

Chapter 2 System Board

This chapter describes the system board and all its major components, including:

- Details about the system board layout
- Jumper and connector locations and functions
- Jumper settings

The AcerPower 4100 system board is a high-performance all-in-one system board that supports the Intel Pentium II with MMX(Multimedia eXtensions) technology and the Celeron processors. Both processors come in a card design and capable of handling multimedia functions as well as enhancing the performance of 32-bit applications. The only difference is that Pentium II comes with 256- or 512-KB second-level cache already integrated. The Celeron processor is Intel Pentium II's cost-down solution; thus, it may come without or with 128-KB second-level cache.

The system board has three 168-pin DIMM (Double In-line Memory Module) sockets that accept PC-66 or PC-100 DIMMs with 16-, 32-, 64- and 128-MB capacities, with or without ECC (Error Correction Coding) feature. The system memory is upgradable to 384 MB.

The board also incorporates a 3-D video controller with AGP (Accelerated Graphics Port), 4-MB SGRAM (Synchronous Graphics Random Access Memory), a 3-D ISA audio controller, a 10/100Base-TX Ethernet controller, and an AOL (Alert-on LAN) chip.

Onboard I/O (input/output) interfaces are comprised of a UART (Universal Asynchronous Receiver-Transmitter) 16C550 serial port, a parallel port with SPP (Standard Parallel Port)/ECP (Extended Capabilities Port)/EPP (Enhanced Parallel Port), and PS/2 keyboard and mouse ports. Two USB (Universal Serial Bus) interfaces, one VGA (Video Graphics Accelerator) port, and one audio connector for AIO board are also added to the system design to enable it to support multimedia functions. For expansion, the board comes with one riser card that supports three PCI and four ISA (shared) slots.

Special features such as ACPI (Advanced Configuration and Power Management Interface) support, PnP (Plug-and-Play) support, APM (Advanced Power Management), Wireless Communication, Hardware Monitoring, Modem Ring-in, Alert-on LAN (Local Area Network), and Alert-on LAN functions are also supported. These functions are individually discussed in this chapter.

The system is fully compatible with MS-DOS V6.X, OS/2, SCO UNIX, Windows NT, and Windows 95/98 operating systems.

2.1 Major Components

The system board has the following major components:

- A CPU (Central Processing Unit) connector that supports Pentium II processors running from 233 - 450 MHz and Celeron processors (Slot 1) running from 300 - 366 MHz
- Supports 256- or 512-KB PBSRAM (PBSRAM - Pipelined-burst Synchronous Random Access Memory) second-level cache (incorporated in Pentium II)
- Three DIMM sockets that accept PC-66/PC-100 16-, 32-, 64-, and 128-MB Standard DRAMs, with or without Parity Check or Error Correction Code (ECC) feature. These sockets allow memory upgrade of up to 384 MB
- AGP PCI local bus IDE (Integrated Device Electronics) controller
- PCI-ISA bridge controller
- 3-D ISA audio controller
- AGP-compliant 3-D video graphics accelerator with 4-MB SGRAM
- 10/100Base-TX Ethernet controller
- AOL controller
- One Alert/Wake-on LAN connector
- One Hardware Monitoring ASIC
- Two PCI enhanced IDE interfaces that support up to four IDE devices
- One FDD interface

- External ports
 - PS/2 keyboard and mouse ports
 - One buffered high-speed serial port
 - One SPP/ECP/EPP high-speed parallel port
 - Two USB ports
 - One Ethernet port
 - One standard VGA port
 - One audio connector for AIO daughterboard that includes:
 - ◆ One Microphone-in port
 - ◆ One Line-in port
 - ◆ One Line-out port
 - ◆ One Game/MIDI port
- One slot for riser card that supports
 - Four ISA slots
 - Three PCI slots (shared)

2.2 Layout

Figure 2-1 shows the locations of the major components on the system board.

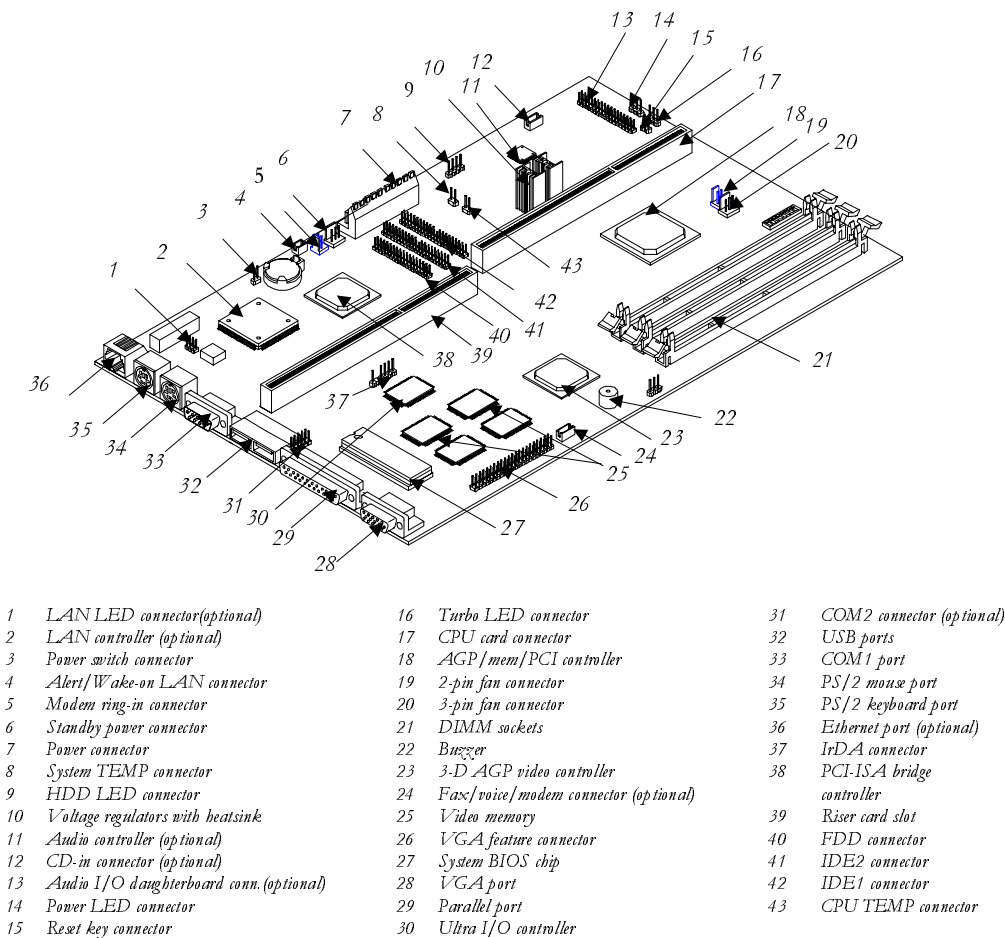


Figure 2-1 System Board Layout

2.3 Jumpers and Connectors

2.3.1 Jumper and Connector Locations

Figure 2-2 shows the jumper and connector locations.

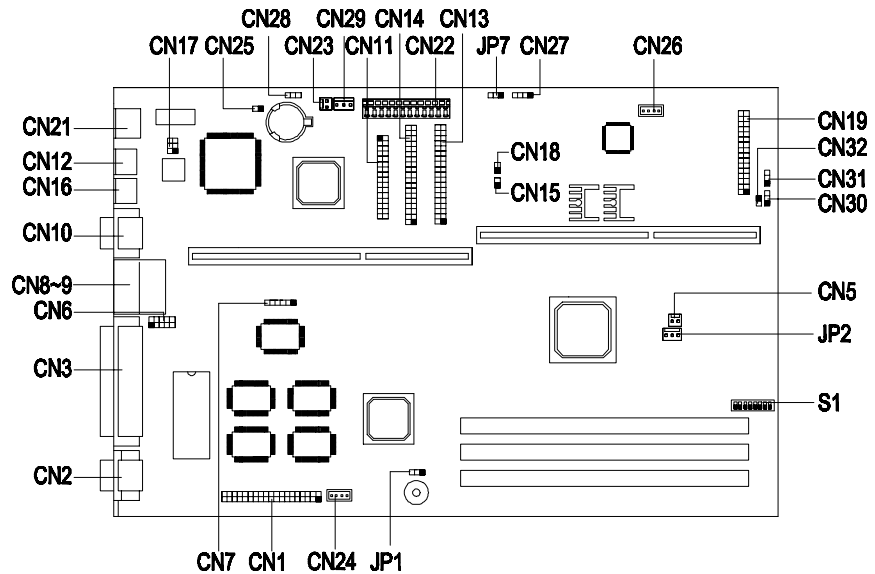


Figure 2-2 Jumper and Connector Locations



The shaded pin indicates pin 1.

2.3.2 Jumper Settings

The following table lists the possible jumper settings:

Table 2-1 Jumper Settings

Jumper		Setting	Function	
JP1		1-2* 2-3	VGA IRQ Assignment Disabled Enabled	
JP7		1-2 2-3*	Hardware Monitor Disabled Enabled	
S1 Settings				
Switch No.		Setting	Function	
1		On Off*	Bus Frequency 66 MHz 100 MHz	
2		On* Off	Password Function Bypass password Check password	
3		On Off*	BIOS Logo OEM Acer	
4		On* Off	Audio Chip + Onboard Not onboard	
5 On On Off Off On On Off Off	6 On Off On Off On On On Off	7 On On On On Off Off Off Off	8 On On On On On On On On	CPU/Bus Frequency Ratio 2 3 4 5 2.5 3.5 4.5 5.5

* default

+ Preset by the manufacturer and must not be changed.

2.3.3 Onboard Connectors

Table 2-2 lists the onboard connectors.

Table 2-2 Onboard Connectors

Connector	Function
CN1	Feature connector
CN2	VGA port
CN3	Parallel port
CN5	2-pin fan connector
CN6	Optional COM2 connector
CN7	IrDA connector
CN8/CN9	USB ports
CN10	COM1 port
CN11	FDD connector
CN12	PS/2 keyboard port
CN13	IDE1 connector
CN14	IDE2 connector
CN15	CPU temperature sensor connector
CN16	PS/2 mouse port
CN17	LAN LED connector
CN18	System temperature sensor connector
CN19	Audio I/O daughterboard connector
CN21	Ethernet port
CN22	Power connector
CN23	Modem ring-in connector
CN24	Fax/voice/modem connector
CN25	Power switch connector

Table 2-2 Onboard Connectors (continued)

Connector	Function
CN26	CD-in connector
CN27	HDD LED connector
CN28	Alert/Wake-on LAN connector
CN29	Standby power connector
CN30	Turbo LED connector
CN31	Power LED connector
CN32	Reset key connector
JP2	3-pin fan connector

2.4 Floppy Disk\IDE Hard Disk Support

The board comes with an enhanced PCI IDE controller that supports PIO mode 4 and Ultra DMA (Direct Memory Access) mode data transfers. Two PCI IDE interfaces are mounted on board to enable the system to support a maximum of four IDE hard disks, or any other IDE devices. See Figure 2-2 for the location of the IDE interfaces.

Connect the cables according to the IDE hard disk configuration in Table 2-3. Follow the instructions in section 4.4 on how to install a hard disk in the system.

Table 2-3 IDE Hard Disk Configuration

IDE Connector	Master	Slave
IDE1 (CN13)	Hard disk 0	Hard disk 1
IDE2 (CN14)	Hard disk 2/ IDE CD-ROM drive	Hard disk 3

The onboard PCI-ISA bridge controller offers an interface for 2-mode or 3-mode floppy disk drive. An LS-120 drive may also be connected to the system via the onboard FDD interface.

2.5 Video Function

The onboard video controller is capable not only of enhancing video display, but supporting 3-D video applications as well. The video controller features the Accelerated Graphics Port (AGP) design - the latest bus architecture that is considered to be the best solution for 3-D applications. AGP offers greater bandwidth; thus, it is capable of speeding up the VGA bus in order to meet the requirement of 3-D applications.

The board may come with 4-MB video memory. Larger video memory allows you to display higher resolutions and more colors.

The following table lists the video resolutions supported by the onboard VGA:

Table 2-4 Supported Video Resolutions

Resolution	Refresh Rate (Hz)	Horizontal Freq. (KHz)	Pixel Clock (MHz)
320 x 200	70	31.5	12.6
320 x 240	60	31.5	12.6
400 x 300	60	37.9	20.0
512 x 384	70	31.5	21.2
640 x 350	70	31.5	25.2
640 x 400	70	31.5	25.2
640 x 480	60	31.5	25.2
640 x 480	72	37.4	32.0
640 x 480	75	37.5	31.5
640 x 480	85	43.3	36.0
640 x 480	90	48.0	39.9
640 x 480	100	52.9	44.9

Table 2-4 Supported Video Resolutions (continued)

Resolution	Refresh Rate (Hz)	Horizontal Freq. (KHz)	Pixel Clock (MHz)
640 x 480	120	63.7	55.0
640 x 480	160	81.0	70.0
640 x 480	200	100.2	81.0
800 x 600	48	33.8	36.0
800 x 600	56	35.2	36.0
800 x 600	60	37.8	39.9
800 x 600	70	44.5	44.9
800 x 600	72	48.0	50.0
800 x 600	75	46.69	49.5
800 x 600	85	53.7	56.2
800 x 600	90	57.1	56.6
800 x 600	100	62.5	67.5
800 x 600	120	76.1	81.0
800 x 600	160	101.9	110.0
800 x 600	200	125.9	135.0
1024 x 768	43	35.5	44.9
1024 x 768	60	48.4	65.0
1024 x 768	70	56.5	75.0
1024 x 768	72	58.2	75.0
1024 x 768	75	60.0	78.8
1024 x 768	85	68.7	94.5
1024 x 768	90	76.2	100.0
1024 x 768	100	79.0	110.0
1024 x 768	120	96.7	130.0
1024 x 768	140	113.1	157.5
1024 x 768	150	120.6	160.0
1152 x 864	43	45.9	65.0
1152 x 864	47	44.9	65.0
1152 x 864	60	54.9	80.0

Table 2-4 Supported Video Resolutions (continued)

Resolution	Refresh Rate (Hz)	Horizontal Freq. (KHz)	Pixel Clock (MHz)
1152 x 864	70	66.1	100.0
1152 x 864	75	75.1	110.0
1152 x 864	80	76.4	110.0
1152 x 864	85	77.1	121.5
1152 x 864	100	90.2	135.0
1152 x 864	120	108.6	172.0
1152 x 864	75	68.7	100.0
1280 x 1024	43	50.0	80.0
1280 x 1024	47	50.0	80.0
1280 x 1024	60	64.0	110.0
1280 x 1024	70	74.6	126.0
1280 x 1024	74	78.9	135.0
1280 x 1024	75	80.0	135.0
1280 x 1024	85	91.2	157.5
1280 x 1024	90	96.2	160.0
1280 x 1024	100	106.4	172.0
1600 x 1024	76	81.3	170.4
1600 x 1200	52	68.0	135.0
1600 x 1200	58	75.0	135.0
1600 x 1200	60	76.2	156.0
1600 x 1200	66	82.7	172.0
1600 x 1200	72	89.7	194.0
1600 x 1200	75	93.8	202.0
1600 x 1200	76	95.2	198.0
1600 x 1200	86	106.2	229.5



You may disable the onboard video function in the BIOS Utility. For more details on BIOS, see Chapter 3.

2.6 Audio Function (Optional)

The board comes with a 3-D audio controller and an audio I/O daughterboard connector. The audio I/O daughterboard integrates the following ports:

- Mono microphone port
- Stereo line-in port
- Stereo line-out port
- Game/MIDI port

These connectors enable the system to accommodate external audio devices. For instructions on how to connect the external audio devices, refer to section 1.3.6. Connecting Multimedia Components.

2.7 USB

USB (Universal Serial Bus) is a new serial bus design that is capable of cascading low-/medium-speed peripherals (less than 12 Mbps) such as a keyboard, mouse, joystick, scanner, printer and modem/ISDN. With USB, complex cable connections at the back panel of your PC can be eliminated.

The board comes with two USB ports (CN8, CN9). See Figure 2-1 or Figure 2-2 for the location of the ports.

2.8 Hardware Monitoring Function

The onboard Hardware Monitoring controller is capable of checking the system health status, either locally or in a computer network, by using software such as Intel LDCM (LAN Desk Client Manager). It monitors the system voltage, CPU temperature, and CPU fan. If any of these system parameters exceed the pre-defined range, an SMI (System Management Interrupt) will let BIOS generate an alert message and send this message to the Management

software, either locally or remotely. This early-stage system failure detection can prevent system from abnormal shutdown.

The system voltage is monitored via a routed trace to the hardware monitoring ASIC. The CPU temperature and fan speed are monitored via the 3-pin speed-detection fan with a two-pin thermistor. Also, it is required that the fan/sink should be connected to JP2 and CN15 on the system board. See Figure 2-2 for the location of these connectors and Figure 4-24 for the fan/sink connection.

For information on Management software (e.g., LDCM or ADM), refer to the documentation that came with your software.

2.9 Modem Ring-in Function

The Modem Ring-in function enables the system to resume from suspend mode by monitoring the fax/modem (or any device of similar type) activities. Any signal or activity detected from the Modem ring-in connector automatically returns the system to normal operation. Refer to Figure 2-2 for the location of the Modem ring-in connector (CN23) on the system board.

2.10 LAN Function

The system supports LAN connection by integrating a 10/100 Base-TX Ethernet controller and an RJ45 network port.

AcerPower 4100 uses a PS/2-type SPS (Switch Power Supply) which provides a 5V/1A standby power via the onboard connector CN29 (see Figure 2-2 for the location of the connectors). The onboard LAN relies on this standby power for its operation. Once it receives a “magic packet”¹, the system automatically wakes up. These magic packets are sent via Management software that supports remote wake-up capability.

In the absence of an onboard Ethernet controller, LAN function can be supported via the onboard Alert/Wake-on LAN connector (CN28 - see Figure 2-2). This connector is

¹ Magic packet is defined as a 16 bit "0000000001111111" header + NIC card MAC (media control access) address. This packet passes through the Ethernet wire. Once received by the LAN chip and an identical MAC address has been detected, the LAN chip will start the AOL process.

reserved for NICs (Network Interface Cards). The NIC also relies on the system board's standby power for operations such as checking for magic packets. Once it receives a magic packet, a PME (Power Management Event) automatically goes to the AOL connector to inform the system to wake up.

The system BIOS supports LSA (LanDesk Service Agent) which allows AcerPower to boot from a remote PXE (pre-boot execution environment) server by TFTP (Trivial File Transfer Protocol).

2.11 Wireless Communication Support (Optional)

The board comes with an infrared (IrDA) interface for Wireless Communication function (CN7). This function enables the system to communicate with SIR-aware peripherals without the aid of cables. See Figure 2-1 or Figure 2-2 for the location of the IrDA connector.

The supported Wireless Communication function complies with the IrDA specification, i.e., it is capable of supporting 115.2 kilobits per second (Kbps) data transfer rate at a maximum distance of one meter.

2.12 Alert on Lan (AOL) Function (Optional)

The system comes with an onboard AOL controller. This enables the network server to monitor your system's hardware and software health status. Once an error event is detected from your system, AOL generates and sends alert messages to the remote server via the onboard LAN chip, to notify the administrator. The events monitored by the AOL chip includes:

- Hardware monitoring (for details, see section 2.8)
- LAN connection
- POST (Power-on Self Test) error

- System heartbeat failure/timeout

AOL supports different network protocols such as IP and IPX, and is compatible with various PC management software such as LDCM. The current version of LDCM (LANDesk Client Manager) Client and Administrator applications feature the AOL managed client and management server functions, respectively.