MAT-710

Intel 815E Celeron/Pentium III
ETX CPU Module

USER'S MANUAL

Version 1.0B

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Introduction

Product Description

MAT-710 is ETX CPU module based on the Intel 815E chipset. ETX stands for Embedded Technology extended, a technology or form factor that offers flexible time-to-market solution, enabling product development time to shrink from four months to just four weeks. It also features low power consumption and low heat emission, eliminating the need for a CPU fan.

MAT-710 supports Intel Mobile Celeron or Pentium III processors running a front side bus 100/133MHz with speeds up to 933MHz. The integrated Intel 815E chipset contains the Graphics and Memory Controller Hub (GMCH), the I/O Controller Hub (ICH2) and the Firmware Hub (FWH). With the ICH2, it is able to support UDMA/100, four USB ports, and integrated LAN. An optional ATI M6 VGA controller with 8MB/16MB of embedded memory is available.

MAT-710 has four board-to-board high-density interface connectors for I/O signals that plug onto baseboards specific to customer' s applications. ETX embedded solutions provide fast time-to-market through the interchangeability and scalability of both the ETX module and the baseboard.

System memory is provided by a SO-DIMM socket that supports up to 512MB of SDRAM memory. The Award BIOS facilitates easy system configuration and peripheral setup. Other advanced features include PCI to ISA bridge support, built-in Audio, and built-in ICH2 integrated Ethernet supporting 10Base-T / 100Base-TX protocol.

Other features include two RS232 serial ports, one parallel port, four USB ports support, watchdog timer and PCI to ISA bridge. Board size is 95mm by 114mm.

Checklist

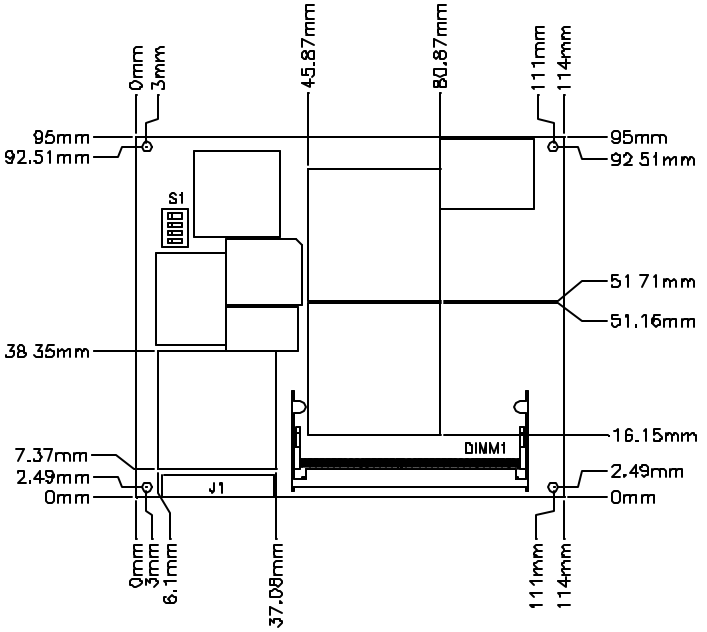
Your MAT-710 package should include the items listed below.

- The MAT-710 CPU Module
- This User's Manual
- 1 CD containing the following:
  - Chipset Drivers
  - Flash Memory Utility
- 1 FDD cable

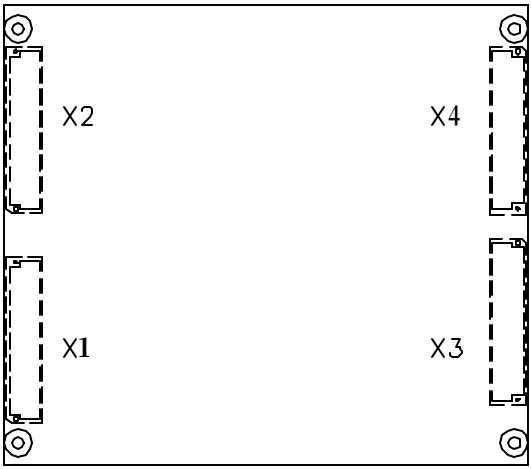
Specifications

Processor Supported	Mounted: Intel ULV Celeron / Mobile Pentium III 400MHz to 933MHz, 100/133MHz Bus Speed
Chipset	Intel 815E Chipset
BIOS	Award BIOS Supports ACPI, DMI, PnP
System Memory	1x SODIMM socket supports up to 512MB capacity PC100/PC133 supported
LPC I/O Chipset	Winbond W83267HF
ETX Interface	Four connectors for PCI bus, USB, Audio, VGA, LCD, COM1, COM2, LPT, IrDA, Mouse, Keyboard, IDE1, IDE2, Ethernet, ISA A separate connector for FDD drive
VGA	815E integrated graphics Shared memory Optional ATI M6 VGA controller, 8MB/16MB embedded memory, supports CRT/TFT panel (2-ch LVDS)
LAN	ICH2 integrated Ethernet controller 10Base-T / 100Base-TX protocol
Other Features	- PCI to ISA bridge with Winbond 83628 and 83629 - Chipset built-in Audio - Watchdog timer - Two serial (RS232) ports, one parallel port, four USB ports support
Form Factor	ETX
Dimensions	95mm x 114mm

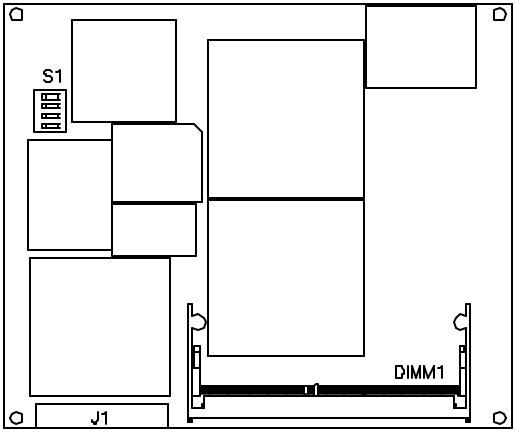
Dimensions


0mm
3mm
45.87mm
80.87mm
111mm
114mm
95mm
92.51mm
95mm
92.51mm
S1
51.71mm
51.16mm
38.35mm
16.15mm
DIMM1
7.37mm
2.49mm
0mm
J1
2.49mm
0mm
0mm
3mm
6.1mm
37.08mm
111mm
114mm

Connector Locations on MAT-710



(top view)



Connector Pin Assignments

S1: Panel/Resolution Switch Setting

This switch is used in conjunction with the optional ATI M6 VGA controller.

SW 1-1	SW 1-2	SW 1-3	SW 1-4	Panel Type
OFF	ON	ON	XX	1024x768 x 18 bit
OFF	OFF	ON	XX	1024x768 x 24 bit
ON	OFF	ON	XX	800 x 600 x 18b it

1. X1 (PCI-Bus, USB, Sound)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	VCC	52	VCC
3	PCICLK3	4	PCICLK4	53	PAR	54	SERRJ
5	GND	6	GND	55	GPERRJ	56	N C
7	PCICLK1	8	PCICLK2	57	PMEJ	58	USB20
9	REQJ3	10	GNTJ3	59	LOCKJ	60	DEVSELJ
11	GNTJ2	12	3V	61	TRDYJ	62	USB30
13	REQJ2	14	GNTJ1	63	IRDYJ	64	STOPJ
15	REQJ 1	16	3V	65	FRAMEJ	66	USB21
17	GNTJ0	18	N.C.	67	GND	68	GND
19	VCC	20	VCC	69	AD16	70	CBEJ2
21	SERIRQ	22	REQJ0	71	AD17	72	USB31
23	AD0	24	3V	73	AD19	74	AD18
25	AD1	26	AD2	75	AD20	76	USB00
27	AD4	28	AD3	77	AD22	78	AD21
29	AD6	30	AD5	79	AD23	80	USB10
31	CBFJ0	32	AD7	81	AD24	82	CBEJ3
33	AD8	34	AD9	83	VCC	84	VCC
35	GND	36	GND	85	AD25	86	AD26
37	AD10	38	AUXAL	87	AD28	88	USB01
39	AD11	40	MIC	89	AD27	90	AD29
41	AD12	42	AUXAR	91	AD30	92	USB11
43	AD13	44	ASVCC	93	PCIRSTJ	94	AD31
45	AD14	46	SNDL	95	IRQY	96	IRQZ
47	AD15	48	ASGND	97	IRQW	98	IRQX
49	CBEJ1	50	SNDR	99	GND	100	GND

2. X2 (ISA-Bus)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	VCC	52	VCC
3	SD14	4	SD15	53	SA6	54	IRQ5
5	SD13	6	MASTERJ	55	SA7	56	IR06
7	SD12	8	DREQ7	57	SA8	58	IRQ7
9	SD11	10	DACKJ7	59	SA9	60	SYSCLK
11	SD10	12	DREQ6	61	SA10	62	REFSHJ
13	SD9	14	DACKJ6	63	SA11	64	DREQ1
15	SD8	16	DREQ5	65	SA12	66	DACKJ 1
17	MEMWJ	18	DACKJ5	67	GND	68	GND
19	MEMRJ	20	DREQ0	69	SA13	70	DREQ3
21	LA17	22	DACKJ0	71	SA14	72	DACKJ3
23	LA18	24	IRQ14	73	SA15	74	IORJ
25	LA19	26	IR015	75	SA16	76	IOWJ
27	LA20	28	IRQ12	77	SA18	78	SA17
29	LA21	30	IRQ11	79	SA19	80	SMEMRJ
31	LA22	32	IRQ10	81	IOCHRDY	82	AEN
33	LA23	34	I016J	83	VCC	84	VCC
35	GND	36	GND	85	SD0	86	SMEMWJ
37	SBHEJ	38	M16J	87	SD2	88	SD1
39	SA0	40	OSC	89	SD3	90	NOWSJ
41	SA1	42	BALE	91	DREQ2	92	SD4
43	SA2	44	TC	93	SD5	94	IRQ9
45	SA3	46	DACKJ2	95	SD6	96	SD7
47	SA4	48	IR03	97	IOCHKJ	98	RSTDRV
49	SA5	50	IRQ4	99	GND	100	GND

3. X3 (VGA, LCD, Video, COM, COM2, LPT/Floppy, IrDA, Mouse, Keyboard, LCD)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	NC	52	NC
3	R	4	B	53	VCC	54	GND
5	HSY	6	G	55	/STB	5 6	/AFD
7	VSY	8	DDCK	57	ic.	58	PD7
9	NC	10	DDDA	59	IRRX	60	/ERR
11	LCD DO16	12	LCD DO18	61	IRTX	62	PD7
13	LCD DO17	14	LCD DO19	63	RXD2	64	/INIT
15	GND	16	GND	65	GND	66	GND
17	LCD DO13	18	LCD DO15	67	RTS2J	68	PD5
19	LCD DO12	20	LCD DO14	69	DTR2J	70	/SLIN
21	GND	22	GND	71	DCD2J	72	PD4
23	LCD DO8	24	LCD DO11	73	DSR2J	74	PD3
25	LCD DO9	26	LCD DO10	75	CTS2J	76	PD2
27	GND	28	GND	77	TXD2J	78	PD1
29	LCD DO4	30	LCD DO7	79	RI2J	80	PD0
31	LCD DO5	32	LCD DO6	81	VCC	82	VCC
33	GND	34	GND	83	RXD1	84	/ACK
35	LCD DO1	36	LCD DO3	85	RTS1J	86	/BUSY
37	LCD DO0	38	LCD DO2	87	DTR1J	88	PE
39	VCC	40	VCC	89	DCD1J	90	/SLCT
41	NC	42	LTGIO0	91	DSR1J	92	MSCLK
43	NC	44	BLON#	93	CTS1J	94	MSDAT
45	BIASON	46	DIGON	95	TXD1	96	KBCLK
47	COMP	48	Y	97	RI1J	98	KBDAT
49	NC	50	C	99	GND	100	GND

4. X4 (IDE 1, IDE 2, Ethernet, Misc)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	SIDE IOWJ	52	PIDE_IORJ
3	5V SB	4	PWGIN	53	SIDE DRQ	54	PIDE IOWJ
5	PS ON	6	SPEAKER	55	SIDE D15	56	PIDE DRQ
7	PWRBTNJ	8	BATT	57	SIDE DO	58	PIDE D15
9	KBINH	10	LILED	59	SIDE D14	60	PIDE DO
11	NC	12	ACTLED	61	SIDE D1	62	PIDE D14
13	NC	14	SPEEDLED	63	SIDE D13	64	PIDE D1
15	NC	16	NC	65	GND	66	GND
17	VCC	18	VCC	67	SIDE D2	68	PIDE D13
19	OVCRJ	20	GPCSJ	69	SIDE D12	70	PIDE D2
21	EXTSMI	22	NC	71	SIDE D3	72	PIDE D12
23	SMBCLK	24	SMBDATA	73	SIDE-D 1	74	PIDE D3
25	SIDE_CS3J	26	N.C.	75	SIDE D4	76	PIDE D11
27	SIDE CS1J	28	DASP S	77	SIDE D10	78	PIDE D4
29	SIDE A2	30	PIDE_CS3J	79	SIDE D5	80	PIDE D10
31	SIDE AO	32	PIDE CS1J	81	VCC	82	VCC
33	GND	34	GND	83	SIDE-D9	84	PIDE D5
35	NC	36	PIDE_A2	85	SIDE D6	86	PIDE D9
37	SIDE AI	38	PIDE_A0	87	SIDE-D8	88	PIDE D6
39	SIDE INTRO	40	PIDE A1	89	N.C.	90	N.C.
41	N.C.	42	N.C.	91	RXD-	92	PIDE D8
43	SIDE_AKJ	44	PIDE INTRO	93	RXD+	94	SIDE D7
45	SIDE_RDY	46	PIDE_AKJ	95	TXD-	96	PIDE D7
47	SIDE_IORJ	48	PIDE RDY	97	TXD+	98	HDRSTJ
49	VCC	50	VCC	99	GND	100	GND

5. J1: FDD Connector

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

6. LCD Data Output Pins for LVDS

Pin Name	LVDS Signal	Channel
LCDDO0	Txout0-	First
LCDDO1	Txout0+	First
LCDDO2	Txout1-	First
LCDDO3	Txout1+	First
LCDDO4	Txout2-	First
LCDDO5	Txout2+	First
LCDDO6	Txclk-	First
LCDDO7	Txclk+	First
LCDDO8	Txout3-	First
LCDDO9	Txout3+	First
LCDDO10	Txout0-	Second
LCDDO11	Txout0+	Second
LCDDO12	Txout1-	Second
LCDDO13	Txout1+	Second
LCDDO14	Txout2-	Second
LCDDO15	Txout2+	Second
LCDDO16	Txclk-	Second
LCDDO17	Txclk+	Second
LCDDO18	Txout3-	Second
LCDDO19	Txout3+	Second

BIOS Setup

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

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel Pentium II/III 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 <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> 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  <DEL>  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.

Phoenix - AwardBIOS CMOS Setup Utility

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 that 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 CPU card 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.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Tue, Jan 1 2002	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level
IDE Primary Master	None	Change the day, month,
IDE Primary Slave	None	Year and century
IDE Secondary Master	None	
IDE Secondary Slave	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 memo ry 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" fieldand 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 s ection allows you to configure and improve your system and allows you to set up some system features according to your preference.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

Virus Warning	Disabled	ITEM HELP
CPU Internal Cache	Enabled	Menu Level
External Cache	Enabled	
CPU L2 Cache ECC Checking	Enabled	Allows you choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
Processor Number Feature	Enabled	
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	
Typematic Rate Setting	Disabled	
Typematic Rate (chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
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 Internal Cache / External 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***.

CPU L2 Cache ECC Checking

This field enables or disables the ECC (Error Correction Checking) checking of the CPU level-2 cache. The default setting is ***Enabled***.

Processor Number Feature
When enabled, this feature allows external systems to detect the processor number/type of the CPU.

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
When enabled, the BIOS will seek whether or not the floppy drive installed has 40 or 80 tracks. 360K type has 40 tracks while 760K, 1.2M and 1.44M all have 80 tracks.

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.

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***.

Video BIOS Shadow

This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

C8000 - CBFFF Shadow/DC000 - DFFFF Shadow

Shadowing a ROM reduces the memory available between 640KB to 1024KB. These fields determine whether or not optional ROM will be copied to RAM.

Small Logo (EPA) Show

This field enables the showing of the EPA logo located at the upper right of the screen during boot up.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

SDRAM CAS Latency Time	3	ITEM HELP
SDRAM Cycle Time Tras/Trc	Auto	Menu Level
SDRAM RAS-to-CAS Delay	Auto	
SDRAM RAS Precharge Time	Auto	
System BIOS Cacheable	Enabled	
Video BIOS Cacheable	Enabled	
Memory Hole At 15M-16M	Disabled	
CPU Latency Timer	Enabled	
Delayed Transaction	Enabled	
AGP Graphics Aperture Size	64MB	
User VGA BIOS in VBU Block	Enabled	
System Memory Frequency	100Mhz	
Power-Supply Type	AT	
On-Chip Video Window Size	64MB	

SDRAM 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.

SDRAM Cycle Time Tras/Trc

The default setting for the SDRAM Cycle Time Tras/Trc is ***Auto***.

SDRAM RAS-to-CAS Delay

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 default setting is ***Auto***.

SDRAM RAS Precharge Time

This option defines the length of time for Row Address Strobe is allowed to precharge. The default setting is ***Auto***.

System BIOS Cacheable

The setting of *Enabled* allows caching of the system BIOS ROM at F000h-FFFFFh, 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.

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are *Enabled* and *Disabled*.

CPU Latency Timer

The default setting for the CPU Latency Timer is ***Enabled***.

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.

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***.

Use VGA BIOS in VBU Block

When enabled, this field allows the use of VGA BIOS in VBU block.

System Memory Frequency

This field sets the frequency of the memory installed in the CPU card. The default setting is ***100MHz***.

Power-Supply Type

By default, the power supply type is set to ***AT***.

On-Chip Video Window Size

The setting choices for the On-Chip Video Window Size are *64MB* and *32MB*. By default, this option is set to ***64MB***.

Integrated Peripherals

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

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

On-Chip Primary PCI IDE	Enabled	ITEM HELP
On-Chip Secondary PCI IDE	Enabled	Menu Level
IDE Primary Master PIO	Auto	
IDE Primary Slave PIO	Auto	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
USB Controller	Enabled	
USB Keyboard Support	Disabled	
Init Display First	PCI Slot	
AC97 Audio	Auto	
IDE HDD Block Mode	Disabled	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
RxD, TxD Active	Hi,Lo	
IR Transmission Delay	Enabled	
UR2 Duplex Mode	Half	
Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
EPP Mode Select	EPP1.7	
ECP Mode Use DMA	3	
PWRON After PWR-Fail	Off	

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 t ransfer 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 Keyboard Support

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

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.

AC97 Audio

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

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 allows powering on by the following methods:

Password	Hot KEY	Mouse Left	Mouse Right
Any KEY	BUTTON ONLY	Keyboard 98	

KB Power ON Password

This field allows you to set the power on function via the keyboard.

Hot Key Power ON

This field allows you to set the power on function via hot keys on the keyboard including Ctrl-F1 to Ctrl-F12.

Onboard FDC Controller

Select *Enabled* if your system has a floppy disk controller (FDC) installed on the CPU card 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	3F8/IRQ4
Serial Port 2	2F8/IRQ3
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

Midi Port Address

The option settings for this field are *330, 400* and *Disabled*. The default setting is ***330***.

Midi Port IRQ

The default Midi Port IRQ is ***10***.

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.

Phoenix - AwardBIOS CMOS Setup Utility
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	
Wake-Up by PCI card	Disabled	
Power On by Ring	Disabled	
CPU Thermal-Throttling	50.0%	
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 PIRQ[A-D] #	Enabled	

ACPI Function

Use this option to enable or disable the ACPI function

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. (Default)

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 the BIOS to control the video display card if it supports the DPMS feature.
Blank Screen	This option only writes blanks to the video buffer.

Video Off In Suspend

When enabled, the video is off in suspend mode. The default setting 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. The default value is ***Instant Off***.

Wake Up by PCI Card

This field allows the system to wake up from a signal received from a PCI card such as a LAN card.

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.

CPU Thermal 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.

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.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

PNP OS Installed	No	ITEM HELP
Reset Configuration Data	Disabled	Menu Level
Resources Controlled By	Auto (ESCD)	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
IRQ Resources	Press Enter	
DMA Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	

PNP OS Installed

Enable the PNP OS Install option if it is supported by the operating system installed. The default value is ***No***.

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 configures all of the boot and compatible devices with the use of a use a PnP operating system such as Windows 95.

IRQ / DMA Resources

These fields allow you to configure the IRQ / DMA Resources.

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.

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

		ITEM HELP
CPU Warning Temperature	Disabled	
System Temp.	34°C	
CPU Temp.	55°C	
Vcore (V)	1.15V	
VCC3(V)	3.29V	
+5V	5.05V	
+12V	12.46V	
VBAT(V)	3.21V	
5VSB(V)	4.67V	
Shutdown Temperature	Disabled	

CPU Warning Temperature

This field sets the temperature threshold that when reached, the system would give an audible warning. The default is 80°C.

Temperatures/Fan Speeds/Voltages

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

Frequency/Voltage Control

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

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

Auto Detect DIMM/PCI Clk	Disabled	ITEM HELP
Spread Spectrum	Disabled	Menu Level

Auto Detect DIMM/PCI Clk

This field enables or disables the auto detection of the DIMM/PCI clock. The default setting is ***Disabled***.

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, justpress 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.

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Drivers Installation

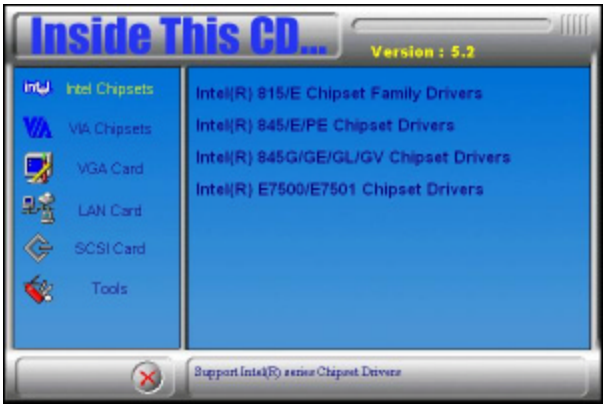
This section describes the installation procedures for software and drivers under the Windows 98, Windows NT 4.0 and Windows 2000. The software and drivers are included in the package. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include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

Windows 98 Chipset Drivers Installation

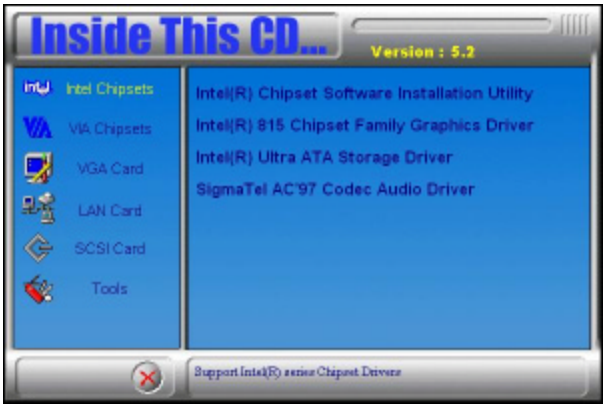
Intel Software Installation Utility

The Intel Chipset Software Installation Utility will enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation under Windows 98.

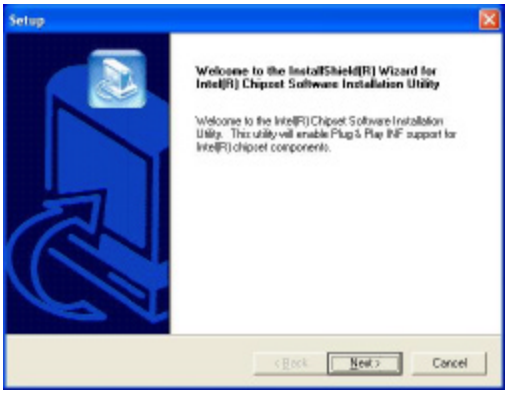
1. Insert the CD that comes with the CPU card and the screen below would appear. Click Intel(R) 815/E Chipset Family Drivers.



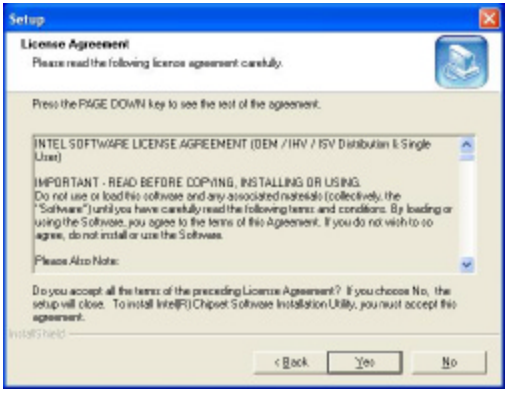
2. Click Intel(R) Chipset Software Installation Utility.



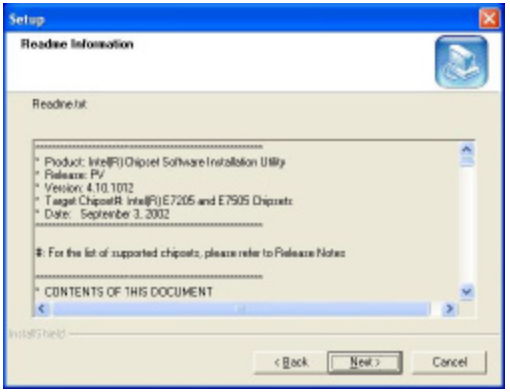
3. When the Welcome screen appears, click Next to continue.



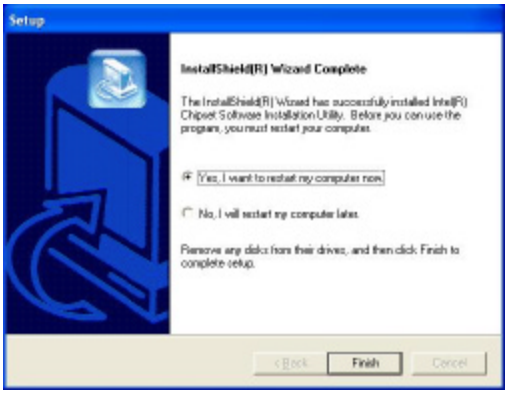
4. Click Yes to accept the software license agreement and proceed with the installation process.



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



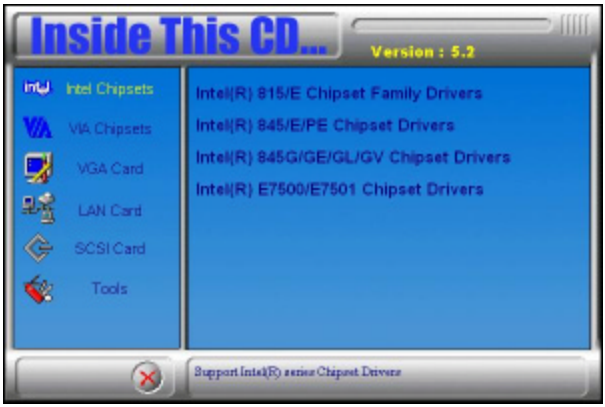
6. The Setup processis now complete. Click Finish to restart the computer and for changes to take effect.



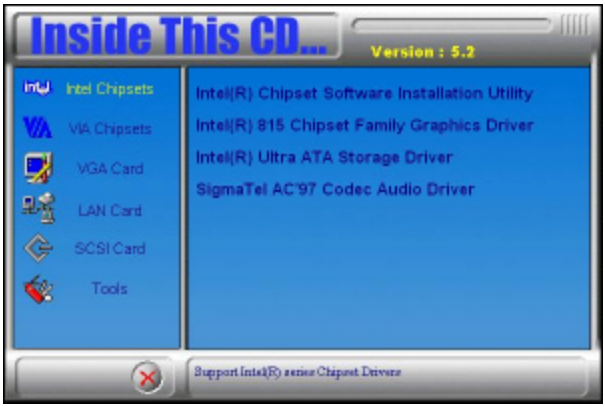
Intel Ultra ATA Storage Driver

Follow the steps below to install Intel Ultra ATA Storage Driver with the InstallShield Wizard under Windows 98.

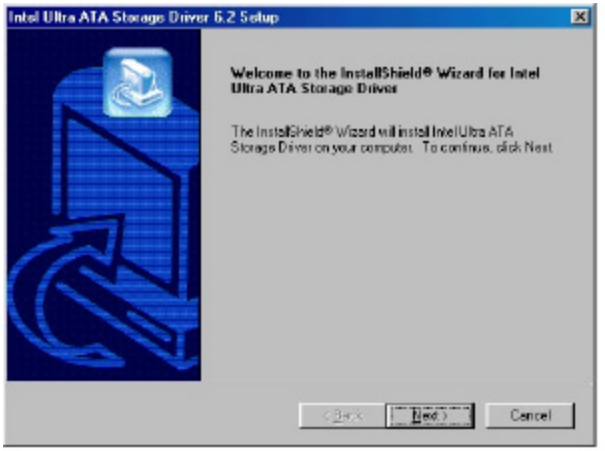
1. Insert the CD that comes with the CPU card and the screen below would appear. Click Intel(R) 815/E Chipset Family Drivers.



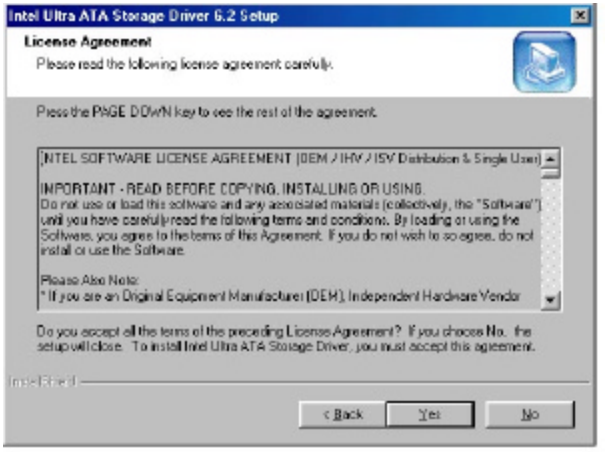
2. Click Intel(R) Ultra ATA Storage Driver.



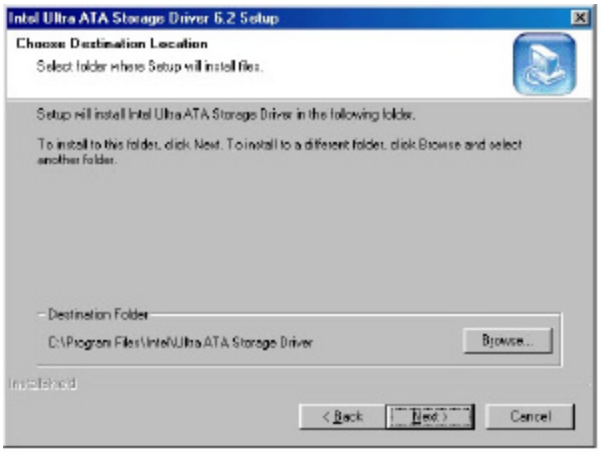
3. The Welcome screen of the Install Shield Wizard for Intel Ultra ATA Storage Driver appears. To continue, click Next.



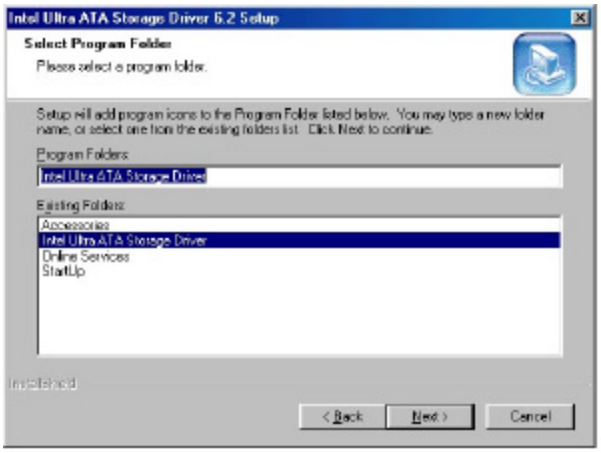
4. Click Yes to accept the software license agreement and proceed with the installation process.



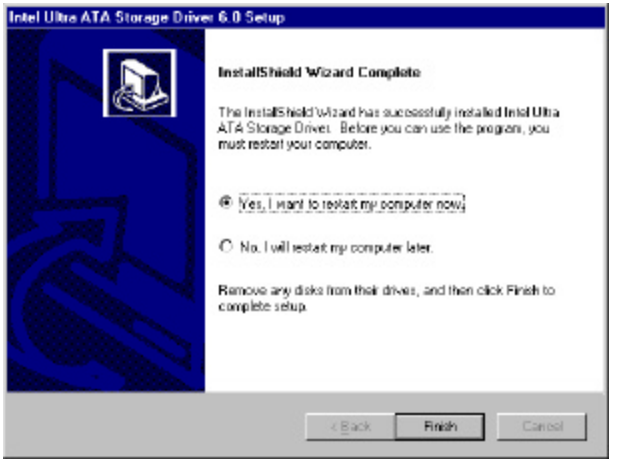
5. You are now required to Select the folder where Setup will install files. Click Next to accept the default folder or click Browse to configure the location.



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.

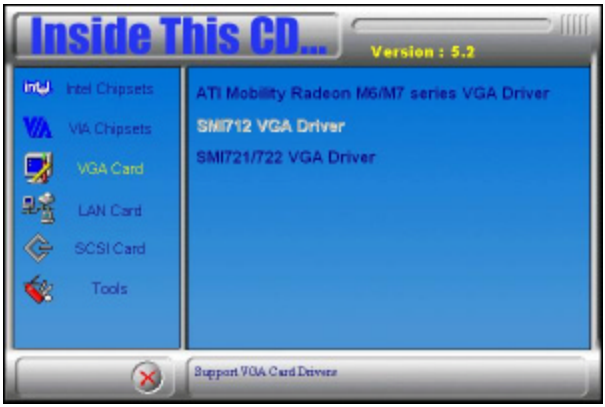


7. The InstallShield Wizard has completed installation. Click Finish for the computer to restart and changes to take effect.

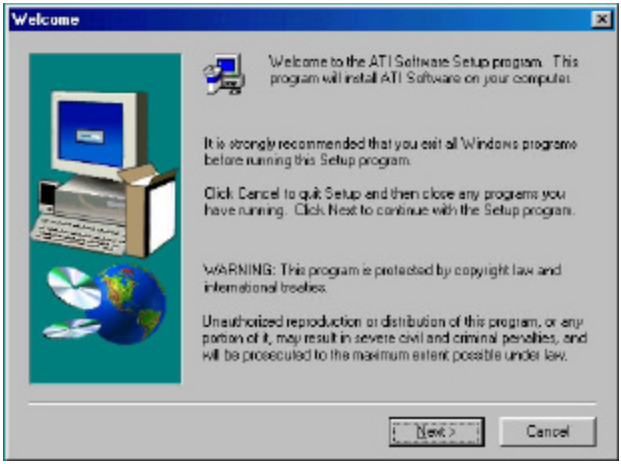


ATI M6 VGA Driver Installation

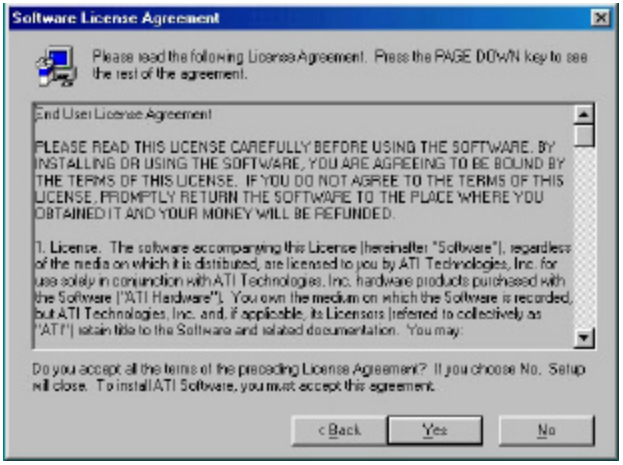
1. Insert the CD that comes with the ETX board. On the initial screen, click VGA Card on the left side and the screen below would appear. Click ATI Mobility Radeon M6/M7 series VGA Driver.



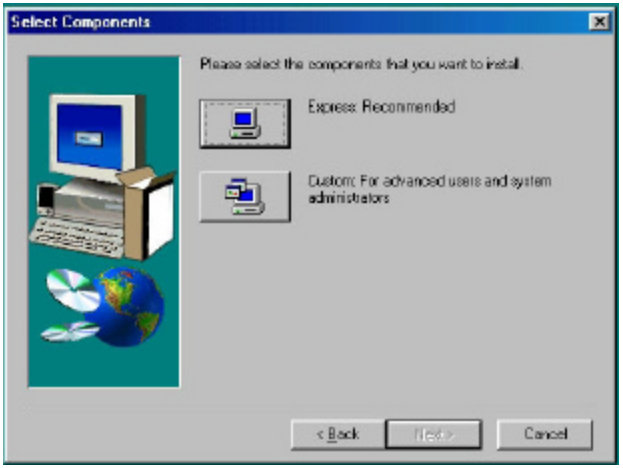
2. When the Welcome screen appears, click Next to continue.



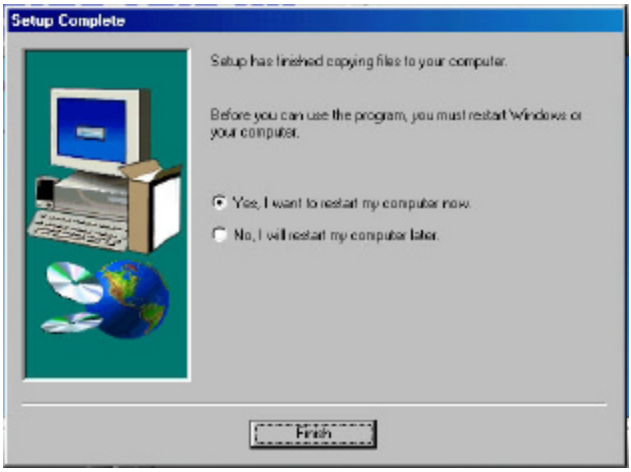
3. Click Yes to accept the software license agreement and proceed with the installation process.



4. Select on the Express icon and click Next to continue.



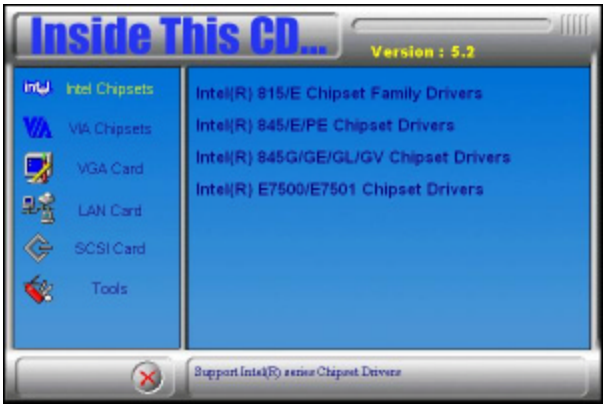
5. The Setup process is now complete. Click Finish to restart the computer and for changes to take effect. Restart your computer when prompted.



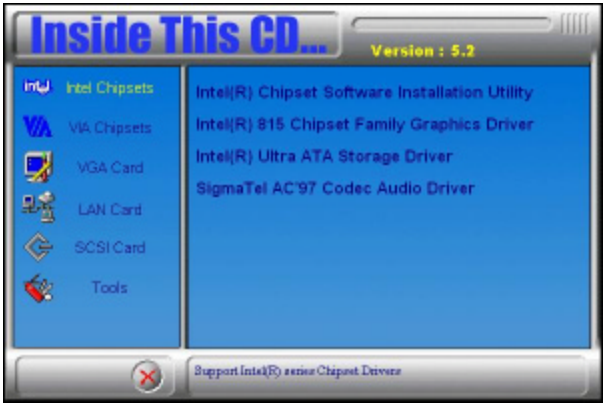
SigmaTel AC97 Audio Drivers

Follow the steps below to install SigmaTel AC97 Audio Drivers on your system under Windows 98.

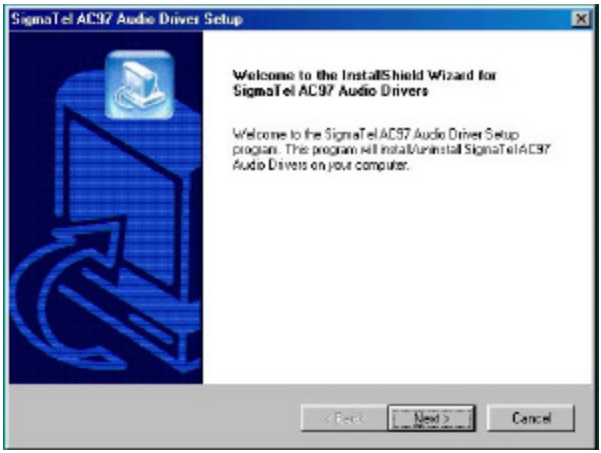
1. Insert the CD that comes with the CPU card and the screen below would appear. Click Intel(R) 815/E Chipset Family Drivers.



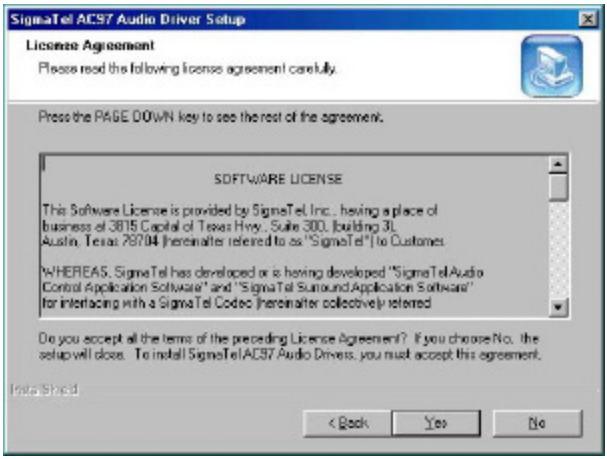
2. Click SigmaTel AC'97 Codec Audio Driver.



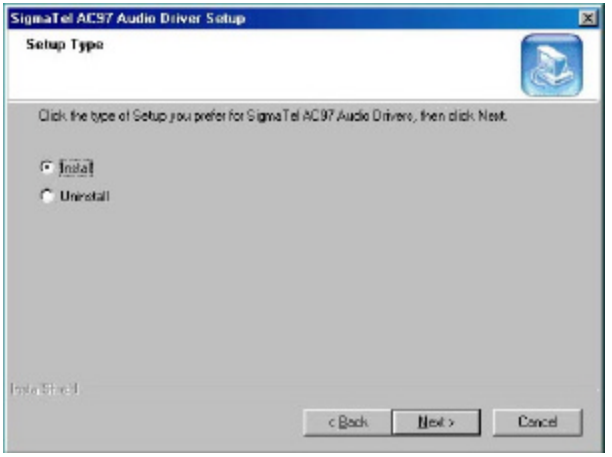
3. The Welcome screen of the SigmaTel AC97 Audio Driver Setup program appears. To continue, click Next.



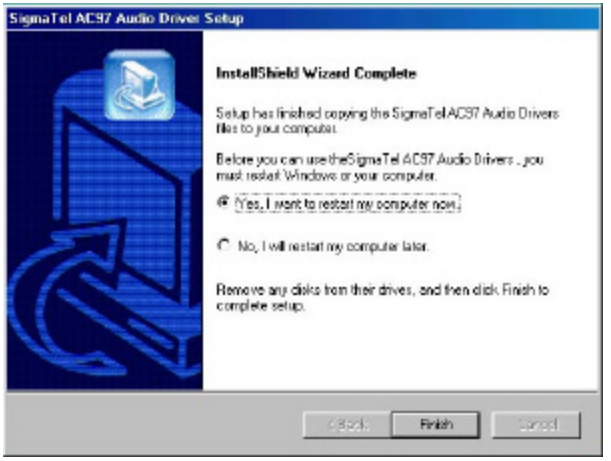
4. Click Yes to accept the software license agreement and proceed with the installation process.



5. Select Install and click Next to install SigmaTel AC97 Audio Drivers on your system.



6. The Setup program has now completed installation. Click Finish for the computer to restart and changes to take effect.

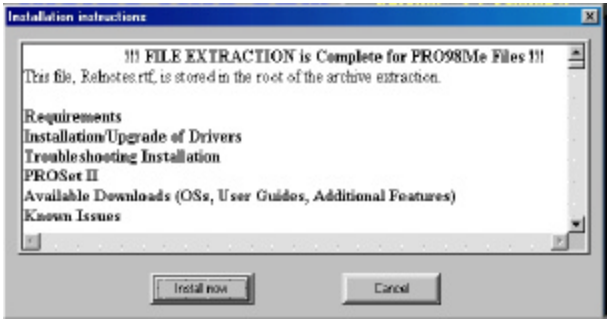


PCI Ethernet Drivers

Follow the steps below to install the PCI Ethernet/LAN drivers Windows 98.

1. Insert the CD that comes with the ETX board and the screen below would appear. Click LAN Card on the left side and then click Intel(R) PRO LAN Drivers.

2. Click Install Now.



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

Windows NT 4.0 Chipset Drivers Installation

Intel Ultra ATA Storage Driver

To install the Intel Ultra ATA Storage drivers for Windows NT 4.0, please follow the same procedure as shown in the Intel Ultra ATA Storage Driver for Windows 98 in the previous section.

ATI M6 VGA Driver Installation

To install the ATI Radeon M6 Graphics drivers for Windows NT 4.0, please follow the same procedure as shown in the ATI M6 VGA Driver Installation for Windows 98 in the previous section.

SigmaTel AC97 Audio Drivers

To install the SigmaTel AC97 Audio drivers for Windows NT 4.0, please follow the same procedure as shown in the SigmaTel AC97 Audio Drivers for Windows 98 in the previous section.

PCI Ethernet Drivers

The first thing to do to install the Ethernet drivers is to create a floppy diskette that would contain the drivers. Follow the steps below.

1. Under the Windows NT 4.0 environment, click Start → Control Panel. Double click Network → Adapters → Add.
2. Select "Have disk …" and insert the floppy diskette containing the Ethernet drivers for Windows NT 4.0 into the FDD drive, then click OK.
3. Click OK → Close, and then enter IP address.
4. Restart the system for changes to take effect.

NOTE: You may also directly use the floppy disks containing the Ethernet drivers instead of creating the Install Disks from the CD.

Windows 2000 Chipset Drivers Installation

Intel Ultra ATA Storage Driver

To install the Intel Ultra ATA Storage drivers for Windows NT 4.0, please follow the same procedure as shown in the Intel Ultra ATA Storage Driver for Windows 98 in the previous section.

ATI M6 VGA Driver Installation

To install the ATI Radeon M6 Graphics drivers for Windows NT 4.0, please follow the same procedure as shown in the ATI M6 VGA Driver Installation for Windows 98 in the previous section.

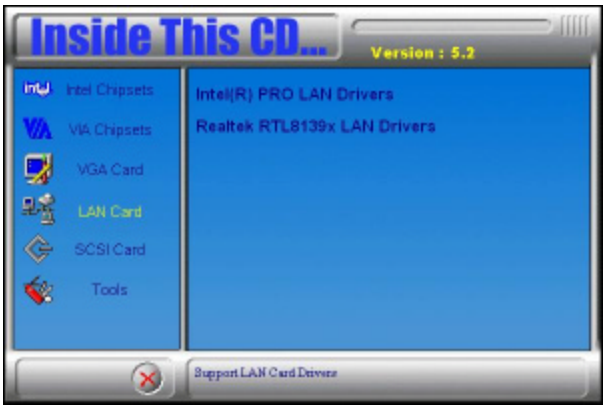
SigmaTel AC97 Audio Drivers

To install the SigmaTel AC97 Audio drivers for Windows NT 4.0, please follow the same procedure as shown in the SigmaTel AC97 Audio Drivers for Windows 98 in the previous section.

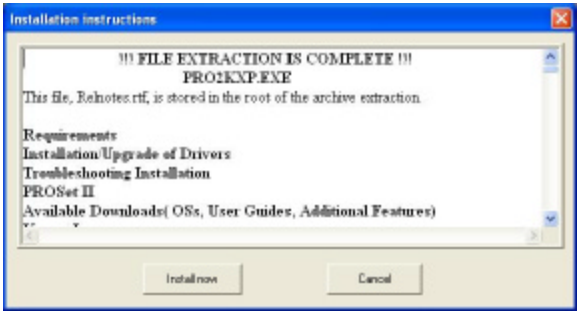
PCI Ethernet Drivers

Follow the steps below to install the PCI Ethernet/LAN drivers Windows 2000.

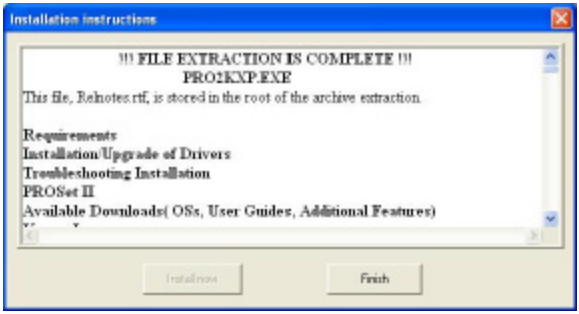
1. Insert the CD that comes with the ETX board and the screen below would appear. Click LAN Card on the left side and then click Intel(R) PRO LAN Drivers.



2. Click Install now to continue.



3. The Setup process is now complete. Click Finish.



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 WDTO

          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
;[]=============================================
```

```
; 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
;[]================================================
```