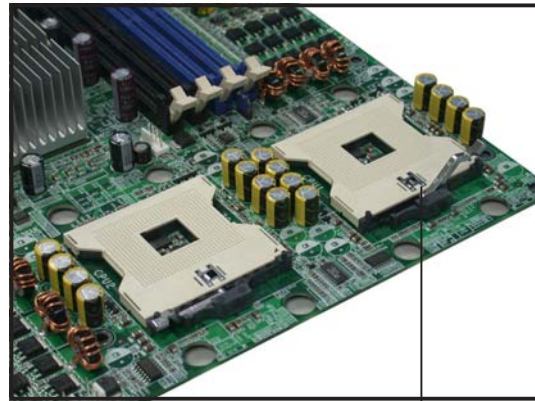
Incorrect installation of the CPU into the socket may bend the pins and severely damage the CPU!

To install a CPU:

1. Locate the 604-pin ZIF sockets on the motherboard. Flip up the socket lever and push it all the way to the other side.



Make sure that the socket lever is pushed back all the way; otherwise the CPU does not fit in completely.

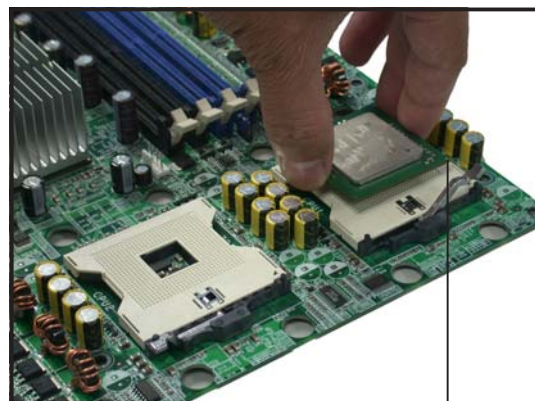


Socket for CPU1

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!



Marked corner
(gold arrow)

4. Carefully push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.
5. Apply the thermal interface material (thermal grease) to the top of the CPU. This thermal grease should come with the CPU package.
6. Repeat steps 1 to 5 to install a second CPU.



2.3.3 Installing the CPU heatsink and fan

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

When you buy a boxed Intel CPU, the package includes the heatsink, fan, retention brackets, screws, thermal grease, installation manual, and other items that are necessary for CPU installation.

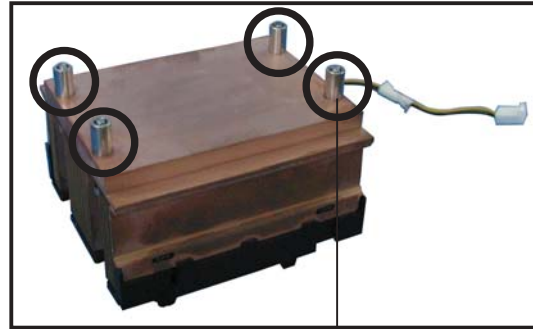


- Make sure that you have applied the thermal grease to the top of the CPU before installing the heatsink and fan.
- Refer to the installation manual that came with the CPU package for details on heatsink/fan assembly and installation.

CPU heatsink (top view)



CPU heatsink (bottom view)



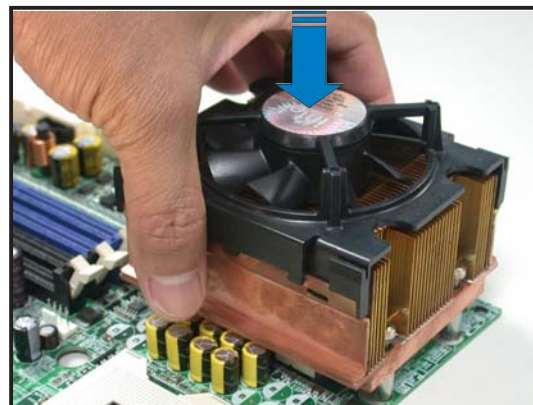
Heatsink screw



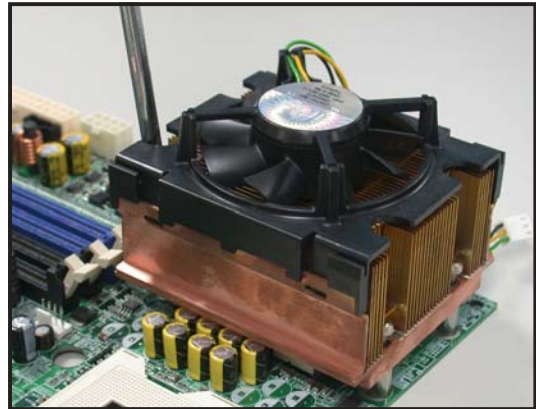
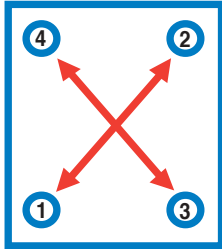
Before installing the CPU heatsinks, ensure that the jumpers FM_CPU1 and FM_CPU2 are set correctly depending on the pin definition of your CPU fan cables. Refer to section “4.2 Jumpers” for information on these jumpers.

To install the CPU heatsink and fan:

1. Place the heatsink on top of the installed CPU, making sure that the four screws on the heatsink align with the nuts on the support plate.



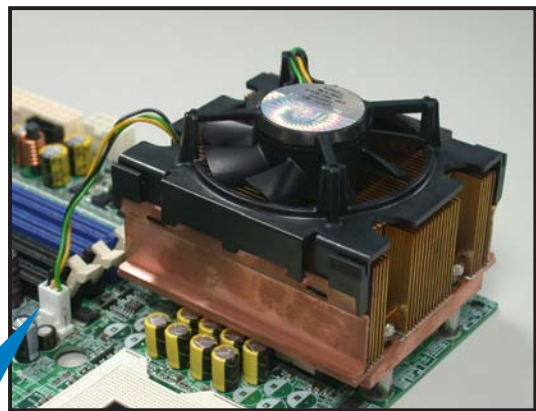
2. Use a Phillips screwdriver to tighten the four heatsink screws in a diagonal sequence.



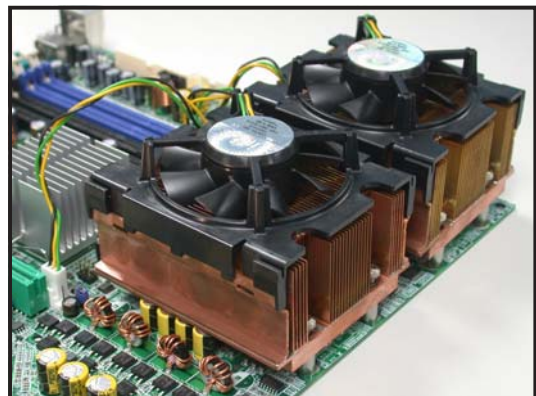
3. Connect the fan cable to the 4-pin connector labeled CPU_FAN1.



Do not forget to connect the CPU fan connector! Hardware monitoring errors may occur if you fail to plug this connector.



4. Repeat steps 1 to 3 to install the other heatsink if you have installed a second CPU, then connect the fan cable to the 4-pin connector labeled CPU_FAN2.
The heatsinks appear as shown when installed.



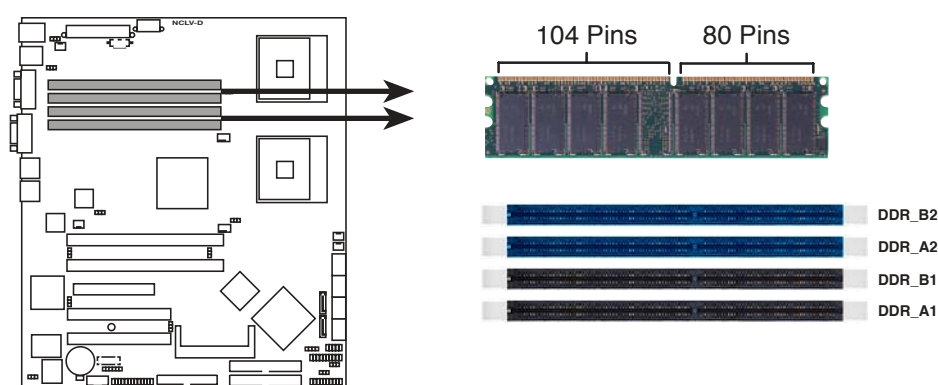
2.4 System memory

2.4.1 Overview

The motherboard comes with four Double Data Rate (DDR) Dual Inline Memory Modules (DIMM) sockets.

A DDR module has the same physical dimensions as a DDR2 DIMM but has a 184-pin footprint. DDR DIMMs are notched to match the break on the socket and ensure correct installation.

The figure illustrates the location of the DDR DIMM sockets:



NCLV-D 184-Pin DDR DIMM sockets

2.4.2 Memory configurations

You may install 256 MB, 512 MB, 1 GB, 2 GB, and 4 GB registered ECC DDR DIMMs into the DIMM sockets.



- Always install DIMMs with the same CAS latency. For optimum compatibility, we recommend that you obtain memory modules from the same vendor. Visit the ASUS website (www.asus.com) for the latest QVL.
- Due to chipset resource allocation, the system may detect less than 8 GB system memory when you installed four 2 GB DDR memory modules.
- This motherboard does not support memory modules made up of 128 Mb chips or double-sided x16 memory modules.
- Installing DDR DIMMs other than the recommended configurations may cause memory sizing error or system boot failure. Use any of the recommended configurations on the next page.
- When all four sockets are populated with 2 GB DIMMs (total 8 GB), the system may detect only less than 8 GB due to resource allocation on onboard devices.

Recommended memory configurations

Mode	Sockets			
	DDR_B2 (blue)	DDR_A2 (blue)	DDR_B1 (black)	DDR_A1 (black)
Single-channel	(1) Populated	—	—	—
	(2) —	Populated	—	—
Dual-channel*	(1) Populated	Populated	—	—
	(2) Populated	Populated	Populated	Populated

* For dual-channel configuration, you may:

- install **identical** DIMMs in all four sockets, or
- install **identical** (the same type and size) DIMM pair in DDR_B2 and DDR_A2 (blue sockets) only.



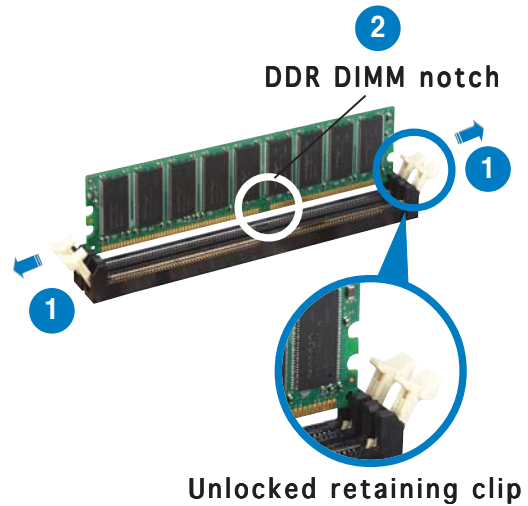
Obtain DDR DIMMs only from ASUS qualified vendors for better system performance. Visit the ASUS website (www.asus.com) for the latest QVL.

2.4.3 Installing a DIMM



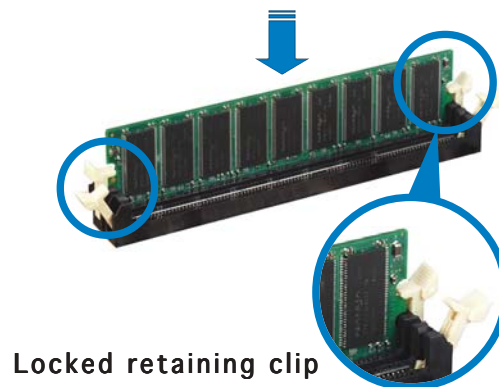
Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

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.

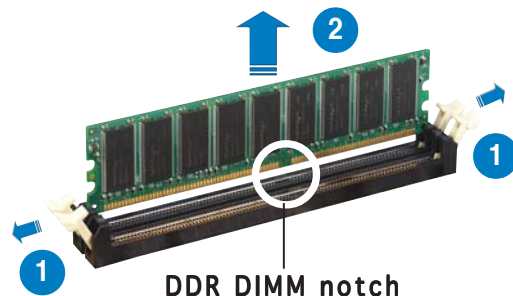
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



2.4.4 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.

2.5 Front panel assembly

2.5.1 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. Pull the lock lever (blue bar) on the front edge of the chassis outward to release the front panel assembly.

Lock lever



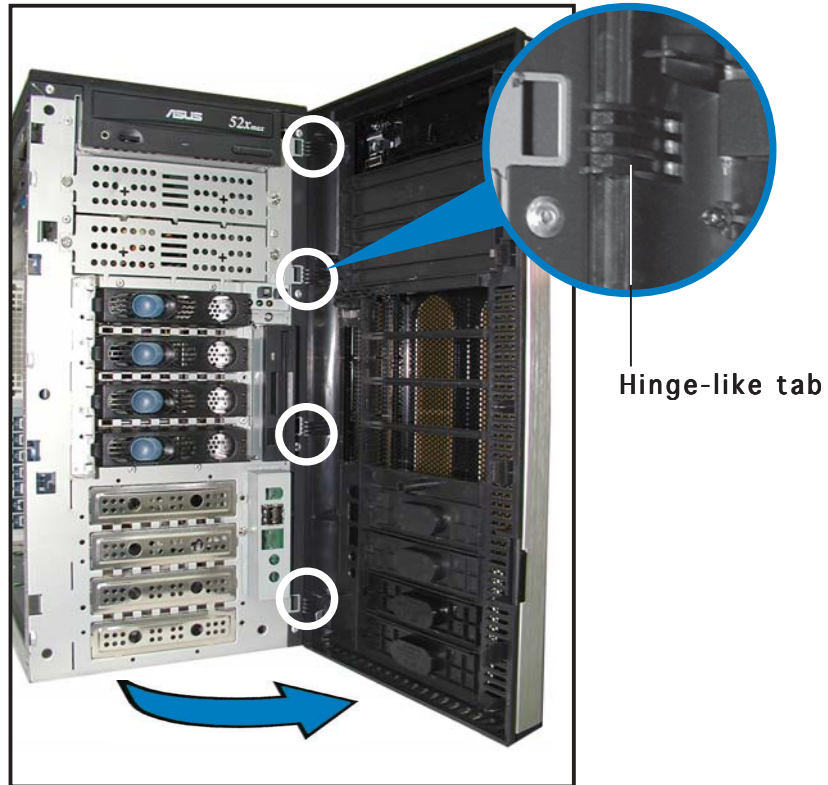
2. Pull and swing the left edge of the front panel outward.



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.



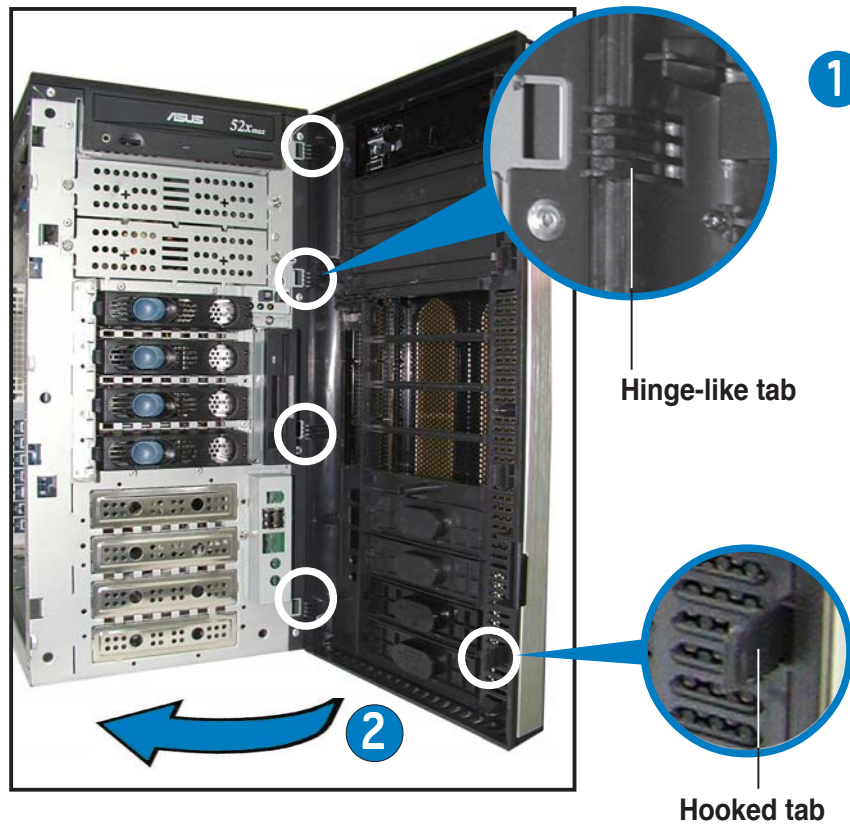
Do not use too much force when removing the front panel assembly.



2.5.2 Reinstalling the front panel assembly

To reinstall the front panel assembly (front bezel and front panel cover):

1. Insert the four hinge-like tabs to the holes on the right edge of the chassis.
2. 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 back in place.

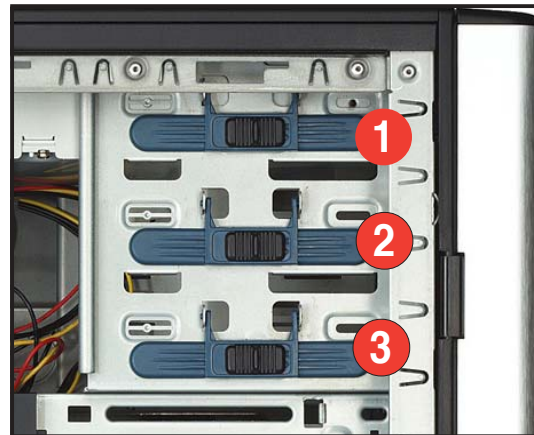


2.6 5.25-inch drives



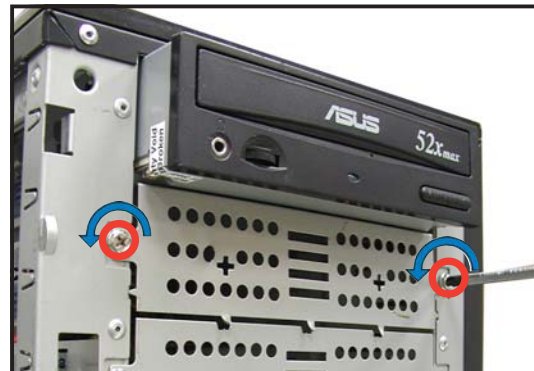
If you have previously used and powered up the system, and that it may be connected to an AC power source, make sure to unplug the power cable before installing or removing any system components. Failure to do so may cause damage to the motherboard and other system components!

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.



To install a 5.25-inch drive:

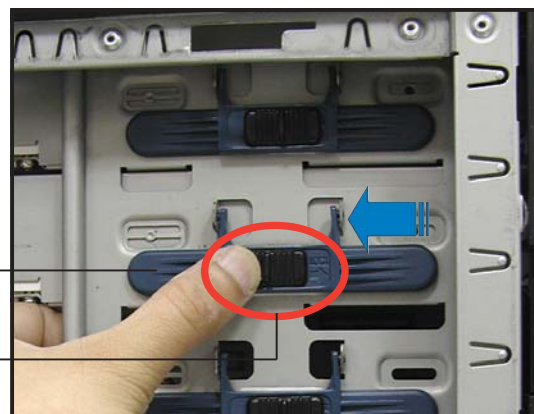
1. Use a Phillips (cross) screwdriver to remove the screws that secure the metal cover of the bay where you want to install the drive.



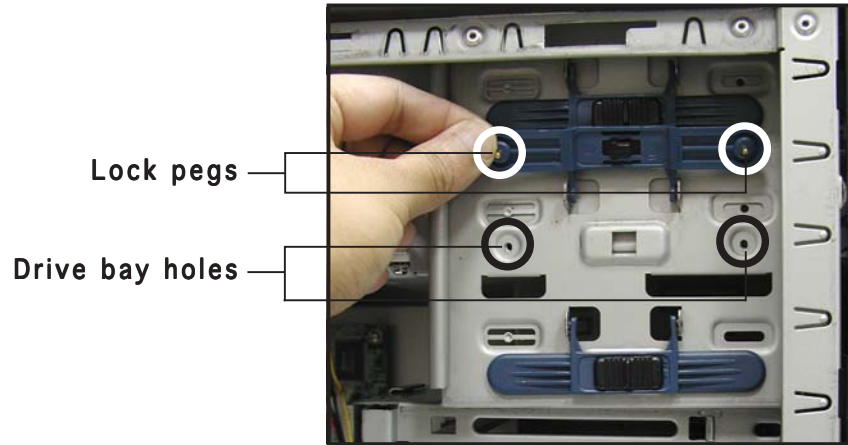
2. From the side of the drive bay, slide the drive bay lock by pushing it to the left to release the drive lock bar.

Drive lock bar

Drive bay lock



- When released, pull up the drive bay lock bar. Underneath the lock bar are two pegs that match the holes on the drive bay. This mechanism secures the drive to the bay in place of screws.

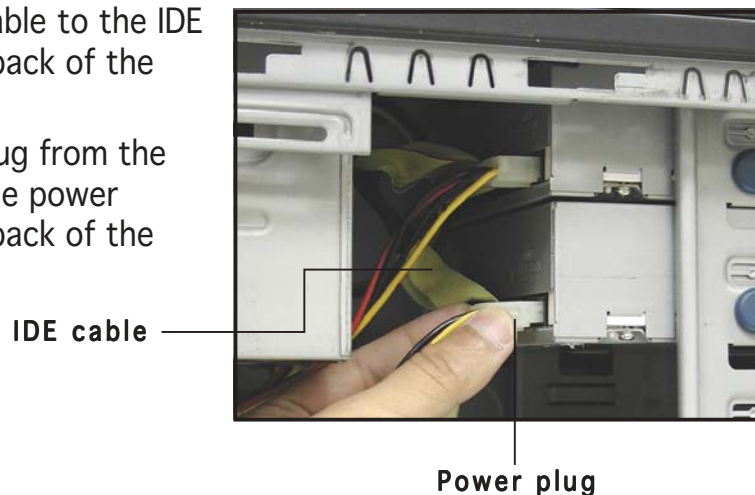


- While holding up the drive lock bar, carefully insert a 5.25-inch drive into the bay, until the back of the drive aligns to the rear edge of the drive cage.

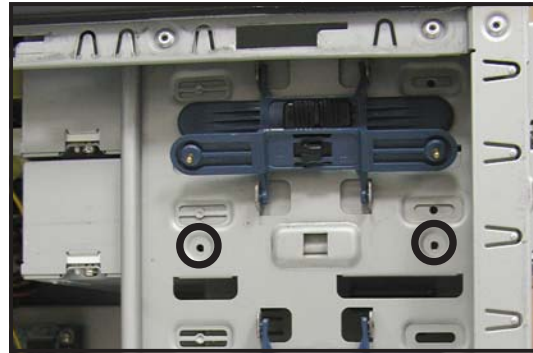


Due to space constraints inside the chassis, do not insert the drive all the way at this time. This will allow you enough space to easily connect the drive cables.

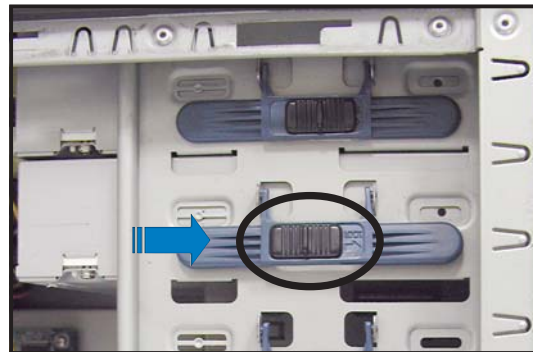
- Connect the IDE cable to the IDE connector on the back of the drive.
- Connect a 4-pin plug from the power supply to the power connector on the back of the drive.



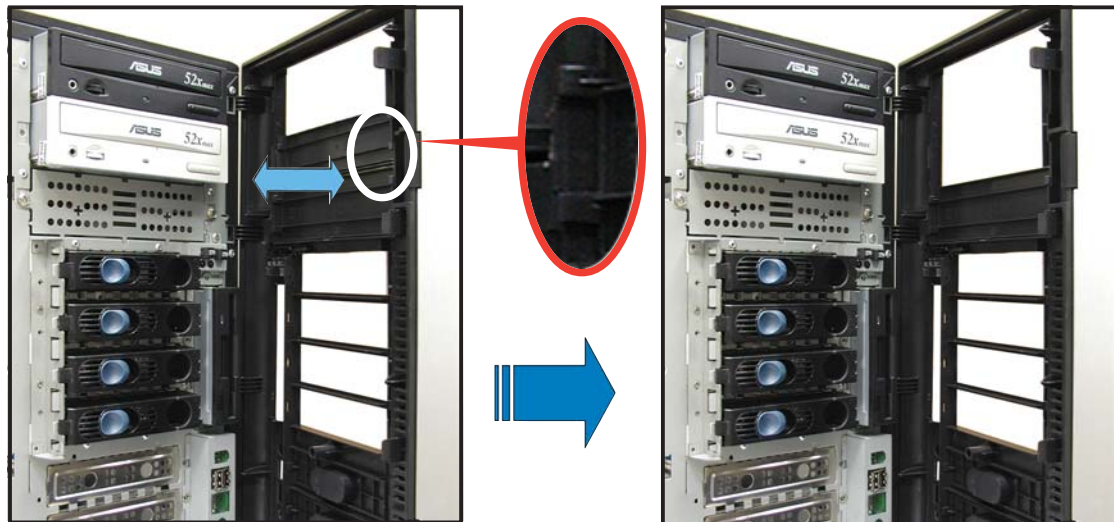
7. Make sure that the drive and bay holes align as shown. When in place, the drive protrudes about an inch from the front panel.



8. Pull down the bar lock and insert the lock pegs to the drive/bay holes, then push the drive lock to the right to secure the drive.



9. 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.



10. Reinstall the front panel assembly when done. Refer to section “2.5.2 Reinstalling the front panel assembly” for instructions.

2.7 Hard disk drives

2.7.1 Installing a hot-swap SATA/SCSI HDD

If you purchased an AS8, AS4, or AA4 configured model, follow these instructions to install a hot-swap SATA or SCSI hard disk drive (HDD).

1. Open the front bezel to access the hot-swap drive trays.

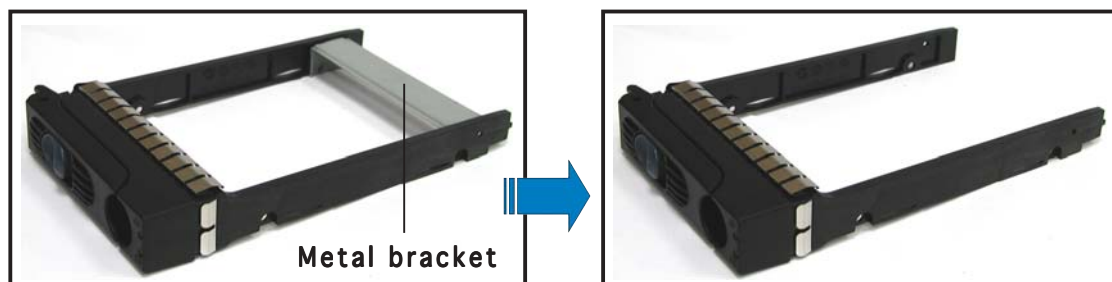
2. Release a drive tray by pushing the spring lock to the right, then pulling the tray lever outward. The drive tray ejects slightly after you pull out the lever.



3. Firmly hold the tray lever and pull the drive tray out of the bay.



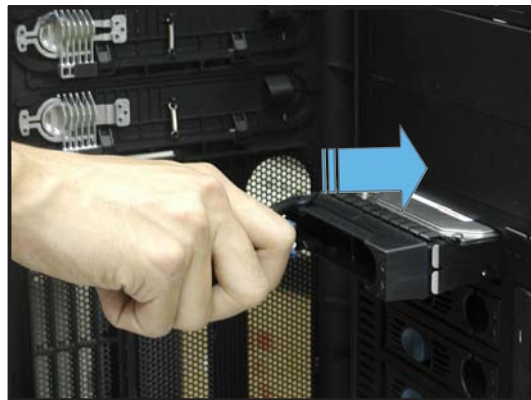
4. An empty drive tray requires a metal bracket for support. Use a Phillips (cross) screwdriver to remove the bracket when you are ready to install a hard disk in the drive tray.



5. Place a SATA or an SCA SCSI hard disk to the drive tray, and secure it with four screws.



6. Carefully insert drive tray and push it all the way to the depth of the bay until just a small fraction of the tray edge protrudes.



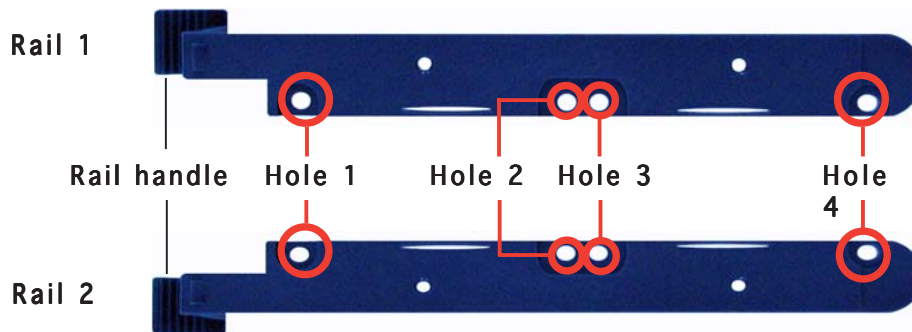
7. Push the tray lever until it clicks, and secures the drive tray in place. The drive tray is correctly placed when its front edge aligns with the bay edge.



2.7.2 Installing an internal IDE/SATA HDD

If you purchased an internal IDE/SATA model (AI4), your package comes with specially designed hard disk drive rails. Depending on which bay you wish to install your hard disk drive, the orientation of the drive rails vary so that the screw holes match those on the drive.

For identification purposes, the drive rails are referred to as “Rail 1” and “Rail 2” as shown below.

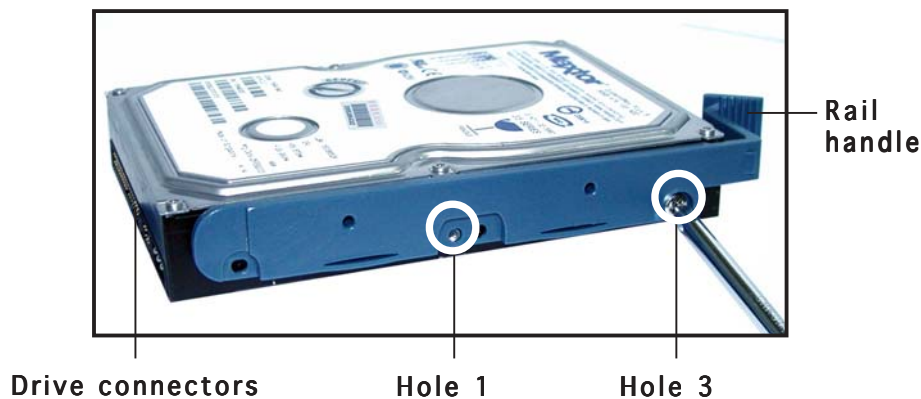


Take note of the correct orientation of the drive rails. There is only one **correct** way to attach the rails when installing drives on the hard disk drive cage.

Installing an IDE hard disk drive to the first hard disk drive cage

To install an IDE hard disk drive to the first hard disk drive cage:

1. Remove the front panel assembly. Refer to section 2.5.1 for instructions.
2. Use a Phillips (cross) screwdriver to attach **Rail 1** to the side of the drive as shown. The rail end should be on the side of the drive connectors.



3. Attach **Rail 2** to the other side of the drive as shown. The rail end should be on the side of the drive connectors.



Rail handle Hole 1 Hole 3 Drive connectors

4. Check the HDD jumper setting. Refer to the label pasted on the HDD for the description of jumper settings. The setting “Cable Select” is recommended.
5. Carefully insert the drive into a bay on the front panel.



6. Push the drive all the way to the depth of the bay until the rail locks clicks, indicating that the drive is securely in place.



7. Connect the IDE and power cables to their corresponding connectors on the back of the drive.
8. Follow steps 2 to 6 to install other hard disk drives.
9. Reinstall the front panel assembly when done.



Installing a Serial ATA HDD to the first hard disk drive cage

To install a Serial ATA hard disk drive to the first hard disk drive cage:

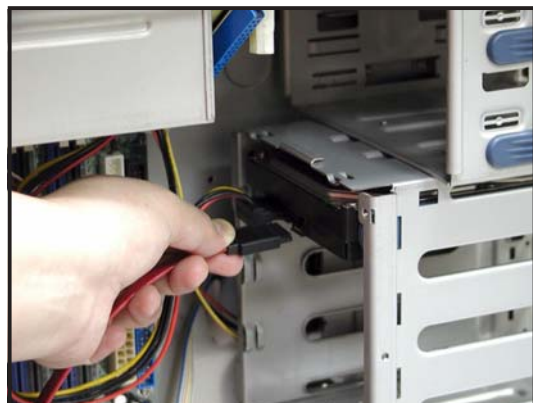
1. Follow instructions 1 to 6 of the previous section.
2. Connect the 15-pin SATA power plug to the power connector at the back of the drive.



3. Connect the other end of the SATA power cable to a 4-pin plug (female) from the power supply unit.



4. 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. Refer to the motherboard user guide for the location of the SATA connectors.

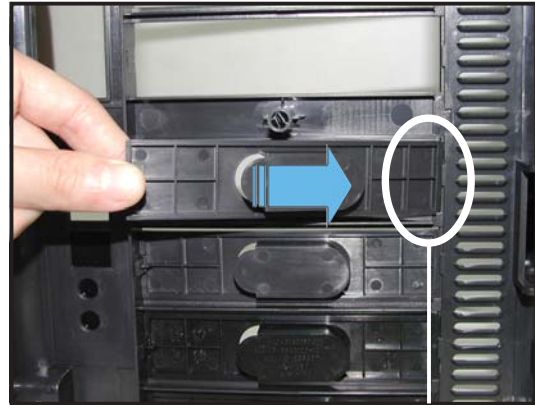


Installing an HDD dummy cover

The HDD dummy covers come pre-installed on the front panel bezel. In case you removed the covers, follow these steps to re-install them.

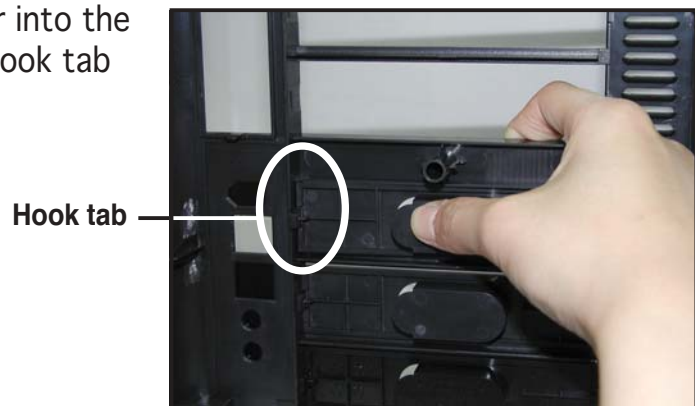
To install an HDD dummy cover:

1. From the inside of the front panel assembly, insert the flat end of a dummy cover into the slot as shown. The end with the hook tab should be close to the front panel LEDs.



Flat end

2. Press the dummy cover into the slot opening until the hook tab clicks in place.



3. When installed, the dummy cover appears as shown.



2.8 Expansion cards

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.

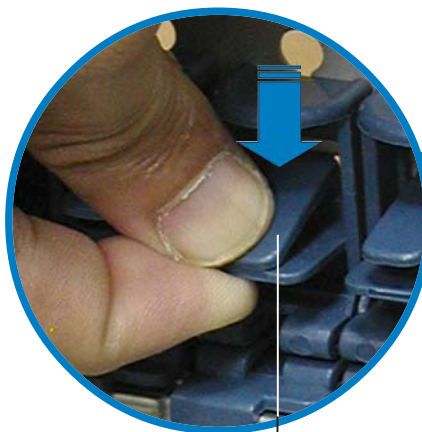


Make sure to unplug the power cord before installing or removing expansion cards. Failure to do so may cause physical injury, and damage to the card and motherboard components!

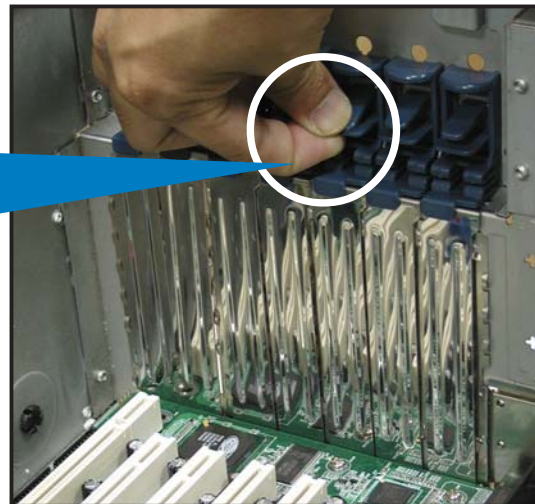
2.8.1 Installing a standard size expansion card

To install a standard size expansion card:

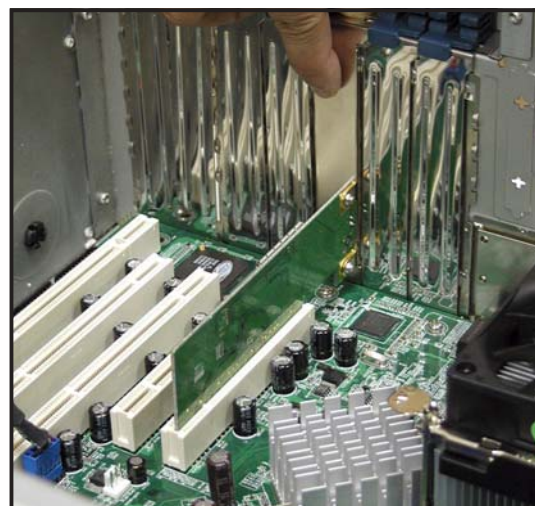
1. Remove the plastic card lock opposite the slot where you wish to install the expansion card. Release the card lock by pressing the center tabs and pushing outward. Set the card lock aside for later use.



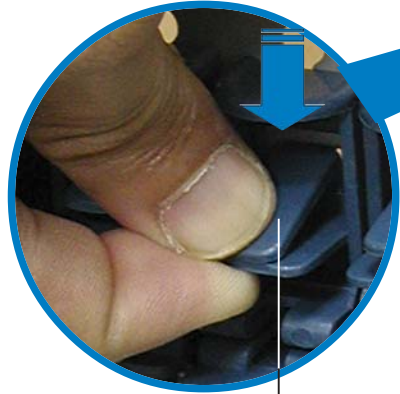
Card lock tab



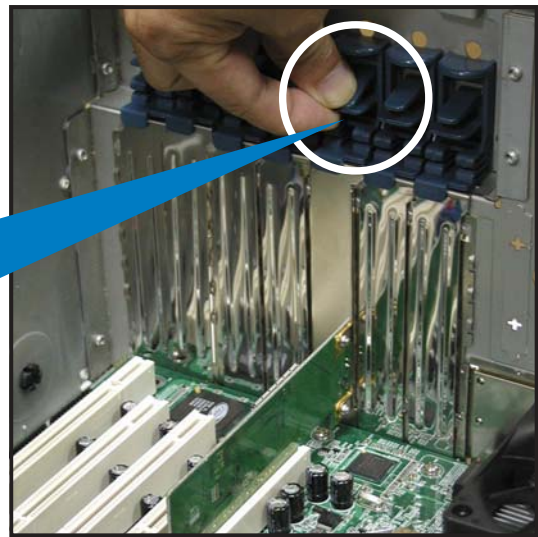
2. Carefully install an expansion card making sure that it is properly seated on the slot.



3. When the card is in place, secure it with the plastic card lock that you removed earlier.



Card lock tab



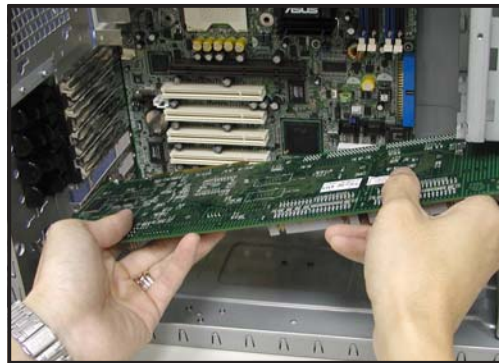
2.8.2 Installing a long expansion card

The **AS4**, **AA4**, and **AI4** models support long expansion cards. Refer to the instructions in this section to install a long expansion card.

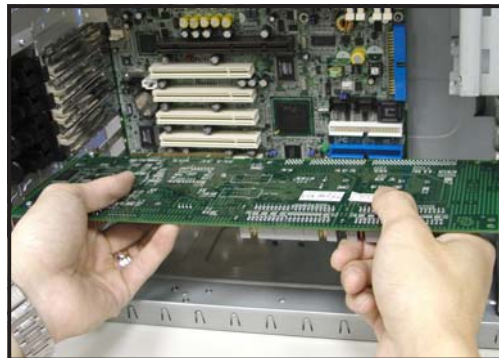
To install a long expansion card:

1. Remove the plastic card lock opposite the slot where you wish to install the expansion card. Release the card lock by pressing the center tabs and pushing outward. Set the card lock aside for later use.

2. Tilt the long card as shown while aligning the metal bracket with the slot opening on the rear panel.



3. When the card is inside the chassis, push down the end of the card until it is level with the PCI slot.



4. Push the card connector into the PCI slot until it is securely seated.

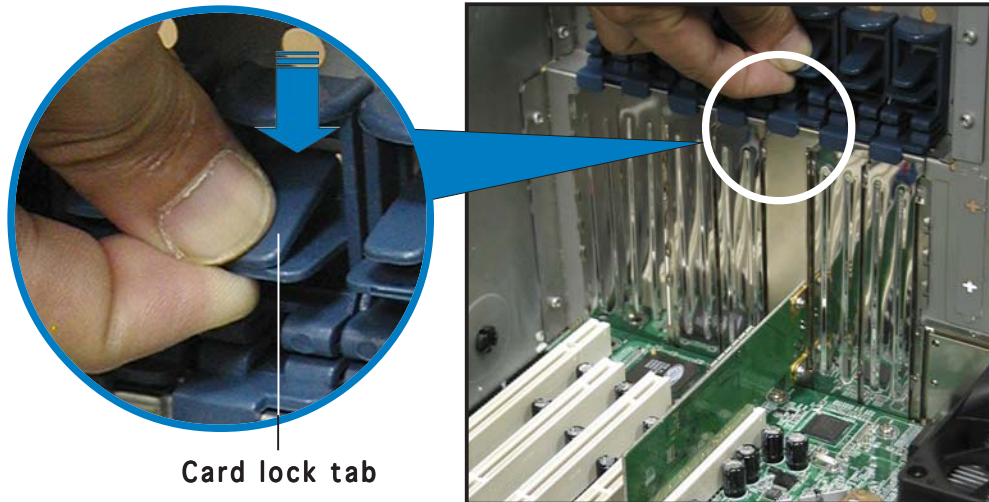
5. When the card is in place, secure it with the plastic card lock that you removed earlier.



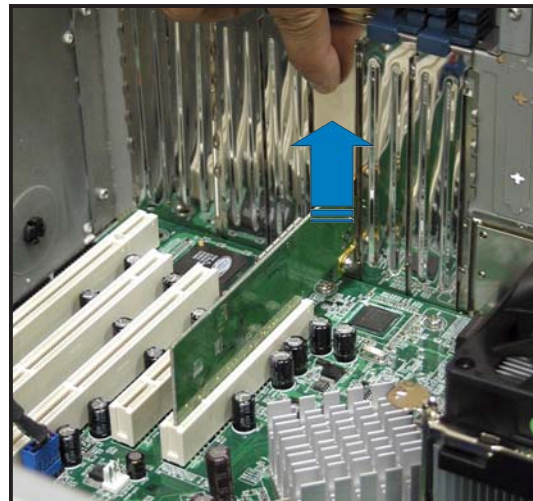
2.8.3 Removing an expansion card

To remove an expansion card:

1. Remove the plastic card lock that secures the expansion card.



2. Firmly hold the expansion card and pull it out of the slot.
3. Place the plastic card lock back where you removed it.

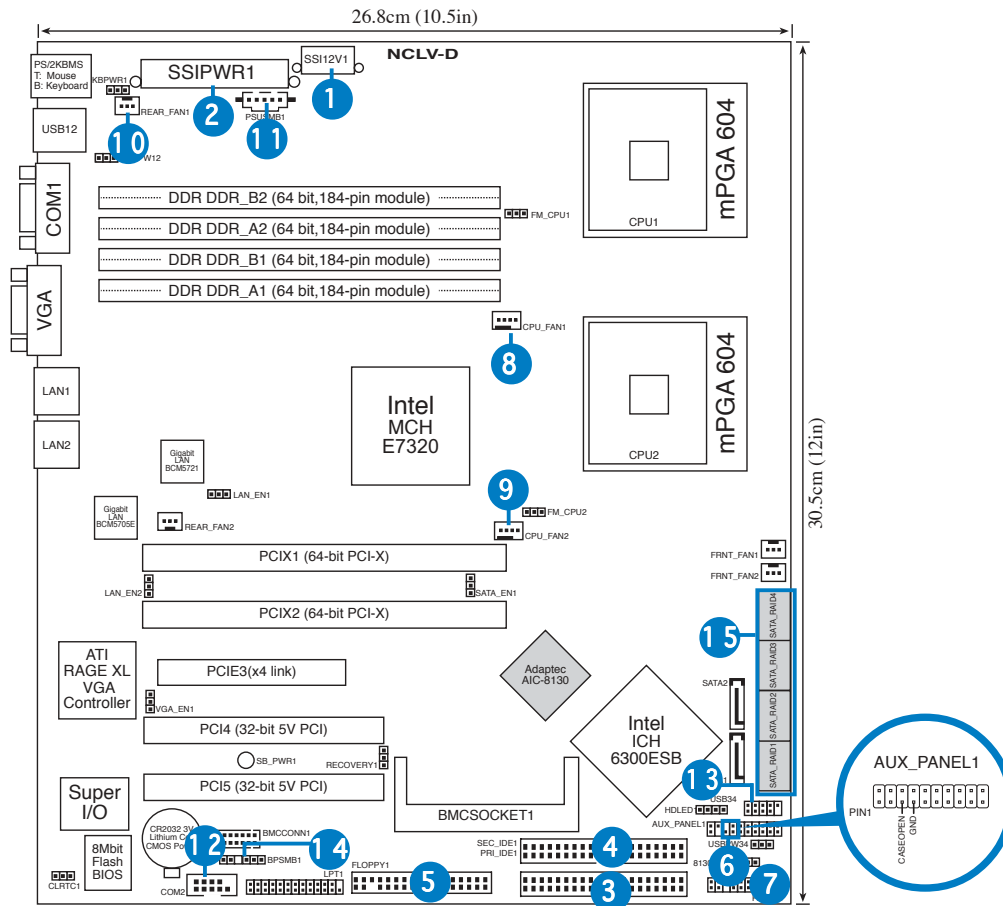


2.9 Cable connections



- The bundled system cables are pre-connected before shipment. You do not need to disconnect these cables unless you will remove pre-installed components to install additional devices.
- Refer to this section when reconnecting cables to ensure correct cable connections.

2.9.1 Motherboard connections



Standard cables connected to the motherboard

- | | |
|----------------------------------|--------------------------------|
| 1. 8-pin 12V power | 9. CPU fan2 |
| 2. 24-pin ATX power | 10. Rear fan1 |
| 3. Primary IDE cable | 11. Power supply SMBus |
| 4. Secondary IDE (optical drive) | 12. Serial port (COM2) |
| 5. Floppy disk drive | 13. Front USB cable |
| 6. Chassis intrusion | 14. SMBus cable to backplane |
| 7. Front panel cable | 15. Serial ATA RAID connectors |
| 8. CPU fan1 | |



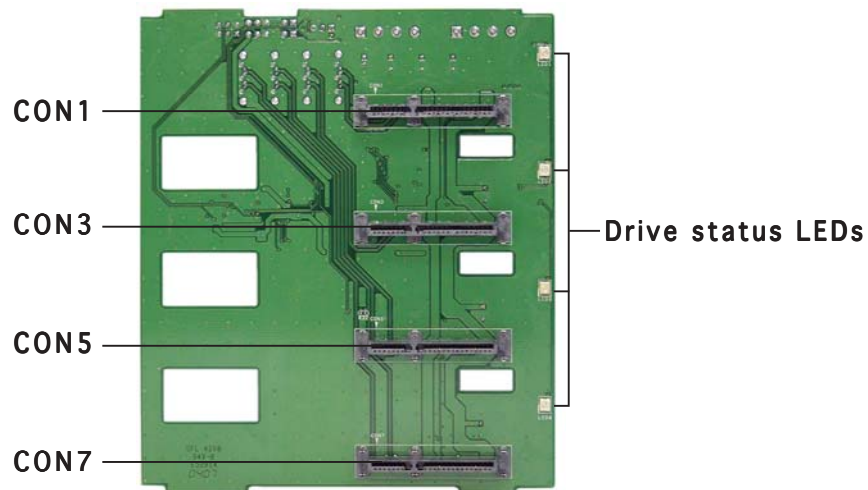
Refer to the motherboard user guide for detailed information on the connectors.

2.9.2 SATA backplane connections (in AA4 models only)

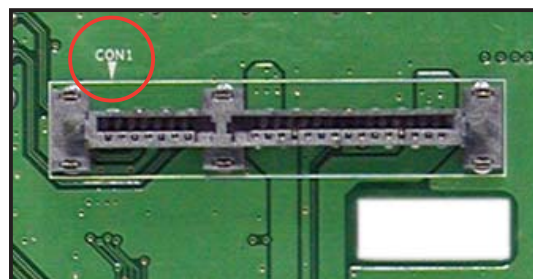
A SATA backplane comes pre-installed in the AP1710-E1 AA4 model. The SATA backplane has four 15-pin SATA connectors to support Serial ATA hard disk drives. The backplane design incorporates a hot swap feature to allow easy connection or removal of SATA hard disks. The LED on the backplane connect to the front panel LED to indicate HDD status. See section “1.6 LED information” for details.

Front side

The front side of the SATA backplane faces the front panel when installed. This side includes four SATA connectors for the hot swap drive trays.



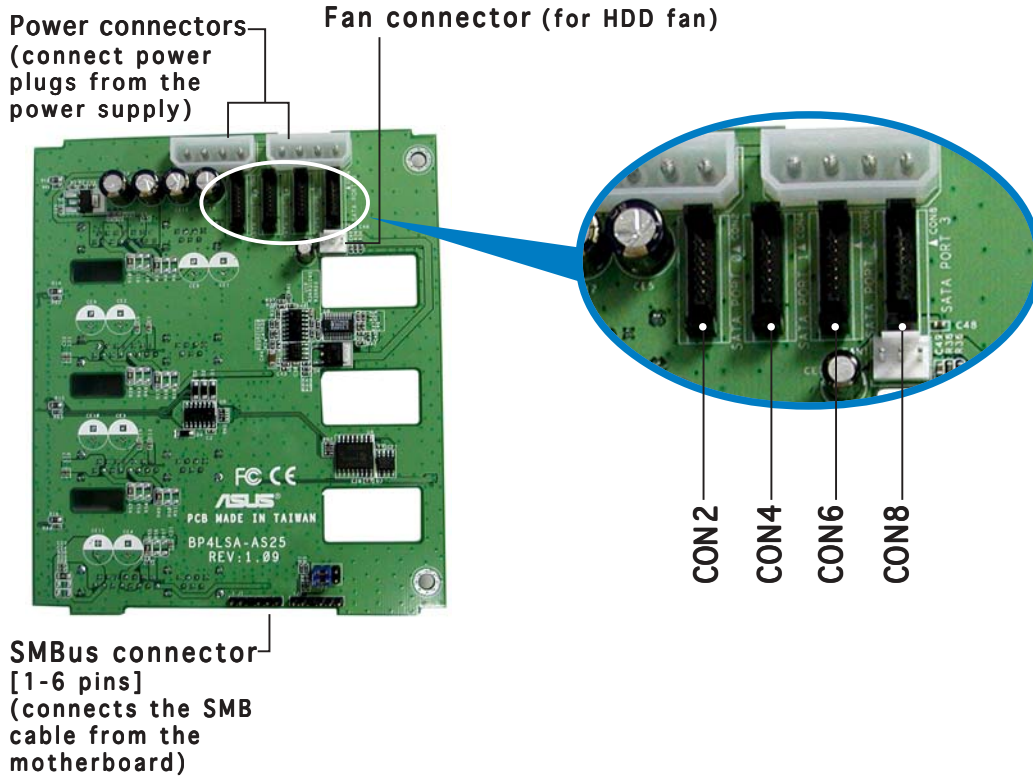
Each SATA connector is labeled (CON1, CON3, CON5, CON7) so you can easily determine their counterpart connectors at the back side of the backplane. Refer to the table for reference.



HDD Device	Front side connector	Back side connector
HDD 1	CON1	CON2
HDD 2	CON3	CON4
HDD 3	CON5	CON6
HDD 4	CON7	CON8

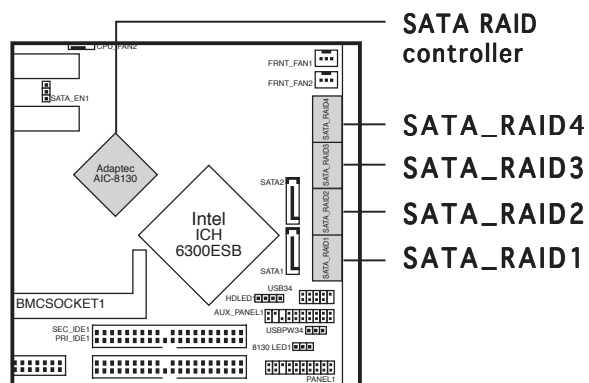
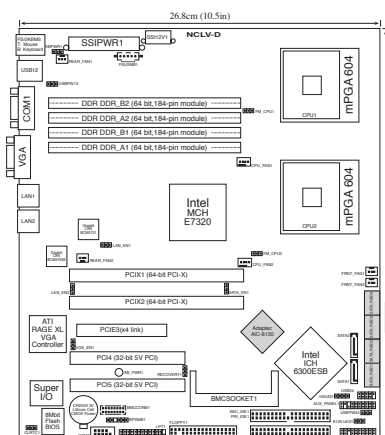
Back side

The back side of SATA backplane faces the rear panel when installed. This side includes the power connectors, SATA interfaces for the SATA RAID card, an HDD fan connector, and SMBus connectors.



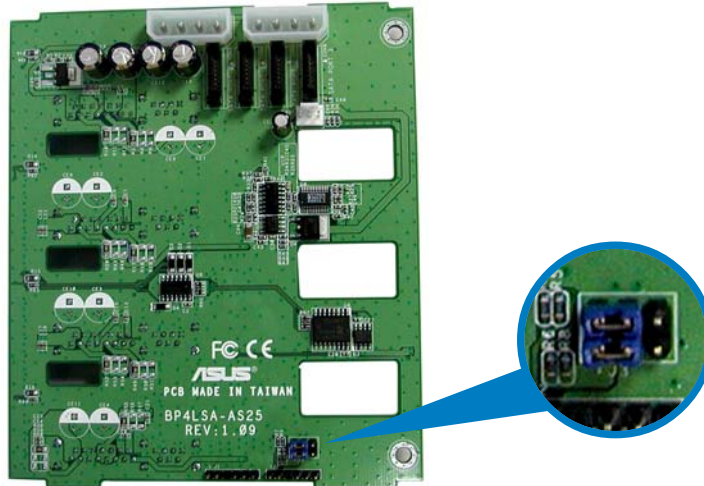
The back side SATA connectors are attached to the motherboard SATA connectors via the supplied SATA cables. Refer to the illustration below for the location of the SATA connectors. Refer to the table on the right for the default SATA cable connections.

Backplane ID	Connected to (on motherboard)	Controlled by
CON2	SATA_RAID1	Adaptec AIC-8130
CON4	SATA_RAID2	Adaptec AIC-8130
CON6	SATA_RAID3	Adaptec AIC-8130
CON8	SATA_RAID4	Adaptec AIC-8130



SATA backplane jumper settings and HDD ID assignments

The 6-pin jumper **J3** allows you to define your desired SATA configuration. The picture below shows the location of jumper J3 with pins 1-3 and 2-4 shorted.



Refer to the table for the jumper settings and the appropriate ID# for each SATA HDD bay.

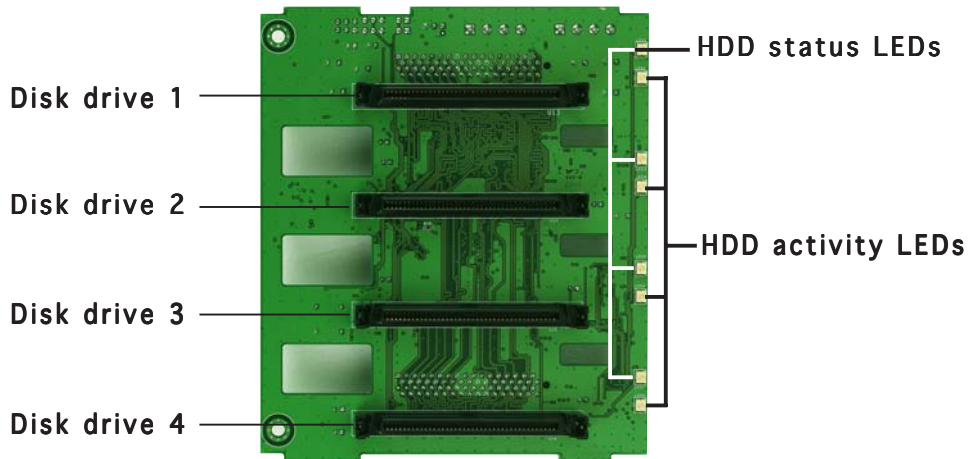
J3 setting (1-3 shorted, 2-4 shorted)		
Device	SATA ID #	
Drive Bay 1	ID0	
Drive Bay 2	ID1	
Drive Bay 3	ID2	
Drive Bay 4	ID3	

2.9.3 SCSI backplane connections (in AS8 and AS4 models only)

Two SCSI backplanes come pre-installed in the AP1710-E1 AS8 model. One SCSI backplane comes pre-installed in the AS4 model. The SCSI backplane has four 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 LEDs on the backplane connect to the front panel LEDs to indicate HDD access, HDD failure, thermal failure, or fan failure. See section “1.6 LED information.”

Front side

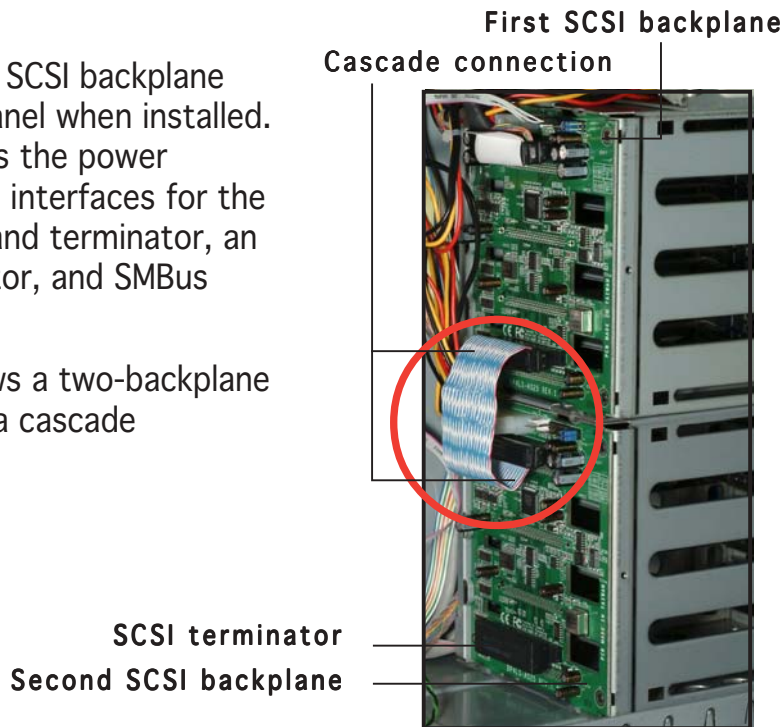
The front side of the SCSI backplane faces the front panel when installed. This side includes four SCSI connectors for the hot swap drive trays.



Back side

The back side of SCSI backplane faces the rear panel when installed. This side includes the power connectors, SCSI interfaces for the SCSI/RAID card and terminator, an HDD fan connector, and SMBus connectors.

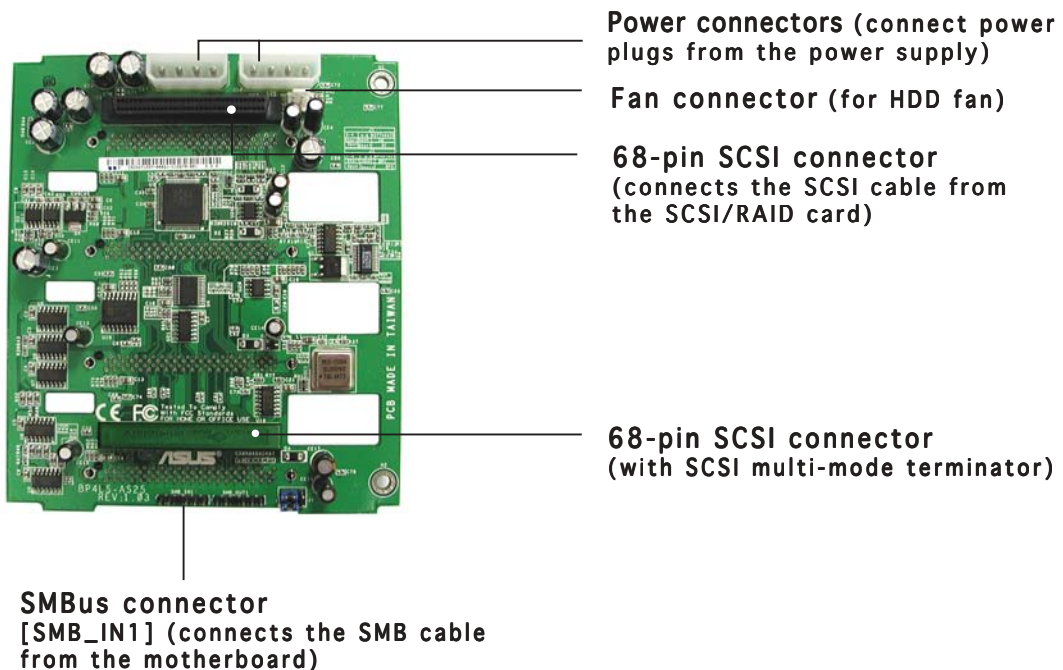
The picture shows a two-backplane configuration in a cascade connection.



One-backplane configuration

In a **one-backplane** configuration:

- the upper SCSI interface of the backplane connects to the SCSI/RAID card
- a SCSI multi-mode terminator (LVD/SE) is connected to the lower SCSI interface of the backplane

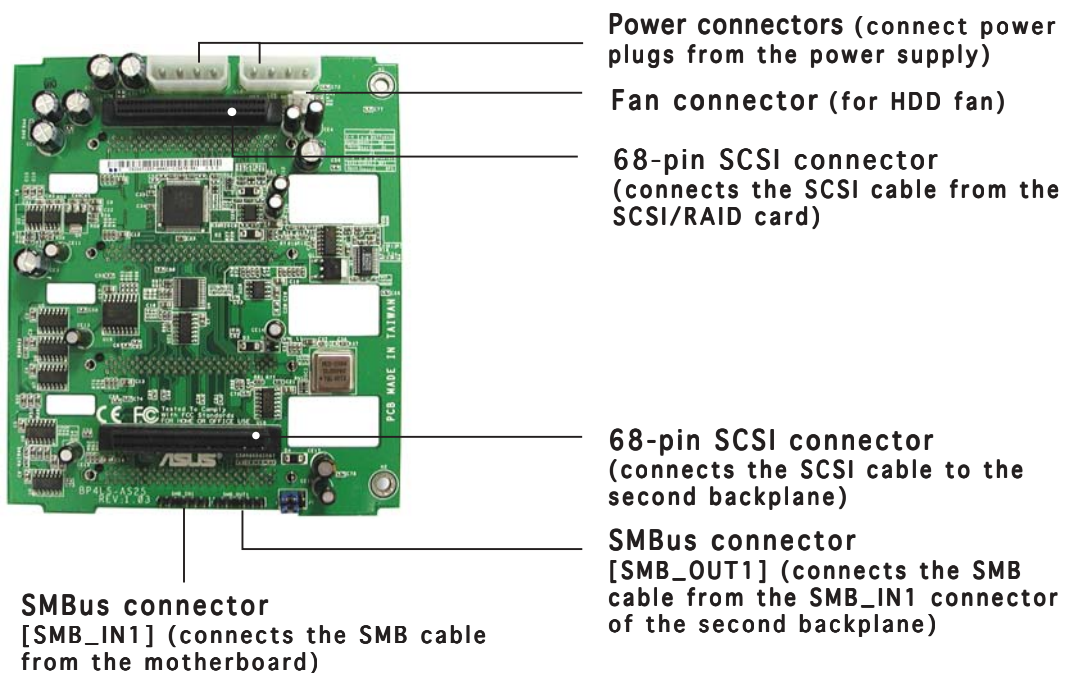


Two-backplane configuration

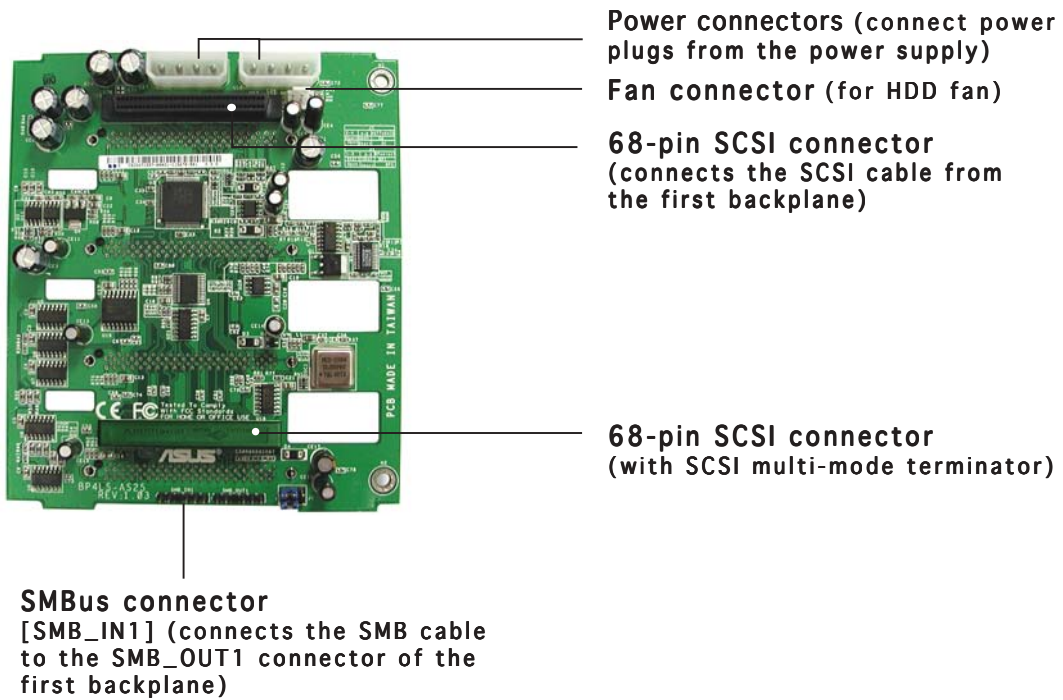
In a **two-backplane** configuration:

- the upper SCSI interface of the first backplane connects to the SCSI card
- the lower SCSI interface connects to the upper SCSI interface of the second backplane
- a SCSI multi-mode terminator (LVD/SE) is placed on the lower SCSI interface of the second backplane

First backplane



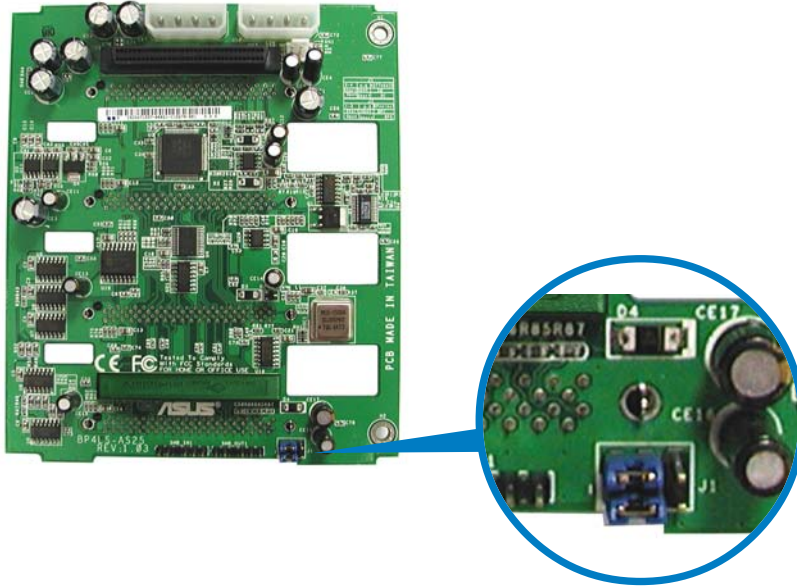
Second backplane



SCSI backplane jumper settings and HDD ID assignments



The 6-pin jumper **J1** on each of the SCSI backplanes allows you to define your desired SCSI configuration.

The picture below shows the location of jumper J1 with pins 1-3 and 2-4 shorted.





Refer to the following tables for the jumper settings and the appropriate ID# for each SCSI HDD bay.

Setting 1: Using single-channel SCSI/RAID card

Cascade configuration	
First backplane (BP1) J1 setting (1-3 shorted, 2-4 shorted) 	
Device	SCSI ID#
Drive Bay 1	ID0
Drive Bay 2	ID1
Drive Bay 3	ID2
Drive Bay 4	ID3
GEM SAF-TE	ID15
Second backplane (BP2) J1 setting (3-5 shorted, 4-6 shorted) 	
Device	SCSI ID#
Drive Bay 5	ID4
Drive Bay 6	ID5
Drive Bay 7	ID6
Drive Bay 8	ID8
GEM SAF-TE	ID11

Setting 2: Using dual-channel SCSI/RAID card
(two separate cables connected to each BP)

Non-Cascade configuration	
First backplane (BP1) J1 setting (1-3 shorted, 2-4 shorted) 	
Device	SCSI ID#
Drive Bay 1	ID0
Drive Bay 2	ID1
Drive Bay 3	ID2
Drive Bay 4	ID3
GEM SAF-TE	ID15 (SCSI channel-0)
Second backplane (BP2) J1 setting (1-3 shorted, 2-4 shorted) 	
Device	SCSI ID#
Drive Bay 5	ID0
Drive Bay 6	ID1
Drive Bay 7	ID2
Drive Bay 8	ID3
GEM SAF-TE	ID15 (SCSI channel-1)



In a non-cascade configuration, you must install a SCSI multi-mode terminator on both backplanes.

2.10 Removable components

You may need to remove previously installed system components when installing or removing system devices, or when you need to replace defective components. This section tells how to remove the following components:

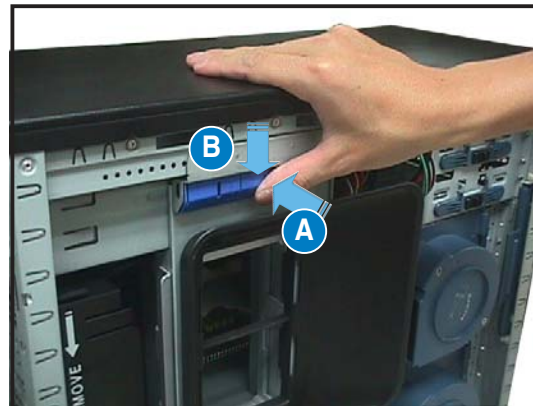
1. Air duct
2. Chassis fan
3. HDD blowers
4. SATA/SCSI backplanes
5. Floppy disk drive module
6. Front I/O board
7. Chassis footpads and roller wheels
8. Power supply

2.10.1 Air duct

The barebone server system features an air duct that provides cool air from the outside through the chassis side cover vent for the system to maintain optimum thermal performance. The HDD blowers circulate cool air within the system.

To uninstall the air duct:

1. Press, then slide down the blue tab in the middle of the top lock.
2. Simultaneously push up the side locks at the lower part of the air duct.
3. Carefully pull out the air duct out of the chassis, and set it aside.



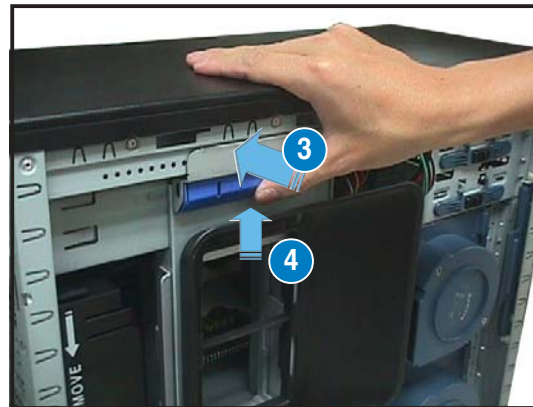
To reinstall the air duct:

1. Slide in the air duct into the chassis.
2. Align the air duct vent holes to the CPU fans in the system, making sure that there are no obstructing cables.



Air duct vent holes

3. Firmly press the top lock onto the metal railing.
4. Press, then slide up the blue tab in the middle of the top lock.



5. Align the lower part of the air duct to the metal railing.
6. Push firmly until the lock tab snaps into one of the holes of the metal railing.



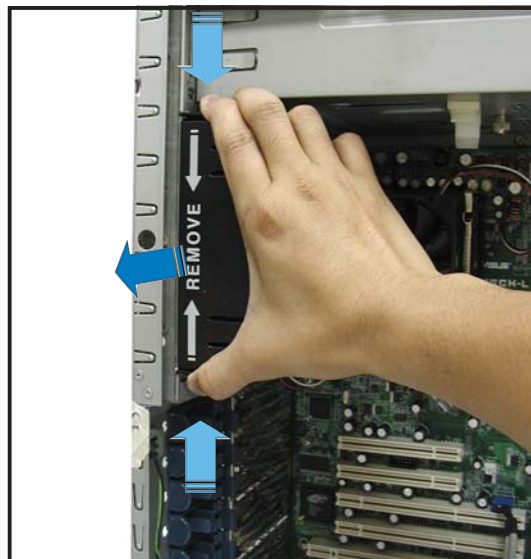
7. Simultaneously push down the side locks to secure the air duct from the chassis.



2.10.2 Chassis fan

To remove the chassis fan:

1. Disconnect the 3-pin fan cable from the connector REAR_FAN1 on the motherboard.
2. Press the tabs on the outer corners of the system fan, then pull the fan out of the chassis.
3. Lift the chassis fan case lock hooks, then push the fan from the center of the case until it is detached.



4. Pull the fan out from the fan case, then set aside.

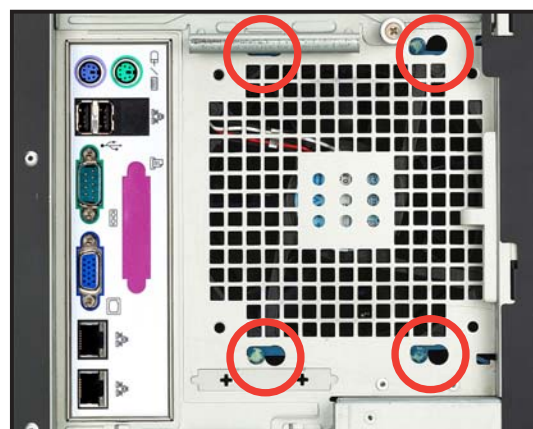


To reinstall the chassis fan:

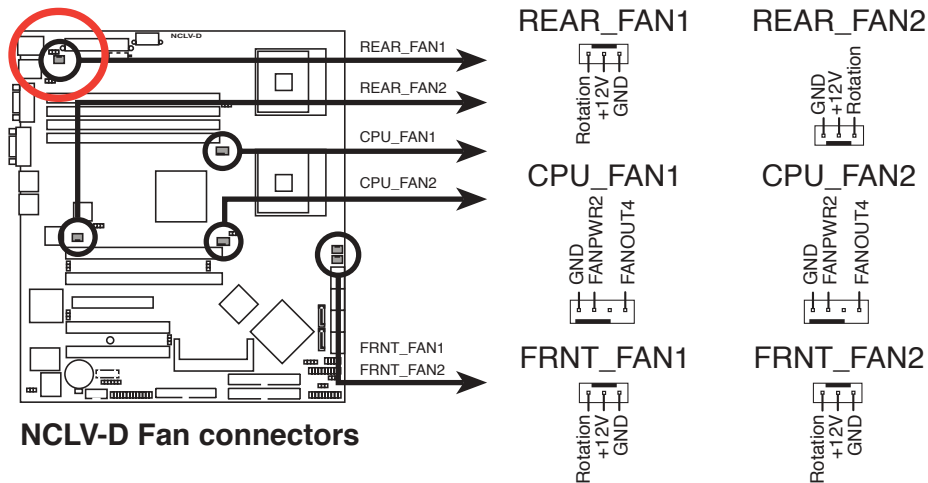
1. Insert the new fan to the chassis fan cage.



2. Firmly hold the chassis fan on the side with the tabs and position it into its slot, making sure that the four hooks underneath the fan match the corresponding holes on the rear panel.



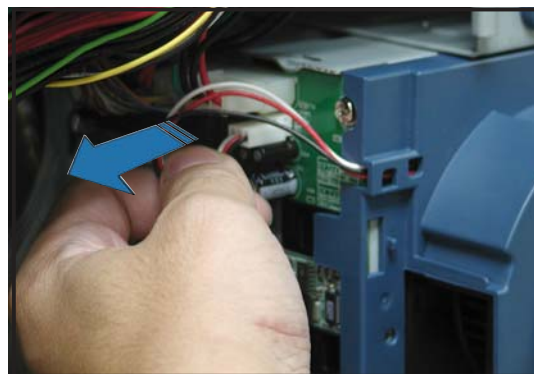
3. Push the fan into the chassis until the four hooks lock securely into the holes on the rear panel.
4. Reconnect the 3-pin fan cable from the connector REAR_FAN1 on the motherboard.



2.10.3 HDD blower

To remove the HDD blower:

1. Lay down the system on its side, on a flat and stable surface.
2. Remove the side cover. Refer to section “2.1.1 Removing the side cover” for instructions.
3. Disconnect the 3-pin fan cable from the fan connector on the backplane.



4. Loosen the thumb screw that secures the HDD blower case to the chassis.



5. Firmly grip the blower case as shown, then slide it out of the chassis in the direction of the arrow.



6. Remove the two screws on the blower case using a Phillips screwdriver. Set the screws aside.

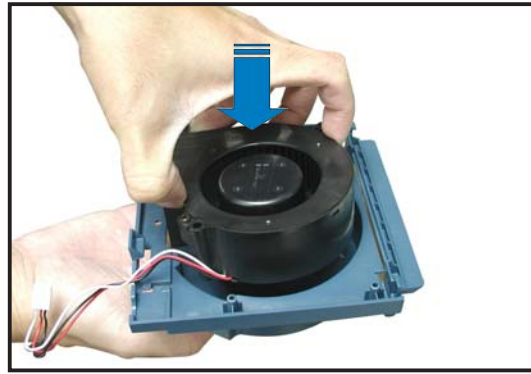


7. Remove the blower from the case.



To reinstall the HDD blower:

1. Replace the blower into the case.



2. Secure the blower to the case with the two screws you removed earlier.



3. Slide in the blower case as shown, making sure the side tabs fit into the holes on the HDD cage.

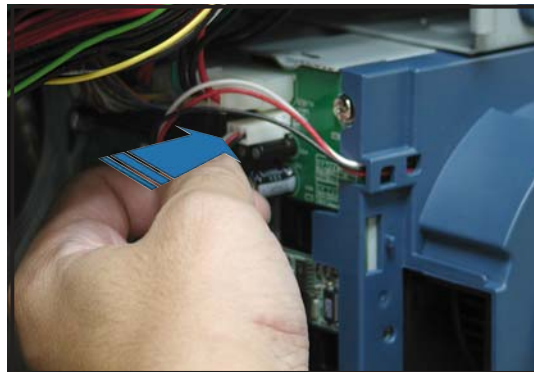


Side tab in HDD cage hole

4. Secure the blower case with the thumb screw.



5. Reconnect the 3-pin fan cable to the fan connector on the backplane.



2.10.4 SATA/SCSI backplane

To remove the SATA/SCSI backplane:

1. Remove the HDD blower case. Refer to section “2.10.2 HDD blowers” for instructions.
2. Disconnect all cables from the SATA/SCSI backplane.



When disconnecting a cable, hold and firmly pull the cable plug. DO NOT pull the cable itself. Doing so may damage the cable!

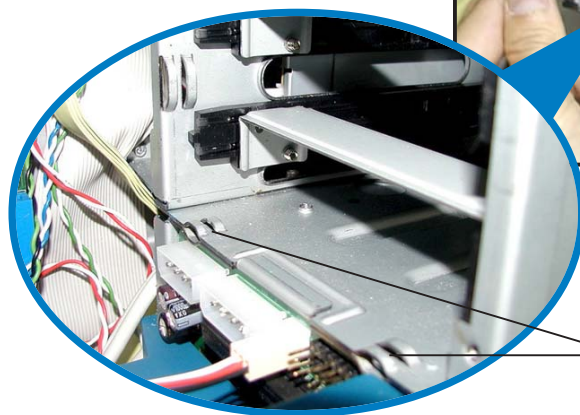
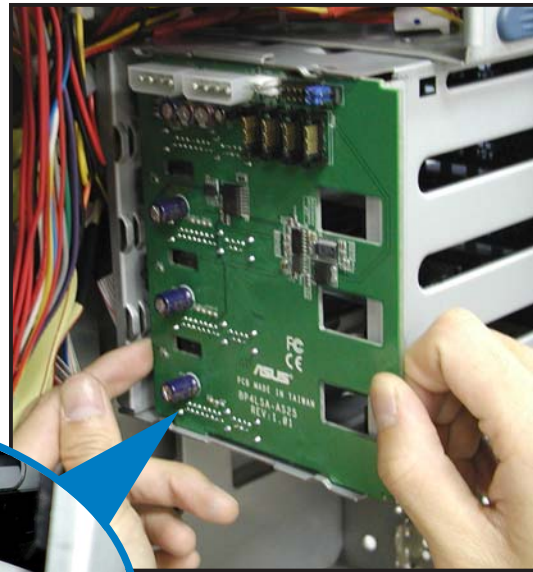


3. From the inner edge, push the backplane outward so that the outer edge protrudes slightly from the slot.
4. From the outer edge, firmly hold the backplane and carefully slide it out.



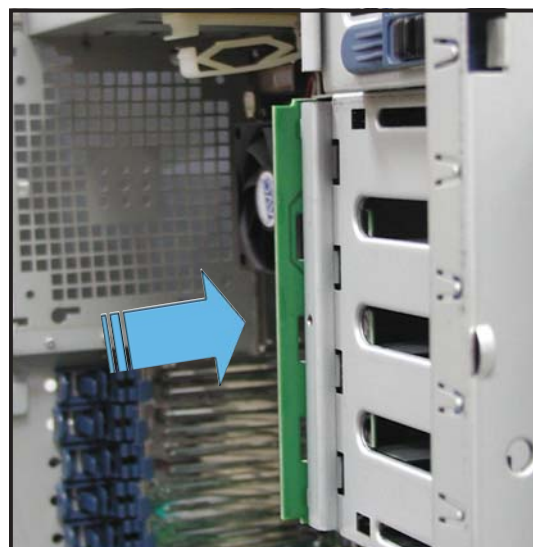
To reinstall a SATA/SCSI backplane:

1. Position the backplane into its slot with the component side facing the rear panel, and the power connectors on top.
2. Align the backplane with the rail-like dents on the slot to ensure that it fits securely.



Rail-like dents

3. Slide the backplane into the slot until it fits. If correctly installed, the outer edge of the backplane aligns with the corner of the drive cage.
4. Connect the appropriate cables to the backplane. Refer to sections “2.9.2 SATA backplane connections” and “2.9.3 SCSI backplane connections” for details.



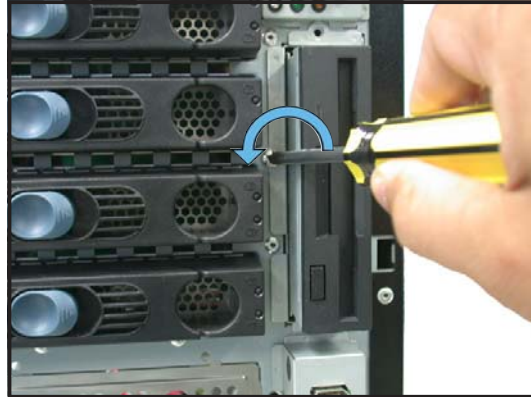
2.10.5 Floppy disk drive



You need to remove the front panel assembly before you can remove the floppy disk drive. Refer to section “2.5.1 Removing the front panel assembly” for instructions.

To remove the floppy disk drive:

1. Remove the screw that secures the drive to the chassis.



2. Carefully pull out the drive from the chassis until you see the cables connected to the drive.

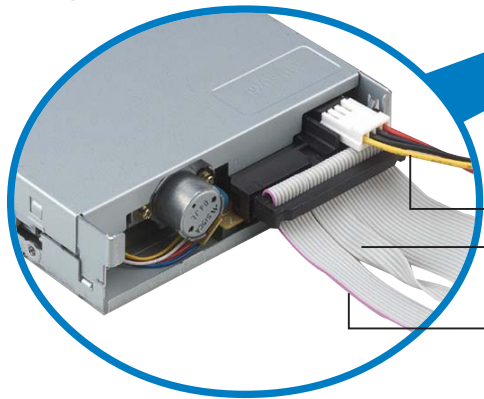


3. Disconnect the floppy disk cable and power cable from the drive to completely release the drive.



To install a floppy disk drive:

1. Position the floppy drive vertically with the eject button on the left side (close to the HDDs).
2. Connect the drive signal cable and power cable.



Floppy drive power cable

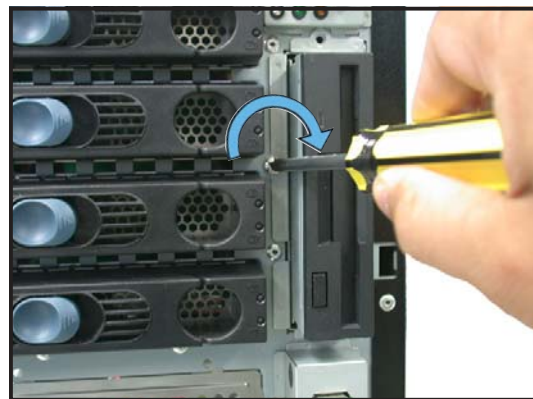
Floppy drive signal cable

Red stripe to match Pin 1 on the connector

3. Carefully push the drive into the bay until the drive cage fits the front edge of the bay.



4. Secure the drive cage with a screw.



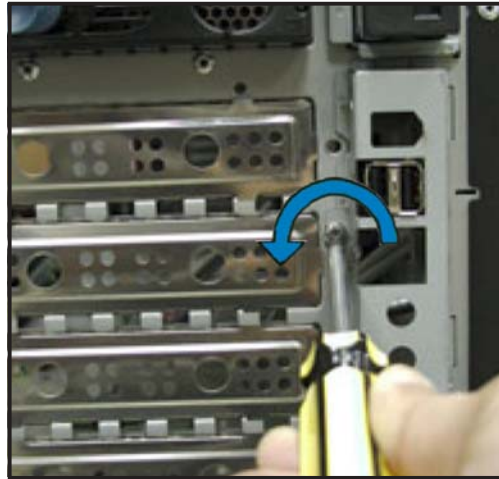
2.10.6 Front I/O board



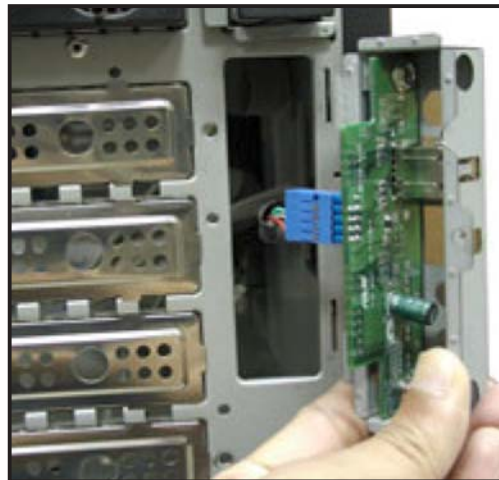
You need to remove the front panel assembly before you can remove the front I/O board. Refer to section “2.5.1 Removing the front panel assembly” for instructions.

To remove the front I/O board:

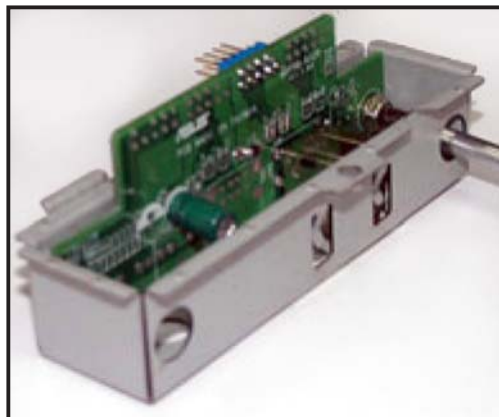
1. Remove the screw that secures the front I/O board bracket to the front panel.



2. Carefully pull out the bracket until you see the cables connected to the I/O board.
3. Disconnect all the cables from the I/O board.

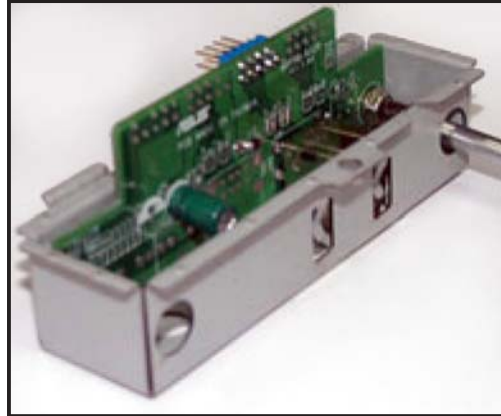


4. Remove the screw that secures the I/O board to the bracket.

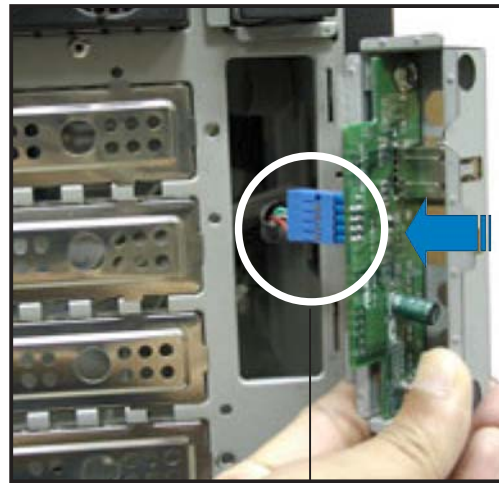


To install the front I/O board:

1. Place the I/O board in the bracket, component side up. Secure the front I/O board to the bracket with a screw.

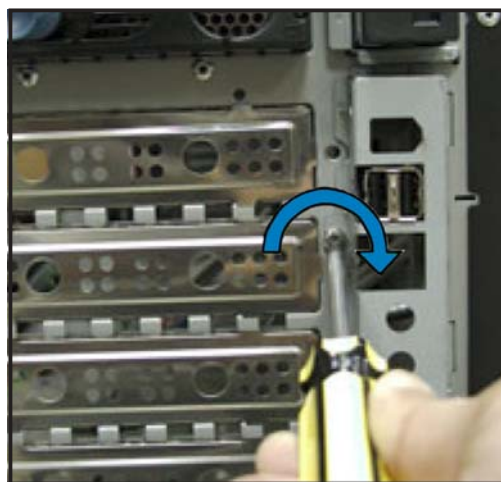


2. Position the I/O board into the bay with the component side to the left (close to the HDDs). Connect the I/O cables to the connectors on the back of the I/O board.



USB 2.0 connector

3. Insert the I/O board into the bay until the bracket fits the front edge of the bay.
4. Secure the I/O board bracket with a screw.



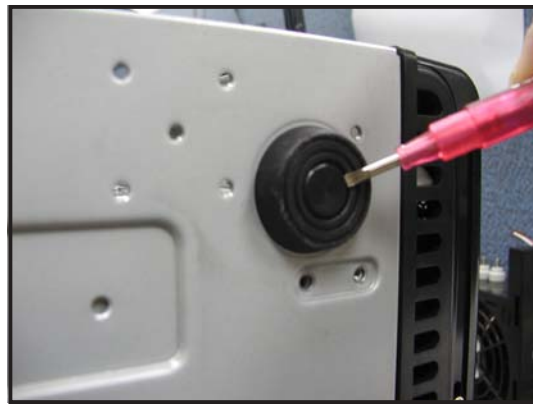
2.10.7 Chassis footpads and roller wheels

The barebone server system is shipped with four footpads attached to the bottom of the chassis for stability. You need to remove these footpads if:

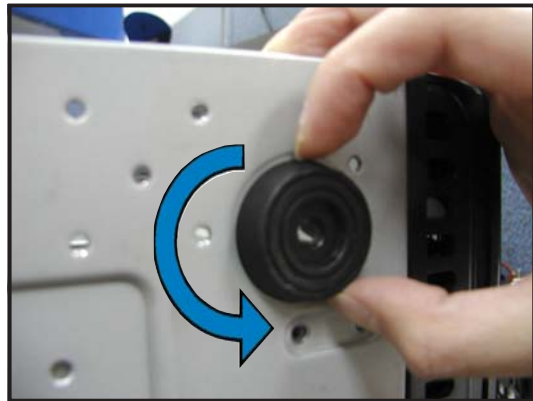
- if you want to replace the footpads with the bundled roller wheels
- you wish to install the system to a rack
(Refer to “Chapter 3 Installation options” of this user guide, and to the “Rackmount Kit” user guide for instructions)

To remove the footpads:

1. Lay the system chassis on its side.
2. Use a flat screwdriver to flip out the top layer of a footpad.



3. Remove the footpad by rotating it counterclockwise.

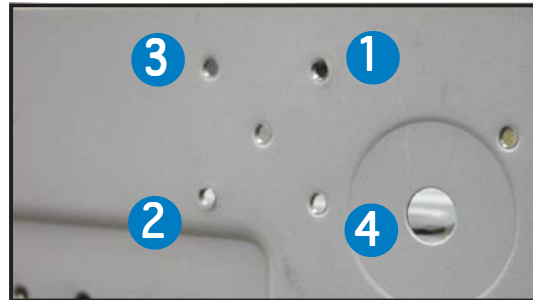


4. Repeat steps 2 and 3 to remove the other three footpads.

For convenient transport, install the roller wheels the came with the system package. Each wheel has a brake lock to stabilize the chassis in place.

To install the chassis wheels:

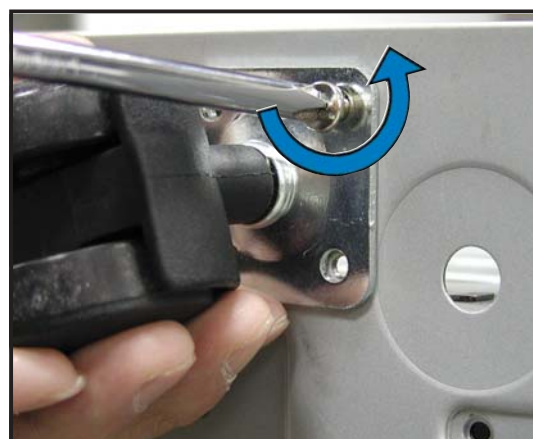
1. Lay the chassis in its side.
2. Locate the designated screw holes for each of the four wheel sets. Take note of the numbers alongside each hole when placing screws.
3. Secure each wheel to the bottom of the chassis using four screws.
4. Repeat steps 2 and 3 to install the other three wheels.



Remove the chassis roller wheels if you wish to mount the system to a rack.

To remove the chassis wheels:

1. Lay the system chassis on its side.
2. Use a Phillips screwdriver to remove the screws that secure the wheels to the bottom of the chassis.
3. Repeat step 2 to remove the other three roller wheels.



2.10.8 Power supply modules

The user can choose from any of these three power supply configurations:



600 W single power supply
(110 V/220 V autoswitch)



2 x 300 W dual power supply
(110 V/220 V autoswitch)



3 x 300 W redundant power supply
(110 V/220 V autoswitch)



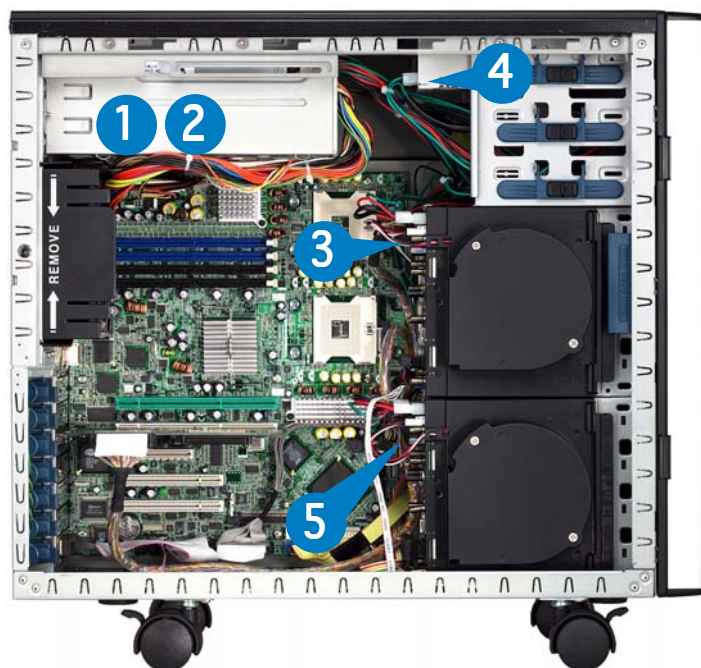
- If you are using a 600 W (2 x 300 W) dual power supply, make sure to plug the two power cords.
- If you are using a 600 W (3 x 300 W) redundant power supply, make sure to plug the three power cords.

Refer to this section when removing or installing power supply modules to the barebone system.



You **MUST** disconnect all power cable plugs from the motherboard and other installed devices before removing the power supply modules.

The picture below shows the motherboard and device connectors where the power plugs are connected. Refer to the Appendix at the end of this document for the power supply specifications.



1. 24-pin ATX (motherboard power connector; *hidden behind PSU*)
2. 8-pin +12V (motherboard power connector; *hidden behind PSU*)
3. 2 x 4-pin plugs (SCSI/SATA backplane)
4. 4-pin plug (floppy disk drive; *hidden*)
5. 2 x 4-pin plugs (second SCSI backplane, if available)



Make sure to unplug **ALL** power cables from the system devices before removing the power supply module.

To remove the 600 W single power supply module:

1. Loosen the thumbscrew that secures the power supply metal plate. Do not remove the thumb screw from the metal plate.



Thumbscrew

2. Hold the metal plate bar and push it downward to release the plate from the chassis. Remove the metal plate completely.



Metal plate bar

3. Use one hand to push the power supply module from inside the power supply cage, then carefully pull out the module from the chassis.



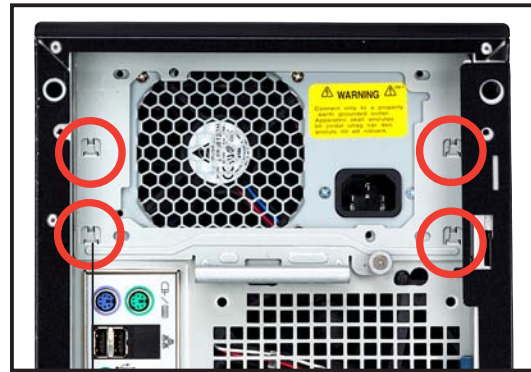
To install a 600 W single power supply module:

1. Firmly hold the power supply module and insert it into the power supply cage.
2. Push the power supply all the way in until its outer end aligns with the rear panel.



Be careful with the power supply cables when inserting the power supply module into the cage. Due to space constraints, the cables may get entangled with the installed components or other cables, causing the cables to break!

3. Place the metal plate flat on the outer end of the power supply module, flushed to the top of the chassis, while matching the four hooks with their corresponding holes on the rear panel.



Hook matched to a hole

4. Hold the metal plate bar and push it upward to lock the hooks to their holes. At the same time, you may also push the top of the metal plate to fit it completely.
5. Secure the metal plate with the thumb screw.

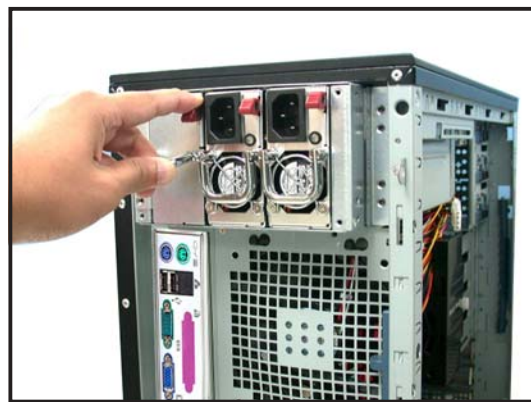


To remove a 600 W dual or redundant power supply:

1. Loosen four screws on the metal brackets that secure the power supply to the chassis.



2. Use one hand to push the power supply module from inside the power supply cage, then carefully pull out the power supply module from the chassis.
3. Set the power supply aside.



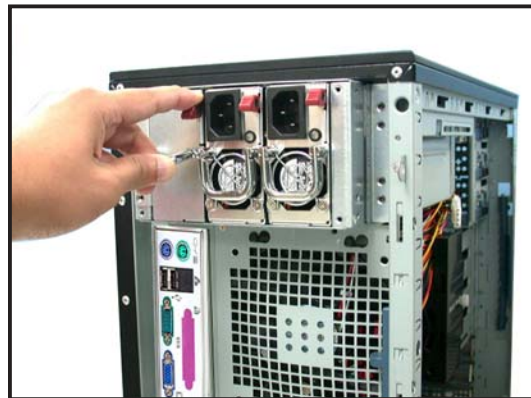
To install a 600 W dual or redundant power supply:

1. Insert the power supply cables and plugs to the power supply cage.

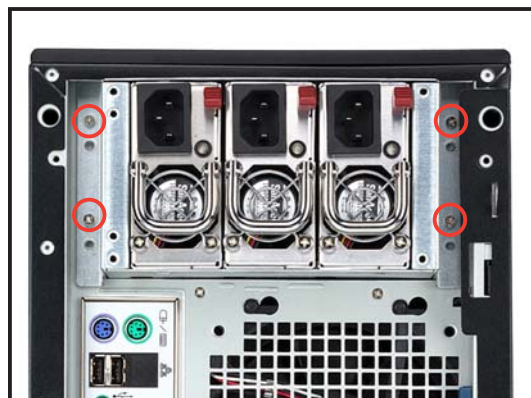


Be careful with the power supply cables when inserting the power supply module into the cage. Due to space constraints, the cables may get entangled with the installed components or other cables, causing the cables to break!

2. Use a power supply module handle to push the power supply until it fits in place.



3. Secure the power supply to the chassis with two screws on the metal brackets on each side.



Chapter 3

This chapter describes how to install optional components into the barebone server.



ASUS AP1710-E1

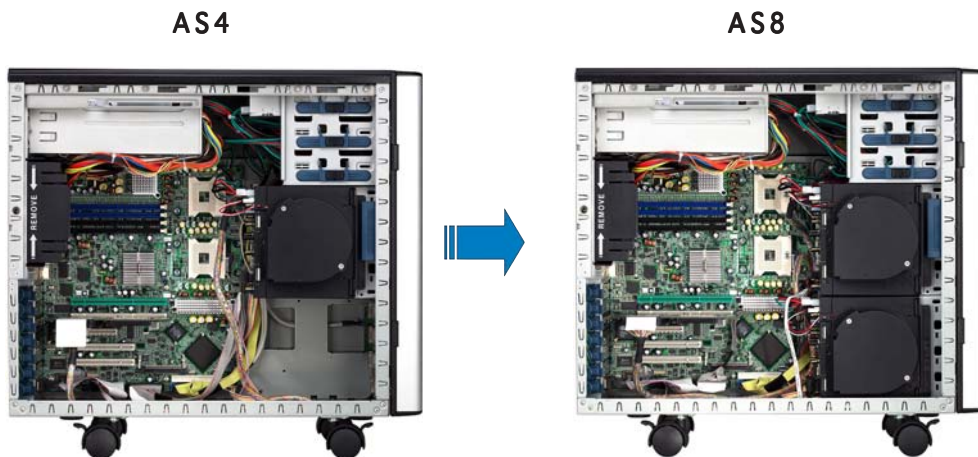
Installation options



The items required for the optional configurations described in this chapter are not included in the standard barebone system package. These items are purchased separately.

3.1 Installing a second SCSI drive cage

Perform this installation if you wish to upgrade your 4-SCSI configuration system (AS4 model) to an 8-SCSI configuration (AS8).



Clear the space under the first SCSI drive cage. Make sure that you disconnect all pre-connected cables so they do not get in the way when you install the second drive cage.

To install a second SCSI drive cage:

1. Position the drive cage in the same orientation as the first drive cage. Note that the lock tab on top of the cage faces the rear panel.

Cage lock tab

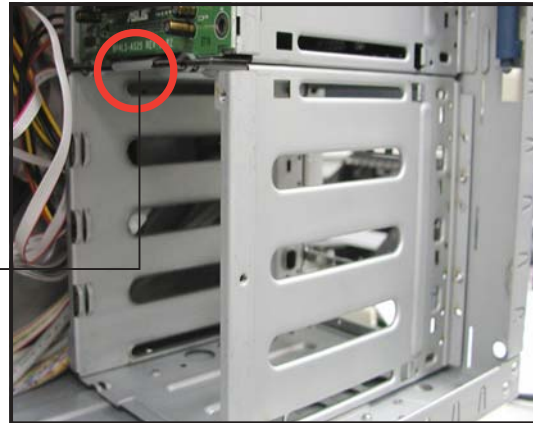


2. Carefully slide the drive cage toward the front panel until it fits in place.

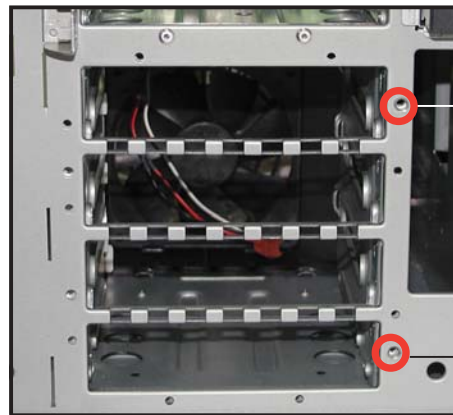


3. Make sure that the cage lock tab snaps to the bottom of the first drive cage. When properly installed, the cage should align with the first drive cage.

Cage lock tab snapped securely to the bottom of the first drive cage

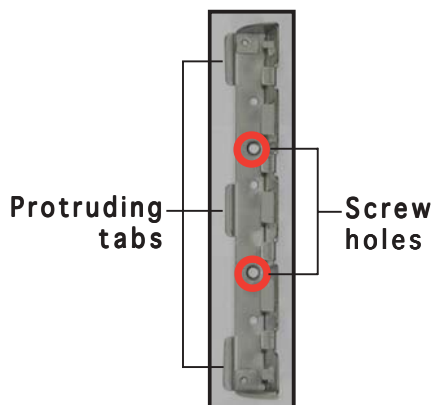


4. From the front side, secure the right side of the cage with two screws.

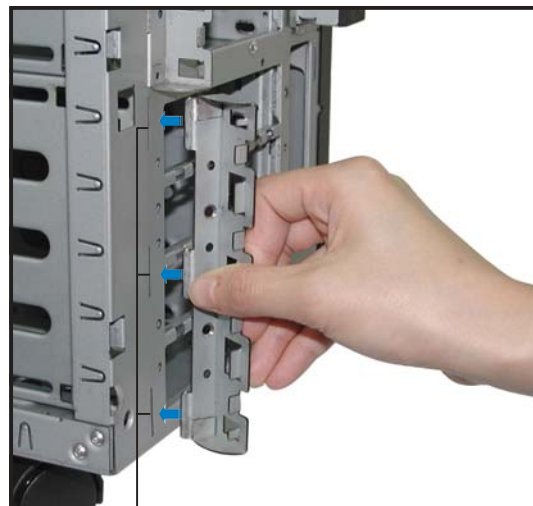


Front screw holes

5. Position the support bracket for the drive trays to the left side of the cage with the three protruding tabs matching the elongated holes on the chassis.

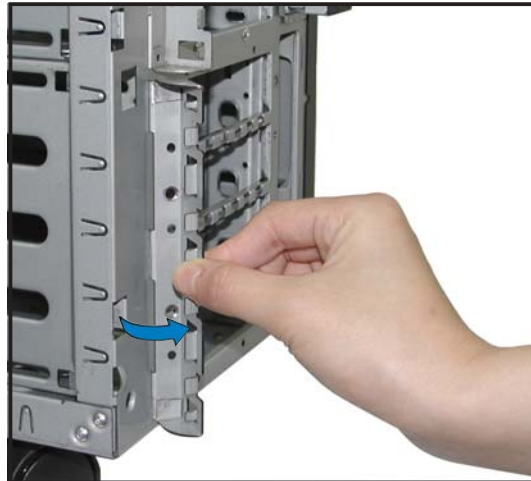


SCSI drive tray support bracket

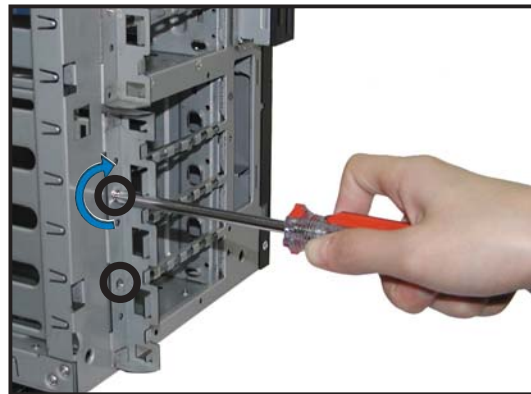


Elongated holes for bracket

6. Insert the tabs into the holes. You may need to swing the bracket a bit from left to right and back to fully insert the tabs.
7. When the tabs are fully inserted in the holes, swing the bracket to the right until one side is flat to the chassis.



8. Secure the bracket with two screws in the holes indicated.



Securing the bracket with the two screws also secures the left side of the SCSI drive cage.

3.2 Installing an IDE drive cage

Perform this installation if you wish to upgrade your 4-SCSI configuration system (AS4) to a combination of 4-SCSI/4-IDE configuration.

4-SCSI configuration



4-SCI/4-IDE configuration



Clear the space under the first SCSI drive cage. Make sure that you disconnect all pre-connected cables so they do not get in the way when you install the second drive cage.

To install an IDE drive cage:

1. Position the drive cage into the bay with the screw hole tab on top and facing out.



2. Carefully slide the drive cage toward the front panel until it fits in place.



3. Make sure that the drive cage fits snugly to the bay as shown. The drive cage is properly installed when it is parallel to the front panel, and the screw hole matches the hole of the first drive cage.



4. Secure the drive cage with a screw.



3.3 Upgrading to a dual or redundant power supply

Perform this installation if you wish to upgrade your barebone server system from 600 W single power supply to 600 W dual or redundant power supply.

1. Remove the single power supply following the instructions in the section “2.10 Removable components.”
2. Lay the system on its side on a flat surface, then remove the metal stopper screw under the power supply cage.
Keep the screw for later use.



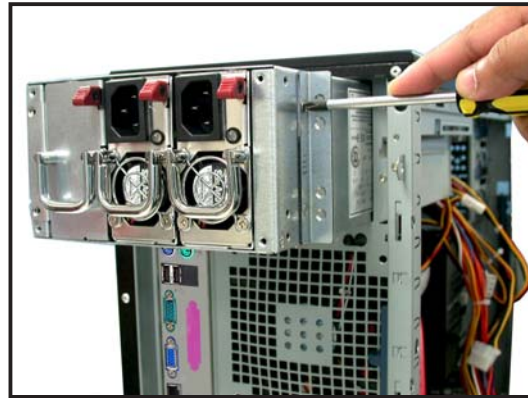
3. Locate and remove the metal stopper from inside the power supply cage.
Keep the metal stopper for later use.



4. Insert the power supply cables and plugs to the power supply cage.



5. Push the power supply halfway to the power supply cage, then attached the a metal bracket on each side of the power supply with two screws.



6. Push the power supply to the power supply cage. Make sure that the metal brackets and the chassis screw holes



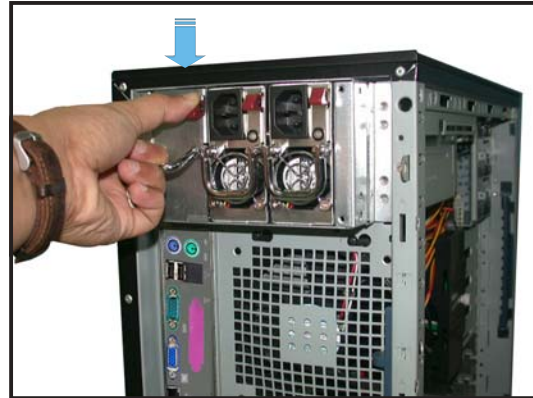
7. Secure the power supply to the chassis with two screws on each metal bracket.



3.4 Installing a power supply module

Perform this installation if you wish to upgrade your barebone server system from 600 W dual to 600 W redundant power supply.

1. Press down the rubber lever of the dummy module to unlock.



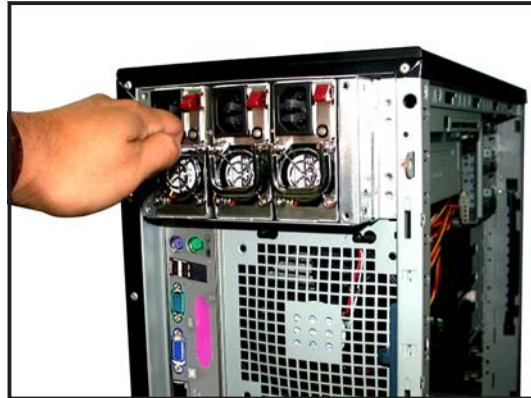
2. Use the module handle to pull the dummy module out from the power supply case.



3. Insert the power supply module to the empty bay with the power connector on top.



4. Push the power supply module inside the bay until it is aligned with the other power supply modules.



The picture shows the power supply module when installed.



3.5 Mounting the system to a rack

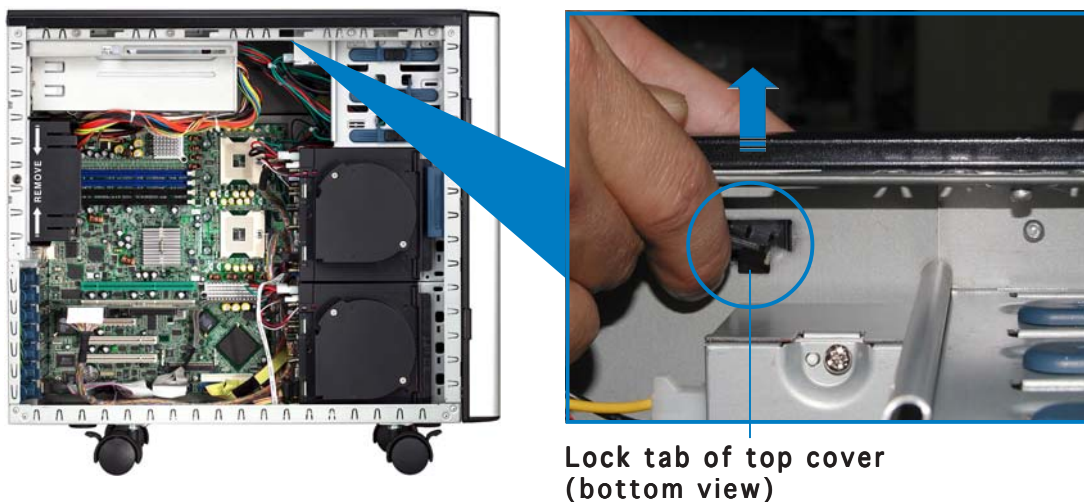
3.5.1 Removing the footpads or roller wheels

Refer to section “2.10.7 Chassis roller wheels and footpads” for instructions on removing the footpads or roller wheels.

3.5.2 Removing the top cover

To remove the top cover:

1. Remove the side cover. Refer to section “2.1.1 Removing the side cover” for instructions.
2. Remove the front panel assembly. Refer to section “2.5.1 Removing the front panel assembly” for instructions.
3. Locate the lock tab underneath the top cover and press it outward to release the cover.
4. Slide the top cover toward the front panel, then lift it up from the chassis.



3.5.3 Attaching the rack rails

Refer to the installation guide that came with the Rackmount Rail Kit for instructions on how to attach the rails and on the barebone server system and the corresponding rails on the industrial rack.

Chapter 4

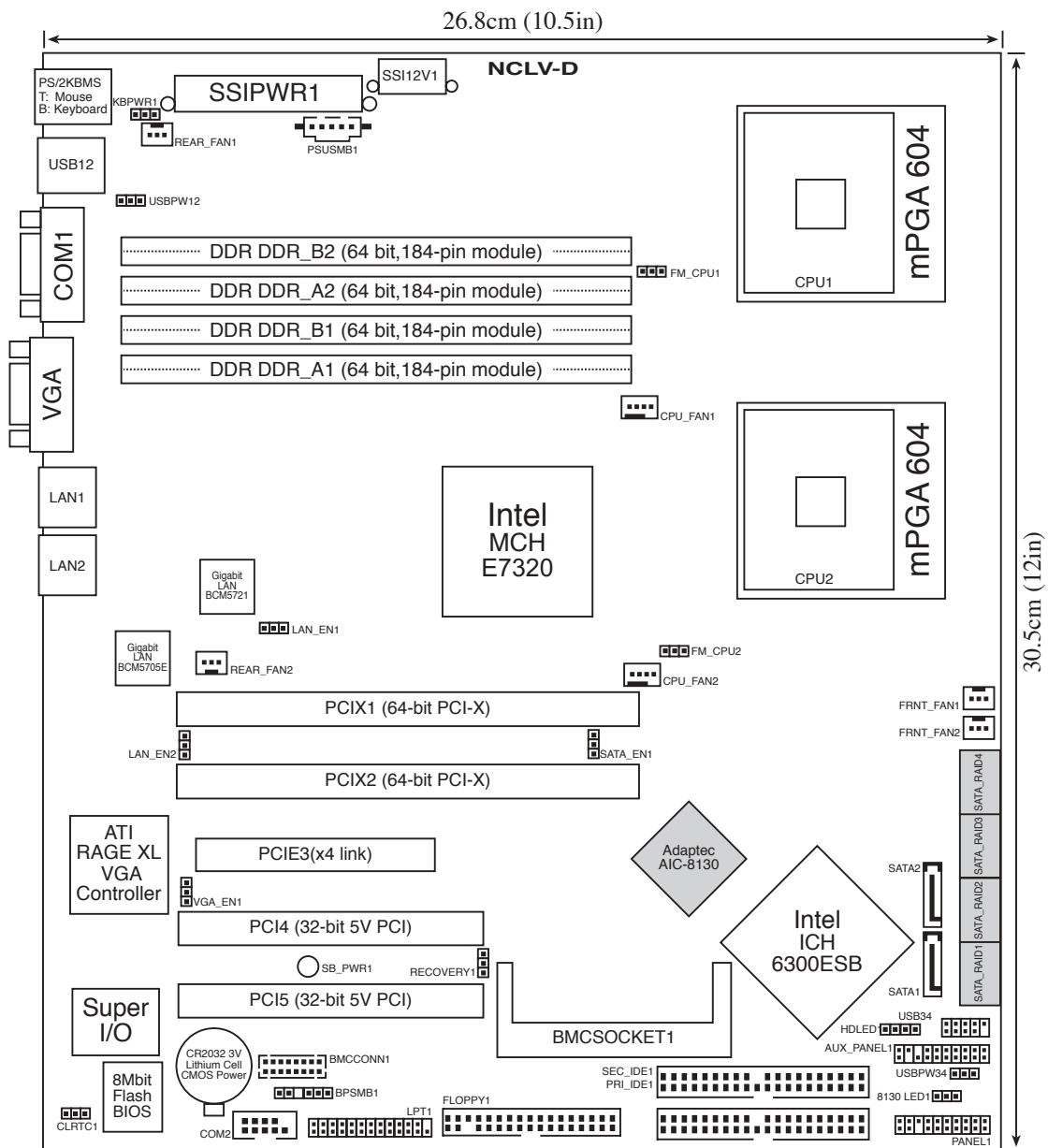
This chapter gives information about the motherboard that comes with the server. This chapter includes the motherboard layout, jumper settings, and connector locations.



ASUS AP1710-E1

Motherboard info

4.1 Motherboard layout



The Adaptec AIC-8130 RAID controller and RAID Serial ATA features are optional. These components are grayed out in the above motherboard layout.

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Internal connectors	Page
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5. Hard disk activity LED connector (2-pin HDLED1)	4-13
6. CPU, Chassis, and Power Fan connectors (3-pin CPU_FAN1/2, REAR_FAN1/2, FRNT_FAN1/2)	4-14
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- System warning speaker (Orange 4-pin SPEAKER)	4-20
- ATX power button/soft-off button (Yellow 2-pin PWRSW)	4-20
- Reset button (Blue 2-pin RESET)	4-20

4.2 Jumpers

1. Clear RTC RAM (CLRTC1)

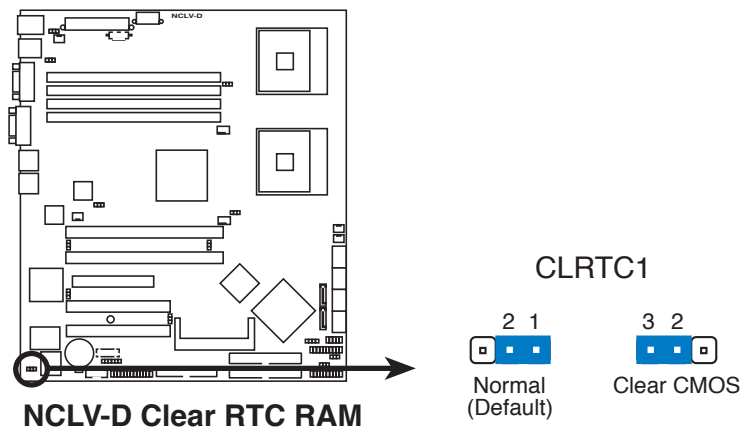
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Reinstall the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the key during the boot process and enter BIOS setup to re-enter data.



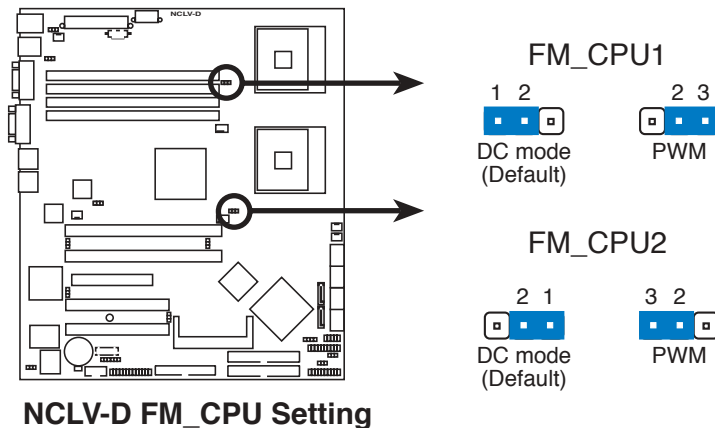
Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

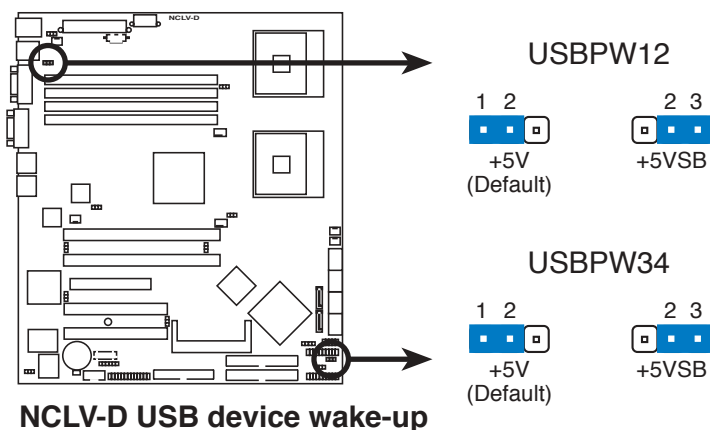
2. CPU fan pin selection (3-pin FM_CPU1, FM_CPU2)

These jumpers allow you to connect either a 3-pin or a 4-pin fan cable plug to the CPU fan connectors (CPU_FAN1, CPU_FAN2). Set these jumpers to pins 1-2 if you are using a 3-pin fan cable plug, or to pins 2-3 if you are using a 4-pin plug.



3. USB device wake-up (3-pin USBPW12, USBPW34)

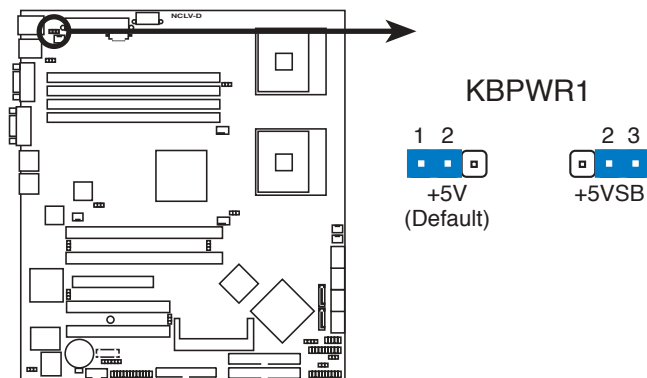
Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).



- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system would not power up.
- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

4. Keyboard power (3-pin KBPWR1)

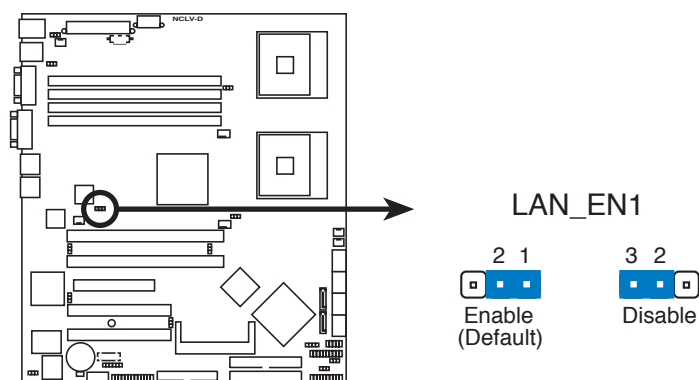
This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) to wake up the computer when you press a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS.



NCLV-D Keyboard power setting

5. Gigabit LAN controller setting (3-pin LAN_EN1)

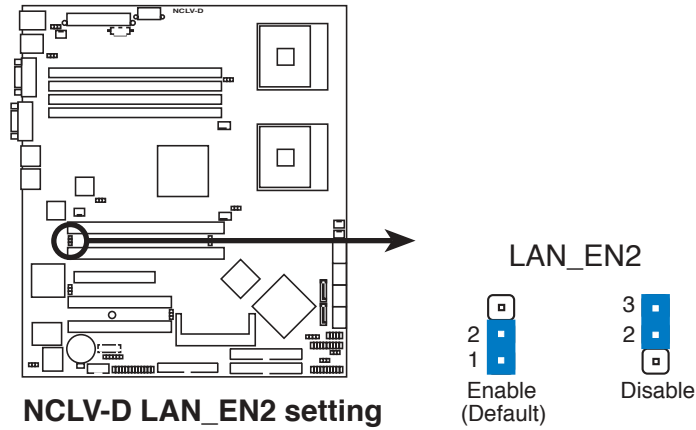
These jumpers allow you to enable or disable the onboard Broadcom BCM5721 Gigabit LAN controller. Set to pins 1-2 to activate the Gigabit LAN feature.



NCLV-D LAN_EN1 setting

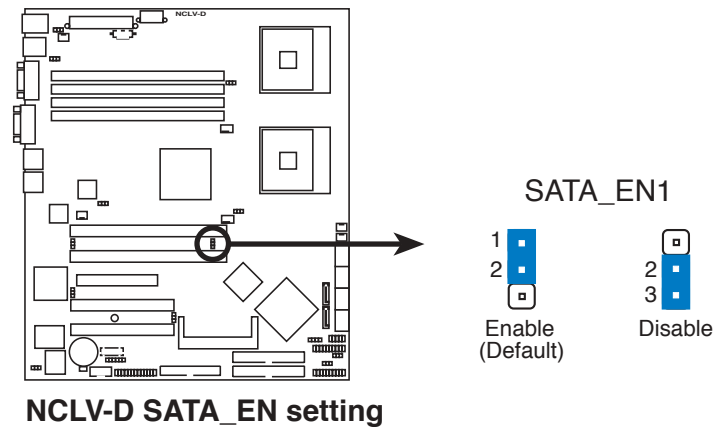
6. Gigabit LAN controller setting (3-pin LAN_EN2)

These jumpers allow you to enable or disable the onboard Broadcom BCM5705E Gigabit LAN controller. Set to pins 1-2 to activate the Gigabit LAN feature.



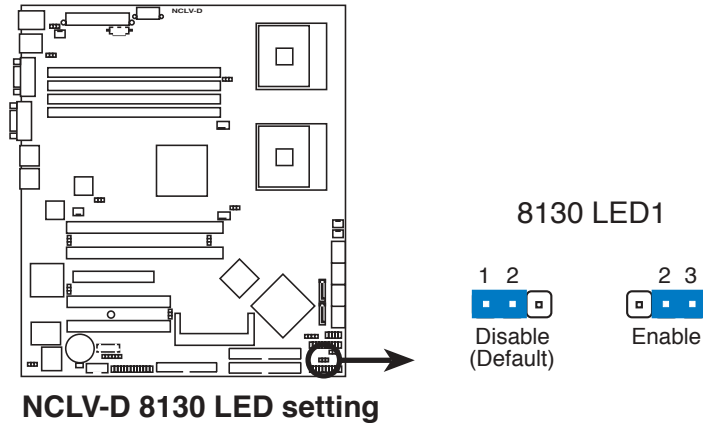
7. SATA controller setting (3-pin SATA_EN1) (Optional)

These jumpers allow you to enable or disable the onboard Adaptec AIC-8130 SATA RAID controller. Set to pins 1-2 to activate the SATA RAID feature.



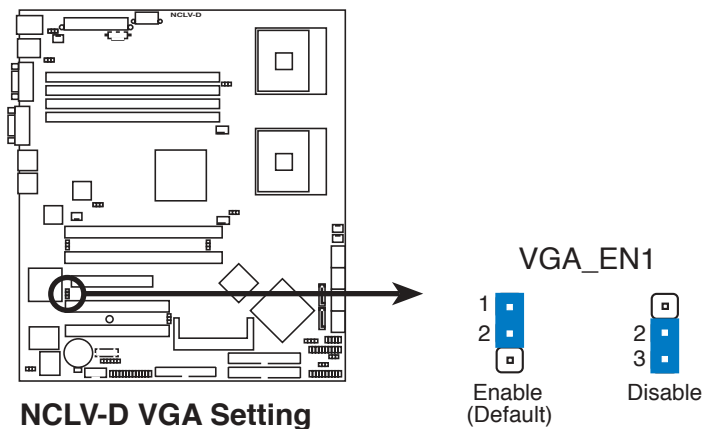
8. 8130 LED setting (3-pin 8130LED1) (*Optional*)

These jumpers allow you to enable or disable the onboard 8130 LED. Set to pins 1-2 to enable the LED.



9. VGA Graphics controller setting (3-pin VGA_EN1)

These jumpers allow you to enable or disable the onboard ATI Rage XL video graphics controller. Set to pins 1-2 to enable the video graphics controller.

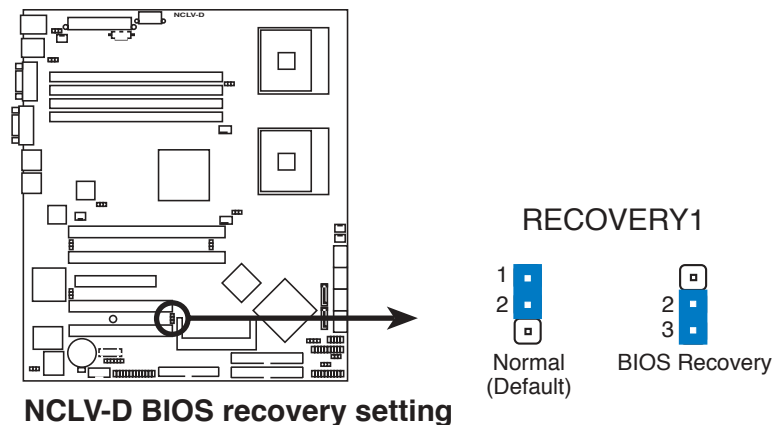


10. BIOS Recovery (3-pin RECOVERY1)

This jumper allows you to recover your original BIOS from a floppy disk in case the BIOS codes and data are corrupted.

To recover the BIOS:

1. Turn OFF your computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3.
3. Insert a floppy disk with the original or updated BIOS file.
4. Plug the power cord and turn ON the computer.
5. The system searches for the BIOS file in the floppy then reflashes the BIOS.
6. When finished, shut down your computer.
7. Replace the jumper cap from pins 2-3 to pins 1-2.
8. Reboot your computer.
9. Hold down the key during the boot process and enter BIOS setup to re-enter data.



4.3 Internal connectors

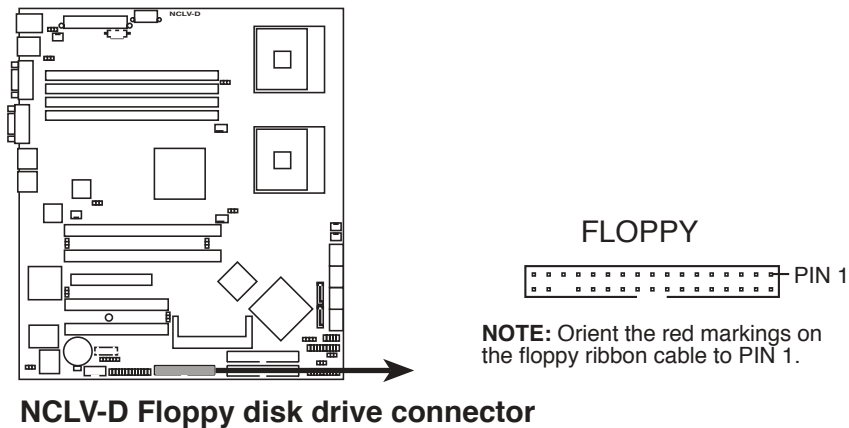
This section describes and illustrates the connectors on the motherboard. See section “1.4 Rear panel features” for the description of rear panel connectors.

1. Floppy disk drive connector (34-1 pin FLOPPY)

This connector is for the provided floppy disk drive (FDD) signal cable. Insert one end of the cable to this connector, then connect the other end to the signal connector at the back of the floppy disk drive.



Pin 5 on the connector is removed to prevent incorrect cable connection when using a FDD cable with a covered Pin 5.

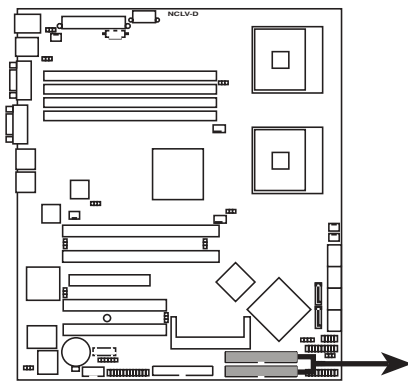


2. IDE connectors (40-pin PRI_IDE1, SEC_IDE1)

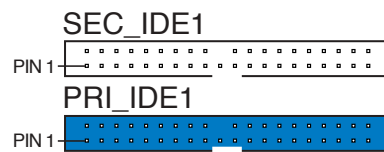
These connectors are for Ultra DMA 100/66 signal cables. The Ultra DMA 100/66 signal cable has three connectors: a blue connector for the primary IDE connector on the motherboard, a black connector for an Ultra DMA 100/66 IDE slave device (optical drive/hard disk drive), and a gray connector for an Ultra DMA 100/66 IDE master device (hard disk drive). If you install two hard disk drives, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings.



- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA 100/66 IDE devices.



NCLV-D IDE connectors



NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1.

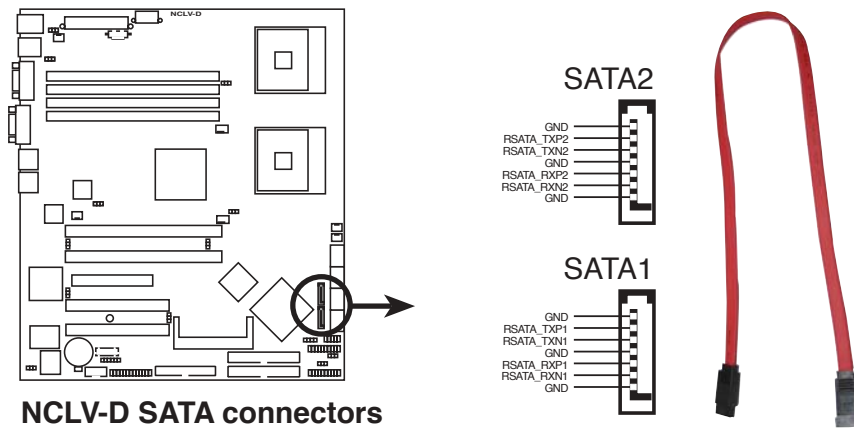
3. Serial ATA connectors (7-pin SATA1, SATA2)

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.

If you installed Serial ATA hard disk drives, you can create a RAID 0 or RAID 1 configuration with the Adaptec® HostRAID Technology through the onboard Intel® 6300ESB integrated RAID controller.



These connectors are set to **Standard IDE** mode by default. In **Standard IDE** mode, you can connect Serial ATA boot/data hard disk drives to these connectors. If you intend to create a Serial ATA RAID set using these connectors, set the **Configure SATA As** item in the BIOS to [RAID]. See section “5.3.5 IDE Configuration” for details.



Important notes on Serial ATA

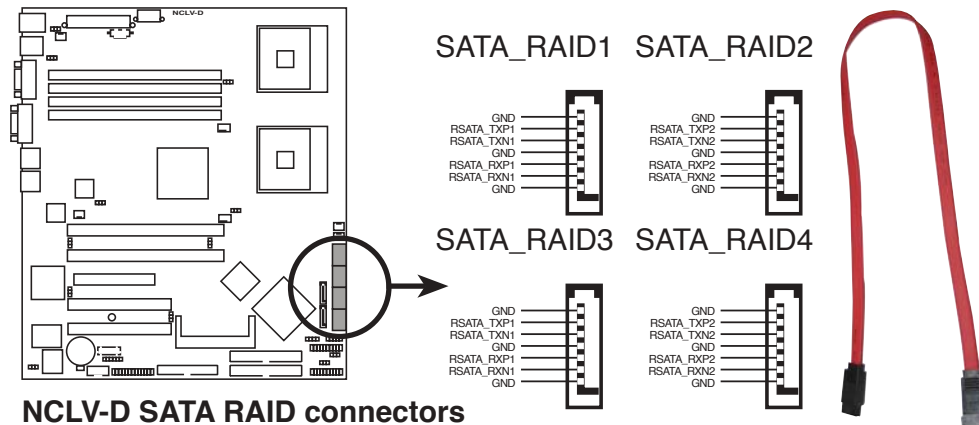
- You must install Windows® 2000 Service Pack 4 or the Windows® XP Service Pack 1 before using Serial ATA hard disk drives.
- Use only two Serial ATA RAID connectors for each RAID 0 or RAID 1 set.
- When using the connectors in **Standard IDE** mode, connect the primary (boot) hard disk drive to the SATA1 or SATA2 connector. Refer to the table below for the recommended SATA hard disk drive connections.

Serial ATA hard disk drive connection

Connector	Setting	Use
SATA1	Master	Boot disk
SATA2	Slave	Data disk

4. Serial ATA RAID connectors (7-pin SATA_RAID1, SATA_RAID2, SATA_RAID3, SATA_RAID4) (Optional)

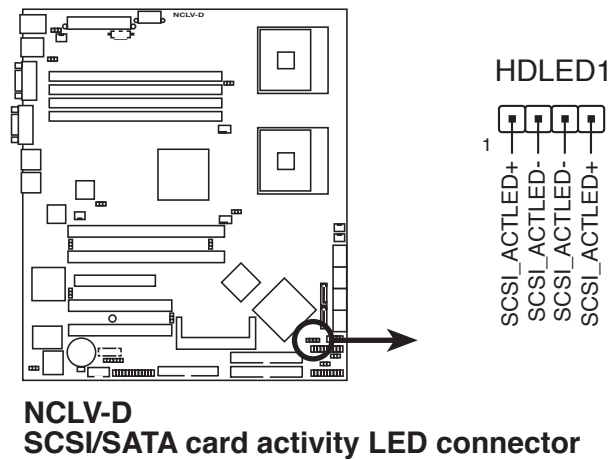
These connectors are for Serial ATA signal cables. These connectors support up to four Serial ATA hard disk drives that you can configure as a disk array through the onboard SATA RAID controller.



Before creating a RAID set using Serial ATA hard disks, make sure that you have connected the Serial ATA signal cable and installed Serial ATA hard disk drives; otherwise, you cannot enter the RAID utility and SATA BIOS setup during POST.

5. Hard disk activity LED connector (2-pin HDLED1)

This connector supplies power to the hard disk activity LED. The read or write activities of any device connected to the primary/secondary IDE connectors or the SATA connectors cause this LED to light up.

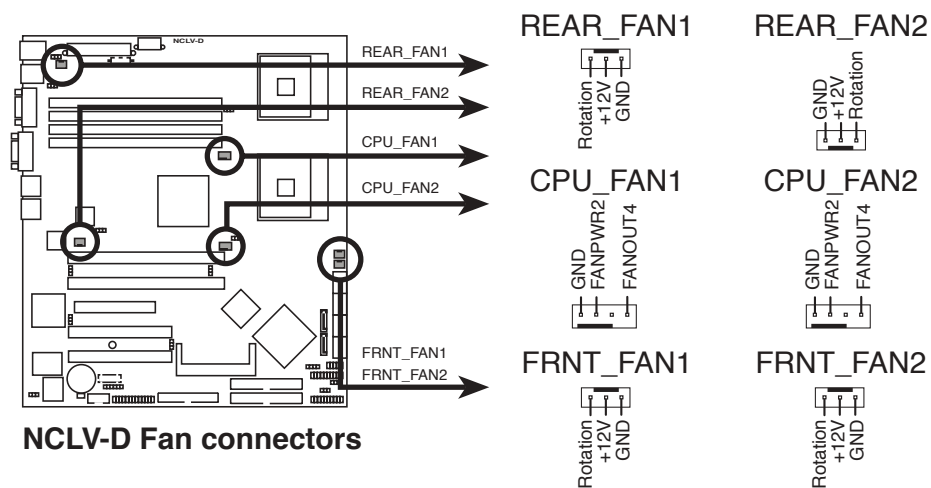


6. CPU and system fan connectors (3-pin CPU_FAN1/2, REAR_FAN1/2, FRNT_FAN1/2)

The fan connectors support cooling fans of 350 mA ~ 740 mA (8.88 W max.) or a total of 2.1 A ~ 4.44 A (53.28 W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

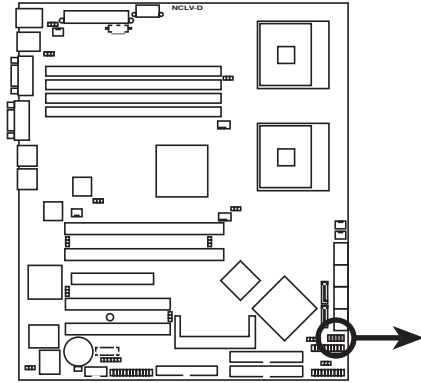


Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!

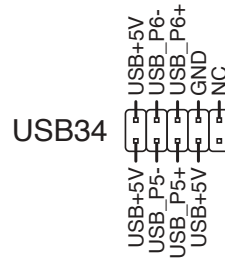


7. USB connector (10-1 pin USB34)

This connector is for USB 2.0 ports. The system connects a front USB cable to this connector. The USB connector complies with USB 2.0 specification that supports up to 480 Mbps connection speed.

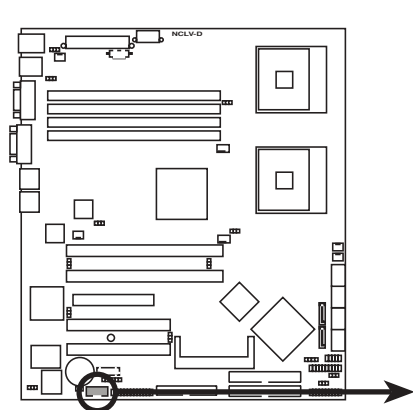


NCLV-D USB 2.0 connector

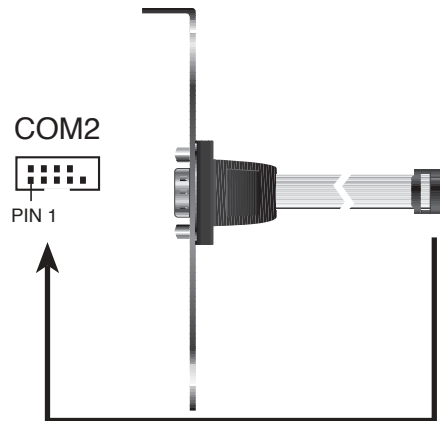


8. Serial port connector (10-1 pin COM2)

This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



**NCLV-D
Serial port2 (COM2) connector**

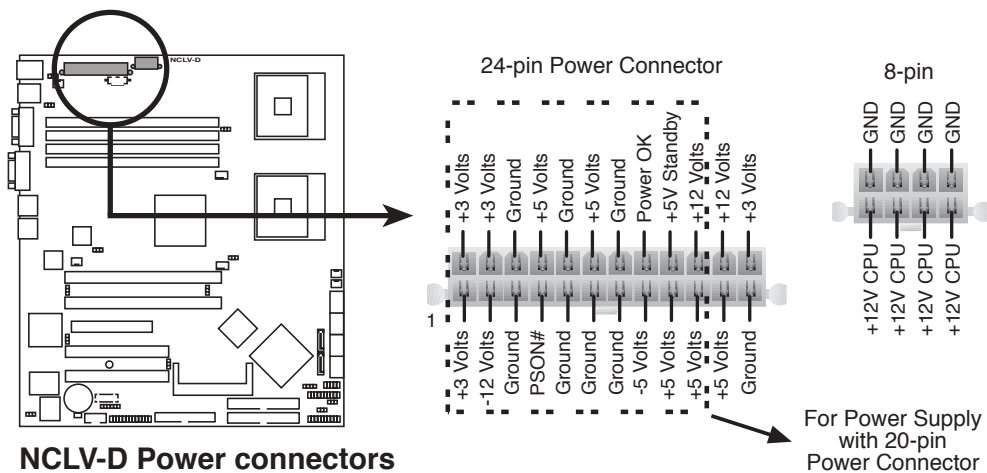


9. SSI power connectors (24-pin EATXPWR1, 8-pin SSI+12V_1)

These connectors are for SSI power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

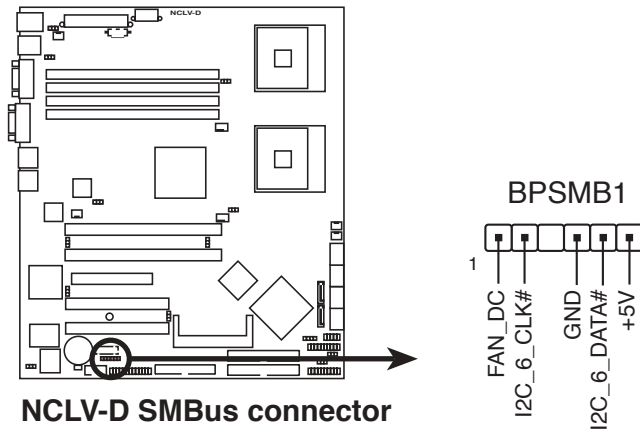


- Use of an SSI 12 V Specification 2.0-compliant power supply unit (PSU) that provides a minimum power of 450 W is recommended for a fully-configured system.
- Do not forget to connect the 8-pin ATX +12 V power plug; otherwise, the system will not boot up.
- Use of a PSU with a higher power output is recommended when configuring a system with more power consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- You must install a PSU with a higher power rating if you intend to install additional devices.



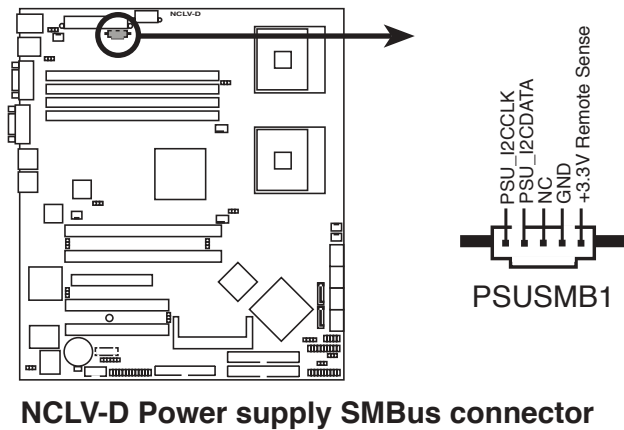
10. Backplane SMBus connector (6-1 pin BPSMB1)

This connector allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.



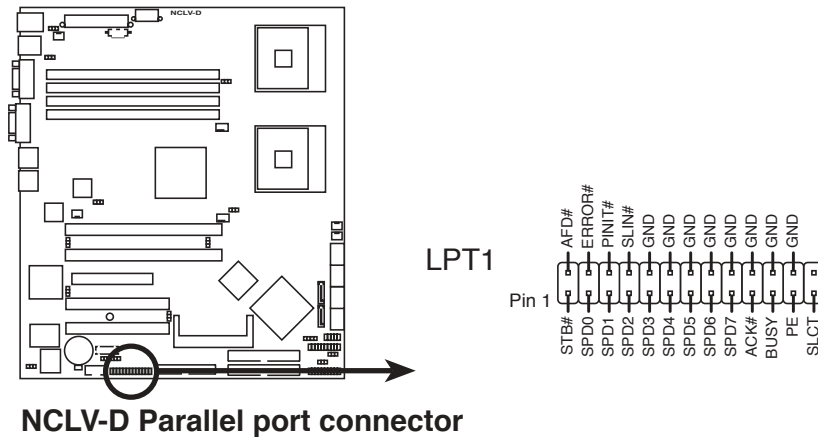
11. Power Supply SMBus connector (6-1 pin PSUSMB1)

This connector allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.



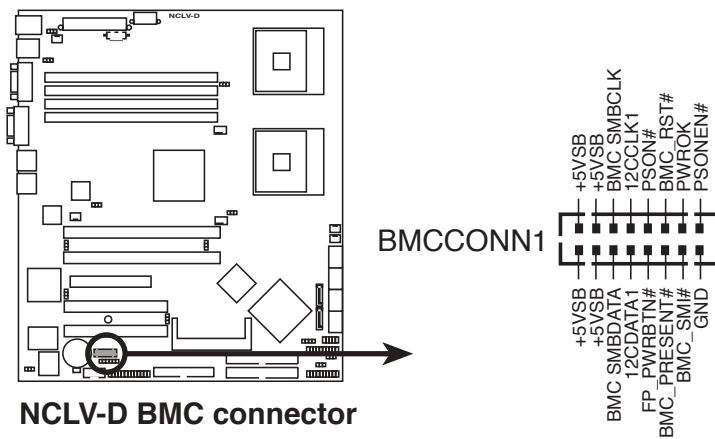
12. Parallel port connector (26-1 pin LPT1)

This connector is for a parallel port. Connect the parallel port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



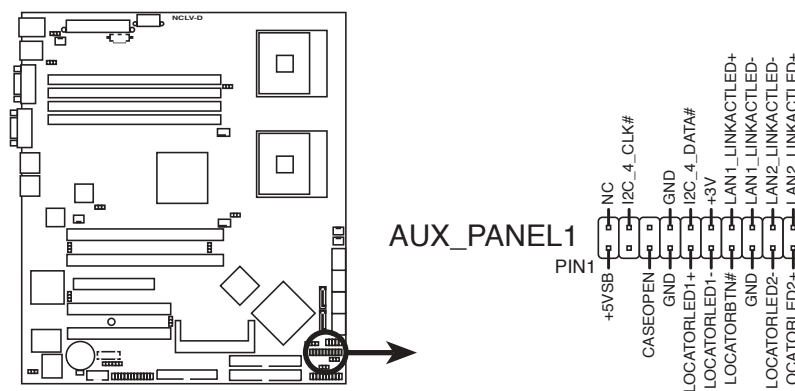
13. BMC connector (16-pin BMCCONN1)

This connector is for an ASUS server management card.



14. Auxiliary panel connector (20-pin AUX_PANEL1)

This connector supports several server system functions.

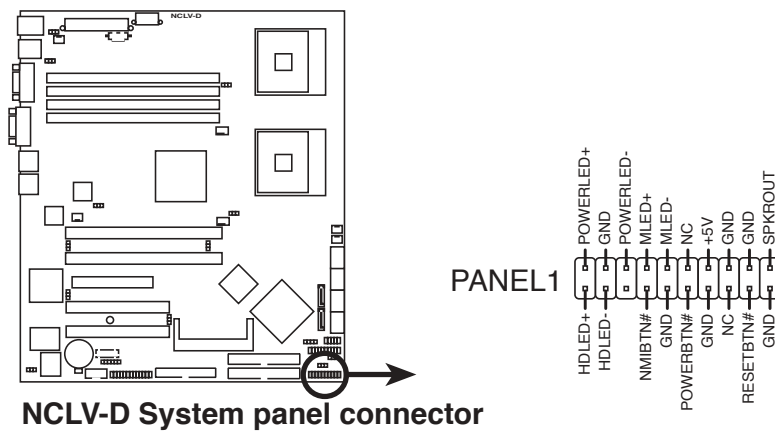


NCLV-D Auxiliary panel connector

- **Chassis Intrusion connector (3-pin CASEOPEN)**
This lead is for a chassis with an intrusion detection feature. This requires an external detection mechanism such as a chassis intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to this lead to record a chassis intrusion event.
- **LAN1 link activity LED (2-pin LAN1_LINKACTLED)**
This 2-pin connector is for the LAN1 Activity LED. Connect the LAN1 Activity LED cable to this connector. This LED blinks during a network activity and is always lit when linked.
- **LAN2 link activity LED (2-pin LAN2_LINKACTLED)**
This 2-pin connector is for the LAN2 Activity LED. Connect the LAN2 Activity LED cable to this connector. This LED blinks during a network activity and lights up when linked.
- **Locator LED 1 (2-pin LOCATORLED1)**
This 2-pin connector is for the Locator LED 1. Connect the Locator LED 1 cable to this connector. This LED lights up when the Locator button is pressed and if there is no LAN1 connection (e.g. the LAN1 controller is broken).
- **Locator LED 2 (2-pin LOCATORLED2)**
This 2-pin connector is for the Locator LED 2. Connect the Locator LED 2 cable to this connector. This LED is synchronized with the LAN2 LED.
- **Locator Button/Switch (2-pin LOCATORBTN)**
This connector is for the locator button. This button queries the state of the system locator.
- **Front Panel SMBus (6-1 pin)**
This connector allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.

15. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.



The system panel connector is color-coded for easy connection.

- **System power LED (Green 3-pin PLED)**
This 3-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.
- **Hard disk drive activity LED (Red 2-pin IDE_LED)**
This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.
- **System warning speaker (Orange 4-pin SPEAKER)**
This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.
- **ATX power button/soft-off button (Yellow 2-pin PWRSW)**
This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.
- **Reset button (Blue 2-pin RESET)**
This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

Chapter 5

This chapter tells how to change system settings through the BIOS Setup menus and describes the BIOS parameters.



ASUS AP1710-E1

5.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup.

1. **ASUS AFUDOS** (Updates the BIOS in DOS mode using a bootable floppy disk.)
2. **ASUS CrashFree BIOS 2** (Updates the BIOS using a bootable floppy disk or the motherboard support CD when the BIOS file fails or gets corrupted.)
3. **ASUS Update** (Updates the BIOS in Windows® environment.)

Refer to the corresponding sections for details on these utilities.



Save a copy of the original motherboard BIOS file to a bootable floppy disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

5.1.1 Creating a bootable floppy disk

1. Do either one of the following to create a bootable floppy disk.
 - DOS environment
 - a. Insert a 1.44MB floppy disk into the drive.
 - b. At the DOS prompt, type `format A: /S` then press <Enter>.
 - Windows® XP environment
 - a. Insert a 1.44 MB floppy disk to the floppy disk drive.
 - b. Click **Start** from the Windows® desktop, then select **My Computer**.
 - c. Select the 3 1/2 Floppy Drive icon.
 - d. Click **File** from the menu, then select **Format**. A **Format 3 1/2 Floppy Disk** window appears.
 - e. **Windows® XP users:** Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.
2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

5.1.2 AFUDOS utility

The AFUDOS utility allows you to update the BIOS file in DOS environment using a bootable floppy disk with the updated BIOS file. This utility also allows you to copy the current BIOS file that you can use as backup when the BIOS fails or gets corrupted during the updating process.

Copying the current BIOS

To copy the current BIOS file using the AFUDOS utility:



- Make sure that the floppy disk is not write-protected and has at least 600 KB free space to save the file.
- The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be same as shown.

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.
2. Boot the system in DOS mode, then at the prompt type:

```
afudos /o[filename]
```

where the [filename] is any user-assigned filename not more than eight alphanumeric characters for the main filename and three alphanumeric characters for the extension name.

```
A:\>afudos /oOLDBIOS1.rom
```

Main filename Extension name

3. Press <Enter>. The utility copies the current BIOS file to the floppy disk.

```
A:\>afudos /oOLDBIOS1.rom
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
  Reading flash ..... done
  Write to file..... ok
A:\>
```

The utility returns to the DOS prompt after copying the current BIOS file.

Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

1. Visit the ASUS website (www.asus.com) and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable floppy disk.



Write the BIOS filename on a piece of paper. You need to type the exact BIOS filename at the DOS prompt.

2. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.
3. Boot the system in DOS mode, then at the prompt type:

```
afudos /i[filename]
```

where [filename] is the latest or the original BIOS file on the bootable floppy disk.

```
A:\>afudos /iNCLVD.ROM
```

4. The utility verifies the file and starts updating the BIOS.

```
A:\>afudos /iNCLVD.ROM /pbnc
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

WARNING!! Do not turn off power during flash BIOS
Reading file ..... done
Reading flash ..... done

Advance Check .....
Erasing flash ..... done
Writing flash ..... 0x0008CC00 (9%)
```



Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

```
A:\>afudos /iNCLVD.ROM /pbnc
AMI Firmware Update Utility - Version 1.19 (ASUS V2.07 (03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

WARNING!! Do not turn off power during flash BIOS
Reading file ..... done
Reading flash ..... done

Advance Check .....
Erasing flash ..... done
Writing flash ..... done
Verifying flash .... done

Please restart your computer

A:\>
```

5.1.3 ASUS CrashFree BIOS 2 utility

The ASUS CrashFree BIOS 2 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard support CD or the floppy disk that contains the updated BIOS file.



- Prepare the motherboard support CD or the floppy disk containing the updated motherboard BIOS before using this utility.
- Make sure that you rename the original or updated BIOS file in the floppy disk to **NCLVD.ROM**.

Recovering the BIOS from a floppy disk

To recover the BIOS from a floppy disk:

1. Turn on the system.
2. Insert the floppy disk with the original or updated BIOS file to the floppy disk drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "NCLVD.ROM". Completed.
Start flashing...
```



DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

4. Restart the system after the utility completes the updating process.

5.1.4 ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment. The ASUS Update utility allows you to:

- Save the current BIOS file
- Download the latest BIOS file from the Internet
- Update the BIOS from an updated BIOS file
- Update the BIOS directly from the Internet, and
- View the BIOS version information.

This utility is available in the support CD that comes with the motherboard package.



ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

Installing ASUS Update

To install ASUS Update:

1. Place the support CD in the optical drive. The **Drivers** menu appears.
2. Click the **Utilities** tab, then click **Install ASUS Update VX.XX.XX**.
3. The ASUS Update utility is copied to your system.

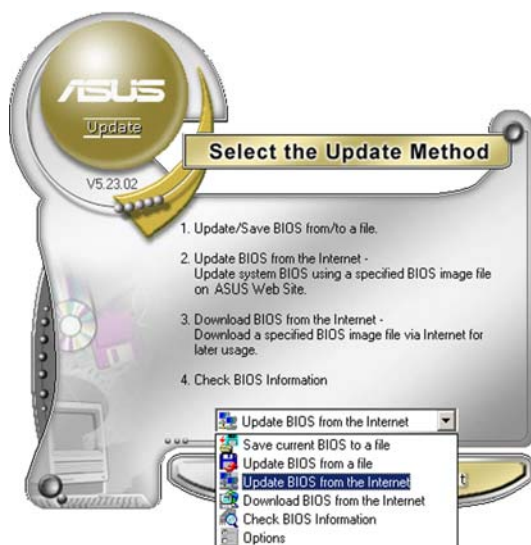
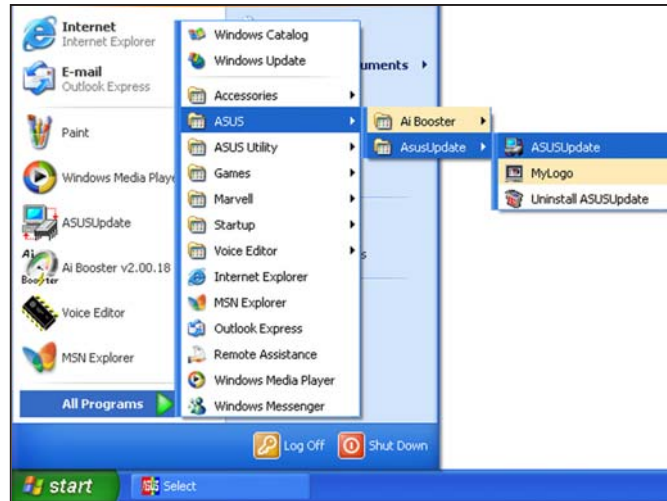


Quit all Windows® applications before you update the BIOS using this utility.

Updating the BIOS through the Internet

To update the BIOS through the Internet:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.



2. Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.



3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.

4. From the FTP site, select the BIOS version that you wish to download. Click Next.
5. Follow the screen instructions to complete the update process.



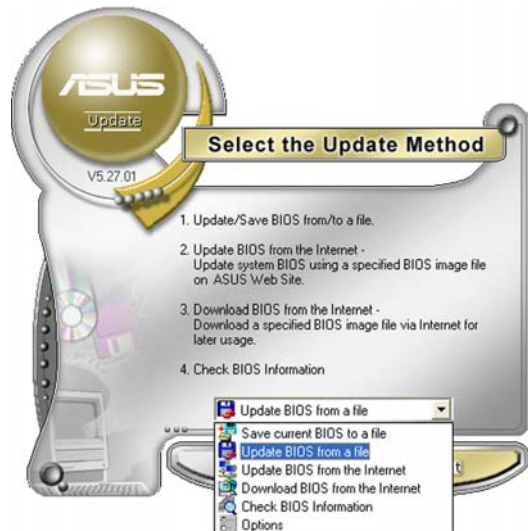
The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail of all its features.



Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.
2. Select **Update BIOS from a file** option from the drop-down menu, then click **Next**.



3. Locate the BIOS file from the **Open** window, then click **Save**.
4. Follow the screen instructions to complete the update process.

5.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section “5.1 Managing and updating your BIOS.”

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to “Run Setup.” This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware hub.

The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press during the Power-On-Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

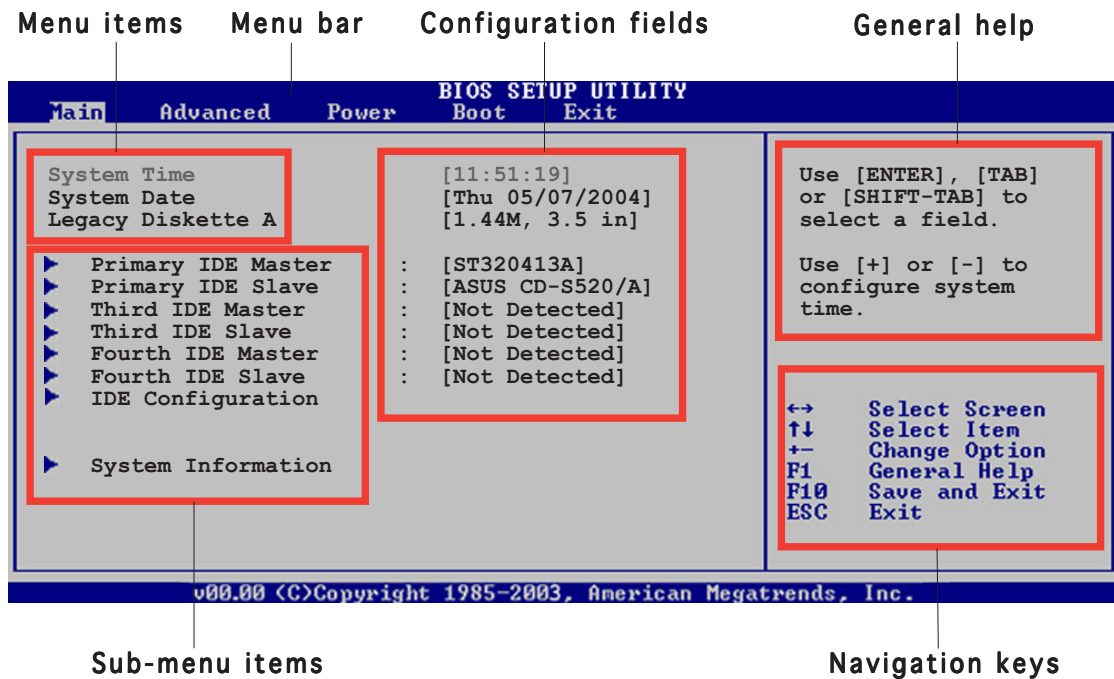
If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.



-
- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit Menu. See section “5.7 Exit Menu.”
 - The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
 - Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.
-

5.2.1 BIOS menu screen



5.2.2 Menu bar

The menu bar on top of the screen has the following main items:

Main	For changing the basic system configuration
Advanced	For changing the advanced system settings
Power	For changing the advanced power management (APM) configuration
Boot	For changing the system boot configuration
Exit	For selecting the exit options and loading default settings

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

5.2.3 Navigation keys

At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.



Some of the navigation keys differ from one screen to another.

5.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.



Main menu items

5.2.5 Sub-menu items

A solid triangle before each item on any menu screen means that the item has a sub-menu. To display the sub-menu, select the item and press <Enter>.

5.2.6 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

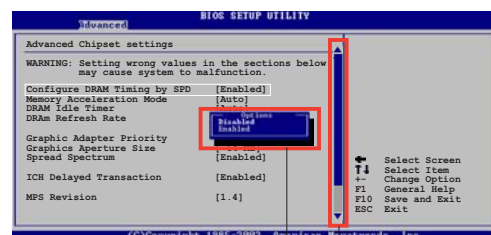
A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to “4.2.7 Pop-up window.”

5.2.7 Pop-up window

Select a menu item then press <Enter> to display a pop-up window with the configuration options for that item.

5.2.8 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.



Pop-up window

Scroll bar

5.2.9 General help

At the top right corner of the menu screen is a brief description of the selected item.

5.3 Main menu

When you enter the BIOS Setup program, the **Main** menu screen appears, giving you an overview of the basic system information.



Refer to section “5.2.1 BIOS menu screen” for information on the menu screen items and how to navigate through them.

```
BIOS SETUP UTILITY
Main  Advanced  Power  Boot  Exit

System Time           [11:51:19]
System Date           [Thu 05/07/2004]
Legacy Diskette A     [1.44M, 3.5 in]

▶ Primary IDE Master   : [ST320413A]
▶ Primary IDE Slave   : [ASUS CD-S520/A]
▶ Third IDE Master    : [Not Detected]
▶ Third IDE Slave     : [Not Detected]
▶ Fourth IDE Master   : [Not Detected]
▶ Fourth IDE Slave    : [Not Detected]
▶ IDE Configuration

▶ System Information

Use [ENTER], [TAB]
or [SHIFT-TAB] to
select a field.

Use [+] or [-] to
configure system
time.

↔ Select Screen
↑↓ Select Item
+- Change Option
F1  General Help
F10 Save and Exit
ESC Exit

v00.00 (C)Copyright 1985-2003, American Megatrends, Inc.
```

5.3.1 System Time [xx:xx:xxxx]

Allows you to set the system time.

5.3.2 System Date [Day xx/xx/xxxx]

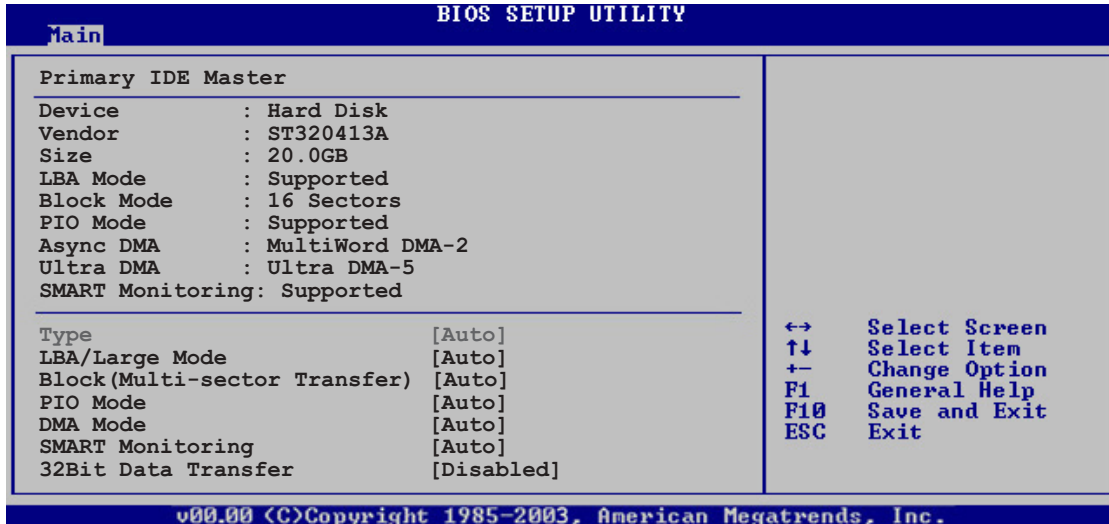
Allows you to set the system date.

5.3.3 Legacy Diskette A [1.44M, 3.5 in.]

Sets the type of floppy drive installed. Configuration options: [Disabled]
[360K, 5.25 in.] [1.2M, 5.25 in.] [720K, 3.5 in.] [1.44M, 3.5 in.]
[2.88M, 3.5 in.]

5.3.4 Primary, Third and Fourth IDE Master/Slave

The BIOS automatically detects the connected IDE devices. There is a separate sub-menu for each IDE device. Select a device item, then press <Enter> to display the IDE device information.



The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show N/A if no IDE device is installed in the system.

Type [Auto]

Selects the type of IDE drive. Setting to [Auto] allows automatic selection of the appropriate IDE device type. Select [CDROM] if you are specifically configuring a CD-ROM drive. Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive. Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to [Auto] enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Configuration options: [Disabled] [Auto]

Block (Multi-sector Transfer) [Auto]

Enables or disables data multi-sectors transfers. When set to [Auto], the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time. Configuration options: [Disabled] [Auto]

PIO Mode [Auto]

Selects the PIO mode.

Configuration options: [Auto] [0] [1] [2] [3] [4]

SMART Monitoring [Auto]

Sets the Smart Monitoring, Analysis, and Reporting Technology.

Configuration options: [Auto] [Disabled] [Enabled]

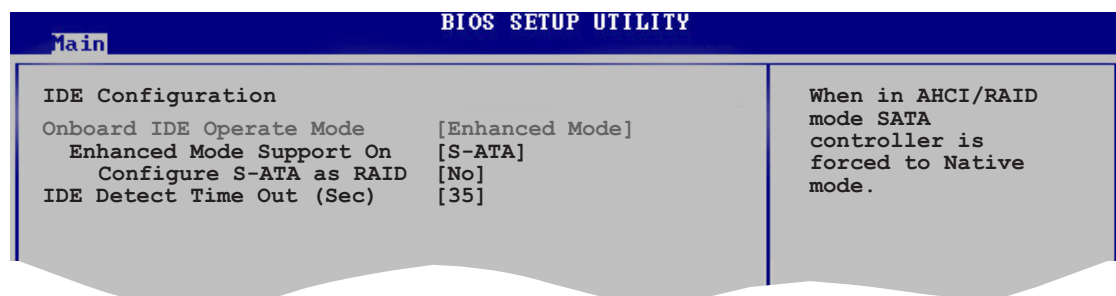
32Bit Data Transfer [Disabled]

Enables or disables 32-bit data transfer.

Configuration options: [Disabled] [Enabled]

5.3.5 IDE Configuration

The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press <Enter> if you wish to configure the item.



Onboard IDE Operate Mode [Enhanced Mode]

Allows selection of the IDE operation mode depending on the installed operating system (OS). Set to [Enhanced Mode] if you are using native OS including Windows® 2000/XP. Configuration options: [Compatible Mode] [Enhanced Mode]

Enhanced Mode Support On [S-ATA]

Allows you to use native OS on Serial ATA and Parallel ATA ports. It is recommended that you do not change the default setting for better OS compatibility. In this setting, you may use legacy OS on the Parallel ATA ports only if you do not install any Serial ATA device.

Configuration options: [P-ATA+S-ATA] [S-ATA] [P-ATA]

Configure S-ATA as RAID [No]

Allows you to set the Serial ATA devices connected to the Serial ATA connectors as RAID sets. Configuration options: [No] [Yes]



The following item appears only when you set the **Onboard IDE Operate Mode** to [Compatible Mode]

Compatible Mode Option [Primary P-ATA+S-ATA]

Allows you to select the combined mode for the installed IDE and SATA devices.

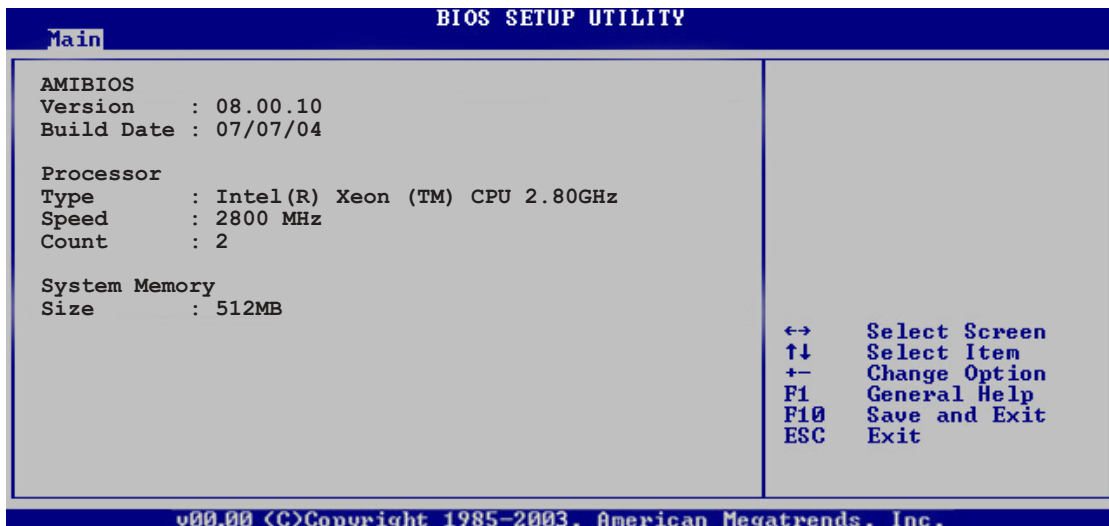
The Secondary **P-ATA+S-ATA** and **P-ATA Ports Only** options are for advanced users only. If you set to any of these options and encountered problems, revert to the default setting **Primary P-ATA+S-ATA**. Configuration options: [Primary P-ATA+S-ATA] [Secondary P-ATA+S-ATA] [P-ATA Ports Only]

IDE Detect Time Out [35]

Selects the time out value for detecting ATA/ATAPI devices. Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

5.3.6 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu.



AMI BIOS

Displays the auto-detected BIOS information

Processor

Displays the auto-detected CPU specification

System Memory

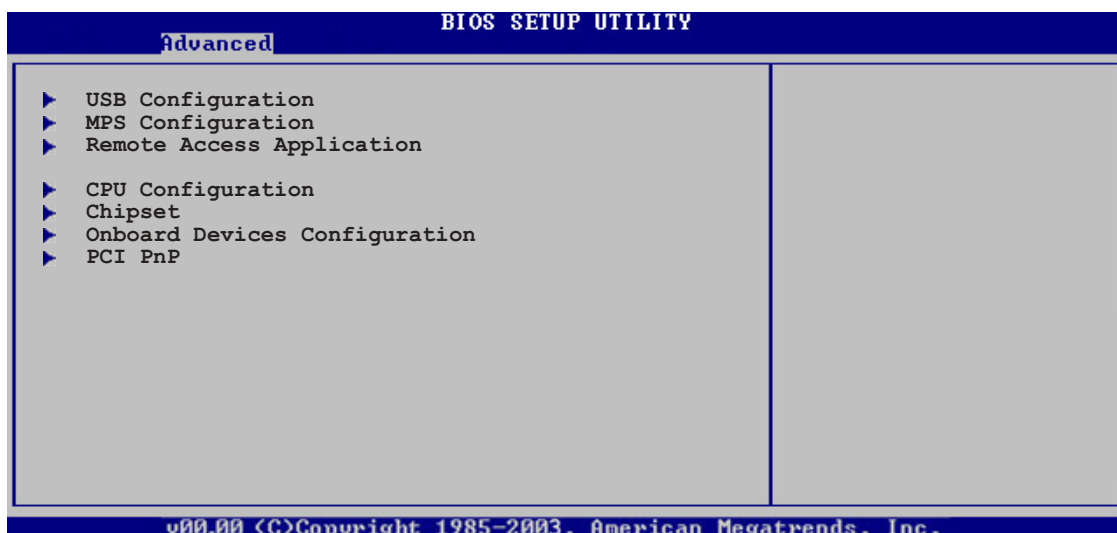
Displays the auto-detected system memory

5.4 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.

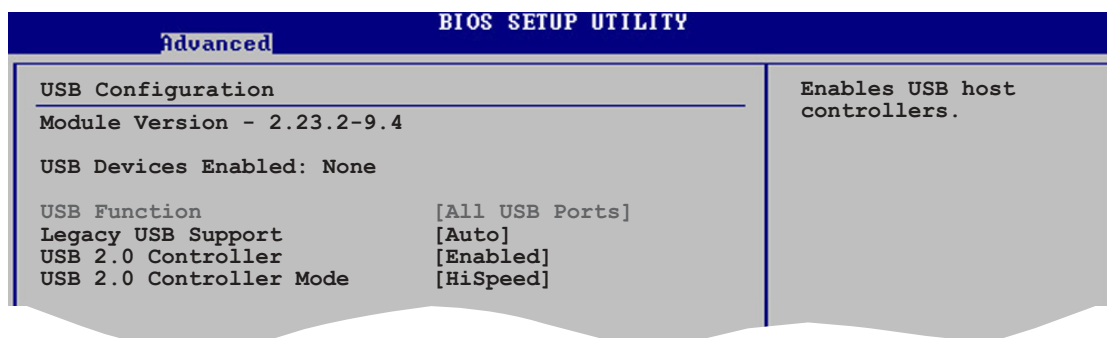


Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.



5.4.1 USB Configuration

The items in this menu allows you to change the USB-related features. Select an item then press <Enter> to display the configuration options.



The **Module Version** and **USB Devices Enabled** items show the auto-detected values. If no USB device is detected, the **USB Devices Enabled** item shows **None**.

USB Function [Enabled]

Allows you to enable or disable the USB function.
Configuration options: [Disabled] [Enabled]

Legacy USB Support [Auto]

Allows you to enable or disable support for legacy USB devices. Setting to [Auto] allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

Configuration options: [Disabled] [Enabled] [Auto]

USB 2.0 Controller [Enabled]

Allows you to enable or disable the USB 2.0 controller.

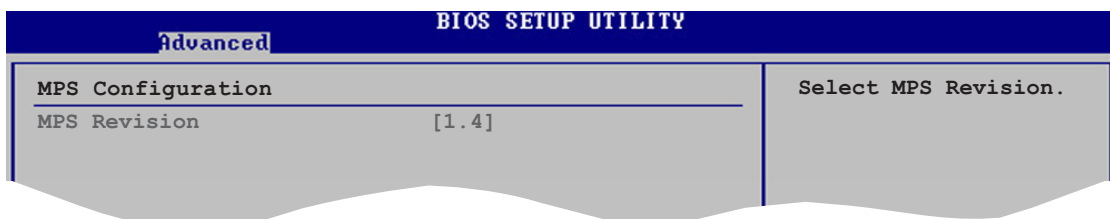
Configuration options: [Enabled] [Disabled]

USB 2.0 Controller Mode [HiSpeed]

Allows you to set the USB 2.0 controller mode to HiSpeed (480 Mbps) or FullSpeed (12 Mbps). Configuration options: [HiSpeed] [FullSpeed]

5.4.2 MPS Configuration

The items in this menu allows you to configure the Multi-Processor Table. Select an item then press <Enter> to display the configuration options.



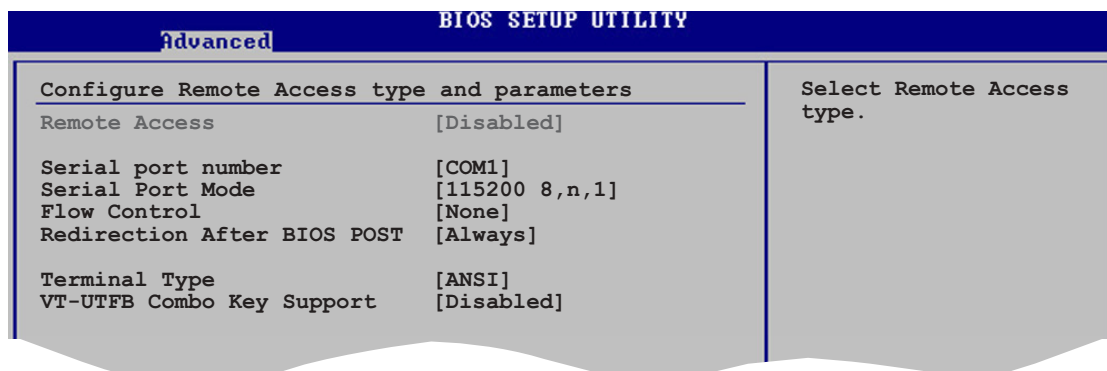
MPS Revision [1.4]

Allows you to select the multi-processor system revision.

Configuration options: [1.1] [1.4]

5.4.3 Remote Access Configuration

The items in this menu allows you to configure the Remote Access features. Select an item then press <Enter> to display the configuration options.



Remote Access [Disabled]

Enables or disables the remote access feature.

Configuration options: [Disabled] [Enabled]

Serial port number [COM1]

Enables or disables the remote access feature.

Configuration options: [Disabled] [Enabled]

Serial Port Mode [115200 8,n,1]

Sets the Serial port mode.

Configuration options: [115200 8,n,1] [57600 8,n,1] [38400 8,n,1]

[19200 8,n,1] [09600 8,n,1]

Flow Control [None]

Allows you to select the flow control for console redirection.

Configuration options: [None] [Hardware] [Software]

Redirection After BIOS POST [Always]

Sets the redirection mode after the BIOS Power-On Self-Test (POST). Some operating systems may not work when this item is set to Always.

Configuration options: [Disabled] [Boot Loader] [Always]

Terminal Type [ANSI]

Allows you to select the target terminal type.

Configuration options: [ANSI] [VT100] [VT-UTF8]

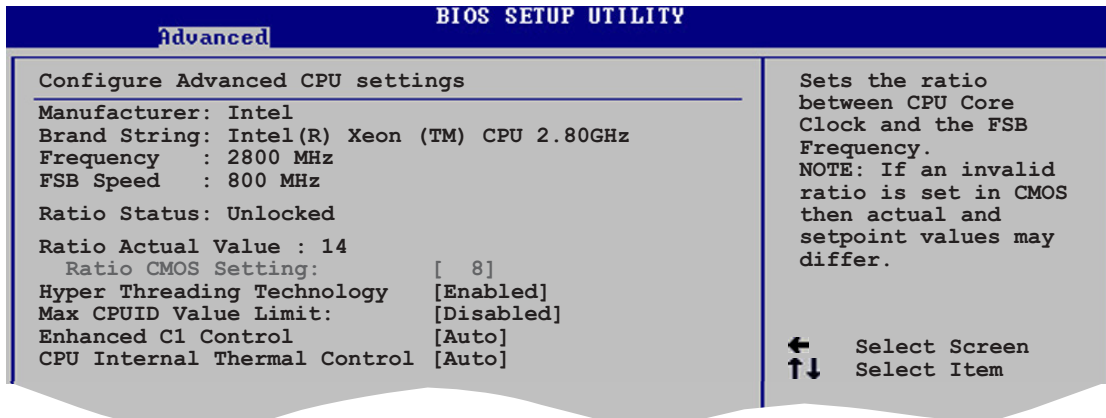
VT-UTF8 Combo Key Support [Disabled]

Enables or disables the VT-UTF8 combo key support for ANSI or VT100

terminals. Configuration options: [Disabled] [Enabled]

5.4.4 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.



Ratio CMOS Setting [8]

Sets the ratio between the CPU core clock and the Front Side Bus frequency. The BIOS auto-detects the default value of this item. Use the <+> or <-> keys to adjust the values. Configuration options: [8]...[28]



You can only adjust the **Ratio CMOS** settings if you installed an unlocked CPU. Refer to the CPU documentation for details.

Hyper-Threading Technology [Enabled]

Allows you to enable or disable the processor Hyper-Threading Technology. Configuration options: [Disabled] [Enabled]

Max CPUID Value Limit [Disabled]

Setting this item to [Enabled] allows legacy operating systems to boot even without support for CPUs with extended CPUID functions. Configuration options: [Disabled] [Enabled]

Enhanced C1 Control [Auto]

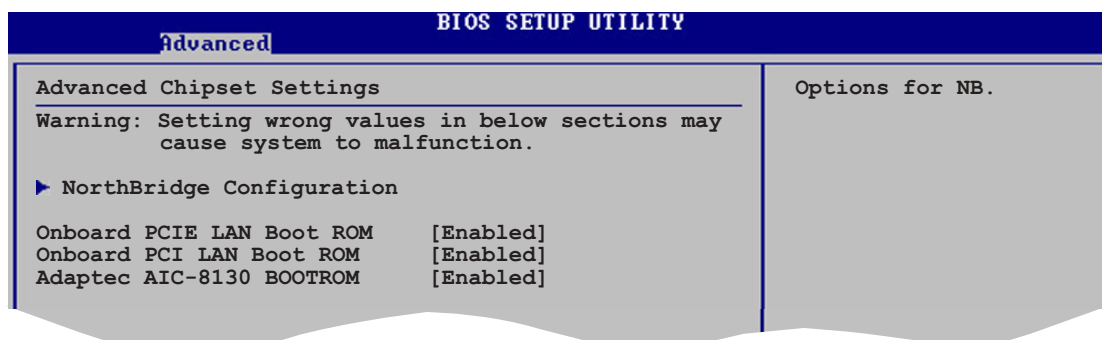
When set to [Auto], the BIOS automatically checks the CPU's capability to enable the C1E support. In C1E mode, the CPU power consumption is lower when idle. Configuration options: [Auto] [Disabled]

CPU Internal Thermal Control [Auto]

Allows you to disable or set to auto the CPU Internal Thermal Control function. The default setting [Auto] allows the BIOS to automatically detect whether the CPU supports temperature control. Configuration options: [Auto] [Disabled]

5.4.5 Chipset

The Chipset menu allows you to change the advanced chipset settings. Select an item then press <Enter> to display the sub-menu.



Onboard PCIE LAN Boot ROM [Enabled]

Allows you to enable or disable the option ROM in the onboard BCM5721 PCI Express LAN controller. Configuration options: [Disabled] [Enabled]

Onboard PCI LAN Boot ROM [Enabled]

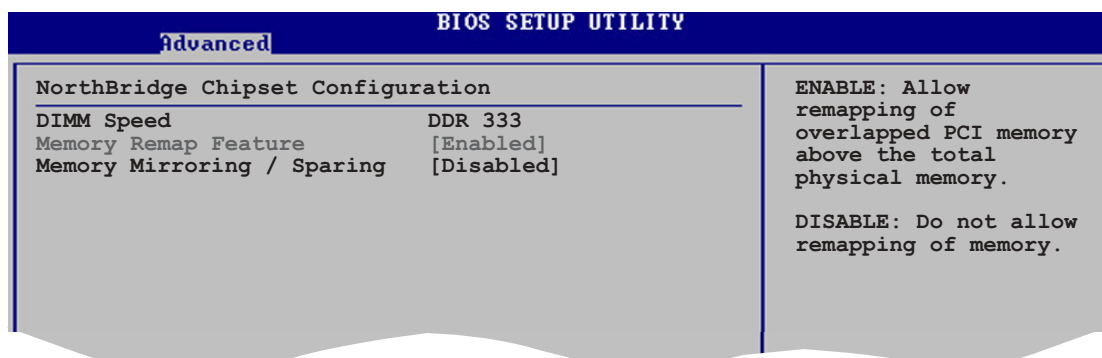
Allows you to enable or disable the option ROM in the onboard BCM5705E PCI LAN controller. Configuration options: [Disabled] [Enabled]

Adaptec AIC-8130 BOOTROM [Enabled]

Allows you to enable or disable the Adaptec AIC-8130 boot ROM. Configuration options: [Disabled] [Enabled]

NorthBridge Configuration

The NorthBridge Configuration menu allows you to change the Northbridge settings.



DIMM Speed

Displays the installed DIMM type and speed. This item is auto-detected and is not configurable.

Memory Remap Feature [Enabled]

Allows you to remap the overlap PCI memory over the total physical memory. Configuration options: [Disabled] [Enabled]

Memory Mirroring/Sparing [Disabled]

Allows you to enable memory mirroring or sparing under certain memory configurations. Configuration options: [Mirroring] [Sparing] [Disabled]

5.4.6 Onboard Devices Configuration

Advanced		BIOS SETUP UTILITY
Configure Win627EHF Super IO Chipset		Allows BIOS to Select Serial Port1 Base Addresses.
Serial Port1 Address	[3F8/IRQ4]	
Serial Port2 Address	[2F8/IRQ3]	
Parallel Port Address	[378]	
Parallel Port Mode	[Normal]	
Parallel Port IRQ	[IRQ7]	

Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address. Configuration options: [Disabled] [3F8/IRQ4] [3E8/IRQ4] [2E8/IRQ3]

Serial Port1 Address [2F8/IRQ3]

Allows you to select the Serial Port2 base address. Configuration options: [Disabled] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

Parallel Port Address [378]

Allows you to select the Parallel Port base addresses. Configuration options: [Disabled] [378] [278]

Parallel Port Mode [Normal]

Allows you to select the Parallel Port mode. Configuration options: [Normal] [Bi-directional] [EPP] [ECP]

ECP Mode DMA Channel [DMA3]

Appears only when the Parallel Port Mode is set to [ECP]. This item allows you to set the Parallel Port ECP DMA. Configuration options: [DMA0] [DMA1] [DMA3]

EPP Version [1.9]

Allows selection of the Parallel Port EPP version. This item appears only when the **Parallel Port Mode** is set to **EPP**. Configuration options: [1.9] [1.7]

Parallel Port IRQ [IRQ7]

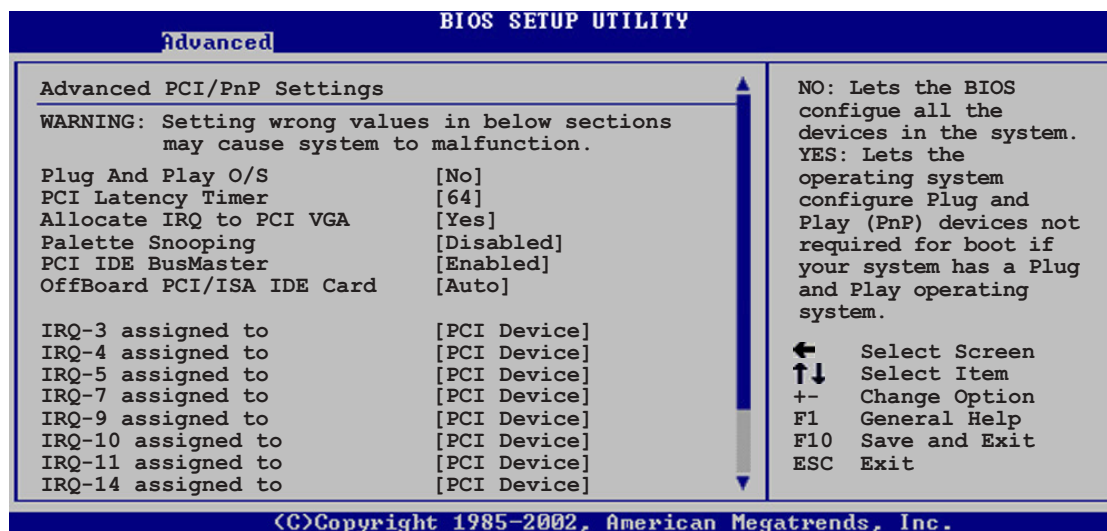
Sets the Parallel port IRQ. Configuration options: [IRQ5] [IRQ7]

5.4.7 PCI PnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel resources for either PCI/PnP or legacy ISA devices, and setting the memory size block for legacy ISA devices.



Take caution when changing the settings of the PCI PnP menu items. Incorrect field values can cause the system to malfunction.



Plug And Play O/S [No]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot.

Configuration options: [No] [Yes]

PCI Latency Timer [64]

Allows you to select the value in units of PCI clocks for the PCI device latency timer register. Configuration options: [32] [64] [96] [128] [160] [192] [224] [248]

Allocate IRQ to PCI VGA [Yes]

When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested. Configuration options: [No] [Yes]

Palette Snooping [Disabled]

When set to [Enabled], the palette snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Configuration options: [Disabled] [Enabled]

PCI IDE BusMaster [Enabled]

Allows BIOS to use PCI bus mastering when reading/writing to IDE devices.
Configuration options: [Disabled] [Enabled]

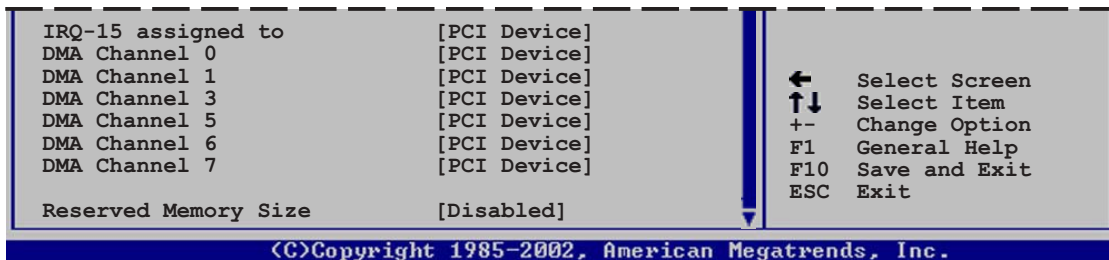
Offboard PCI/ISA IDE Card [Auto]

Allows you to assign a PCI slot to a PCI IDE card, when required.
Configuration options: [Auto] [PCI Slot1] [PCI Slot2] [PCI Slot3] [PCI Slot4]
[PCI Slot5] [PCI Slot6]

IRQ-xx assigned to [PCI Device]

When set to [PCI Device], the specific IRQ is free for use of PCI/PnP devices. When set to [Reserved], the IRQ is reserved for legacy ISA devices. Configuration options: [PCI Device] [Reserved]

Use the arrow down key to scroll down the menu.



DMA Channel X assigned to [PCI Device]

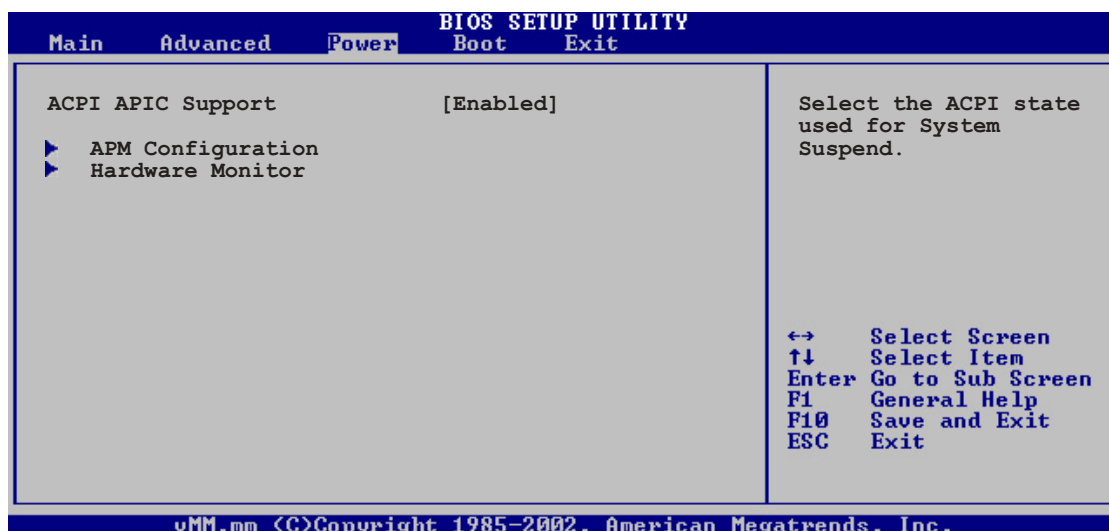
When set to [PCI Device], the specific DMA channel is free for use of PCI/PnP devices. When set to [Reserved], the DMA channel is reserved for legacy ISA devices. Configuration options: [PCI Device] [Reserved]

Reserved Memory Size [Disabled]

Allows you to set the reserved memory size.
Configuration options: [Disabled] [16k] [32k] [64k]

5.5 Power menu

The Power menu items allow you to change the settings for the ACPI and Advanced Power Management (APM) features. Select an item then press <Enter> to display the configuration options.



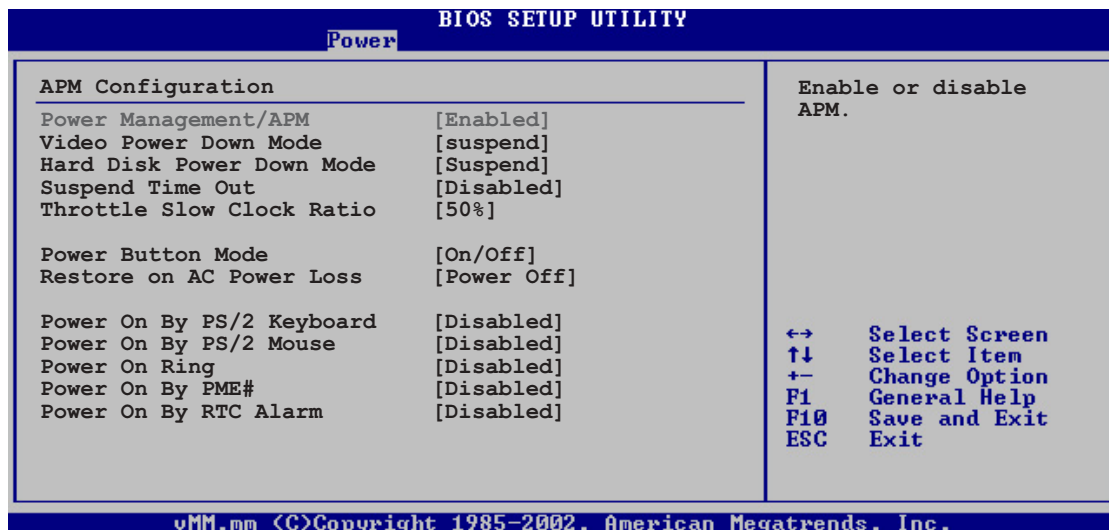
5.5.1 ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Application-Specific Integrated Circuit (ASIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]



Do not change the ACPI APIC support after you have installed the operating system (OS), otherwise, a boot failure may occur.

5.5.2 APM Configuration



Power Management [Enabled]

Allows you to enable or disable the motherboard Advance Power Management (APM) feature. Configuration options: [Enabled] [Disabled]

Video Power Down Mode [Suspend]

Allows you to select the video power down mode
Configuration options: [Disabled] [Standby] [Suspend]

Hard Disk Power Down Mode [Suspend]

Allows you to select the hard disk power down mode
Configuration options: [Disabled] [Standby] [Suspend]

Suspend Time Out [Disabled]

Allows you to select the specified time at which the system goes on suspend mode. Configuration options: [Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [10 Min] [20 Min] [30 Min] [40 Min] [50 Min] [60 Min]

Throttle Slow Clock Ratio [50%]

Allows you to select duty cycle in throttle mode.
Configuration options: [87.5%] [75.0%] [62.5%] [50.0%] [37.5%] [25.0%] [12.5%]

Power Button Mode [On/Off]

Allows the system to go into On/Off mode or suspend mode when the power button is pressed. Configuration options: [On/Off] [Suspend]

Restore on AC Power Loss [Power Off]

When set to Power Off, the system goes into off state after an AC power loss. When set to Power On, the system goes on after an AC power loss. When set to Last State, the system goes into either off or on state, whatever the system state was before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

Power On By PS/2 Keyboard [Disabled]

Allows you to use specific keys on the keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Power On By PS/2 Mouse [Disabled]

When set to [Enabled], this parameter allows you to use the PS/2 mouse to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Power On Ring [Disabled]

When set to [Enabled], the system enables the RI to generate a wake event while the computer is in Soft-off mode.
Configuration options: [Disabled] [Enabled]

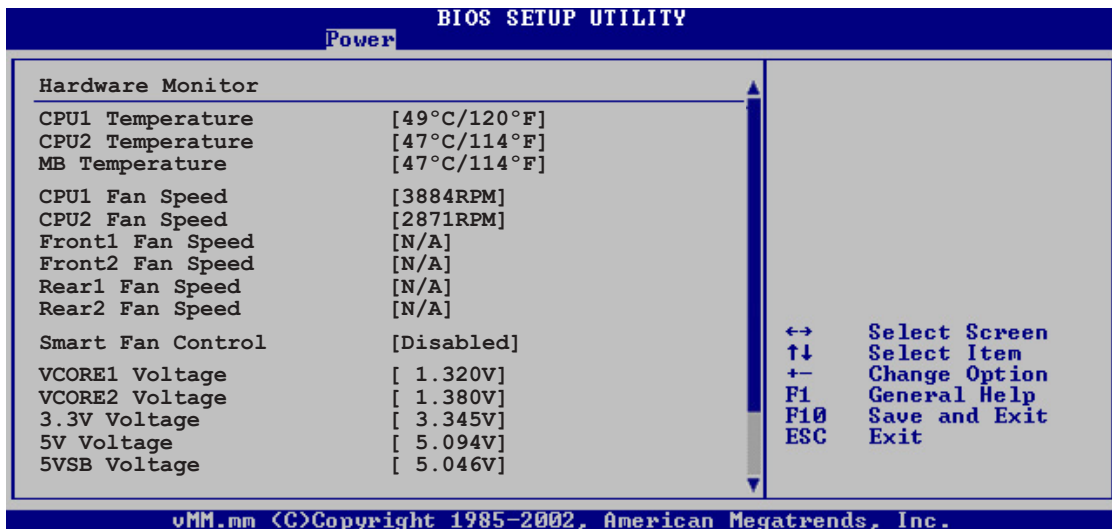
Power On By PME# [Disabled]

When set to [Enabled], the system enables the PME to generate a wake event while the computer is in Soft-off mode.
Configuration options: [Disabled] [Enabled]

Power On By RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to [Enabled], the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values.
Configuration options: [Disabled] [Enabled]

5.5.3 Hardware Monitor



CPU1/CPU2 Temperature [xxx°C/xxx°F] MB Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the motherboard and CPU temperatures. Select [Disabled] if you do not wish to display the detected temperatures.

CPU1/CPU2 Fan Speed [xxxxRPM] or [N/A] Front1/Front2 Fan Speed [xxxxRPM] or [N/A] Rear1/Rear2 Fan Speed [xxxxRPM] or [N/A]

The onboard hardware monitor automatically detects and displays the CPU, front, and rear fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows N/A.

Smart Fan Control [Disabled]

Allows you to enable or disable the ASUS Smart Fan feature that smartly adjusts the fan speeds for more efficient system operation. Configuration options: [Disabled] [Enabled]



The **CPU1 Temperature**, **CPU2 Temperature**, and **Front1 Temperature** items appear when you enable the **Smart Fan Control** feature.

CPU1/CPU2 Temperature [XXX] Front1 Temperature [XXX]

Allows you to set the CPU and system threshold temperature before the Smart Fan Control is disabled.

Use the down arrow key to display additional items.

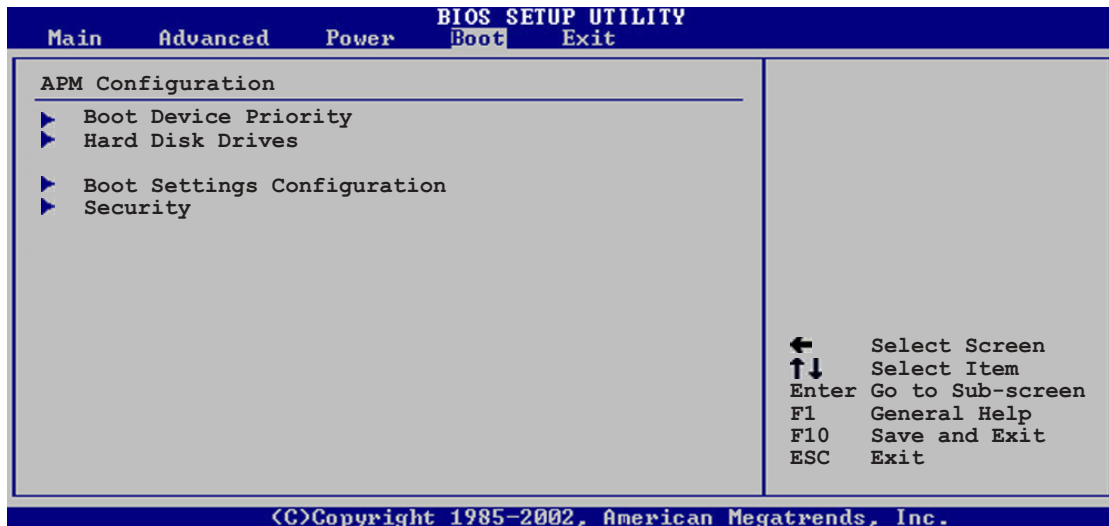


VCORE1 Voltage, VCORE2 Voltage, 3.3V Voltage, 5V Voltage, 5VSB Voltage, VBAT Voltage, 12V Voltage

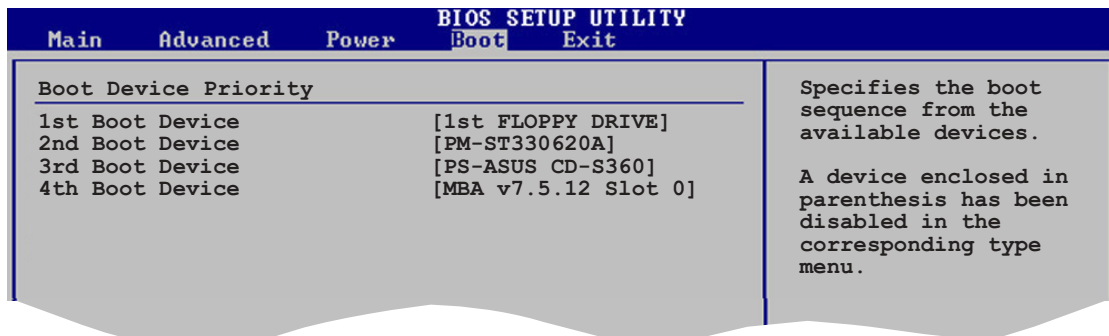
The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.

5.6 Boot menu

The Boot menu items allow you to change the system boot options. Select an item then press <Enter> to display the sub-menu.



5.6.1 Boot Device Priority



1st ~ xxth Boot Device [1st Floppy Drive]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

Configuration options: [xxxxx Drive] [Disabled]

5.6.2 Hard Disk Drives

1st ~ xxth Boot Device [1st Hard Disk Drive]

Allows the user to choose the boot device priority sequence from the available hard disk drives. Configuration options: [xxxxx Drive] [Disabled]

5.6.3 Boot Settings Configuration

BIOS SETUP UTILITY	
Boot	
Boot Settings Configuration	
Quick Boot	[Enabled]
Full Screen Logo	[Enabled]
AddOn ROM Display Mode	[Force BIOS]
Bootup Num-Lock	[On]
PS/2 Mouse Support	[Auto]
Wait For 'F1' If Error	[Enabled]
Hit 'DEL' Message Display	[Enabled]
Interrupt 19 Capture	[Enabled]
Quiet Boot Progress Bar	[Disabled]

Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.

Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.

Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

Allows you to enable or disable the full screen logo display feature.

Configuration options: [Disabled] [Enabled]



Set this item to [Enabled] to use the ASUS MyLogo2™ feature.

Add On ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.

Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.

Configuration options: [Off] [On]

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.

Configuration options: [Disabled] [Enabled] [Auto]

Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for the F1 key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]

Hit 'DEL' Message Display [Enabled]

When set to Enabled, the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

Interrupt 19 Capture [Enabled]

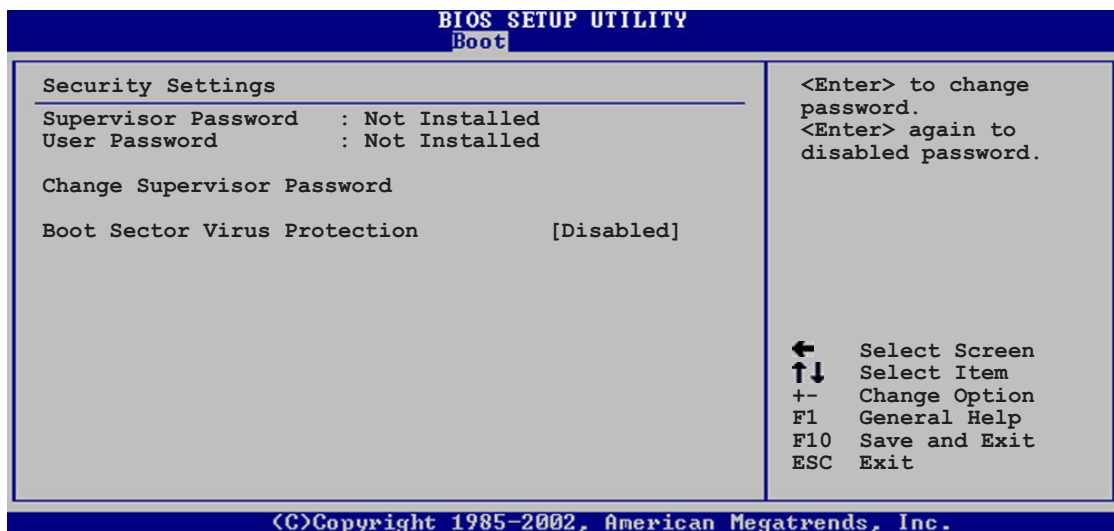
When set to [Enabled], this function allows the option ROMs to trap Interrupt 19. Configuration options: [Disabled] [Enabled]

Quiet Boot Progress Bar [Disabled]

Enables or disables the quiet boot progress bar during POST. Configuration options: [Disabled] [Enabled]

5.6.4 Security

The Security menu items allow you to change the system security settings. Select an item then press <Enter> to display the configuration options.



Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a Supervisor Password:

1. Select the **Change Supervisor Password** item, then press <Enter>.
2. From the password box, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message "Password Installed" appears after you successfully set your password.

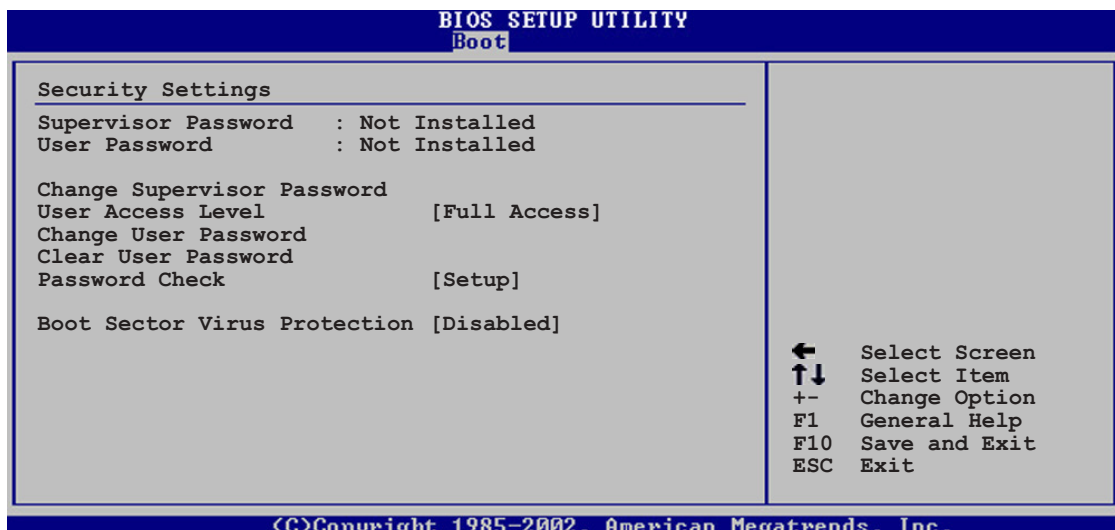
To change the supervisor password, follow the same steps as in setting a user password.

To clear the supervisor password, select the **Change Supervisor Password** then press <Enter>. The message “Password Uninstalled” appears.



If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section “4.2 Jumpers” for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.



User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

No Access prevents user access to the Setup utility.

View Only allows access but does not allow change to any field.

Limited allows changes only to selected fields, such as Date and Time.

Full Access allows viewing and changing all the fields in the Setup utility.

Change User Password

Select this item to set or change the user password. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a User Password:

1. Select the Change User Password item and press <Enter>.
2. On the password box that appears, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message “Password Installed” appears after you set your password successfully.

To change the user password, follow the same steps as in setting a user password.

Clear User Password

Select this item to clear the user password.

Password Check [Setup]

When set to [Setup], BIOS checks for user password when accessing the Setup utility. When set to [Always], BIOS checks for user password both when accessing Setup and booting the system.

Configuration options: [Setup] [Always]

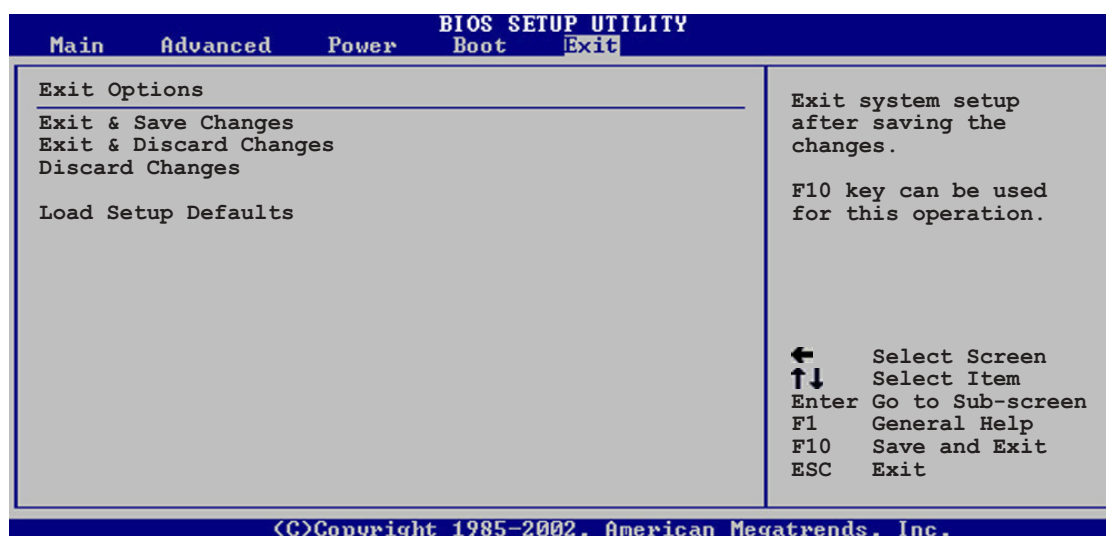
Boot Sector Virus Protection [Disabled]

Allows you to enable or disable the boot sector virus protection.

Configuration options: [Disabled] [Enabled]

5.7 Exit menu

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

Exit & Save Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the computer is turned off. When you select this option, a confirmation window appears. Select **Yes** to save the changes and exit.



If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Press <Enter> to save the changes while exiting.

Exit & Discard Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than System Date, System Time, and Password, the BIOS asks for a confirmation before exiting.

Discard Changes

Allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select **Yes** to discard any changes and load the previously saved values.

Load Setup Defaults

Allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **Yes** to load default values. Select **Exit & Save Changes** or make other changes before saving the values to the non-volatile RAM.

Appendix

This appendix gives information on the standard and redundant power supply that came with the barebone server. This section also provides a troubleshooting guide for solving common problems when using the barebone server.



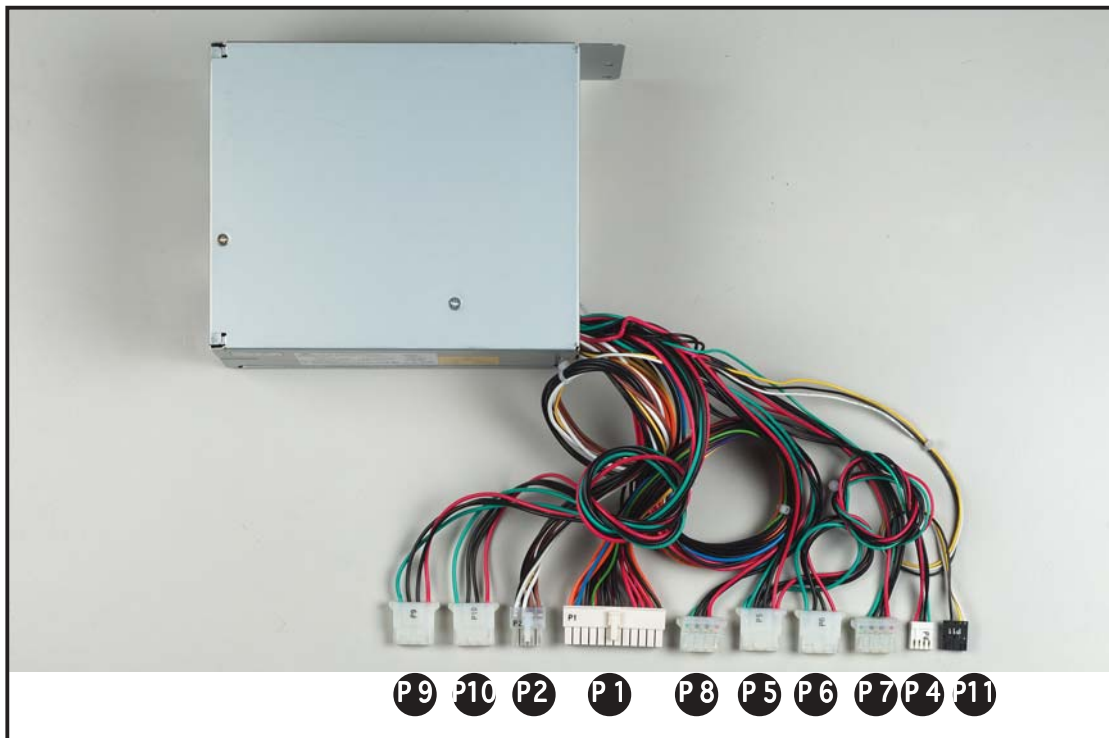
ASUS AP1710-E1

Reference information

A.1 600 W single power supply

A.1.1 General description

The 600 W SSI-type single power supply with universal AC input includes PFC and ATX-compliant output cables and connectors. The power supply has nine plugs labeled P1 to P11 (no P3). Take note of the devices to which you should connect the plugs.



P 9	Peripheral device (available); connect this to the second SCSI/SATA backplane
P 10	Peripheral device (available); connect this to the second SCSI/SATA backplane
P 2	Motherboard 8-pin +12V AUX power connector
P 1	Motherboard 24-pin ATX power connector
P 8	Auxiliary power connector; connect this to the first SCSI/SATA backplane
P 5	Peripheral device (optical drive)
P 6	Peripheral device (available)
P 7	Auxiliary power connector; connect this to the first SCSI/SATA backplane
P 4	Floppy disk drive
P 8	Peripheral device (available)
P 11	Power SMBus connector

A.1.2 Specifications

Input Characteristics

Input Voltage Range

Normal Range 110 to 127 V ~ 10 A

Auto Range 200 to 240 V ~ 5 A

Input Frequency Range 50 Hz to 60 Hz

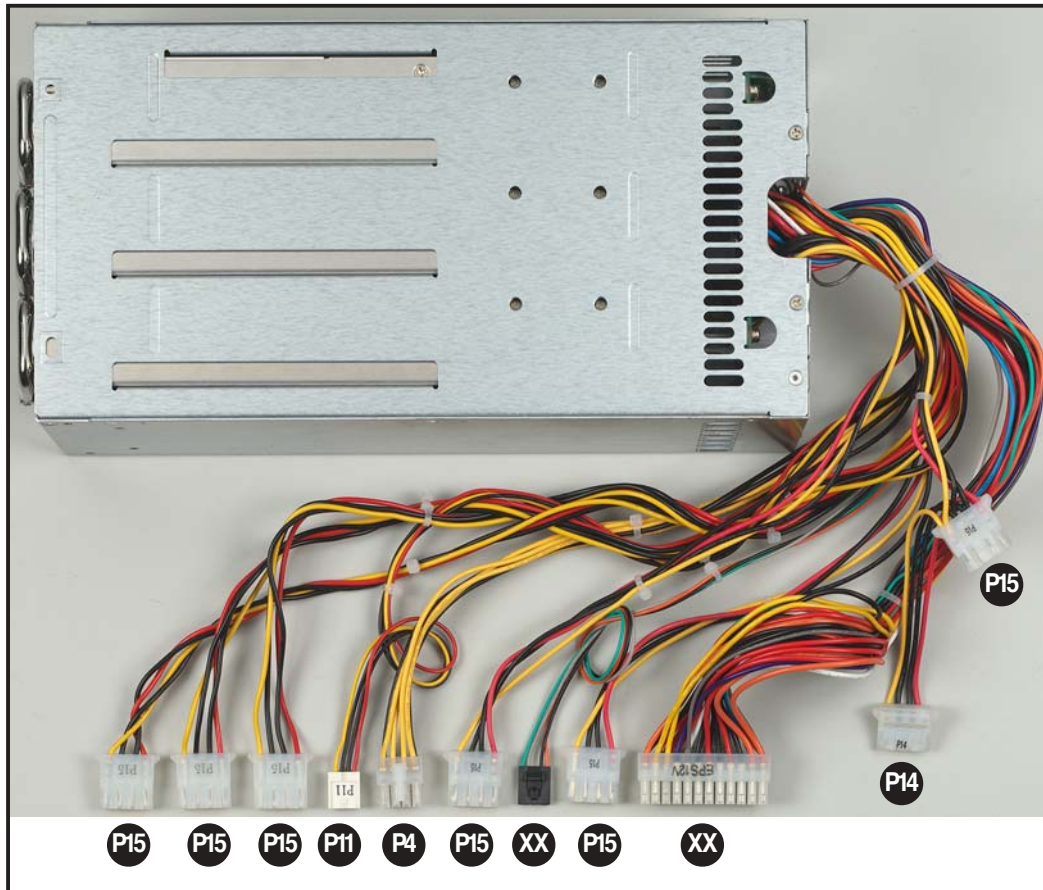
DC Output characteristics

Output Voltage	Max (A)
+3.33V	24
+5V	24
+12V	43
-12V	0.5
-5V	0.5
+5VSB	2.0

A.2 600 W dual/redundant power supply

A.2.1 General description

The 600 W dual/redundant-type power supply has 11 plugs. Take note of the devices that you should connect to the plugs.



XX	Motherboard 24-pin ATX power connector
XX	Power SMBus connector
P 4	Motherboard 4-pin +12V AUX power connector
P 1 1	Floppy disk drive
P 1 4	Peripheral device (available)
P 1 5	Peripheral devices (available)

A.2.2 Specifications

Input characteristics

Input Voltage

Normal Range 100 to 240 Vac

Minimum 90 Vac

Maximum 264 Vac

Input Frequency Range 47Hz to 63Hz

DC Output characteristics

Output Voltage	Max (A)	Max Power (W)
+3.33V	40	580
+5V	50	580
+12V	34	580
-12V	1.0	12
-5V	0.5	2.5
+5VSB	2.0	15

Operating conditions

Efficiency 65 % minimum

Hold-up Time 16 mS

Over Power Protection overloaded to 110 ~ 150 %

Hold-up Time 16 mS

Temperature 104° F to 122° F (40° C - 50° C)

Relative Humidity 20% - 90% non-condensing at 104° F (40° C)

Altitude Sea level to 10,000 ft

Mean Time Between Failures MTBF > 100,000 hours at 25° C

A.3 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	<ol style="list-style-type: none">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	<ol style="list-style-type: none">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
<p>The system continuously beeps after it was turned on</p>	<ol style="list-style-type: none"> 1. Check the memory modules and make sure you installed supported DIMMs. 2. Make sure that the DIMMs are properly installed on the sockets.
<p>The message “Non-system disk or disk error” appears</p>	<ol style="list-style-type: none"> 1. Check if a bootable HDD is active. 2. Check if the HDDs are properly installed.
<p>Network connection not available</p>	<ol style="list-style-type: none"> 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.

