

MAT-830

Socket 478 Pentium 4
Intel 845G 5.25" SBC

USER'S MANUAL

Version 1.0

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Introduction

Product Description

MAT-830 Pentium 4 5.25" embedded board incorporates the Intel® advanced 845G Chipset Memory Controller hub and supports 478-pin Intel Pentium 4 processors of 1.3GHz and up to 3.06GHz+ with FSB 533MHz/400MHz. MAT-830 supports the Pentium 4 processor with 256-KB L2 cache and the Pentium 4 processor with 512-KB L2 cache on 0.13 micron process.

The I/O functions are on MAT-830 integrated onto the ICH4. It supports either the integrated graphics device (IGD) on the GMCH. The IGD has 3D, 2D, and video capabilities. The system memory size can be up to 2 GB, using the two DDR sockets on board. Four USB ports are supported with the USB 1.1/2.0 standard.

MAT-830 supports TV out and LVDS with the use of the Chronitel CH7017 display controller device which accepts two digital graphics input data streams. One data stream outputs through an LVDS transmitter to an LCD panel, while the other data stream is encoded for NTSC or PAL TV and outputs through a 10-bit high speed DAC. The TV encoder device encodes a graphics signal up to 1024x768 resolution and outputs the video signals according to NTSC or PAL standards. The LVDS transmitter operates at pixel speeds up to 165MHz per link, supporting 1600x1200 panels at 60Hz refresh rate. MAT-830, however, supports either TV out or LVDS interface one at a time.

MAT-830 5.25-inc SBC supports CRT VGA interface as well as TV out and LVDS interface. It comes with Ethernet functionality, the primary LAN integrated on ICH4's LAN controller and the optional secondary LAN using Intel 82540EM(10/100/1000Mb). The board also supports AC97 audio, 4 COM ports, UDMA 100, 4 USB ports, watchdog timer and a PCI slot for expandability. Dimensions of the board are 203mm x 146mm.

This board represents the perfect choice for those who want superior performance for POS, kiosk, ATM, Web payphone, medical and other embedded applications.

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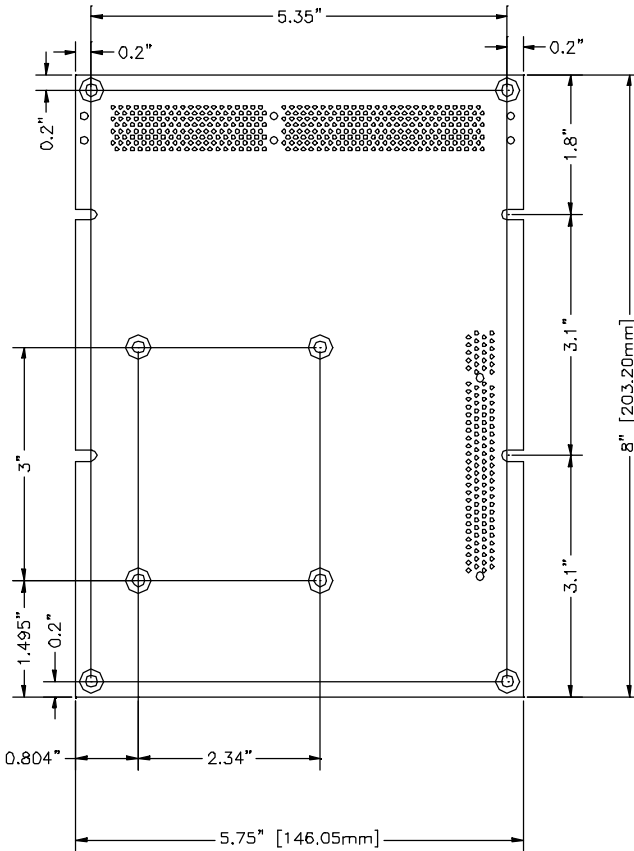
Checklist

Your MAT-830 package should include the items listed below.

- The MAT-830 P4 embedded board
- This User' s Manual
- 1 CD containing chipset drivers and flash memory utility
- Optional cables such as:
 - 1 slim FDD Ribbon Cable
 - 1 Audio Cable
 - 2 IDE Ribbon Cables (40-pin & 44-pin)
 - 1 COM Port Cable
 - 1 Printer Port Cable
 - 1 PS/2 Keyboard/Mouse Cable
 - 1 VGA Cable
 - ID240 cable bracket for dual Ethernet

Specifications

Product Name	MAT-830
Form Factor	Little board
CPU Type	Socket 478 (Intel Pentium 4)
CPU Voltage	1.1V~1.85V (VRM 9.0)
System Speed	1.30G~2.40G+Hz
Front Side Bus	400 MHz (100MHz x 4) /533MHz(133Hz x4)
Green/APM	APM1.2
CPU Socket	Socket 478
Chipset	Intel 845G Chipset GMCH: 82845G 760-pin FC-BGA ICH4: 82801DB 421-pin BGA FWH
BIOS	Award BIOS Support ACPI Function
Cache	128K/256K/512K Level 2 (CPU integrated)
VGA	82845G built-in, AGP 4X, supports CRT
LVDS & TV-out	Chrontel CH7017 TV Encoder / LVDS Transmitter
Primary LAN	ICH4 integrated LAN controller(10/100Mb)
Secondary LAN	Intel 82540EM(10/100/1000Mb)
Audio	ICH4 Built-in Sound controller + AC97 Codec STAC9750, 2x6 12 pin header (Line-out, Line-in, MIC.)
Memory type	2 x DDR 2.5V PC200/266 DDR SDRAM (without ECC) DIMM Module, Max. capacity - 2GB
LPC I/O	Winbond 83627HF: IrDA, Parallel, COM1 (RS-232), COM2 (RS232/RS422/RS485), FDC 2.88MB (Slim), Hardware monitoring (3 thermal inputs,6 voltage monitor inputs, VID0-4, 3 Fan Header)
Secondary I/O	Winbond 83627HF: COM3,4 (RS232)
RTC/CMOS	ICH4 Built-in
Battery	Lithium Battery
PS2 KB/MS controller	Winbond 83627HF Built-in
EPP/ECP	Yes
Local bus IDE	ICH4 built-in, IDE1, IDE2, UDMA 33/66/100
Power Connector	ATX 12V
Expansion slots	PCI slot x 1 (supports 2 Bus master)
USB	4 ports, USB 2.0 compliant
IrDA	Pin header
Watchdog Timer	256 segments: (0, 1 , 2, ...255 sec/min)
System Voltages	+5V, +12V, -12V, 5VSB
Board Size	203mm x 146mm
Other Features	Modem Wakeup, LAN Wakeup



Installations

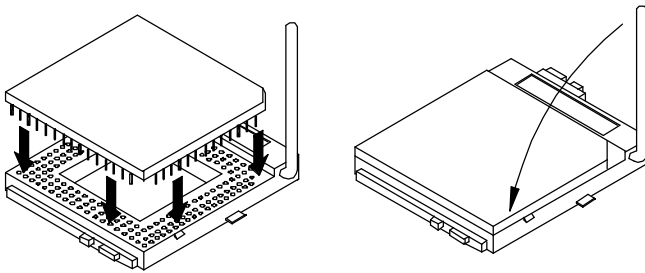
This section provides information on how to use the jumpers and connectors on the MAT-830 in order to set up a workable system. The topics covered are:

- Installing the CPU 7
- Installing the Memory 8
- Setting the Jumpers 9
- Connectors on MAT-830..... 13
- Watchdog Timer Configuration 25

Installing the CPU

MAT-830 embedded board supports a Socket 478 processor socket for Intel Pentium 4 processors.

The Socket 478 processor socket comes with a lever to secure the processor. Raise this lever to about a 90° angle to allow the insertion of the processor. Place the processor into the socket by making sure the notch on the corner of the CPU corresponds with the notch on the inside of the socket. Once the processor has slide into the socket, return the lever to the lock position. Refer to the figures below.



After you have installed the processor into the socket, check if the jumpers for the CPU type and speed are correct.

NOTE: *Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.*

Installing the Memory

The MAT-830 embedded board supports two DDR memory sockets for a maximum total memory of 2GB in DDR memory type. The memory module capacities supported are 64MB, 128MB, 256MB, 512MB and 1GB. The following table lists the supported DDR DIMM configurations. Intel 845G supports configurations defined in the JEDEC DDR DIMM specification only (A,B,C). Non-JEDEC standard DIMMs such as double-sided x16 DDR SDRAM DIMMs are not supported.

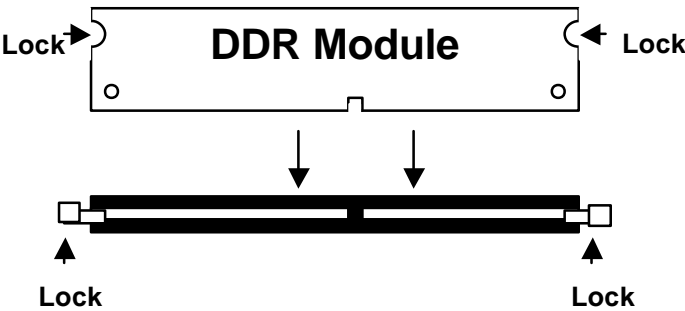
Supported DDRM DIMM Configurations.

Density	64 Mbit		128Mbit		256Mbit		512Mbit	
Device Width	X8	X16	X8	X16	X8	X16	X8	X16
Single/ Double	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS
184-pin DDR	64/128MB	32MB/NA	128/256M B	64MB/NA	256/512M B	128MB/NA	512/1024 M	256MB/NA

Installing and Removing Memory Modules

To install the DDR modules, locate the memory slot on the embedded board and perform the following steps:

1. Hold the DDR module so that the key of the DDR module align with those on the memory slot.
2. Gently push the DDR module in an upright position until the clips of the slot close to hold the DDR module in place when the DDR module touches the bottom of the slot.
3. To remove the DDR module, press the clips with both hands.

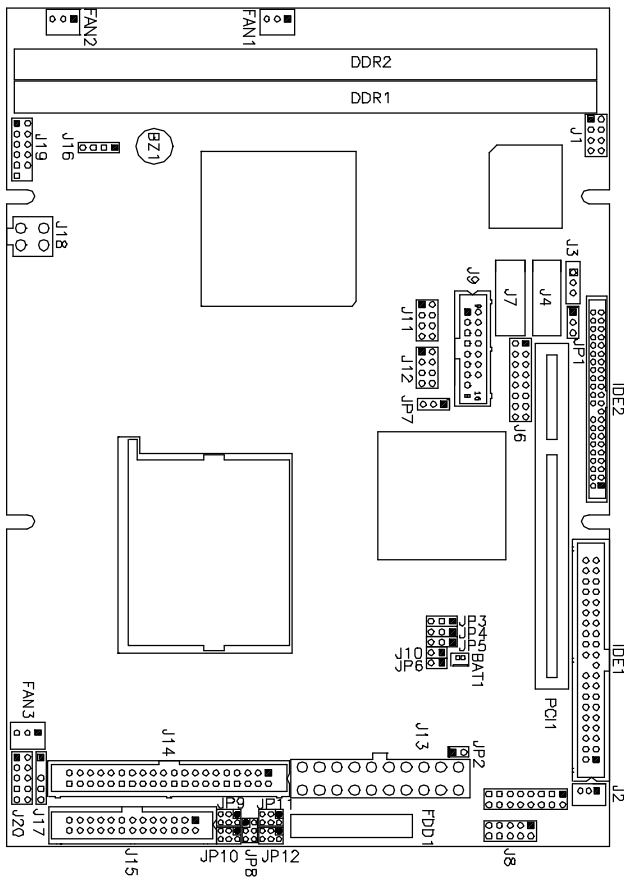


Setting the Jumpers

Jumpers are used on MAT-830 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MAT-830 and their respective functions.

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JP4: Clear CMOS Contents	11
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JP12: COM1/2 RS232 +5V / +12V Power Setting	12

Jumper Locations on MAT-830



Jumper Locations on MAT-830

JP1: LVDS Panel Power Select

JP4: Clear CMOS Contents

JP5: Gigabit LAN Enable/Disable

JP8, JP9, JP10: RS232/422/485 (COM2) Selection



JP11: COM3/4 RS232 +5V / +12V Power Setting

JP12: COM1/2 RS232 +5V / +12V Power Setting

Configuring the CPU Frequency

MAT-830 embedded board does not provide DIP switches to configure the processor speed (CPU frequency).



JP1: LVDS Panel Power Select

JP1	LVDS Panel Power
 1 2 3	3.3V (default)
 1 2 3	5V



Note: The LVDS panel resolution can be configured in the BIOS Setup.

JP4: Clear CMOS Contents

Use JP4 to clear the CMOS contents. *Note that the ATX-power connector should be disconnected from the board before clearing CMOS.*

JP4	Setting	Function
 1 2 3	Pin 1-2 Short/Closed	Normal
 1 2 3	Pin 2-3 Short/Closed	Clear CMOS

JP5: Gigabit LAN Enable/Disable

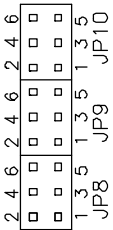
JP5	Gigabit LAN
 1 2 3	Enable
 1 2 3	Disable

JP8, JP9, JP10: RS232/422/485 (COM2) Selection

COM1, COM3, and COM4 are fixed for RS-232 use only.


COM2 is selectable for RS232, RS-422 and RS-485.

The following table describes the jumper settings for COM2 selection.



COM2 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	JP8: 1-2	JP8: 3-4	JP8: 5-6
	JP9: 3-5 & 4-6	JP9: 1-3 & 2-4	JP9: 1-3 & 2-4
	JP10: 3-5 & 4-6	JP10: 1-3 & 2-4	JP10: 1-3 & 2-4


JP11: COM3/4 RS232 +5V / +12V Power Setting

Pin #	Signal Name	JP11	Signal Name	Pin #
1	+5V		+5V	2
3	Pin 9 (COM3)		Pin 9 (COM4)	4
5	+12V		+12V	6

COM3 Settings: Pin 1-3 short = +5V, Pin 3-5 short = +12V

COM4 Settings: Pin 2-4 short = +5V, Pin 4-6 short = +12V

JP12: COM1/2 RS232 +5V / +12V Power Setting

Pin #	Signal Name	JP12	Signal Name	Pin #
1	+5V		+5V	2
3	Pin 9 (COM1)		Pin 9 (COM2)	4
5	+12V		+12V	6

COM1 Settings: Pin 1-3 short = +5V, Pin 3-5 short = +12V

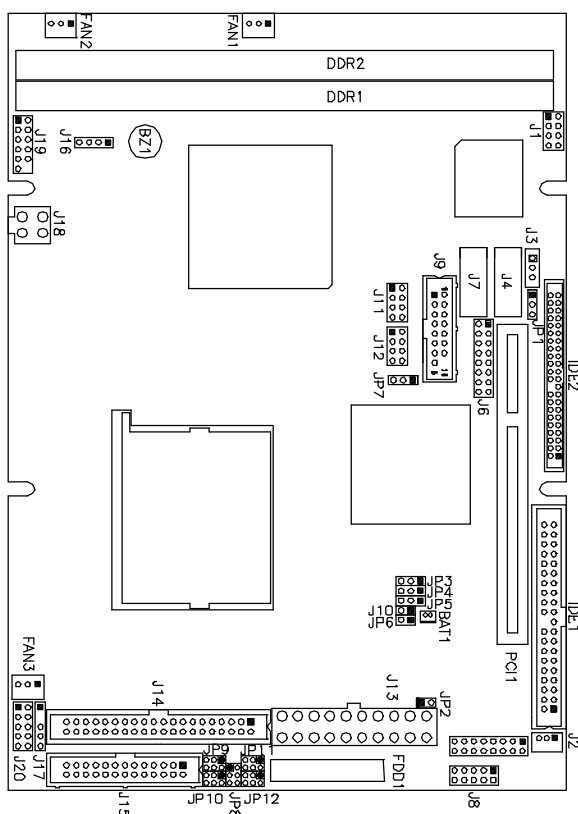
COM2 Settings: Pin 2-4 short = +5V, Pin 4-6 short = +12V

Connectors on MAT-830

Connectors on MAT-830 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on MAT-830 and their respective functions.

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J18: ATX 12V/+12V Power Connector	24
J19: External Audio Connector	24
J20: PS/2 Keyboard/Mouse Connector	24

Connector Locations on MAT-830

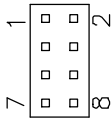


Connector Locations on MAT-830

- J1: TV out Connector
- IDE1, IDE2: EIDE Connectors
- FDD1: Floppy Drive Connector
- FAN1, FAN2: System Fan Power Connector
- FAN3: CPU Fan Power Connector
- J2: Wake On LAN Connector
- J3: Panel Inverter Power Connector
- J4, J7: LVDS Connectors (1st channel, 2nd channel)
- J5: Gigabit LAN Connector (used with ID240)
- J6: System Function Connector
- J8: 10/100Mbit Ethernet Connector
- J9: VGA CRT Connector
- J11, J12: USB Connectors
- J13: ATX Power Supply Connector
- J14: Serial Ports
- J15: Parallel Port Connector
- J16: CD-In Audio Connector
- J17: IrDA Connector
- J18: ATX12V/+12V Power Connector
- J19: External Audio Connector
- J20: PS/2 Keyboard/Mouse Connector

J1: TV out Connector

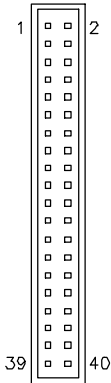
The pin assignments of the TV out connector are as follows:



Signal Name	Pin	Pin	Signal Name
Ground	1	2	Ground
Y	3	4	C
NC	5	6	NC
COMP	7	8	Protect pin

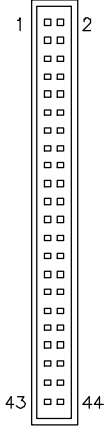
IDE1, IDE2: EIDE Connectors

IDE1: Primary IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Protect pin
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

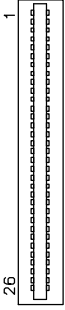
IDE2: Secondary IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground
Vcc	41	42	Vcc
Ground	43	44	N.C.

FDD1: Floppy Drive Connector

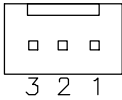
FDD1 is a slim 26-pin connector and will support up to 2.88MB FDD.



Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	INDEX
VCC	3	4	DRV_SEL
VCC	5	6	DSK_CH
NC	7	8	NC
NC	9	10	MOTOR
DINST	11	12	DIR
NC	13	14	STEP
GND	15	16	WDATA
GND	17	18	WGATE
GND	19	20	TRACK
NC	21	22	WPROT
GND	23	24	RDATA
GND	25	26	SIDE

FAN1, FAN2: System Fan Power Connector

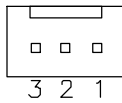
FAN1, FAN2 is a 3-pin header for system fans. The fan must be a 12V (500mA) fan.



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

FAN3: CPU Fan Power Connector

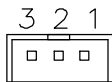
FAN3 is a 3-pin header for the CPU fan. The fan must be a 12V fan.



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

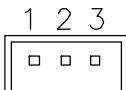
J2: Wake On LAN Connector

J2 is a 3-pin header for the Wake On LAN function on the CPU card. The following table shows the pin out assignments of this connector. Wake On LAN will function properly only with an ATX power supply with 5VSB that has 200mA.



Pin #	Signal Name
1	+5VSB
2	Ground
3	-PME

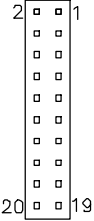
J3: Panel Inverter Power Connector



Pin #	Signal Name
1	+12V
2	ENABKL
3	Ground

J4, J7: LVDS Connectors (1st channel, 2nd channel)

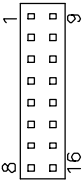
The LVDS connectors are composed of the first channel (J4) and second channel (J7) to support 24-bit or 48-bit.



Signal Name	Pin #	Pin #	Signal Name
TX0-	2	1	TX0+
Ground	4	3	Ground
TX1-	6	5	TX1+
5V/3.3V	8	7	Ground
TX3-	10	9	TX3+
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+
5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

J5: Gigabit LAN Connector (used with ID240)

The pin assignments of the Gigabit LAN connector are as follows:



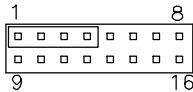
Signal Name	Pin	Pin	Signal Name
MDI0+	1	9	MDI0-
2.5V	2	10	GND
MDI1+	3	11	MDI1-
MDI2+	4	12	MDI2-
2.5V	5	13	2.5V
MDI3+	6	14	MDI3-
ACT_LED	7	15	LINK_UP
Link1000_LED	8	16	Link100_LED

J6: System Function Connector

J6 provides connectors for system indicators that provide light indication of the computer activities and switches to change the computer status. J6 is a 16-pin header that provides interfaces for the following functions.

Speaker: Pins 1 - 4

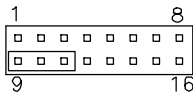
This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.



Pin #	Signal Name
1	Speaker out
2	No connect
3	Ground
4	+5V

Power LED: Pins 9-11

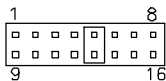
The power LED indicates the status of the main power switch.



Pin #	Signal Name
9	Power LED
10	NC
11	Ground

ATX Power ON Switch: Pins 5 and 13

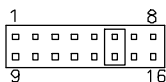
This 2-pin connector is an "ATX Power Supply On/Off Switch" on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.



Pin #	Signal Name
5	PS_ON
13	Ground

SMI/Hardware Switch: Pins 6 and 14

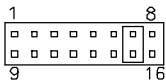
This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system into the power-saving mode immediately.



Pin #	Signal Name
6	SMI
14	Ground

Reset Switch: Pins 7 and 15

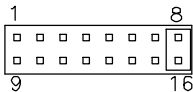
The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.



Pin #	Signal Name
7	Reset#
15	Ground

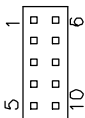
Hard Disk Drive LED Connector: Pins 8 and 16

This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



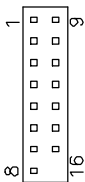
Pin #	Signal Name
8	HDD Active
16	5V

J8: 10/100Mbit Ethernet Connector



Signal Name	Pin	Pin	Signal Name
5VSB	1	6	SPEED LED
RX+	2	7	RX-
LILED	3	8	PULL LOW
ACTLED	4	9	PULL LOW
TX+	5	10	TX-

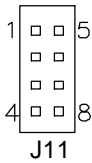
J9: VGA CRT Connector



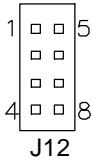
Signal Name	Pin	Pin	Signal Name
R	1	9	+5V
G	2	10	GND
B	3	11	NC
NC	4	12	DDCDAT
GND	5	13	HSYNC
GND	6	14	VSYNC
GND	7	15	DDCCLK
GND	8	16	Protect pin

J11, J12: USB Connectors

The following table shows the pin outs of the USB pin headers connectors. Overall, the two pin headers support four USB ports (USB 2.0 compliant).

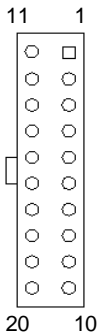


Signal Name	Pin	Pin	Signal Name
Vcc	1	5	Ground
USB0-	2	6	USB1+
USB0+	3	7	USB1-
Ground	4	8	Vcc



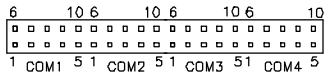
Signal Name	Pin	Pin	Signal Name
Vcc	1	5	Ground
USB2-	2	6	USB3+
USB2+	3	7	USB3-
Ground	4	8	Vcc

J13: ATX Power Supply Connector



Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

J14: Serial Ports



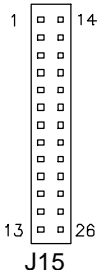
Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	Ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	No Connect.

COM2 is jumper selectable for RS-232, RS-422 and RS-485.

Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

J15: Parallel Port Connector

The following table describes the pin out assignments of this connector.

		Signal Name	Pin #	Pin #	Signal Name
		Line printer strobe	1	14	AutoFeed
		PD0, parallel data 0	2	15	Error
		PD1, parallel data 1	3	16	Initialize
		PD2, parallel data 2	4	17	Select
		PD3, parallel data 3	5	18	Ground
		PD4, parallel data 4	6	19	Ground
		PD5, parallel data 5	7	20	Ground
		PD6, parallel data 6	8	21	Ground
		PD7, parallel data 7	9	22	Ground
		ACK, acknowledge	10	23	Ground
		Busy	11	24	Ground
		Paper empty	12	25	Ground
		Select	13	N/A	N/A

J16: CD-In Audio Connector

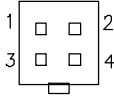
Pin #	Signal Name
1	CD Audio R
2	Ground
3	Ground
4	CD Audio L

J17: IrDA Connector

J17 is used for an optional IrDA connector for wireless communication.

Pin #	Signal Name
1	+5V
2	No connect
3	Ir RX
4	Ground
5	Ir TX

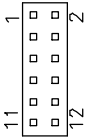
J18: ATX 12V/+12V Power Connector



Pin #	Signal Name
1	Ground
2	Ground
3	+12V
4	+12V

J19: External Audio Connector

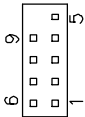
J19 is a 12-pin header that is used to connect to the optional audio cable card that integrates jacks for Line In, Line Out and Mic.



Signal Name	Pin #	Pin #	Signal Name
LINEOUT_R	1	2	LINEOUT_L
Ground	3	4	Ground
LINEIN_R	5	6	LINEIN_L
Ground	7	8	Ground
Mic-In	9	10	VREFOUT
Ground	11	12	Protect pin

J20: PS/2 Keyboard/Mouse Connector

J20 a 10-pin header connector, has functions for both keyboard and mouse. The following table shows the pin assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Protect pin	10	5	N.C.
KB clock	9	4	Mouse clock
KB data	8	3	Mouse data
Vcc	7	2	Vcc
Ground	6	1	Ground

Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sort of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:

This code and information is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability and/or fitness for a particular purpose.

```

;[]=====
; Name  : Enable_And_Set_Watchdog
; IN    : AL - 1sec ~ 255sec
; OUT   : None
;[]=====
Enable_And_Set_Watchdog Proc Near
    push    ax                ;save time interval
    call    Unlock_Chip

    mov     cl, 2Bh
    call    Read_Reg
    and     al, NOT 10h
    call    Write_Reg         ;set GP24 as WDIO

    mov     cl, 07h
    mov     al, 08h
    call    Write_Reg         ;switch to LD8
  
```

```

        mov     cl, 0F5h
        call Read_Reg
        and     al, NOT 08h
        call Write_Reg      ;set count mode as second

        pop     ax
        mov     cl, 0F6h
        call Write_Reg      ;set watchdog timer

        mov     al, 01h
        mov     cl, 30h
        call Write_Reg      ;watchdog enabled

        call Lock_Chip
        ret
Enable_And_Set_Watchdog Endp
;[]=====
; Name  : Disable_Watchdog
; IN    : None
; OUT   : None
;[]=====
Disable_Watchdog Proc      Near
        call Unlock_Chip

        mov     cl, 07h
        mov     al, 08h
        call Write_Reg      ;switch to LD8

        xor     al, al
        mov     cl, 0F6h
        call Write_Reg      ;clear watchdog timer

        xor     al, al
        mov     cl, 30h
        call Write_Reg      ;watchdog disabled

        call Lock_Chip
        ret
Disable_Watchdog Endp
;[]=====

```

```

; Name : Unlock_Chip
; IN : None
; OUT : None
;[]=====
Unlock_Chip Proc Near
    mov dx, 2Eh
    mov al, 87h
    out dx, al
    out dx, al
    ret
Unlock_Chip Endp
;[]=====
; Name : Lock_Chip
; IN : None
; OUT : None
;[]=====
Unlock_Chip Proc Near
    mov dx, 2Eh
    mov al, 0AAh
    out dx, al
    ret
Unlock_Chip Endp
;[]=====
; Name : Write_Reg
; IN : CL - register index
; AL - Value to write
; OUT : None
;[]=====
Write_Reg Proc Near
    push ax
    mov dx, 2Eh
    mov al, cl
    out dx, al
    pop ax
    inc dx
    out dx, al
    ret
Write_Reg Endp
;[]=====

```

INSTALLATIONS

```
; Name  : Read_Reg
; IN : CL - register index
; OUT  : AL - Value to read
;[]=====
===
Read_Reg Proc Near
    mov     al, cl
    mov     dx, 2Eh
    out     dx, al
    inc     dx
    in      al, dx
    ret
Read_Reg Endp
;[]=====
```

BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the motherboard. The topics covered in this chapter are as follows:

BIOS Introduction	30
BIOS Setup.....	30
Standard CMOS Setup.....	32
Advanced BIOS Features.....	35
Advanced Chipset Features	38
Integrated Peripherals	41
Power Management Setup.....	44
PNP/PCI Configurations.....	47
PC Health Status.....	48
Frequency/Voltage Control.....	49
Load Fail-Safe Defaults	50
Load Setup Defaults	50
Set Supervisor/User Password.....	50
Save & Exit Setup.....	50
Exit Without Saving	50

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel Pentium 4 processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the key immediately allows you to enter the Setup utility. If you are a little bit late pressing the key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

Press to Enter Setup

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

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Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type...	

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section, which displays information on the currently highlighted item in the list.

Note: *If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

Warning: *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

“Standard CMOS Setup” choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

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Standard CMOS Features

Date (mm:dd:yy)	Tue, Mar 26 2001	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level
IDE Primary Master	Press Enter 13020 MB	Change the day, month, Year and century
IDE Primary Slave	Press Enter None	
IDE Secondary Master	Press Enter None	
IDE Secondary Slave	Press Enter None	
Drive A	1.44M, 3.5 in.	
Drive B	None	
Video	EGA/VGA	
Halt On	All Errors	
Base Memory	640K	
Extended Memory	129024K	
Total Memory	130048K	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day : Sun to Sat
Month : 1 to 12
Date : 1 to 31
Year : 1994 to 2079

To set the date, highlight the “Date” field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour** : 00 to 23
 Minute : 00 to 59
 Second : 00 to 59

To set the time, highlight the “Time” field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Primary HDDs / IDE Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the “Master” and the second is the “Slave”.

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select ‘Manual’ to define the drive information manually. You will be asked to enter the following items.

CYLS : Number of cylinders
HEAD : Number of read/write heads
PRECOMP : Write precompensation
LANDZ : Landing zone
SECTOR : Number of sectors

The Access Mode selections are as follows:

Auto
Normal (HD < 528MB)
Large (for MS-DOS only)
LBA (HD > 528MB and supports
Logical Block Addressing)

Drive A / Drive B

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

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Advanced BIOS Features

Virus Warning	Disabled	ITEM HELP
CPU L1 and L2 Cache	Enabled	Menu Level
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	
Second Boot Device	HDD-0	
Third Boot Device	CDROM	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Disabled	
Boot Up Numlock Status	On	
Gate A20 Option	Fast	
Typeomatic Rate Setting	Disabled	
Typeomatic Rate (chars/Sec)	6	
Typeomatic Delay (Msec)	250	
Security Option	Setup	
APIC Mode	Enabled	
MPS Version Control for OS	1.4	
OS Select For DRAM>64MB	Non-OS2	
Report No FDD For WIN 95	Yes	
Small Logo (EPA) Show	Enabled	

Virus Warning

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

CPU L1 and L2 Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are **Enabled**.

Quick Power On Self Test

When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to **Enabled**, BIOS will skip some items.

First/Second/Third Boot Device

These fields determine the drive that the system searches first for an operating system. The options available include *Floppy*, *LS/ZIP*, *HDD-0*, *SCSI*, *CDROM*, *HDD-1*, *HDD-2*, *HDD-3*, *LAN* and *Disable*.

Boot Other Device

These fields allow the system to search for an operating system from other devices other than the ones selected in the First/Second/Third Boot Device.

Swap Floppy Drive

This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to *Disabled*.

Boot Up Floppy Seek

This feature controls whether the BIOS checks for a floppy drive while booting up. If it cannot detect one (either due to improper configuration or its absence), it will flash an error message.

Boot Up NumLock Status

This allows you to activate the NumLock function after you power up the system.

Gate A20 Option

This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Typematic Rate Setting

When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to *Disabled*.

Typematic Rate (Chars/Sec)

When the typematic rate is enabled, the system registers repeated keystrokes speeds. Settings are from 6 to 30 characters per second.

Typematic Delay (Msec)

When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to *250msec*.

Security Option

This field allows you to limit access to the System and Setup. The default value is *Setup*. When you select *System*, the system prompts for the User Password every time you boot up. When you select *Setup*, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

APIC Mode

APIC stands for Advanced Programmable Interrupt Controller. The default setting is *Enabled*.

MPS Version Control for OS

This option specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability. The default setting is *1.4*.

OS Select for DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is *Non-OS/2*.

Report No FDD For WIN 95

If you are using Windows 95/98 without a floppy disk drive, select Enabled to release IRQ6. This is required to pass Windows 95/98's SCT test. You should also disable the Onboard FDC Controller in the Integrated Peripherals screen when there's no floppy drive in the system. If you set this feature to Disabled, the BIOS will not report the missing floppy drive to Win95/98.

Small Logo (EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up. The default setting is *Enabled*.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

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Advanced Chipset Features

Advanced Chipset Features		ITEM HELP
DRAM Timing Selectable	By SPD	Menu Level
CAS Latency Time	2.5	
Active to Precharge Delay	6	
DRAM RAS# to CAS# Delay	3	
DRAM RAS# Precharge	3	
Turbo Mode	Disabled	
Memory Frequency For	Auto	
System BIOS Cacheable	Enabled	
Video BIOS Cacheable	Enabled	
Delayed Transaction	Enabled	
Delay Prior to Thermal	16 Min	
AGP Aperture Size (MB)	64	
** On-Chip VGA Setting **		
On-Chip VGA	Enabled	
On-Chip Frame Buffer Size	8MB	
Boot Display	CRT	
Panel Scaling	Auto	
Panel Type	800x600 LVDS	
TV Standard	Off	
Video Connector	Automatic	
TV Format	Auto	

DRAM Timing Selectable

This option refers to the method by which the DRAM timing is selected. The default is **By SPD**.

CAS Latency Time

You can select CAS latency time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU. The choices are 2 and 3.

Active to Precharge Delay

The default setting for the Active to Precharge Delay is **6**.

DRAM RAS# to CAS# Delay

This option allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Reducing the delay improves the performance of the SDRAM.

DRAM RAS# Precharge

This option sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes. The default setting for the Active to Precharge Delay is **3**.

Memory Frequency For

This field sets the frequency of the DRAM memory installed. The default setting is **Auto**. The other settings are **DDR200** and **DDR266**.

System BIOS Cacheable

The setting of **Enabled** allows caching of the system BIOS ROM at F000h-FFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable

The Setting **Enabled** allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select **Enabled** to support compliance with PCI specification version 2.1.

Delay Prior to Thermal

This field activates the CPU thermal function after the systems boots for the set number of minutes. The options are **16Min** and **64Min**.

AGP Aperture Size

The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The default setting is **64M**.

On-Chip VGA

By default, the On-Chip VGA or chipset-integrated VGA is **Enabled**.

On-Chip Frame Buffer Size

The On-Chip Frame Buffer Size can be set us 1MB or 8MB. This memory is shared with the system memory.

Boot Display

Boot Display determines the display output device where the system boots. The options are Auto, CRT, TV and EFP.

Panel Scaling

Setting this field to choose the initial state of Panel Fitting. A new state will overwrite the initial state and be remembered if Panel Fitting Hotkey is requested. Panel Fitting can only be enabled when in LFP only display. This panel fitting state is checked to update the hardware status after changing Video mode or Switching Display Devices

Panel Type

This field sets panel type with the resolution and interface information. The default setting is **800x 600 LVDS**.

TV Standard

This field sets the TV Standard as NTSC, PAL, SECAM or can be set off. The default setting is **Off**.

Video Connector

The video connector field selects the video connector as automatic, Composite, Component, or Both.

TV Format

This field sets the TV format that can be applied. The default setting is **Auto**.

Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals.

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Integrated Peripherals

		ITEM HELP
On-Chip Primary PCI IDE	Enabled	Menu Level
IDE Primary Master PIO	Auto	
IDE Primary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
On-Chip Secondary PCI IDE	Enabled	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
USB Controller	Enabled	
USB 2.0 Controller	Disabled	
USB Keyboard Support	Disabled	
AC97 Audio	Auto	
Init Display First	PCI Slot	
ICH4 LAN	Enabled	
IDE HDD Block Mode	Enabled	
POWER ON Function	BUTTON Only	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
PWRON After PWR-Fail	Off	
Onboard Serial Port 3	3E8H	
Serial Port 3 Use IRQ	IRQ10	
Onboard Serial Port 4	2E8H	
Serial Port 4 Use IRQ	IRQ11	

OnChip Primary/Secondary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.

IDE Primary/Secondary Master/Slave PIO

These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA

These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

USB Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to *Enabled*.

USB 2.0 Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to *Disabled*. In order to use USB 2.0, necessary OS drivers must be installed first.

USB Keyboard Support

The options for this field are *Enabled* and *Disabled*. By default, this field is set to *Disabled*.

AC97 Audio

The default setting of the AC97 Audio is *Auto*.

Init Display First

This field allows the system to initialize first the VGA card on chip or the display on the PCI Slot. By default, the *PCI Slot* VGA is initialized first.

ICH4 LAN

This field enables or disables the chipset-integrated LAN function.

IDE HDD Block Mode

This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

Power On Function

This field sets how the system can be powered on from a system off state. The default setting is *Button Only*.

Onboard FDC Controller

Select *Enabled* if your system has a floppy disk controller (FDC) installed on the motherboard and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select *Disabled* in this field. This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port

These fields allow you to select the onboard serial and parallel ports and their addresses. The default values for these ports are:

Serial Port 1	3F8H/IRQ4
Serial Port 2	2F8H/IRQ3
Serial Port 3	3E8H/IRQ10
Serial Port 4	2E8H/IRQ11
Parallel Port	378H/IRQ7

UART Mode Select

This field determines the UART 2 mode in your computer. The default value is *Normal*. Other options include *IrDA* and *ASKIR*.

Parallel Port Mode

This field allows you to determine parallel port mode function.

SPP	Standard Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port

PWRON After PWR-Fail

This field sets the system power status whether on or off when power returns from a power failure situation.

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
Power Management Setup

ACPI Function	Disabled	ITEM HELP
Power Management	User Define	Menu Level
Video Off Method	V/H Sync+Blank	
Video Off In Suspend	Yes	
Suspend Type	Stop Grant	
Modem Use IRQ	3	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
CPU THRM-Throttling	50%	
Power On by Ring	Disabled	
Resume by Alarm	Disabled	
Date (of Month) Alarm	0	
Time (hh:mm:ss) Alarm	0 : 0 : 0	
** Reload Global Timer Events **		
Primary IDE 0	Enabled	
Primary IDE 1	Enabled	
Secondary IDE 0	Enabled	
Secondary IDE 1	Enabled	
FDD, COM, LPT Port	Enabled	
PCI IRQ[A-D] #	Enabled	

ACPI Function

Enable this function to support ACPI (Advance Configuration and Power Interface).

Power Management

This field allows you to select the type of power saving management modes. There are four selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min.

Video Off Method

This field defines the Video Off features. There are three options.

V/H SYNC + Blank	Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS	Allows BIOS to control the video display.
Blank Screen	Writes blanks to the video buffer.

Video Off In Suspend

When enabled, the video is off in suspend mode. The default is *Yes*.

Suspend Type

The default setting for the Suspend Type field is *Stop Grant*.

Modem Use IRQ

This field sets the IRQ used by the Modem. By default, the setting is *3*.

Suspend Mode

When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

HDD Power Down

When enabled, and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Soft-Off by PWRBTN

This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds.

CPU THRM-Throttling

When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

Power On by Ring

This field enables or disables the power on of the system through the modem connected to the serial port or LAN.

Resume by Alarm

This field enables or disables the resumption of the system operation. When enabled, the user is allowed to set the *Date* and *Time*.

Reload Global Timer Events

The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events which can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

PNP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
PnP/PCI Configurations

Reset Configuration Data	Disabled	ITEM HELP
Resources Controlled By	Auto (ESCD)	Menu Level
IRQ Resources	Press Enter	
DMA Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	
		Default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is **Disabled**.

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices automatically with the use of a use a PnP operating system such as Windows 95.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
PC Health Status

		ITEM HELP
CPU Warning Temperature	Disabled	
Current CPU Temp.	32°C/89°F	
Current System Temp.	39°C/102°F	
CPU FAN Speed (FAN3)	4166 RPM	
System FAN Speed (FAN1)	0 RPM	
Chassis FAN Speed (FAN2)	0 RPM	
Vcore (V)	1.63V	
VCC3(V)	3.37V	
+5(V)	5.05V	
+12(V)	12.09V	
-12(V)	(-)12.03V	
VBAT(V)	3.21V	
5VSB(V)	5.05V	
Shutdown Temperature	Disabled	
CPU Fan Failure Warning	Disabled	
Sys. Fan Failure Warning	Disabled	
Aux. Fan Failure Warning	Disabled	

CPU Warning Temperature

This field allows the user to set the temperature so that when the temperature is reached, the systems sounds a warning. This function can help prevent damage to the system that is caused by overheating.

Temperatures/Fan Speeds/Voltages

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

Shutdown Temperature

This field allows the user to set the temperature by which the system automatically shuts down once the threshold temperature is reached. This function can help prevent damage to the system that is caused by overheating.

Fan Failure Warning

This field allows the user to set the Fan warning so that when the CPU(Fan3)/Sys.(Fan1)/Aux.(Fan2) is stop runing, the system sounds a warning, this function can help user to prevent damage the system that is caused by Fan stop running.

Frequency/Voltage Control

This section shows the user how to configure the processor frequency.

CMOS Setup Utility – Copyright ©1984-2001 Award Software
Frequency/Voltage Control

Auto Detect PCI Clk	Disabled	ITEM HELP
Spread Spectrum Modulated	Disabled	Menu Level

Auto Detect PCI Clk

This field enables or disables the auto detection of the PCI clock.

Spread Spectrum

This field sets the value of the spread spectrum. The default setting is **Disabled**. This field is for CE testing use only.

Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

Load Setup Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Set Supervisor/User Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type “Y”, you will quit the setup utility and save all changes into the CMOS memory. If you type “N”, you will return to Setup utility.

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing “Y” will quit the Setup utility without saving the modifications. Typing “N” will return you to Setup utility.

Drivers Installation

This section describes the installation procedures for software and drivers under the Windows 98, Windows NT 4.0 and Windows 2000. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

Intel Chipset Software Installation Utility	52
Intel 845G Chipset Graphics Driver Installation	55
Intel Application Accelerator Installation	57
Sigmatel AC97 Codec Audio Driver Installation	61
Intel PRO LAN Drivers Installation.....	63

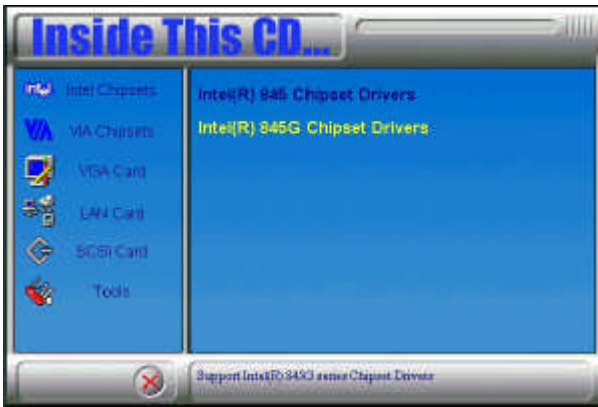
IMPORTANT NOTE:

After installing your Windows operating system (Windows 98/98SE/ME/2000/XP), you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

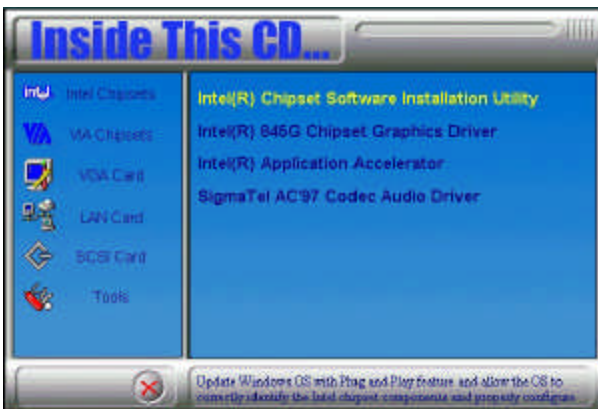
Intel Chipset Software Installation Utility

The Intel Chipset Software Installation Utility, to be installed first before the software drivers, will enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation under Windows 98/98SE/ME/2000/XP.

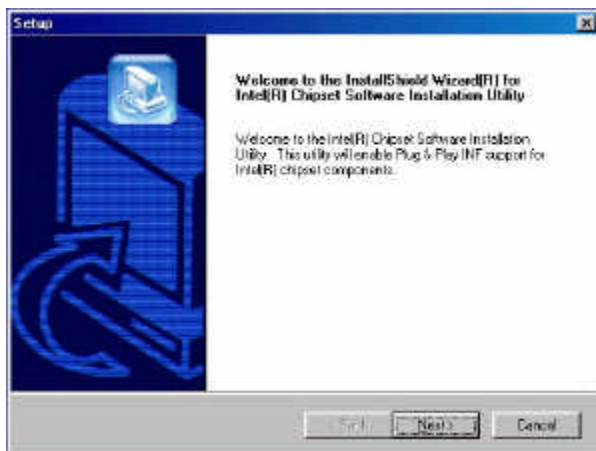
1. Insert the CD that comes with the motherboard and the screen below would appear. Click Intel Chipsets and then Intel 845G Chipset Drivers.



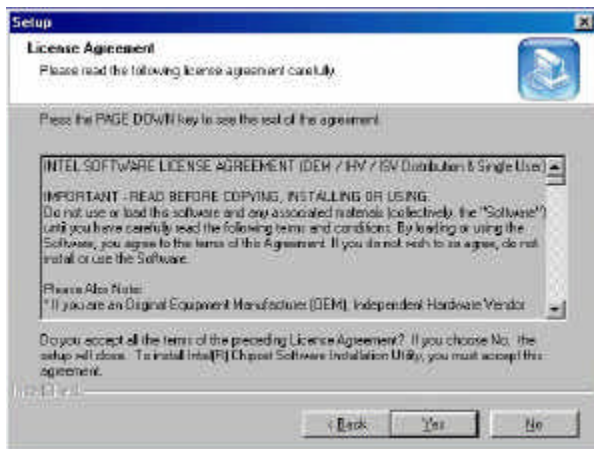
2. Click Intel Chipset Software Installation Utility.



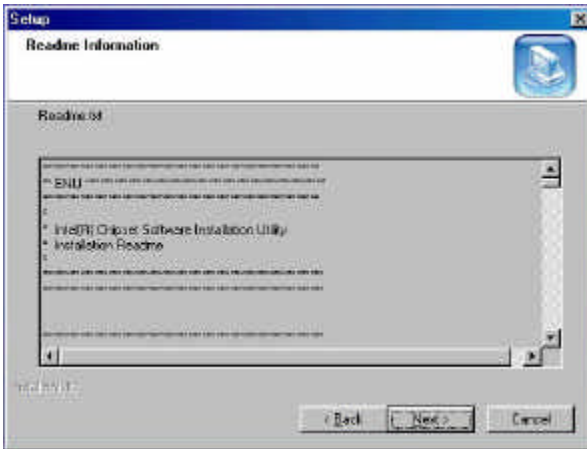
3. When the Welcome screen appears, click Next to continue.



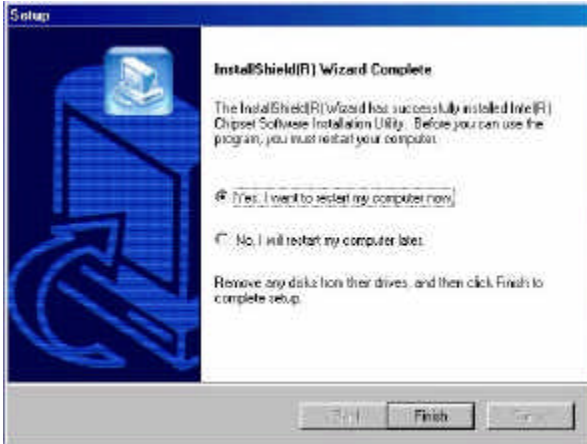
4. Click Yes to accept the software license agreement and proceed with the installation process.



5. On Readme Information screen, click Next to continue the installation.



6. The Setup process is now complete. Click Finish to restart the computer and for changes to take effect. When the computer has restarted, the system will be able to find some devices. Restart your computer when prompted.



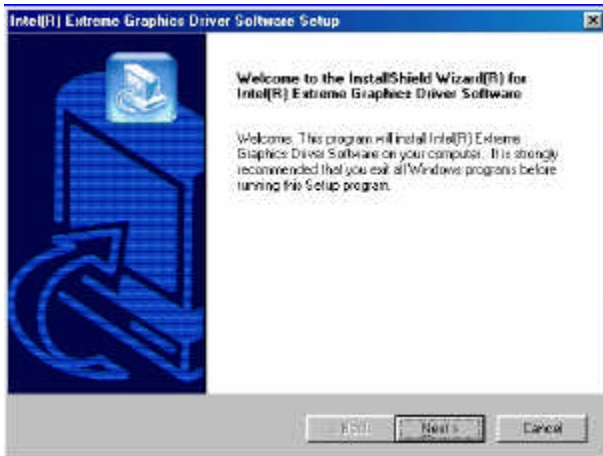
Intel 845G Chipset Graphics Driver Installation

Follow the steps below to install the Intel 845G graphics driver under Windows 98/98SE/ME/2000/XP/NT 4.0.

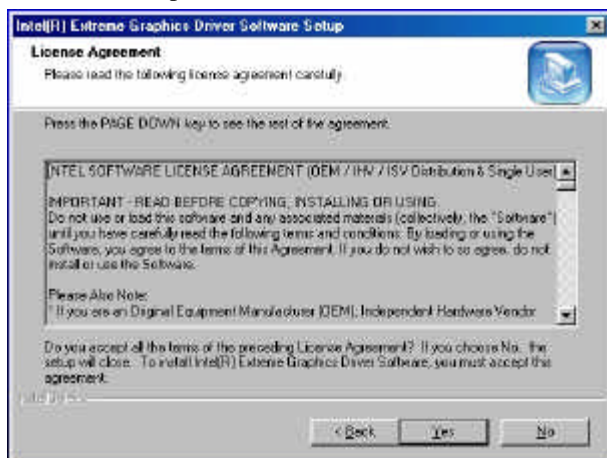
1. Insert the CD that comes with the motherboard. Click Intel Chipsets on the left side of the screen. Then select, Intel 845G Chipset Drivers, then Intel 845G Chipset Graphics Driver.



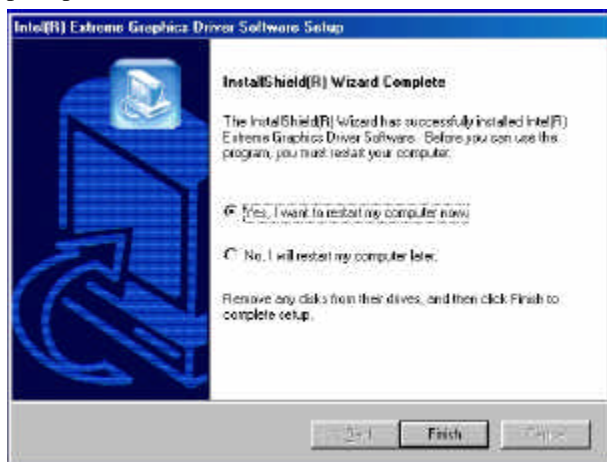
2. When the Welcome screen appears, click Next to continue.



3. Click Yes to accept the software license agreement and proceed with the installation process.



4. The Setup process is now complete. Click Finish to restart the computer and for changes to take effect. Restart your computer when prompted.



Intel Application Accelerator Installation

Follow the steps below to install Intel Application Accelerator software with the InstallShield Wizard under Windows 98/98SE/ME/2000/XP/NT 4.0.

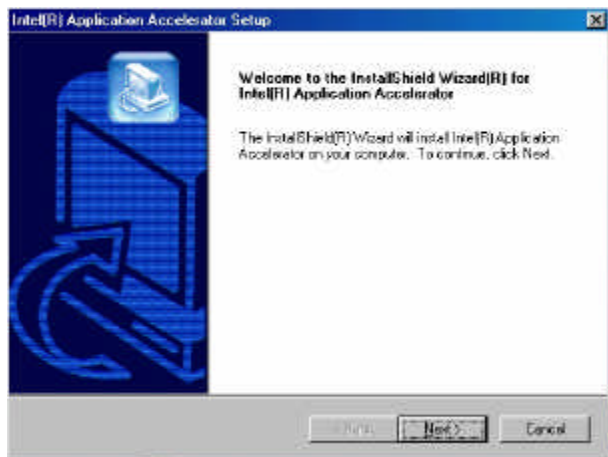
1. Insert the CD that comes with the motherboard and the screen below would appear. Click Intel Chipsets and then Intel 845G Chipset Drivers.



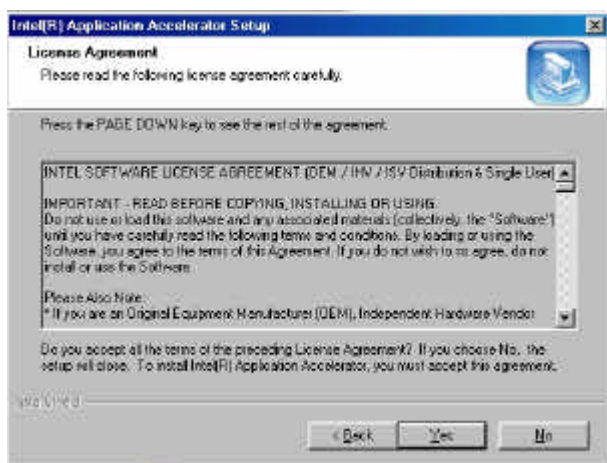
2. Click Intel Application Accelerator.



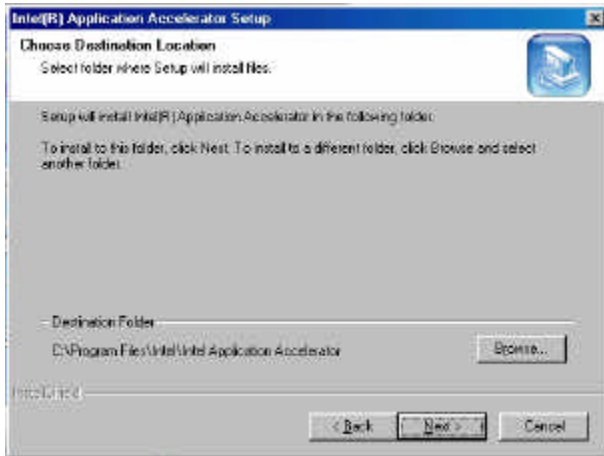
3. The Welcome screen of the Install Shield Wizard for Intel Application Accelerator.



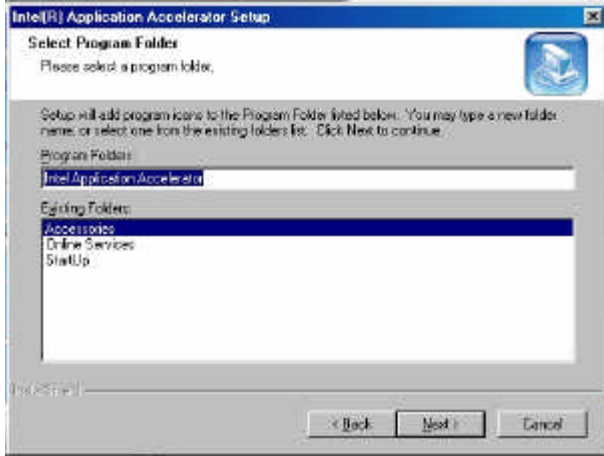
4. Click Yes to accept the software license agreement and proceed with the installation process.



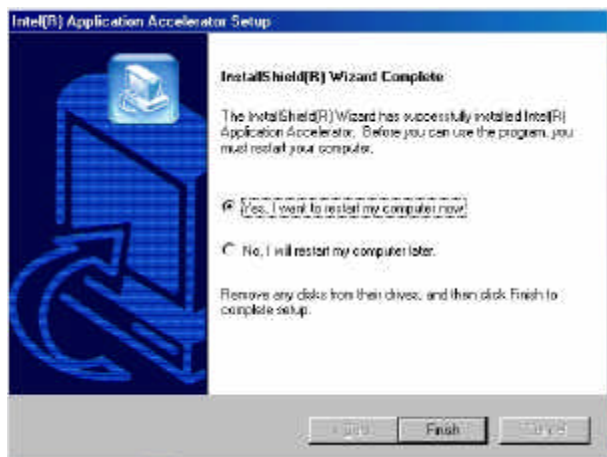
5. You are now required to select the folder where Setup will install files. Click Next to accept the default folder or click Browse to configure the location.



6. You are now asked to select a program folder. Click Next to accept the default program folder or enter the folder name you prefer.



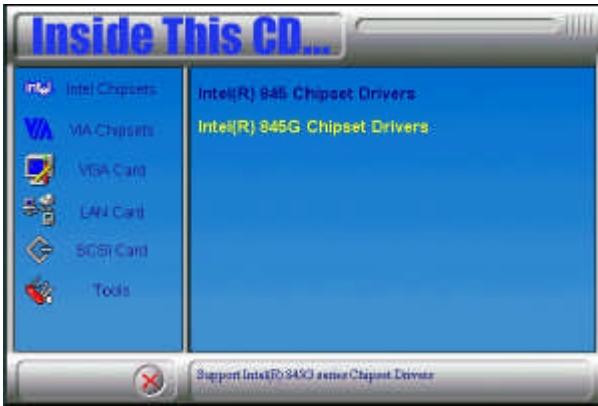
7. The InstallShield Wizard has completed installation. Click Finish for the computer to restart and changes to take effect.



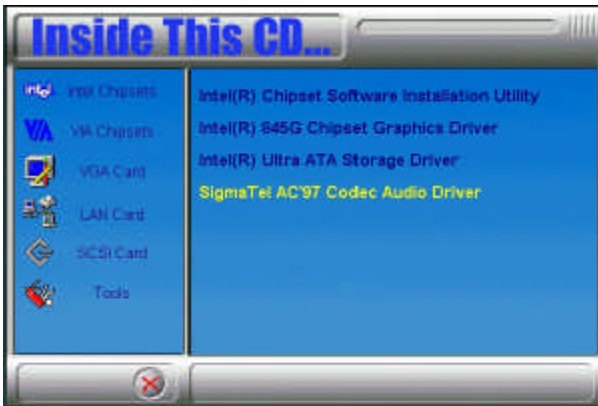
Sigmatel AC97 Codec Audio Driver Installation

Follow the steps below to install SigmaTel AC97 Codec Audio Drivers on your system.

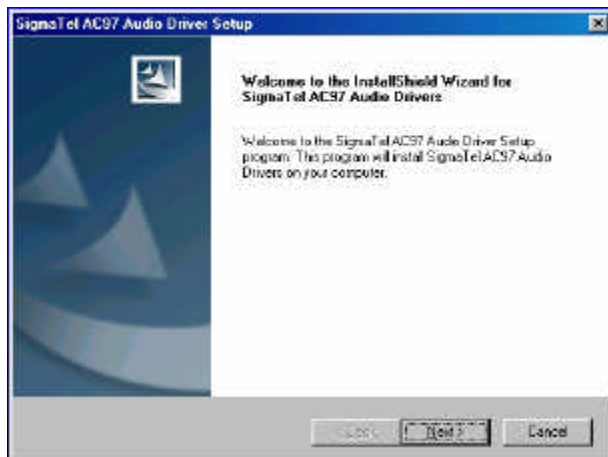
1. Insert the CD that comes with the motherboard and the screen below would appear. Click Intel Chipsets, then Intel 845G Chipset Drivers.



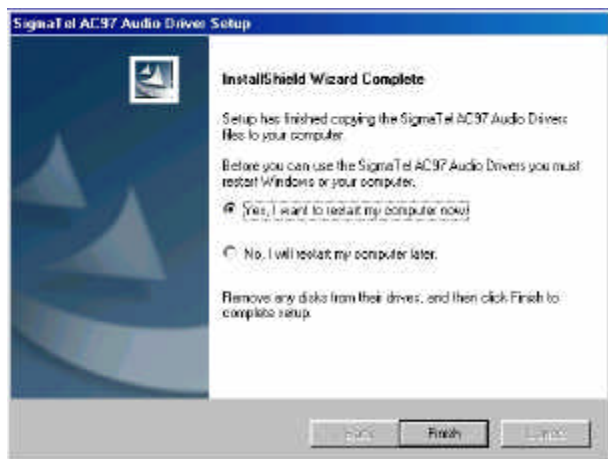
2. Click SigmaTel AC97 Audio Driver.



3. The Welcome screen of the SigmaTel AC97 Codec Audio Driver Setup program appears. To continue and start the installation, click Next.



4. Finish to restart the computer and for changes to take effect. .



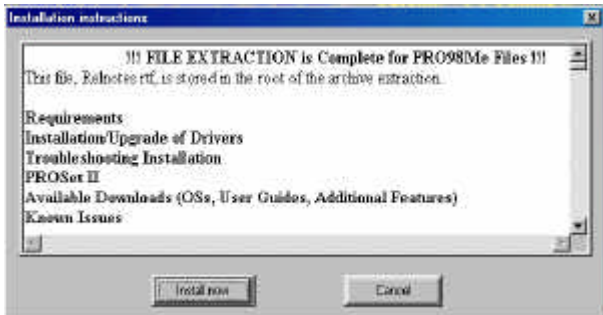
Intel PRO LAN Drivers Installation

The Intel PRO LAN drivers support both Intel® PRO/100 and PRO/1000 drivers. Follow the steps below to complete the installation.

1. Insert the CD that comes with the motherboard and the screen below would appear. Click on LAN Card on the left side to make the LAN drivers selection. Click on Intel(R) PRO LAN Drivers.



2. Click Install Now.



3. Click Restart now to restart the computer and new settings to take effect.



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Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE