# **JUS®** AP5000 Dual Pentium® II Server Platform

# Installation Guide

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# FCC & DOC COMPLIANCE

#### Federal Communications Commission Statement

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

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

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

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

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

#### **Canadian Department of Communications Statement**

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

## Preface

A Guide to build up the ASUSTeK newer and more powerful server system: **AP5000.** 

The AP5000 uses the P2L97-DS smart motherboard as its base to support dual Pentium II processor. With a built-in AGP slot, the AP5000 can be both a server and workstation. The following introductions will guide you to understand and build up such a best system - AP5000.

Two sections will be introduced as following:

\* Bare-Bone Kits Overview

\* Integration Procedure

# I. INTRODUCTION

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### **Bare-Bone Kits Overview**

This section will show you the component kits of AP5000 including housing, motherboard, CPU card, device drive-bay, back plane board, and slot card.

## HOUSING

The housing of the AP5000 is ivory white. Its front and back view after system assembly is shown below:



Fig 2-1: Front view of housing



#### MOTHERBOARD

The AP5000 uses the P2L97-DS motherboard which is designed to support dual Pentium II processors. For detailed specifications, refer to the P2L97-DS user's manual.



Fig 2-3: P2L97-DS Layout

## **II. BARE-BONE KITS**

## DRIVE BAY

There are two types of drive bays, that could mount, floppy drive, CD-ROM drive and hard disk drive. One type is fixed type and another is removable type which has key-lock feature, refer to the following figures:



Fig 2-4: Fixed type drive bay
 Fig 2-5: Hot-Swap drive bay

## BACK PLANE BOARD

**The ASUS Back Plane Board, DA-BP4 series,** were designed for carrying four removable SCSI devices per Back Plane Board. Normally those removable SCSI drives are installed on the Hot-Swap Drive Bay with a small slot card connected together (Fig 2-7). When the completed drive set plugs in, the slot board of drive Bay and bus of DA-BP4 will be connected together. After that, all the four SCSI-ID of SCSI devices could be managed from the switches of Back Plane Board (Fig 2-6). Moreover there are two models of Back Plane Boards available for none SAF-TE and SAF-TE which are named DA-BP4-1 and DA-BP4-1S. SAF-TE one mounted one more management chip named GEM200RE in which could provide additional status information of device drives (Detail refer to chapter 3).



Fig 2-6: DA-BP4 series Back Plane Board

### SLOT CARD

The ASUS slot card is DA-BC68 which uses for wide SCSI. Its jumpers and connectors are shown on Fig:2-7. It will setup with Hot-Swap drive bay.



Fig 2-7: Jumper & Connector of Slot Card

Items	Functions	Cables Uses	Connect To
Golden Finger	Bus of Slot Card	None	DA-BP4-1S
Power Cable	Power of SCSI drive	None	SCSI drive
SCSI connector	Connector of wide SCS I	68-pin wide SCSI cable	DA-BP4-1S
SCSI_ID (8-pin)	SCSI ID could be managed from DA-BP4-1(S), refer to Fig: 3-28	SCSI_ID cable, 8- wire,	ID jumper of SCSI drive. *Be sure the target SCSI ID is in the right order.
ALED_IN (2-pin)	Jumper of device accessing	ALED_IN cable, 2- wire, (Red/Black)	Access jumper of SCSI drive
PLED (3-pin)	Power LED	PLED cable, 3-wire, (Orange/Black/ Green)	Light-1 of Drive Bay
SLED (3-pin)	Status LED	SLED cable, 3-wire, (Green/Black/Red)	Light-2 of Drive Bay
KEY(2-pin)	Insure the SCSI drive power has been off while Key Lock of Drive Bay being opened. To protect device during hot- swap.	KEY cable, 2-wire, (Black/Red)	Key Lock of Drive Bay

Table 2-1: Jumper of Slot Card with SAF-TE Back Plane Board

# II. BARE-BONE KITS

Items	Functions	Cables Uses	Connect To
Golden Finger	Bus of Slot Card	None	DA-BP4-1
Power Cable	Power of SCSI drive	None	SCSI drive
SCSI connector	Connector of wide SCS I	68-pin wide SCSI cable	DA-BP4-1
SCSI_ID (8-pin)	SCSI ID could be managed from DA-BP4-1(S), refer to Fig: 3-28	SCSI_ID cable, 8- wire,	ID jumper of SCSI drive. *Be sure the target SCSI ID is in the right order.
ALED_IN(2-pin)	None	None	**None
SLED (3-pin)	None	None	**None
PLED (3-pin)	Power LED	PLED cable, 3- wire, (Orange/ Black/Green)	Light-1 of Drive Bay
KEY(2-pin)	Insure the SCSI drive power has been off while Key Lock of Drive Bay being opened. To protect device during hot-swap.	KEY cable, 2-wire, (Black/Red)	Key Lock of Drive Bay

Table 2-2: Jumper of Slot Card with none SAF-TE BackPlane Board

\*\* The ALED\_IN and SLED jumpers of slot card will be no function if the Back Plane Board is none SAF-TE, thus they should not connect any cable on these two jumpers. But the ALED\_IN (from SCSI drive) cable and SLED cable (from Drive Bay) must be connected together directly in order to light up on Light-2 (Fig: 2-8) of Drive Bay during SCSI device access.



Fig 2-8: Indicator Light of Drive Bay

**II. BARE-BONE KITS** 

## **II. BARE-BONE KITS**

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## PROCEDURES

Along with previous product shipping kits, this section will introduce you on how to integrate an AP5000 together, and some of the notices you need to be aware of during installation. The step-by-step procedures have divided to five topics which are System Unit Integration, CPU Card Installation, Cabling, Device Drives, Installation, and Back Plane Board Installation.

## SYSTEM UNIT

System assembly steps are as follows:

- 1. Open cover.
- 2. Remove fan frame.
- 3. Install the motherboard.
- 4. Install the CPU, memory, and add-on cards.

## Opening the cover

Remove the four screws in the back of the system (Fig 3-1). Follow the direction on the cover locker to release (Fig 3-2) and remove the cover of housing (Fig 3-3).



Fig 3-1: Open the cover-locker



Fig 3-2: Release cover lock



Fig 3-3: Remove the cover

#### Inserting the motherboard

Set the system down with on a level surface with the open side facing up. Remove the system fan frame module (Fig 3-4). Put the motherboard support (spacer) in order to balance the power of plugging add-on and CPU cards (Fig 3-5), then place the motherboard into the housing (Fig 3-6). Next, screw the motherboard into the housing (Fig 3-7). Please do not over tighten as this may damage the surface of the motherboard.

Spacer



Fig 3-4: Remove Fan Frame



Fig 3-5: Put in Main Board Spacer



Fig 3-6: Place the motherboard



Fig 3-7: Motherboard installed

# III. INTEGRATION

#### Installing the memory and power I/O cables

Next, install the memory, power cable, serial/parallel/VGA brackets, and HDD/FDD cable (Fig 3-8). For more details about cable paths of device drives, refer to Cabling (p.20).



I/O ports and brackets

**Power connector** 

SCSI hard disk connector

Memory FDD cable connector

Fig 3-8: Installation of Cables, Memory and I/O brackets

## Installing the CPU

Pull back the fan frame (Fig 3-9), and install the CPU (Fig 3-10).



Fig 3-9: Pull back the fan frame

Insert the CPU into the retention module. If you only have one CPU, insert a termination card into the other CPU slot.



Fig 3-10: Insert CPU

# III. INTEGRATION

#### Installing the memory

Insert the SDRAM (168-pin) into the DIMM socket (Fig 3-11).



Fig 3-11: Insert the SDRAM

Installing a VGA or PCI add-on card Insert a VGA or PCI add-on card into the PCI slot.



Fig 3-12: Insert a VGA/ PCI add-on card

**Installing the ATX power switch and other signal pins** Refer to the P2L97-DS user's manual to install the ATX power switch pin, system indicator pin, and IDE device indicator pin. (Fig 3-13).



Secure the power switch next to the FDD with screws (Fig 3-13).



Fig 3-14

**III. INTEGRATION** 

#### Closing the cover

Follow the figures below (Fig 3-15, 3-16, 3-17) to complete the hard-ware installation.



Fig 3-15: CPU and motherboard installed



Fig 3-16: Replace the cover



Fig 3-17: Lock the cover

## CABLING

There are three sets of cables, and their locations are indentified in Fig 3-18 and Fig 3-19.



Fig 3-18: Cable locations



Fig 3-19: Cable Path of Floppy, IDE, CD-ROM, and SCSI

## DRIVE SETUP

To install device drives on fix-type drive bay is quite straight forward, simply by screwing the device, inserting it to housing and down at connecting necessary cables. But for Hot-Swap drive bay, the cables connecting and means of indicator light on drive bay are quite complex. This section shows that the installation of slot card with drive bay, the specification of indicator light, device installation and the recommendation of drive position on the housing.

# **III. Integration Procedures**

#### Installing a slot card

To install a slot card with a Hot-Swap drive bay, there are two types of cabling methods as shown below; One is for SAF-TE back plane boards (Fig: 3-20), another is for none SAF-TE back plane boards (Fig: 3-21).

#### SAF-TE back plane boards

To install SAF-TE one, the five cables should connect to the slot card and the connections on the other end should be; two cables for SCSI device and the other three for drive bay, shown below:



Fig 3-20: Jumper Location & Cabling with SAF-TE Features

## **III. Integration Procedures**

#### NON SAF-TE back plane boards

To install a slot card for a non SAF-TE back plane board, three cables connect to slot card shown below, one (SCSI\_ID) for SCSI device and the other two (KEY and PLED) for drive bay. And for the two unconnected cables; SLED and ALED\_IN cables, they should be connected together, so that the SCSI device access status will present to Light-2 (STATUS LED) of drive bay directly without going through the slot card, because there is no function for this two jumper on slot card if the Back Plane Board is non SAF -TE.



Fig 3-21: Jumper Location & Cabling with non SAF-TE Features

#### Indicator lights

This section shows that the indicator light (Fig 3-22) specification of both Back Plane Board SAF-TE (Table 3-1) and back plane board non SAF-TE (Table 3-2). Also the Key lock is used to insure the power is entirely being off while Key Lock is opened during the process of hot swap.



Fig 3-22: Indicator Light of Drive Bay

Device Status	Indicator Light-1	Indicate Light-2	Color of Light
No Error	OFF	NO	NO
Faulty	ON	OFF	Red
Identify	Alternating Fast Blink (. between Light-1 and Lig	3 /sec) ght-2	Red/Green
Rebuild	OFF	Fast Blink (3/sec)	Green
Rebuild Stopped	OFF	ON	Green
Ready for Insertion/Removal	ON	ON	Yellow
Predicated Fault	Fast Blink (3 /sec)	OFF	Red
Hot Spare	Fast Blink (3 /sec)	Fast Blink (3 /sec)	Yellow
In Failed Array	Fast Blink (3 /sec)	ON	Red/Yellow
In Critical Array	Slow Blink (1 /sec)	OFF	Red

Table 3-1: Device Indicator Specification of SAF-TE

Device Status	Indicator Light-1	Indicate Light-2
Power	ON	OFF
Drive Access	ON	Blink

Table 3-2: Device Indicator Specification of Non SAF-TE

## Installing SCSI devices

Next to previous section, the integrated drive bay shown on Fig: 3-23. Then place the SCSI device on to drive bay and connect necessary cables from both drive bay and slot card to SCSI device including SCSI cable, power cable, access status cable and SCSI ID cable. Especially be sure the 8-pin SCSI ID cable is connecting with correspondent SCSI ID on both SCSI drive and slot card (Fig: 3-24). Finally screw in the SCSI drive with drive bay (Fig: 3-25).



Fig 3-23: Integrated Drive Bay



Fig 3-24: Necessary Cables Connect to SCSI device both Front and Back.



Fig 3-25: Screw in device on Drive Bay

## **Drive locations**

The recommendation of drives location is that first top drive used for floppy, second for CD-ROM and the rest could be used for Hot-Swap drive bays (Fig: 3-26). All the devices either carried on Hot-Swap drive bay or Fixed-Type driver bay, should be inserted to housing from the front of housing.

There are types of front covers for floppy, CD-ROM drive, HDD or nothing installed (refer to Fig-27). Finally after drives are being installed, please close or lock the front door of the AP5000 to protect them.





Fig 3-27: 3 types of drive covers

To remove a drive cover, first release the two retainers on each side of the cover by pressing them in and then out toward the front with a screwdriver (Fig 3-28). Carefully remove the drive cover from the front using a screwdriver (Fig 3-29).







Fig 3-29

# III. Integration Procedures BACK PLANE BOARD INSTALLATION

To install Back Plane Board, first we have to integrate DA-BP4-1(S) with its box, then install on to housing. This section will show you these. Also enclose the specification sets of jumper and switches.

#### Integrating the DA-BP4-1(S)

The ASUS DA-BP4-1(S) contains one SCSI connector that will connect to on-board SCSI port of AP5000, and its back has four PCI slots connecting to slot card of drive bay to support 4 SCSI drives. There is a box come with the Back Plane Board for mounting it onto the housing. Below will show the DA-BP4-1(S) with the box.



Fig 3-30: Front-Site View of DA-BP4-1(S) & Switches Specification



Per Back Plane Board contains 4 slots to support 4 SCSI drives and it will connect to Slot Card of Drive Bay.

Fig 3-31: Back-Site View of DA-BP4-1(S)



Fig 3-32: DA-BP4-1(S) with Box together

#### Integrating with the housing

The housing could carry two Back Plane Boards to support eight SCSI drives in total, and the first Back Plane Board has to be placed on lower position of housing (Fig 3-33) and its two notches should connect to the openings housing with no space in between (Fig 3-34), so that it could enlarge the force while inserting the drive bay. The second Back Plane Board also has to use similar method mentioned above for the connection. Next, fix them by screwing in the back and front of hosing as shown in Fig 3-35. Finally connect SCSI cables and power cables to the Back Plane Boards, and fix the SCSI cable on the cable clamps to prevent the conflict of removal or installation of Fan Frame (Fig 3-36)

#### Connecting the SCSI cables

If you are installing one back plane board into the system, connect the SCSI cable connector to the on-board SCSI connector directly.

If you are installing two back plane boards into the system, insert another SCSI card and connect the two SCSI cables to it.



Fig 3-33: Place the first back plane board outside in the system from the front door.



Fig 3-34: Installing the second back plane board



Fig 3-35: Secure the two back plane boards onto the chassis

## **III. Integration Procedures**



Fig 3-36: Be sure the cable clamps are fixed.

#### Installing the disk drive bay to the back plane board

Lift the hold bar up to a  $45^{\circ}$  angle (Fig 3-37).

Push in firmly to ensure that the bay is connected to the back plane board (Fig 3-38).



Fig 3-37



Fig 3-38

# III. Integration Procedures POWER SUPPLY UNIT





#### Replacements

For a defective power system:

- 1. Remove the side cover (Fig 3-40).
- 2. Remove the power cable from the cable clamp (Fig 3-41).
- 3. Unscrew the six screws (Fig 3-42).
- 4. Carefully remove the power supply from the left side (Fig 3-43).





## **III. Integration Procedures**



Fig: 3-41

Remove Driver



Fig: 3-42



Fig: 3-43

#### For a defective module:

- 1. Locate the defective module. Continuous beeping from the power supply indicates that there is a defective module.
- 2. To stop the beeping sound, press the red button located on the power supply (Fig 3-44).
- 3. Unscrew the screw and release the module (Fig 3-45).
- 4. Grab the module handle and pull the power supply out towards you (Fig 3-46).
- 5. Replace with a new module.
- 6. Secure the new module with screws.



**Reset Button** 

Fig: 3-44



Fig: 3-45

# **III. Integration Procedures**



Fig: 3-46

**ASUS AP5000 Installation Guide** 

**III. Integration** Remove Driver