

---

## Chapter 2

# Hardware Installation

This chapter gives you a step-by-step procedure on how to install your system. Follow each section accordingly.



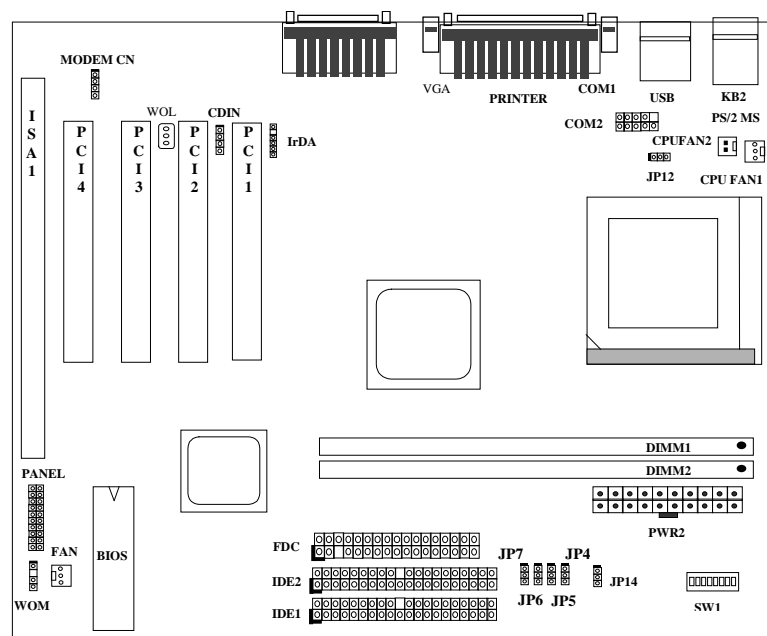
**Caution:** *Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a system component.*

1. *Do not remove a component from its protective packaging until you are ready to install it.*
2. *Wear a wrist ground strap and attach it to a metal part of the system unit before handling a component. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.*

# Hardware Installation

## 2.1 Jumper and Connector Locations

The following figure shows the locations of the jumpers and connectors on the system board:



## Hardware Installation

---

### Jumpers:

<b>SW1:</b>	DIP Switch for CPU voltage and clock ratio
<b>JP4, JP5, JP6, JP7</b>	CPU external clock
<b>JP12:</b>	CPU I/O Voltage
<b>JP14:</b>	Clear CMOS

### Connectors:

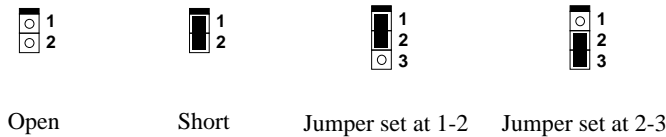
<b>PS2:</b>	PS/2 mouse connector
<b>KB:</b>	PS/2 keyboard connector
<b>COM1:</b>	COM1 connector
<b>COM2:</b>	COM2 connector
<b>PRINTER:</b>	Printer connector
<b>PWR2:</b>	ATX power connector
<b>USB:</b>	USB connector
<b>FDC:</b>	Floppy drive connector
<b>IDE1:</b>	IDE1 primary channel
<b>IDE2:</b>	IDE2 secondary channel
<b>VGA:</b>	VGA connector
<b>CPUFAN1:</b>	CPU fan connector
<b>CDUFAN2:</b>	CPU fan connector
<b>FAN:</b>	Fan connector
<b>IrDA:</b>	IrDA (Infrared) connector
<b>PANEL:</b>	Front panel (Multifunction) connector
<b>CD-IN:</b>	CD-audio connector
<b>MODEM-CN:</b>	Mono in (Pin 1-2) and Mic out (Pin 3-4)
<b>WOM:</b>	0V Wake On Modem connector
<b>WOL:</b>	Wake On LAN connector

# Hardware Installation

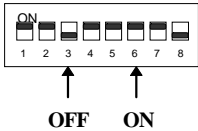
## 2.2 Jumpers

Jumpers are made by pin headers and plastic connecting caps for the purpose of customizing your hardware. Doing so requires basic knowledge of computer hardware, be sure you understand the meaning of the jumpers before you change any setting. The onboard jumpers are normally set to their default with optimized settings.

On the mainboard, normally there is a bold line marked beside pin 1 of the jumper, sometimes, there are numbers also. If we connect (short) plastic cap to pin 1 and 2, we will say set it at 1-2, and when we say jumper is open, that means no plastic cap connected to jumper pins.



For your convenience to install a CPU, this motherboard also use a DIP switch to set CPU voltage and frequency ratio. The following figure simply shows you how to set this DIP switch, please see also to next sections for more details.

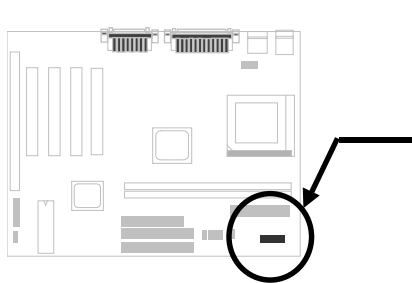


# Hardware Installation

## 2.2.1 Setting the CPU Voltage

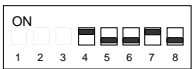
<u>S4</u>	<u>S5</u>	<u>S6</u>	<u>S7</u>	<u>S8</u>	<u>Vcore</u>
ON	ON	ON	ON	OFF	3.52V
OFF	ON	ON	ON	OFF	3.45V
OFF	OFF	ON	ON	OFF	3.2V
ON	OFF	OFF	ON	OFF	2.9V
OFF	OFF	OFF	ON	OFF	2.8V
OFF	OFF	ON	OFF	OFF	2.4V
ON	ON	OFF	OFF	OFF	2.3V
OFF	ON	OFF	OFF	OFF	2.2V

**SW1** is used to select CPU core voltage (Vcore) and ratio, there are totally eight switches on the DIP. After installing CPU, remember to set the switch 4-8 to specify a proper Vcore.



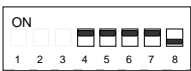
**3.2V**

K6-233



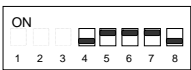
**2.9V**

K6-166/200 or M2



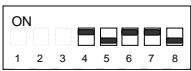
**3.52V**

6x86 or K5



**3.45V**

P54C



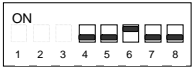
**3.3V**

IDT C6



**2.8V**

P55C (MMX)



**2.4V**

K6-2 400/450 and K6-III



**2.2V**

K6-266/300 or K6-2

## Hardware Installation

The following table lists possible settings of current CPU available on the market. Note that the correct setting may vary because of new CPU product, please see to your CPU specification for more details.

CPU	Type	Vcore	S4	S5	S6	S7	S8
INTEL P54C	Single Voltage	3.45V	OFF	ON	ON	ON	OFF
INTEL P55C	Dual Voltage	2.8V	OFF	OFF	OFF	ON	OFF
AMD K5	Single Voltage	3.52V	ON	ON	ON	ON	OFF
AMD K6-166/200	Dual Voltage	2.9V	ON	OFF	OFF	ON	OFF
AMD K6-233	Dual Voltage	3.2V	OFF	OFF	ON	ON	OFF
AMD K6-266/300	Dual Voltage	2.2V	OFF	ON	OFF	OFF	OFF
AMD K6-2	Dual Voltage	2.2V	OFF	ON	OFF	OFF	OFF
AMD K6-2 400/450	Dual Voltage	2.4V	OFF	OFF	ON	OFF	OFF
AMD K6-III	Dual Voltage	2.4V	OFF	OFF	ON	OFF	OFF
Cyrix 6x86	Single Voltage	3.52V	ON	ON	ON	ON	OFF
Cyrix 6x86L	Dual Voltage	2.8V	OFF	OFF	OFF	ON	OFF
Cyrix M2	Dual Voltage	2.9V	ON	OFF	OFF	ON	OFF
IDT C6	Single Voltage	3.52V	ON	ON	ON	ON	OFF
		3.3V	ON	OFF	ON	ON	OFF



**Warning:** This high performance MX59 Pro motherboard that AOpen presented to you has a capability to overclock to 124MHz external clock while still conforming the design guide from VIA. This overclock scheme is accomplished by AOpen's technical expertise as well as manufacturing capabilities. However, please understand that some of the add-on cards might not work with this board properly when overclock scheme is engaged. Please use designated speed when you encountered such a problem.

**Warning:** Note that overclocking may cause thermal problem. Please make sure that the cooling fan and the heatsink were adequate to dissipate excessive heat that's generated by overclocking the CPU.



**Tip:** Normally, for single voltage CPU, Vcpuio (CPU I/O Voltage) is equal to Vcore, but for CPU that needs dual voltage such as PP/MT (P55C) or Cyrix 6x86L, Vcpuio is different from Vcore and must be set to Vio (PBSRAM and Chipset Voltage). The single or dual voltage CPU is automatically detected by hardware circuit.

**Tip:** For supporting more different CPUs in future, this motherboard uses five switches to specify Vcore. There are

## Hardware Installation

*32 settings totally, and the range is from 1.3V to 3.5V.*

This motherboard supports the CPU core voltage from 1.3V to 3.5V, that can be applied to various CPUs in the future. For your reference, all settings are listed in the following table.

<b><u>Vcore</u></b>	<b><u>S4</u></b>	<b><u>S5</u></b>	<b><u>S6</u></b>	<b><u>S7</u></b>	<b><u>S8</u></b>
1.30V	OFF	OFF	OFF	OFF	ON
1.35V	ON	OFF	OFF	OFF	ON
1.40V	OFF	ON	OFF	OFF	ON
1.45V	ON	ON	OFF	OFF	ON
1.50V	OFF	OFF	ON	OFF	ON
1.55V	ON	OFF	ON	OFF	ON
1.60V	OFF	ON	ON	OFF	ON
1.65V	ON	ON	ON	OFF	ON
1.70V	OFF	OFF	OFF	ON	ON
1.75V	ON	OFF	OFF	ON	ON
1.80V	OFF	ON	OFF	ON	ON
1.85V	ON	ON	OFF	ON	ON
1.90V	OFF	OFF	ON	ON	ON
1.95V	ON	OFF	ON	ON	ON
2.00V	OFF	ON	ON	ON	ON
2.05V	ON	ON	ON	ON	ON
2.1V	ON	OFF	OFF	OFF	OFF
2.2V	OFF	ON	OFF	OFF	OFF
2.3V	ON	ON	OFF	OFF	OFF
2.4V	OFF	OFF	ON	OFF	OFF
2.5V	ON	OFF	ON	OFF	OFF
2.6V	OFF	ON	ON	OFF	OFF
2.7V	ON	ON	ON	OFF	OFF
2.8V	OFF	OFF	OFF	ON	OFF
2.9V	ON	OFF	OFF	ON	OFF
3.0V	OFF	ON	OFF	ON	OFF
3.1V	ON	ON	OFF	ON	OFF
3.2V	OFF	OFF	ON	ON	OFF
3.3V	ON	OFF	ON	ON	OFF
3.4V	OFF	ON	ON	ON	OFF
3.5V	ON	ON	ON	ON	OFF

## Hardware Installation

### 2.2.2 Selecting the CPU Frequency

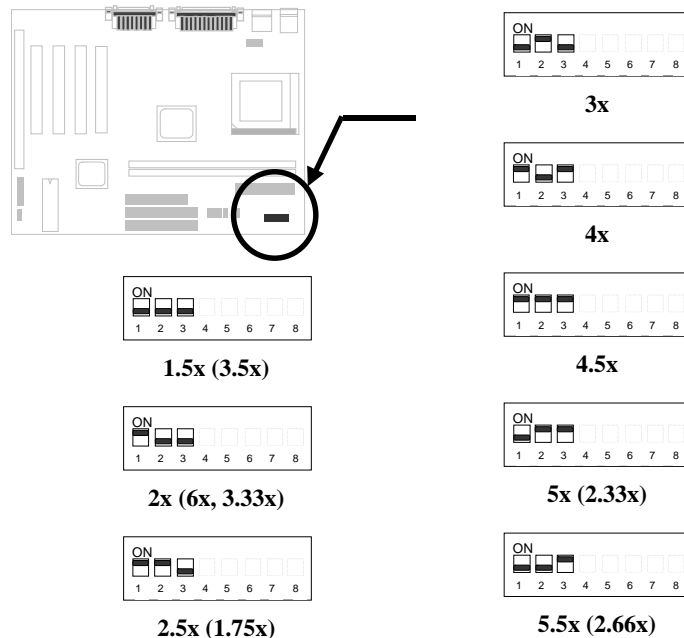
S1	S2	S3	CPU Frequency Ratio
OFF	OFF	OFF	1.5x (3.5x)
ON	OFF	OFF	2x (6x, 3.33x)
ON	ON	OFF	2.5x (1.75x)
OFF	ON	OFF	3x
ON	OFF	ON	4x
ON	ON	ON	4.5x
OFF	ON	ON	5x (2.33x)
OFF	OFF	ON	5.5x (2.66x)

Intel Pentium, Cyrix 6x86 and AMD K5/K6 CPU are designed to have different Internal (Core) and External (Bus) frequency. The ratio of Core/Bus frequency is selected by the switch 1-3 of **SW1**.



**Note:** Intel PP/MT MMX 233MHz is using 1.5x jumper setting for 3.5x frequency ratio, and AMD PR166 is using 2.5x setting for 1.75x frequency ratio.

**Core frequency = Ratio \* External bus clock**



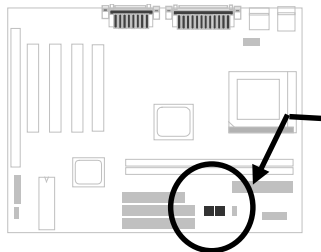


## Hardware Installation

JP4	JP5	JP6	JP7	CPU	PCI
2-3	2-3	2-3	1-2	60MHz	30MHz
1-2	2-3	2-3	1-2	66.8MHz	33.4MHz
2-3	1-2	2-3	1-2	70MHz	35MHz
1-2	1-2	2-3	1-2	75MHz	25MHz
2-3	2-3	2-3	2-3	75MHz	37.5MHz
2-3	2-3	1-2	1-2	80MHz	28.7MHz
1-2	2-3	2-3	2-3	80MHz	40MHz
1-2	2-3	1-2	1-2	83.3MHz	27.7MHz
2-3	1-2	2-3	2-3	83.3MHz	41.7MHz
2-3	1-2	1-2	1-2	95.3MHz	31.6MHz
1-2	1-2	1-2	1-2	100MHz	33.3MHz
1-2	1-2	2-3	2-3	105MHz	35MHz
2-3	2-3	1-2	2-3	110MHz	36.7MHz
1-2	2-3	1-2	2-3	115MHz	38.3MHz
2-3	1-2	1-2	2-3	120MHz	40MHz
1-2	1-2	1-2	2-3	124MHz	41.3MHz

**JP4, JP5 and JP6** are the selections of CPU external clock (bus clock), which is actually the clock from clock generator.

**JP4, JP5, JP6 and JP7** are the selections of CPU external clock (bus clock) and PCI Clock.

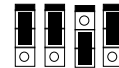


JP4 JP5 JP6 JP7



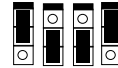
CPU:60MHz;  
PCI:30MHz

JP4 JP5 JP6 JP7



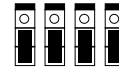
CPU:75MHz;  
PCI:25MHz

JP4 JP5 JP6 JP7



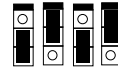
CPU:66.8MHz;  
PCI:33.4MHz

JP4 JP5 JP6 JP7



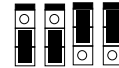
CPU:75MHz;  
PCI:37.5MHz

JP4 JP5 JP6 JP7



CPU:70MHz;  
PCI:35MHz

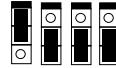
JP4 JP5 JP6 JP7



CPU:80MHz;  
PCI:28.5MHz

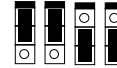
## Hardware Installation

JP4 JP5 JP6 JP7



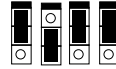
CPU:80MHz;  
PCI:40MHz

JP4 JP5 JP6 JP7



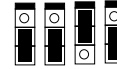
CPU:105MHz;  
PCI:35MHz

JP4 JP5 JP6 JP7



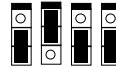
CPU:83.3MHz;  
PCI:27.7MHz

JP4 JP5 JP6 JP7



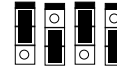
CPU:110MHz;  
PCI:36.7MHz

JP4 JP5 JP6 JP7



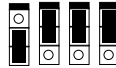
CPU:83.3MHz;  
PCI:41.7MHz

JP4 JP5 JP6 JP7



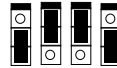
CPU:115MHz;  
PCI:38.3MHz

JP4 JP5 JP6 JP7



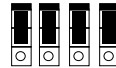
CPU:95.3MHz;  
PCI:31.6MHz

JP4 JP5 JP6 JP7



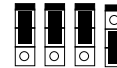
CPU:120MHz;  
PCI:40MHz

JP4 JP5 JP6 JP7



CPU:100MHz;  
PCI:33.3MHz

JP4 JP5 JP6 JP7



CPU:124MHz;  
PCI:41.3MHz



**Warning:** VIA MVP4 chipset supports maximum 100MHz external CPU bus clock, the higher settings are for internal test only, **selecting these settings exceeds the specification of MVP4 chipset, which may cause serious system damage.**

**Warning:** While 100/105/110/112/115/120/124MHz is selected, we strongly recommend choosing PC100 SDRAM for system stability.

## Hardware Installation



**Caution:** The following table lists possible settings of current CPU available on the market. The correct setting may vary because of new CPU product, refer to your CPU specification for more details.

INTEL Pentium	CPU Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP4,JP5,JP6,JP7
P54C 100	100MHz =	1.5x	66MHz	OFF	OFF	OFF	1-2 & 2-3 & 2-3 & 1-2
P54C 133	133MHz =	2x	66MHz	ON	OFF	OFF	1-2 & 2-3 & 2-3 & 1-2
P54C 166	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 2-3 & 2-3 & 1-2
P54C 200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 2-3 & 2-3 & 1-2

INTEL Pentium MMX	CPU Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP4,JP5,JP6,JP7
PP/MT 166	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 2-3 & 2-3 & 1-2
PP/MT 200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 2-3 & 2-3 & 1-2
PP/MT 233	233MHz =	3.5x	66MHz	OFF	OFF	OFF	1-2 & 2-3 & 2-3 & 1-2

Cyrix 6x86 & 6x86L	CPU Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP4,JP5,JP6,JP7
P166+	133MHz =	2x	66MHz	ON	OFF	OFF	1-2 & 2-3 & 2-3 & 1-2
P200+	150MHz =	2x	75MHz	ON	OFF	OFF	1-2 & 1-2 & 2-3 & 1-2

Cyrix M2	CPU Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP4,JP5,JP6,JP7
MX-PR200	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 2-3 & 2-3 & 1-2
	150MHz =	2x	75MHz	ON	OFF	OFF	1-2 & 1-2 & 2-3 & 1-2
MX-PR233	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 2-3 & 2-3 & 1-2
	166MHz =	2x	83.3MHz	ON	OFF	OFF	1-2 & 2-3 & 1-2 & 1-2
MX-PR266	233MHz =	3.5x	66MHz	OFF	OFF	OFF	1-2 & 2-3 & 2-3 & 1-2
MX-PR300	225MHz =	3x	75MHz	OFF	ON	OFF	1-2 & 1-2 & 2-3 & 1-2
	233MHz =	3.5x	66MHz	OFF	OFF	OFF	1-2 & 2-3 & 2-3 & 1-2

IDT C6	CPU Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP4,JP5,JP6,JP7
C6-150	150MHz =	2x	75MHz	ON	OFF	OFF	1-2 & 1-2 & 2-3 & 1-2
C6-200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 2-3 & 2-3 & 1-2

AMD K5	CPU Core	Ratio	External	S1	S2	S3	JP4,JP5,JP6,JP7
--------	----------	-------	----------	----	----	----	-----------------

## Hardware Installation

	Frequency		Bus Clock				
PR100	100MHz =	1.5x	66MHz	OFF	OFF	OFF	1-2 & 2-3 & 2-3 & 1-2
PR133	100MHz =	1.5x	66MHz	OFF	OFF	OFF	1-2 & 2-3 & 2-3 & 1-2
PR166	116MHz =	1.75x	66MHz	ON	ON	OFF	1-2 & 2-3 & 2-3 & 1-2

AMD K6	CPU Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP4,JP5,JP6,JP7
K6-166	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 2-3 & 2-3 & 1-2
K6-200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 2-3 & 2-3 & 1-2
K6-233	233MHz =	3.5x	66MHz	OFF	OFF	OFF	1-2 & 2-3 & 2-3 & 1-2
K6-266	266MHz=	4x	66MHz	ON	OFF	ON	1-2 & 2-3 & 2-3 & 1-2
K6-300	300MHz=	4.5x	66MHz	ON	ON	ON	1-2 & 2-3 & 2-3 & 1-2

AMD K6-2	CPU Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP4,JP5,JP6,JP7
K6-2 300	300MHz	3x	100MHz	OFF	ON	OFF	1-2 & 1-2 & 1-2 & 1-2
K6-2 333	333MHz	3.5x	95MHz	OFF	OFF	OFF	2-3 & 1-2 & 1-2 & 1-2
K6-2 350	350MHz	3.5x	100MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2 & 1-2
K6-2 366	366MHz	5.5x	66MHz	OFF	OFF	ON	1-2 & 2-3 & 2-3 & 1-2
K6-2 380	380MHz	4x	95MHz	ON	OFF	ON	2-3 & 1-2 & 1-2 & 1-2
K6-2 400	400MHz	4x	100MHz	ON	OFF	ON	1-2 & 1-2 & 1-2 & 1-2
K6-2 450	450MHz	4.5x	100MHz	ON	ON	ON	1-2 & 1-2 & 1-2 & 1-2
K6-2 475	475MHz	5x	95MHz	OFF	ON	ON	2-3 & 1-2 & 1-2 & 1-2
K6-III 400	400MHz	4x	100MHz	ON	OFF	ON	1-2 & 1-2 & 1-2 & 1-2
K6-III 450	450MHz	4.5	100MHz	ON	ON	ON	1-2 & 1-2 & 1-2 & 1-2



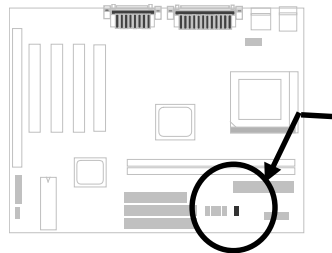
**Note:** Cyrix 6x86, 6x86MX (M2) and AMD K5 CPU use P-rating for the reference of CPU benchmark compared with INTEL P54C, their internal core frequency is not exactly equal to P-rating marked on the CPU. For example, Cyrix P166+ is 133MHz but performance is almost equal to P54C 166MHz and AMD PR133 is 100MHz but performance is almost equal to INTEL P54C 133MHz.

## Hardware Installation

### 2.2.3 Clearing the CMOS

<b>JP14</b>	<b>Clear CMOS</b>
1-2	Normal operation (default)
2-3	Clear CMOS

You need to clear CMOS if you forget your system password. To clear the CMOS, follow the procedures listed below:



**JP14**



Normal Operation  
(default)

**JP14**



Clear CMOS

#### The procedure to clear CMOS:

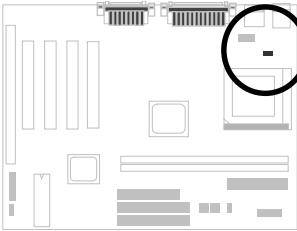
1. Turn off the system and unplug the AC power.
2. Remove ATX power cable from connector PWR2.
3. Locate **JP14** and short pins 2-3 for a few seconds.
4. Return **JP14** to its normal setting by shorting pins 1-2.
5. Connect ATX power cable back to connector PWR2.
6. Turn on the system power.
7. Press **DEL** during bootup to enter the BIOS Setup Utility and specify a new password, if needed.

# Hardware Installation

## 2.2.4 I/O Voltage

<b>JP12</b>	<b>I/O Voltage</b>
1-2	3.32V
2-3	3.45V

**JP12** is reserved for testing purposes only. This jumper enables you to set the voltage of the onboard chipset and PBSRAM (Vio). For dual-voltage CPU, JP12 also functions as CPU I/O voltage (Vcpuio) controller.



**JP12**



3.32V

**JP12**



3.45 V

## Hardware Installation

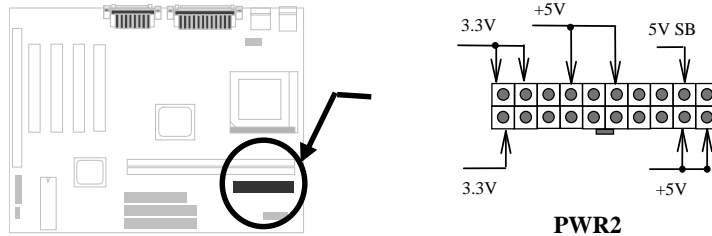
### 2.3 Connectors

#### 2.3.1 Power Cable

The ATX power supply uses 20-pin connector shown below. Make sure you plug in the right direction.



**Caution:** Make sure that the power supply is off before connecting or disconnecting the power cable.



#### 2.3.2 Fan Connectors

The CPU fan connectors are marked as **CPUFAN1** and **CPUFAN2** on the system board. You can plug the CPU fan cable to both the 2-pin fan connector CPUFAN2 and the 3-pin fan connector CPUFAN1. And **FAN** connector can be used to connect housing fan. Note that only CPUFAN1 and FAN support the fan monitoring function, because 3-pin fan has an extra pin called SENSE, which periodically sends fan signal out.

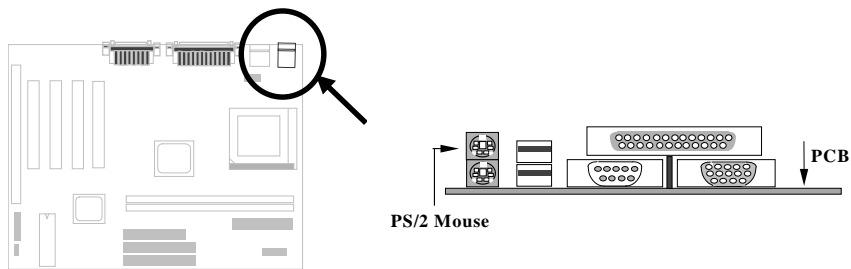


## Hardware Installation

---

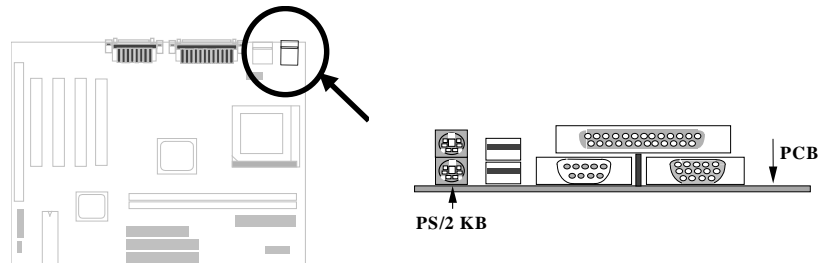
### 2.3.3 PS/2 Mouse

The onboard PS/2 mouse connector is a 6-pin Mini-Din connector marked **PS2**. The view angle of drawing shown here is from back panel of the housing.



### 2.3.4 Keyboard

The onboard PS/2 keyboard connector is a 6-pin Mini-Din connector marked **KB2**. The view angle of drawing shown here is from back panel of the housing.



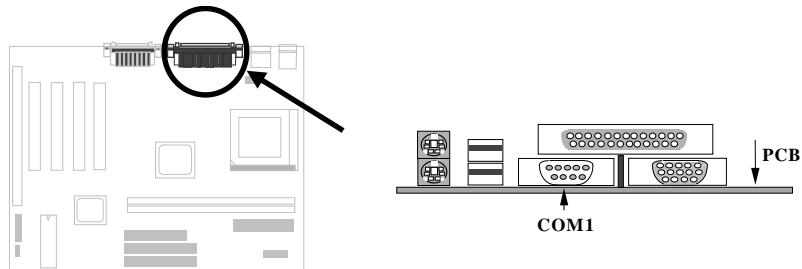


## Hardware Installation

### 2.3.5 VGA (AGP)

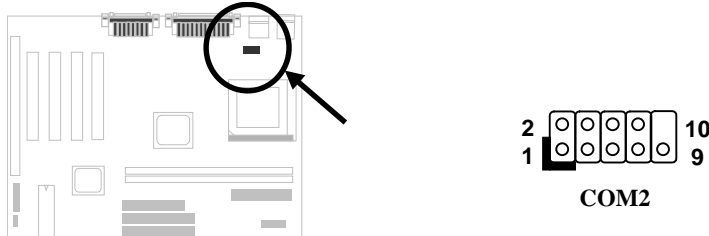
#### 2.3.5 Serial Devices (COM1)

The onboard serial connector **COM1** is a 9-pin D-type connector on the back panel of the mainboard.



#### 2.3.6 Serial Devices (COM2)

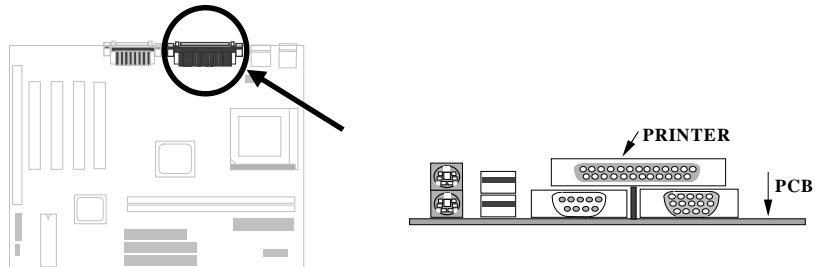
Plug in the 10-pin flat cable to the **COM2** connectors.



#### 2.3.7 Printer

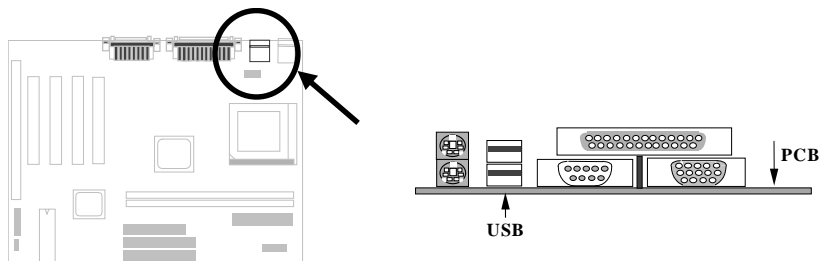
The onboard printer connector is a 25-pin D-type connector marked **PRINTER**. The view angle of drawing shown here is from back panel of the housing.

## Hardware Installation



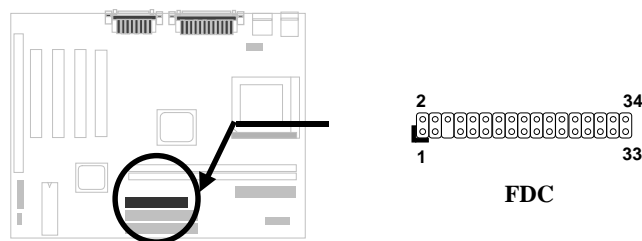
### 2.3.8 USB Device

You can attach USB devices to the USB connector. The motherboard contains two USB connectors, which are marked as **USB**.



### 2.3.9 Floppy Drive

Connect the 34-pin floppy drive cable to the floppy drive connector marked as **FDC** on the system board.



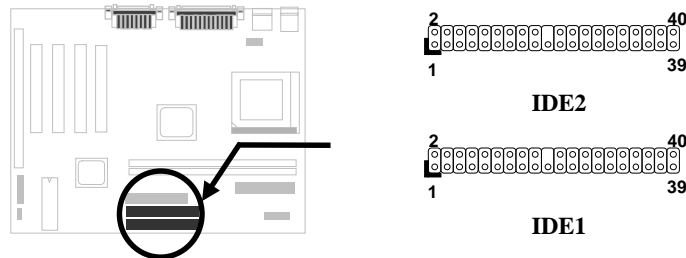
## Hardware Installation

### 2.3.10 IDE Hard Disk and CD ROM

This mainboard supports two 40 pin IDE connectors marked as **IDE1** and **IDE2**. IDE1 is also known as primary channel and IDE2 as secondary channel, each channel supports two IDE devices that makes total of four devices.

In order to work together, the two devices on each channel must be set differently to master and slave mode, either one can be hard disk or CDROM. The setting as master or slave mode depends on the jumper on your IDE device, please refer to your hard disk and CDROM manual accordingly.

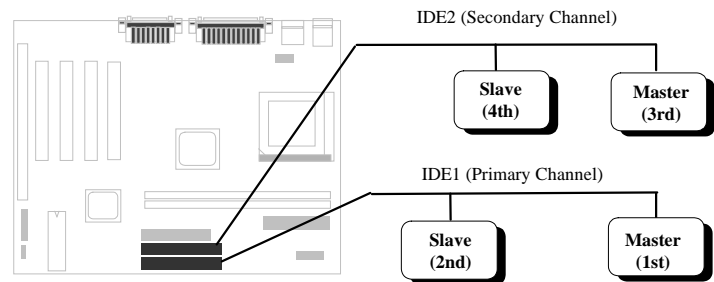
Connect your first IDE hard disk to master mode of the primary channel. If you have second IDE device to install in your system, connect it as slave mode on the same channel, and the third and fourth device can be connected on secondary channel as master and slave mode respectively.



**Caution:** The specification of IDE cable is maximum 46cm (18 inches), make sure your cable does not exceed this length.

**Caution:** For better signal quality, it is recommended to set far end side device to master mode and follow the suggested sequence to install your new device. Please refer to the following figure.

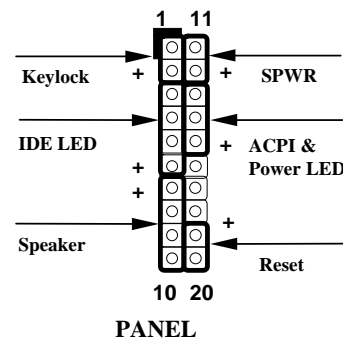
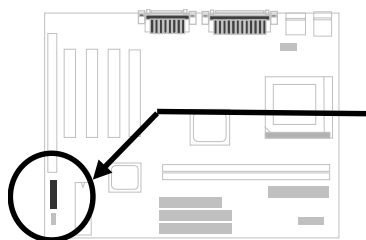
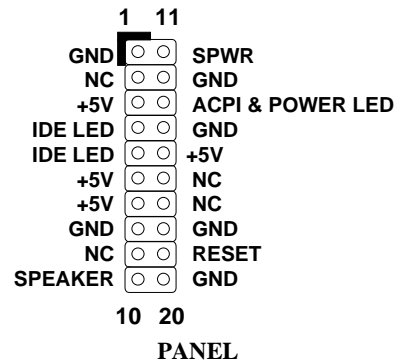
# Hardware Installation



## 2.3.11 Panel Connector

The Panel (multifunction) connector is a 20-pin connector marked as **PANEL** on the board. Attach the power LED, keylock, speaker, SPWR, IDE LED and reset switch to the corresponding pins as shown in the figure.

If your ATX housing supports ACPI specification, the ACPI & Power the LED will keep flashing if you have enabled "suspend mode" item in the BIOS Setup.



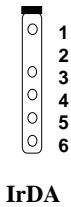
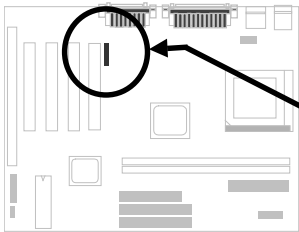
# Hardware Installation

## 2.3.12 IrDA Connector

The IrDA connector can be configured to support wireless infrared module, with this module and application software such as Laplink or Win95 Direct Cable Connection, user can transfer files to or from laptops, notebooks, PDA and printers. This connector supports HPSIR (115.2Kbps, 2 meters), ASK-IR (56Kbps) and Fast IR (4Mbps, 2 meters).

Install infrared module onto **IrDA** connector and enable infrared function from BIOS setup, make sure to have correct orientation when you plug onto IrDA connector.

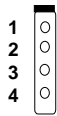
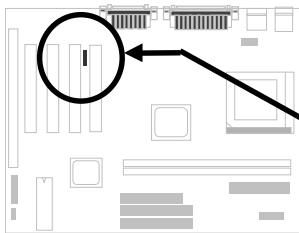
Pin	Description
1	+5V
2	NC
3	IRRX
4	GND
5	IRTX
6	NC



IrDA

## 2.3.13 CD Audio Connector

This connector is used to connect CD audio cable.



CDIN

# Hardware Installation

## 2.3.14 Mono In/Mic Out Connector

This connector is used to connect Mono In/Mic Out connector of an internal modem card. The pin 1-2 is **Mono In**, and the pin 3-4 is **Mic Out**. Please note that there is no standard for this kind of connector yet, only some internal modem cards implement this connector.

Please see the pin definitions to connect the cable.

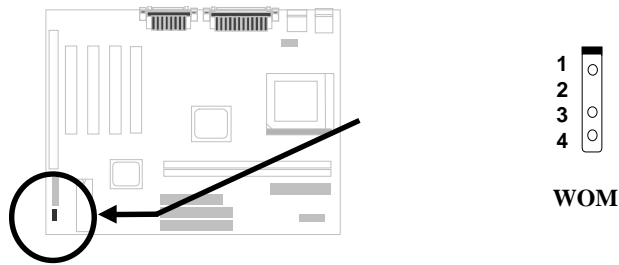
Pin	Description
1	Mono In
2	GND
3	GND
4	Mic Out



## 2.3.15 Wake on Modem Connector

This mainboard implements special circuit to support Wake on Modem, both Internal Modem Card (AOpen MP56) and external box Modem are supported. Since Internal Modem card consumes no power when system power is off, it is recommended to use Internal Modem. To use AOpen MP56, connect 4-pin cable from **RING** connector of MP56 to **WOM** connector on the mainboard.

Pin	Description
1	+5V SB
2	NC
3	RING
4	GND

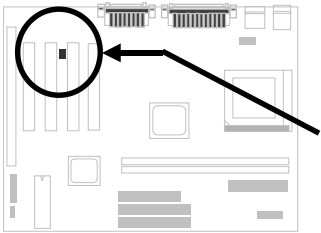


# Hardware Installation

## 2.3.16 Wake on LAN Connector

This mainboard implements a **WOL** connector. To implement Wake on LAN, you need a network card that supports this feature. In addition, you also need to install a network management software.

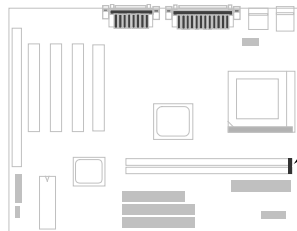
<u>Pin</u>	<u>Description</u>
1	+5V SB
2	GND
3	LID



WOL

## Hardware Installation

### 2.4 Configuring the System Memory



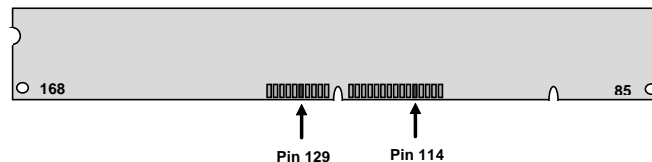
This mainboard has two 168 pin DIMM sockets (Dual-in-line Memory Module) that allow you to install system memory up to **512MB**.

The DIMM supported by this motherboard are always 64-bit wide SDRAM, which can be identified by the following factors:

- I. **Size:** single side, 1Mx64 (8MB), 2Mx64 (16MB), 4Mx64 (32MB), 8Mx64 (64MB), 16Mx64 (128MB), and double side, 1Mx64x2 (16MB), 2Mx64x2 (32MB), 4Mx64x2 (64MB), 8Mx64x2 (128MB).



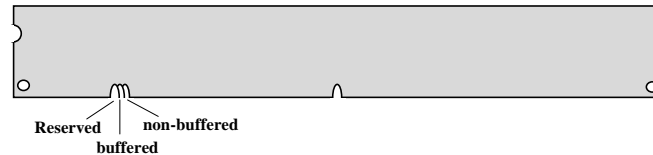
**Tip:** Here is a trick to check if your DIMM is single-side or double-side -- if there are traces connected to golden finger pin 114 and pin 129 of the DIMM, the DIMM is probably double-side; otherwise, it is single-side. The following figure is for your reference.



- II. **Speed:** Normally marked as -12, which means the clock cycle time is 12ns and maximum clock of this SDRAM is 83MHz. Sometimes you can also find the SDRAM marked as -67, which means maximum clock is 67MHz.
- III. **Buffered and non-buffered:** This motherboard supports non-buffered DIMMs. You can identify non-buffered DIMMs and buffered DIMMs according to the position of the notch, the following figure is for your reference:



## Hardware Installation



Because the positions are different, only non-buffered DIMMs can be inserted into the DIMM sockets on this motherboard. Although most of DIMMs on current market are non-buffered, we still suggest you to ask your dealer for the correct type.

- IV. 2-clock and 4-clock signals:** Although both of 2-clock and 4-clock signals are supported by this motherboard, we strongly recommend choosing a 4-clock SDRAM in consideration of reliability.



**Tip:** To identify 2-clock and 4-clock SDRAM, you may check if there are traces connected to golden finger pin 79 and pin 163 of the SDRAM. If there are traces, the SDRAM is probably 4-clock; Otherwise, it is 2-clock.

- V. Parity:** This motherboard supports standard 64 bit wide (without parity) and 72-bit wide (with parity) DIMM modules.

There is no jumper setting required for the memory size or type. It is automatically detected by the system BIOS. This motherboard supports maximum **512MB** system memory.

DIMM1	Size of DIMM1
None	0MB
8MB	8MB
16MB	16MB
32MB	32MB
64MB	64MB
128MB	128MB

DIMM2	Size of DIMM2
None	0MB
8MB	8MB
16MB	16MB
32MB	32MB
64MB	64MB
128MB	128MB

**Total Memory Size = Size of DIMM1 + Size of DIMM2**



**Caution:** There are some old DIMMs made by EDO or FPM memory chip, they can only accept 5V power and probably can not fit into the DIMM socket, make sure you have 3.3V true SDRAM DIMM before your insert it.

## Hardware Installation

---

The driving capability of new generation chipset is limited because the lack of memory buffer (to improve performance). This makes DRAM chip count an important factor to be taking into consideration when you install SIMM. Unfortunately, there is no way that BIOS can identified the correct chip count, you need to calculate the chip count by yourself. The simple rule is: By visual inspection, use only SIMM with chip count less than 24 chips.

There is an important parameter affects SDRAM performance, CAS Latency Time. It is similar as CAS Access Time of EDO DRAM and is calculated as number of clock state. The SDRAM that AOpen had tested are listed below. If your SDRAM has unstable problem, go into BIOS "Chipset Features Setup", change CAS Latency Time to 3 clocks.

Manufacturer	Model	Suggested CAS Latency Time	5V Tolerance
Samsung	KM416511220AT-G12	2	Yes
NEC	D4S16162G5-A12-7JF	2	No
Hitachi	HM5216805TT10	2	No
Fujitsu	81117822A-100FN	2	No
TI	TMX626812DGE-12	2	Yes
TI	TMS626812DGE-15	3	Yes
TI	TMS626162DGE-15	3	Yes
TI	TMS626162DGE-M67	3	Yes

## Hardware Installation

The following table lists the recommended DRAM combinations:

DIMM Data chip	Bit size per side	Single/Double side	Chip count	DIMM size	Recommended
1M by 16	1Mx64	x1	4	8MB	Yes
1M by 16	1Mx64	x2	8	16MB	Yes
2M by 8	2Mx64	x1	8	16MB	Yes
2M by 8	2Mx64	x2	16	32MB	Yes
4M by 16	4Mx64	x2	8	64MB	Yes
4M by 16	4Mx64	x1	4	32MB	Yes
8M by 8	8Mx64	x1	8	64MB	Yes
8M by 8	8Mx64	x2	16	128MB	Yes

DIMM Data chip	Bit size per side	Single/Double side	Chip count	DIMM size	Recommended
2M by 32	2Mx64	x1	2	16MB	Yes, but not tested.
2M by 32	2Mx64	x2	4	32MB	Yes, but not tested.

The following table lists possible DRAM combinations that is **NOT** recommended:

DIMM Data chip	Bit size per side	Single/Double side	Chip count	DIMM size	Recommended
4M by 4	4Mx64	x1	16	32MB	No
4M by 4	4Mx64	x2	32	64MB	No
16M by 4	16Mx64	x1	16	128MB	No