ET863

VIA C3 Eden Processor
ETX CPU Module

USER'S MANUAL

Version 1.0

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Introduction

Product Description

ET863 is an ETX CPU module based on the VIA C3 Eden processor. 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.

System memory is provided by a SO-DIMM socket that supports up 256MB of SDRAM memory. The Award BIOS facilitates easy system configuration and peripheral setup. Other advanced features of ET863 includes:

- On Board Savage AGP4X Graphics, LVDS
- Realtek RTL8100BL LAN Controller
- Built-in Audio with AC97 Codec, TV-out
- 4 USB ports

The ET863 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.

Checklist

Your ET863 package should include the items listed below.

- The ET863 CPU Module
- This User' s Manual
- 1 CD containing the following:
    - Chipset Drivers
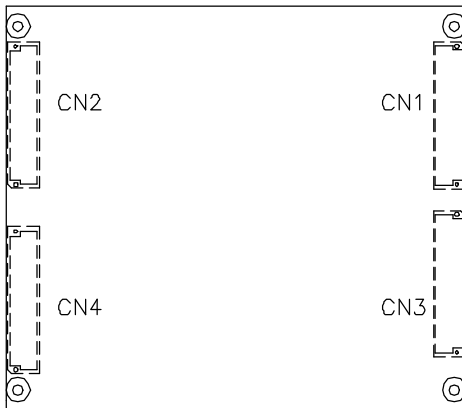   - Flash Memory Utility
- 1 FDD cable

Specifications

Product Name	ET863
Form Factor	ETX
CPU Type	VIA C3 (Samuel 2 or Ezra or Eden) Processor (EBGA)
CPU Voltage	1.05V~1.825V
CPU External Clock	100/133Mhz
Chipset	VIA Pro Savage TwisterT (PN133T)+VT82C686B Chipset North Bridge: VT8606 552 Pin PBGA South Bridge: VT82C686A/B 352 Pin BGA
BIOS	Award BIOS Support ACPI Function
Cache	128K Level 1/64K Level 2 (CPU integrated)
On Board VGA	VT8606 with Integrated Savage4 AGP4x Graphic 8/16/32 MB frame buffer using system memory Integrated 2-channel 110MHZ LVDS interface
LAN	Realtek RTL8100BL Single Chip Ethernet Controller 10/100 Base-T support
Sound	VT82C686A/B Built-in Sound controller + AC97 Codec VIA1611A (Line-out, Line-in, Mic.)
Memory Type	1x SODIMM 3.3V Max. 256MB Support PC100/PC133 SO-DIMM Module
Super I/O	VIA VT82C686A/B: IrDAx1 Parallel x1, COM1/2(RS-232), FDC 2.88MB (3 Mode support), Hardware monitor(2 thermal inputs,4 voltage monitor inputs, VID0-4
RTC/CMOS	VT82C686A/B Built-in
Local Bus IDE	VT82C686A/B Built-in, IDE1, IDE2
ETX Interface	Connectors x 4 For PCI-bus, USB, Sound, VGA LCD, COM1, COM2, LPT, Floppy, IrDA, Mouse, Keyboard, IDE1, IDE2, Ethernet, ISA
USB	Supports 4 ports, transfer rate up to 12Mb/s
Board Size	95mm x 114mm (3.74" x 4.5")

Dimensions
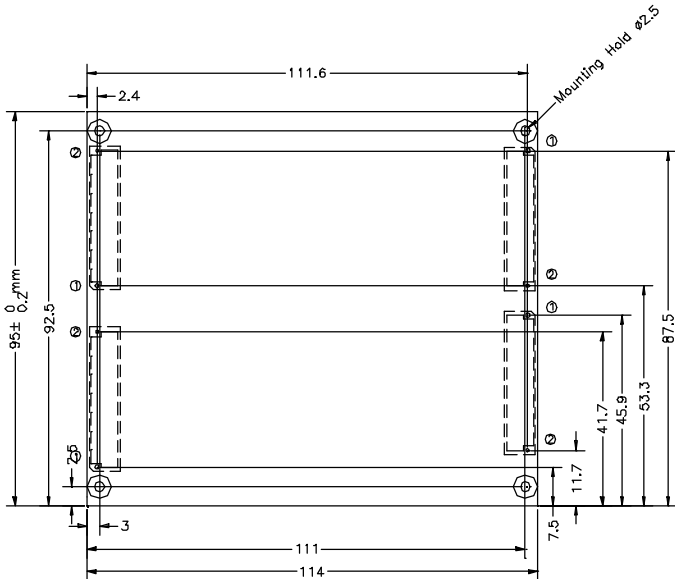
①: Location peg ∅1.0±0.5mm
②: Location peg ∅0.7±0.5mm
All dimension without tolerance ±0.2mm

(Top View)

Connectors on ET863

1. CN1 (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	1016J	83	VCC	84	VCC
35	GND	36	GND	85	SD0	86	SMEMWJ
37	SBHEJ	38	M16J	87	SD2	88	SD1
39	SAO	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

2. CN2 (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

3. CN3 (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

4. CN4 (VGA, LCD, Video, COM, COM2, LPT/Floppy, IrDA, Mouse, Keyboard)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	N C	52	N C
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	TYCLK#	12	NC	61	IRTX	62	PD7
13	TYCLK	14	NC	63	RXD2	64	/INIT
15	GND	16	GND	65	GND	66	GND
17	TY1	18	TY2	67	RTS2J	68	PD5
19	TY1#	20	TY2#	69	DTR2J	70	/SLIN
21	GND	22	GND	71	DCD2J	72	PD4
23	NC	24	TY0	73	DSR2J	74	PD3
25	NC	26	TY0#	75	CTS2J	76	PD2
27	GND	28	GND	77	TXD2J	78	PD1
29	TX2#	30	TXCLK	79	RI2J	80	PD0
31	TX2	32	TXCLK#	81	VCC	82	VCC
33	GND	34	GND	83	RXD1	84	/ACK
35	TX0	36	TX1	85	RTS1J	86	/BUSY
37	TX0#	38	TX1#	87	DTR1J	88	PE
39	VCC	40	VCC	89	DCD1J	90	/SLCT
41	JILI_DAT	42	LTGIO0	91	DSR1J	92	MSCLK
43	JILi_CLK	44	BLON#	98	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

5. J2: 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
1 I	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

Note: JP1 and S1 are for manufacturing test use only.

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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 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 board 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, Mar 26 2000	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, But Keyboard	
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.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

		ITEM HELP
Virus Warning	**Disabled**	
CPU Internal Cache	Enabled	Menu Level
External Cache	Enabled	
CPU L2 Cache ECC Checking	Enabled	Allows you choose
Quick Power On Self Test	Enabled	the VIRUS warning
First Boot Device	Floppy	feature for IDE Hard
Second Boot Device	HDD-0	Disk boot sector
Third Boot Device	CDROM	protection. If this
Boot Other Device	Enabled	function is enabled
Swap Floppy Drive	Disabled	and someone
Boot Up Floppy Seek	Disabled	attempt to write
Boot Up Numlock Status	On	data into this area,
Gate A20 Option	Fast	BIOS will show a
Typematic Rate Setting	Disabled	warning message
Typematic Rate (chars/Sec)	6	on screen and
Typematic Delay (Msec)	250	alarm beep
Security Option	Setup	
OS Select For DRAM>64MB	Non-OS2	
Video BIOS Shadow	Enabled	
C8000-CBFFF Shadow	: Disabled	
CC000-CFFFF Shadow	: Disabled	
D0000-D3FFF Shadow	: Disabled	
D4000-D7FFF Shadow	: Disabled	
D8000-DBFFF Shadow	: Disabled	
DC000-DFFF Shadow	: Disabled	
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***.

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

		ITEM HELP
DRAM Timing By SPD	Enabled	
Memory Hole	Disabled	Menu Level
P2C/C2P Concurrency	Enabled	
System BIOS Cacheable	Disabled	
Video BIOS Cacheable	Disabled	
Frame Buffer Size	8M	
AGP Aperture Size	64M	
AGP-4X Mode	Enabled	
AGP Driving Control	Auto	
Panel Type	07	
Boot Device Select	Both	
Power Supply Type	AT	
OnChip USB	Enabled	
USB Keyboard Support	Disabled	
OnChip Sound	Enabled	
CPU to PCI Write Buffer	Enabled	
PCI Dynamic Bursting	Enabled	
PCI Master 0 WS Write	Enabled	
PCI Delay Transaction	Disabled	
PCI#2 Access #1 Retry	Enabled	
AGP Master 1 WS Write	Disabled	
AGP Master 1 WS Read	Disabled	

DRAM Timing by SPD
This field enables or disables the DRAM Timing based on SPD.

Memory Hole
It is recommended to leave as disabled, although enabling 15M-16M can help with sound issues.

P2C / C2P Concurrency
Set to Disabled for best performance. You may set this to Enabled if you want any sort of system stability.

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.

Frame Buffer Size
The default setting of the frame buffer size is 8M.

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*.

AGP-4X Mode
The field enables or disables the AGP-4X mode of the integrated VGA function.

AGP Driving Control
This BIOS function allows you to adjust the control of the AGP driving force. It is set to Auto by default.

Panel Type
This field sets the panel type that is supported by the system. Below are the selections for the different panel types:

Panel Type 0	640x480	18bit	TFT
1	800x600	18bit	TFT
2	1024x768	36bit	TFT
3	1280x1024	36bit	TFT
4	640x480	16bit	DSTN
5	800x600	16bit	DSTN
6	1024x768	16bit	DSTN
7	1024x768	18bit	1CH LVDS
8	640x480	18bit	TFT
9	800x600	18bit	TFT
A	1024x768	18bit	TFT
B	1280x1024	18bit	TFT
C	1400x1050	36bit	2CH LVDS
D	800x600	16bit	DSTN
E	1024x768	16bit	DSTN
F	1280x1024	16bit	DSTN

Power-Supply Type
This field that power supply type that the system is using. By default, this field is set to *AT*.

OnChip USB
The default setting of this filed is Enabled to enable the USB function.

OnChip Keyboard Support
Enable this if you are using a USB keyboard.

OnChip Sound
This field enables or disables the on board audio function.

CPU to PCI Write Buffer
This controls the CPU write buffer to the PCI bus. If this buffer is disabled, the CPU writes directly to the PCI bus. The default is ***Enabled***.

PCI Dynamic Bursting
This option controls the PCI write buffer. If this is enabled, then every write transaction on the PCI bus goes straight to the write buffer. Burst transactions are then sent on their way as soon as there are enough to send in a single burst.

PCI Master 0 WS Write
This function determines whether there's a delay before any writes to the PCI bus. If this is enabled, then writes to the PCI bus are executed immediately (with zero wait states), as soon as the PCI bus is ready to receive data.

PCI Delay 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.

PCI#2 Access #1 Retry
This BIOS feature is linked to the CPU to PCI Write Buffer. Normally, the CPU to PCI Write Buffer is enabled. All writes to the PCI bus are, as such, immediately written into the buffer, instead of the PCI bus. This frees up the CPU from waiting till the PCI bus is free. The data are then written to the PCI bus when the next PCI bus cycle starts.

AGP Master 1 WS Write/Read
When enabled a single wait state is used when writing/reading to the AGP bus. When disabled a 2 wait state is used. For optimal performance set this to enabled. For improved stability set it to disabled.

Integrated Peripherals

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

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

On-Chip IDE Channel 0	Enabled	ITEM HELP
On-Chip IDE Channel 1	Enabled	Menu Level
IDE Prefetch Mode	Enabled	
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	
Init Display First	PCI Slot	
IDE HDD Block Mode	Enabled	
Onboard FDD Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
Onboard Parallel Port	378/IRQ7	
UART 2 Mode	Standard	
Onboard Parallel Mode	Normal	
Onboard Legacy Audio	Disabled	

OnChip IDE Channel 0 / 1

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

IDE Prefetch Mode

This field enables/disables the prefetch buffers in the PCI IDE controller. The prefetch buffers are used as a temporary storage place as data is transferred from one location to another.

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*.

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.

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.

Onboard FDD Controller
Select *Enabled* if your system has a floppy disk controller 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	3F8H/IRQ4
Serial Port 2	2F8H/IRQ3
Parallel Port	378H/IRQ7

UART 2 Mode
This item allows you to determine which Infra Red (IR) function of onboard I/O chip. The options are *Standard*, *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

Onboard Legacy Audio
Enable or disable the on board legacy audio with this option. If enabled, some audio options will appear.

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	Press Enter	Menu Level
PM Control by APM	Yes	
Video Off Option	Suspend -> Off	
Video Off Method	V/H Sync + Blank	
Modem Use IRQ	3	
Soft-Off by PWRBTN	Instant-Off	
Thermal Duty Cycle	50%	
Wake Up Events	Press Enter	

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

Power Management	User Define	ITEM HELP
HDd Power Down	Disabled	Menu Level
Doze Mode	Disabled	
Suspend Mode	Disabled	

Phoenix - AwardBIOS CMOS Setup Utility
IRQ/Event Activity Detect

VGA	OFF	ITEM HELP
LPT & COM	LPT / COM	Menu Level
HDD & FDD	ON	
PCI Master	OFF	
PowerOn by PCI Card	Disabled	
Modem Ring Resume	Disabled	
RTC Alarm Resume	Disabled	
IRQs Activity Monitoring	**Press Enter**	

Phoenix - AwardBIOS CMOS Setup Utility
IRQs Activity Monitoring

		ITEM HELP
IRQ3	Enabled	
IRQ4	Enabled	Menu Level
IRQ5	Enabled	
IRQ6	Enabled	
IRQ7	Enabled	
IRQ8	Disabled	
IRQ9	Disabled	
IRQ10	Disabled	
IRQ11	Disabled	
IRQ12	Enabled	
IRQ13	Enabled	
IRQ14	Enabled	
IRQ15	Disabled	

ACPI Function
Use this option to enable or disable the ACPI function

Power Management
When you press Enter while selecting this field, the menu for Power Management appears. The following are the fields in this menu.

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.
(Default)	Except for HDD Power Down which ranges from 1 min. to 15 min.

Under this option, you can also configure other features such HDD Power Down, Doze Mode and Suspend Mode.

HDD Power Down
After the selected period of drive inactivity, the hard disk drive powers down while all other devices remain active. Control of this mode is independent of the Power Management mode selected previously.

Doze Mode
After the selected period of system inactivity, the CPU clock runs at slower speed while all other devices still operate at full speed.

Suspend Mode
This option decides when to shutdown video for power saving. You can select it as always on or turn off video when system enters suspend mode.

PM Control by APM
If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings.

Video Off Option
This option decides when to shutdown video for power saving. You can select it as always on or turn off video when system enters suspend mode.

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.

Modem Use IRQ

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

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***.

Thermal Duty Cycle

This field enables or disables the thermal duty cycle. The default setting is ***50%***.

Wake Up 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	Manual	Default is Disabled.
IRQ Resources	Press Enter	Select Enabled to reset Extended
DMA Resources	Press Enter	System Configuration Data (ESCD) when you
		exit Setup if you have
PCI/VGA Palette Snoop	Disabled	installed a new add-on
Assign IRQ for VGA	Enabled	and the system
Assign IRQ for USB	Enabled	reconfiguration has caused such a serious conflict that the OS cannot boot

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 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.

Assign IRQ for VGA/USB
By default, this fields are Enabled.

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	80°C/176°F	
Current System Temperature	34°C/95°F	
Current CPU Temperature	28°C/82°F	
Vcore (V)	1.45V	
2.5V	2.47V	
3.3(V)	3.34V	
5(V)	5.05V	
12(V)	12.09V	

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

VIA C3 Clock Ratio	Default	ITEM HELP
Auto Detect DIMM/PCI Clk	Disabled	Menu Level
Spread Spectrum	Disabled	
Host CPU/PCI Clock	Default	

VIA C3 Clock Ratio
The clock ratio is set as Default.

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.

Host CPU/PCI Clock
The Host CPU/PCI Clock has a default setting of *Default* which automatically detects the systems host CPU clock and PCI clock. You can also use this parameter to overclock your system. However, it is important to note that overclocking the system/CPU can cause your system to become unstable or crash.

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 CPU card. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

VIA 4 in 1 Drivers Installation

Before installing the drivers for VGA, LAN and Audio, install the VIA 4 in 1 drivers first. Follow the instructions below to complete the installation.

1. Insert the CD that comes with the CPU card and the screen below would appear. Click VIA Chipsets on the left side.
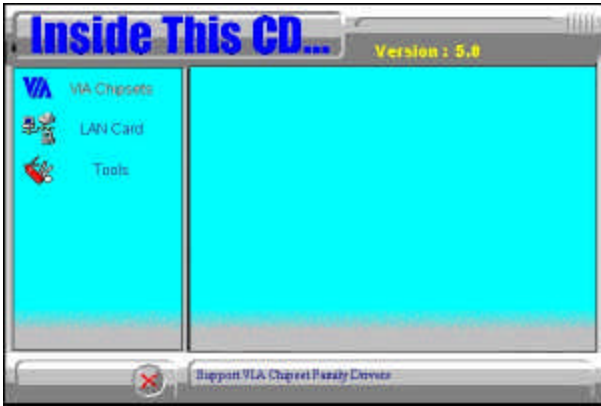
2. Click VIA 4 IN 1 Drivrs.
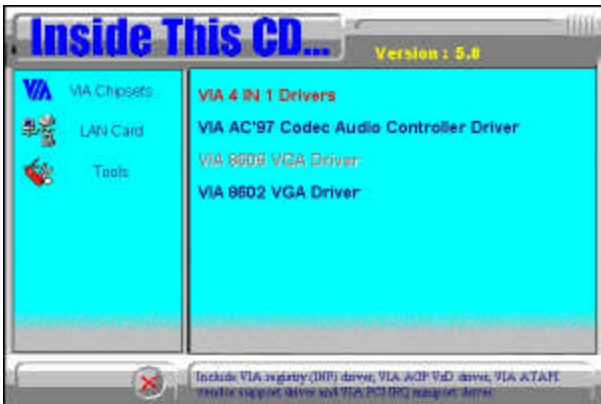
3. When the Welcome screen appears, click Next.
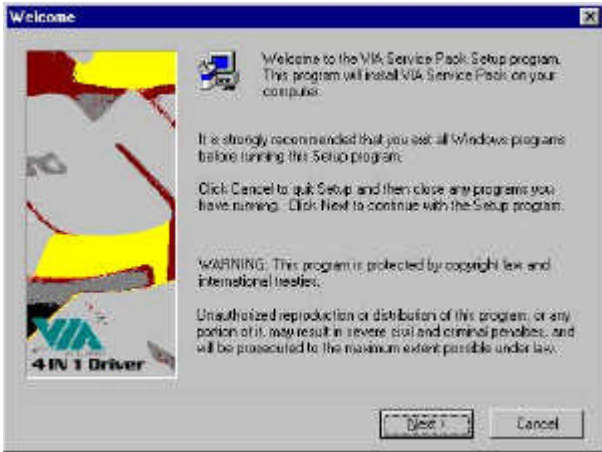
4. Click Next to agree with the license agreement statement and to continue.
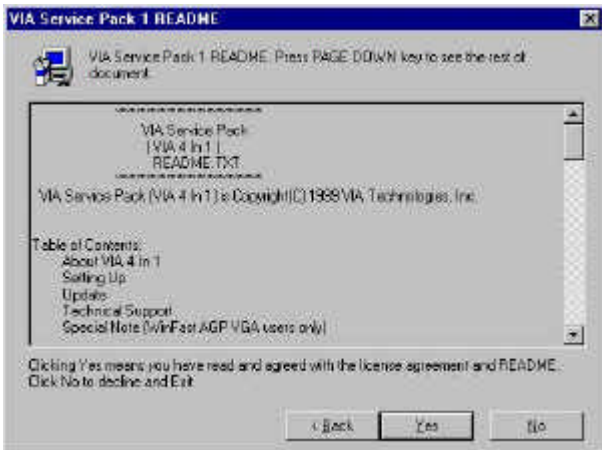
5. Select the Setup Mode and click Next to continue.

6. Click Next to install the drivers listed.
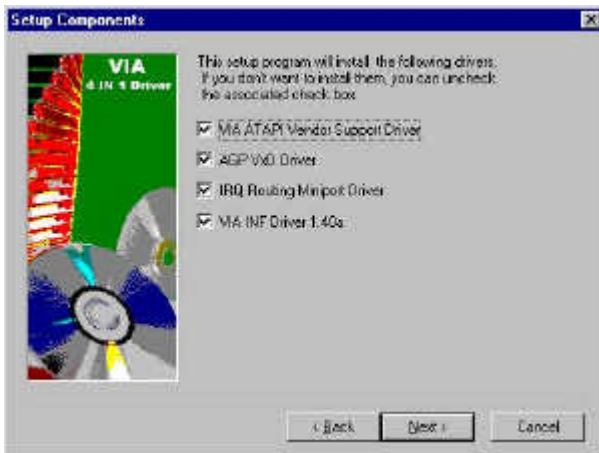
7. Click Next to install the VIA ATAPI Vendor Support Driver.
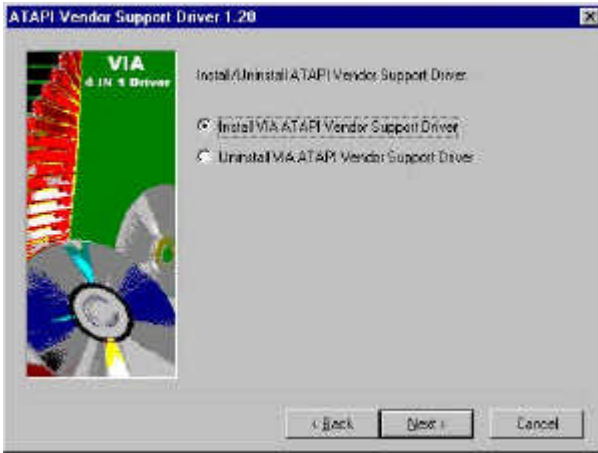
8. Click Next to enable DMA Mode.
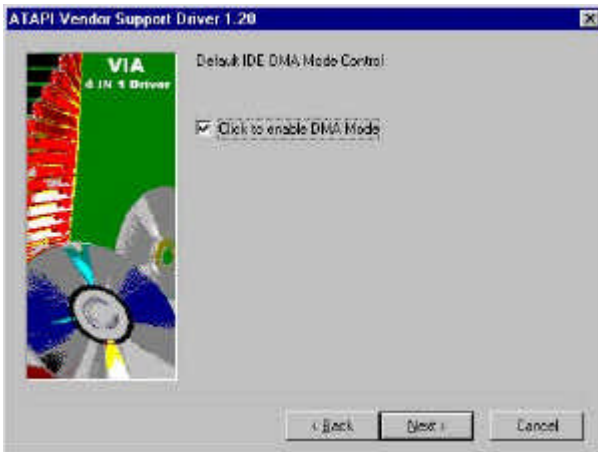
9. Click Next to install the VIA AGP VxD in Turbo mode.
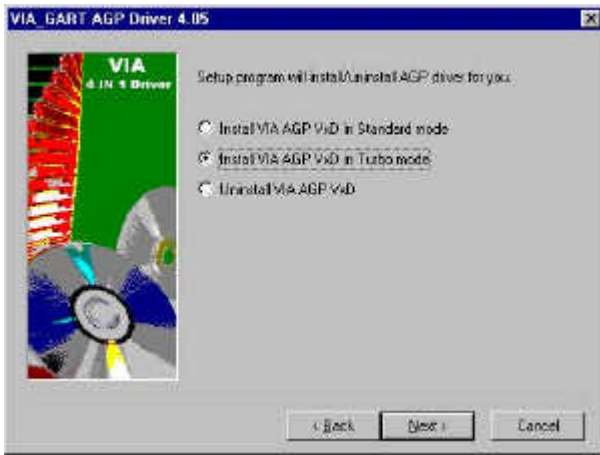
10. Click Finish to restart the computer and for changes to take effect.
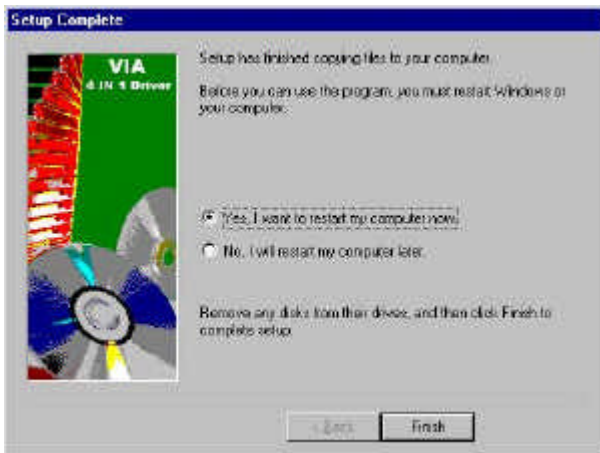
VGA Drivers Installation

After installing the VIA 4 in 1 drivers, you may now install the VIA 8606 VGA Driver. Follow the steps below to proceed with the installation.

NOTE: Before installing the VGA drivers on Windows NT 4.0, you need to install Service Pack 3 or above.

1. In your Windows operating system, click Start → Settings → Control Panel → Display → Settings → Advanced.

2. Click the Adapter tab, then click on the Change icon.
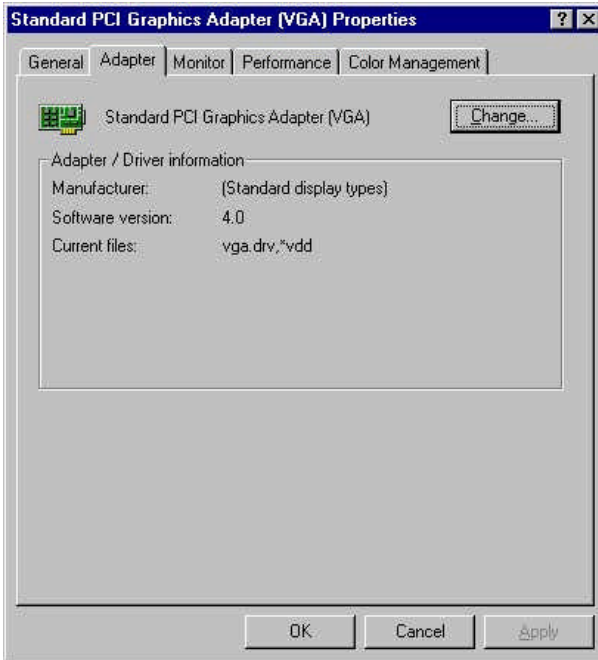
3. The Update Device Driver Wizard will appear. Click Next to search for the VGA drivers.

4. Click Next to continue the search for the drivers.

5. Click on the Specify a location checkbox and type the location path as E:\VIA\VIA8606\Win9x. This is assuming that E: is your CDROM drive and you are installing drivers for Windows 9x. Please select other subdirectories if you are using other operating systems.

6. When Windows find the driver, click Next for Windows to install the drivers into the system.

7. When the driver installation is finished, click Finish for changes to take effect.

LAN Drivers Installation

This section describes LAN features and driver installation of the onboard Realtek RTL8139C Ethernet controller.

Introduction

Realtek RTL8139C is a 32-bit 10/100MBps Ethernet controller for PCI local bus-compliant PCs. It supports bus mastering architecture, and auto-negotiation feature which make it possible to combine one common type of Ethernet cabling − an RJ-45 connector for twisted-pair cabling that can be used for both 10Mbps and 100Mbps connection. Extensive driver support for commonly used network operating systems is also provided.

Features

- Conforms to the Ethernet IEEE 802.3u standard
- Compatible with PCI Local Bus Revision 2.1 specification
- IEEE 802.3u Auto-Negotiation for automatic speed selection
- Supports Full-Duplex/Half-Duplex Operation
- Provides 32-bit bus mastering data transfer
- Supports 10Mbps and 100Mbps operation in a single port

The following section describes the installation driver procedure for Windows 98.

Installing LAN Drivers for Windows 98

This section describes the procedure to install Windows 98 drivers for Realtek RTL8100BL PCI Fast Ethernet controller.

1. Under Windows 98, click Start, then Settings, then Control Panel. Double click System Properties. Under System Properties, click Device Manager, then Other Properties. Remove the two PCI Ethernet Controller and click Refresh.
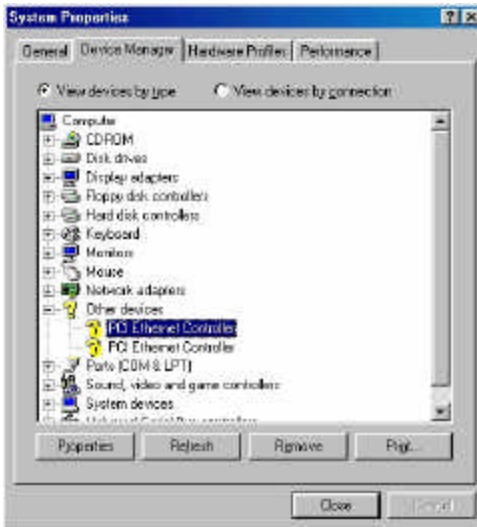
2. Windows will start to search for the new drivers for the Ethernet
controllers. In the Add New Hardware Wizard, click Next.
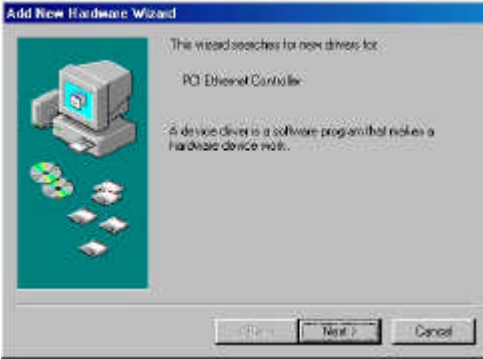
3. Now, select Search for the best driver for your device,
(Recommended), and click Next.

4. Select Specify a location: and specify the path of the drivers. Assuming that the drivers are in diskettes, the path would be A:\RTL8139C\Win98. But if your drivers come in a CD disc, the path would be (assuming d: is your CDROM drive) d:\LAN\RTL8139X\WIN98 . After entering the path, click Next. Click Next to start the driver search.
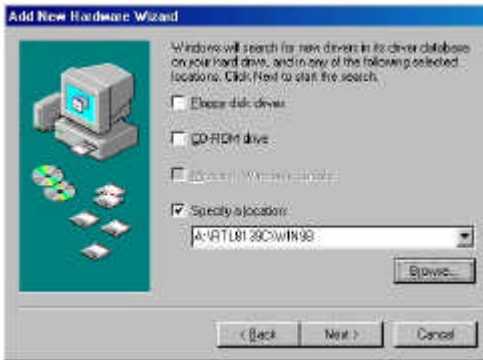
5. When the driver location has been verified, click Next to start the driver installation.
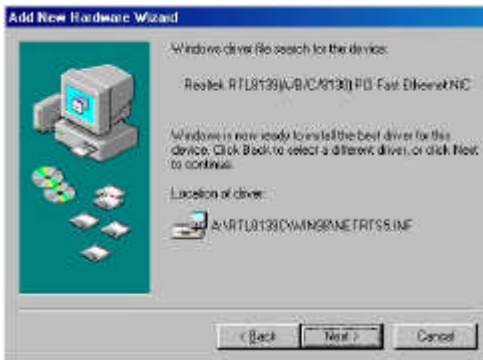
6. After file copying is done, click Finish and restart the computer when prompted.

Audio Drivers Installation

Follow the This chapter describes the VIA 686A/B audio driver installation process for Windows 98SE and Windows NT. Follow the installation steps below to finish the audio driver installation.

## Windows 98SE Audio Driver Installation

1. Insert the driver CD disc to the CD-ROM drive. The CD-ROM autoruns and displays the selections available. Click on **VIA Chips Driver** and the following window appears. Click **VIA 686A/B PCI Multimedia Audio Driver**.
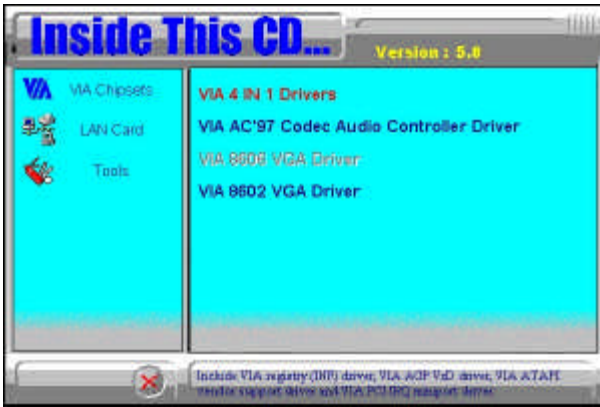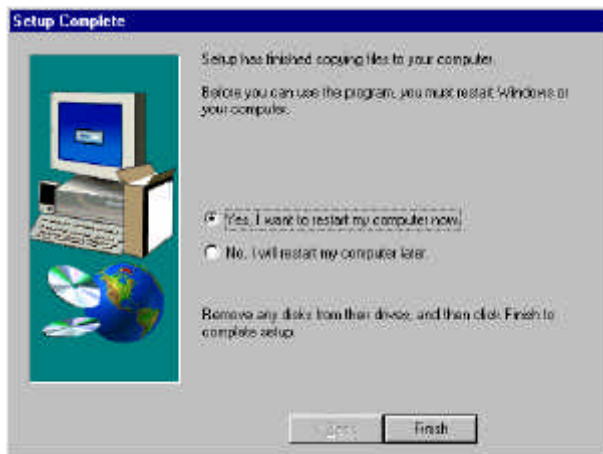

2. When the **Welcome** screen appears, click **Next** to proceed with the audio driver installation.

3. The **Select Components** window will appear. Click **Next** to install the audio driver.
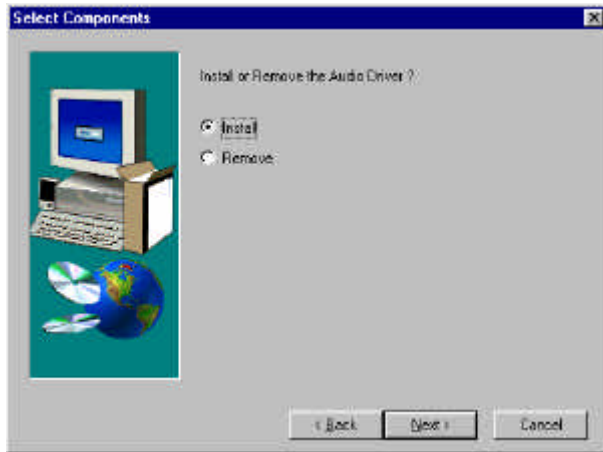
4. After the necessary files are copied, click **Finish**.

5. When Windows restarts, the new hardware wizard window will appear. The wizard searches for the drivers for VIA PCI Audio Controller (WDM). Click Next to continue.

6. In the next window, select Search for the best driver for your device (Recommended). Click Next.

7. Now, select Specify a location, then key in location path as d:\via\via686A\win98\win98se, assuming that D: is your CDROM drive and the driver CD is in the CDROM. Now, click Next → Next.

8. When prompted to insert the Windows 98SE CD, do so accordingly and click OK. When the screen appears with a message can' t find viaudio.dat, insert the driver CD into the CDROM and key in the file path as d:\via\via686a\win98\win98se and click Finish.

9. Restart your computer when prompted for changes to take effect.

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