HS-4650

Socket 370 133MHz FSB
Embedded Engine Board

• CRT/Panel • 133MHz FSB • PCI Slot •
• Four LAN • Audio • RS-232/422/485 •
• 4COM • IrDA • USB • TV-Out • H/W Monitor •
• Industrial Embedded Single Board computer •

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Table of Contents

Safety Instructions

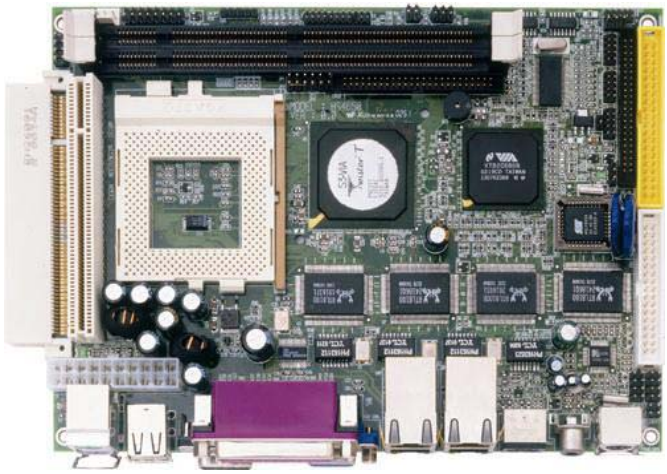
Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This helps to discharge any static electricity on your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components. Fasten the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please wear and connect the strap before handle the HS-4650 to ensure harmlessly discharge any static electricity through the strap.
- Please use an anti-static pad when putting down any components or parts or tools outside the computer. You may also use an anti-static bag instead of the pad. Please inquire from your local supplier for additional assistance in finding the necessary anti-static gadgets.

NOTE: *DO NOT TOUCH THE BOARD OR ANY OTHER SENSITIVE COMPONENTS WITHOUT ALL NECESSARY ANTI-STATIC PROTECTION.*

Chapter 1

General Description



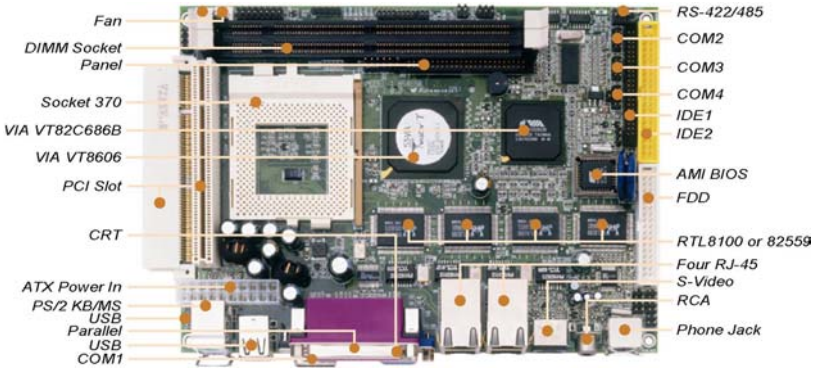
The HS-4650 is a 133MHz FSB VIA VT8606 chipset-based board designed for PCI Bus Socket 370 Intel® Celeron/Coppermine/Tualatin and VIA C3 800MHz~1.3GHz CPU. These features combine and make the HS-4650 an ideal all-in-one industrial single board computer. Additional features include an enhanced I/O with CRT/Panel, four LAN, audio, 4COM ports, and TV-Out interfaces.

Its onboard ATA/33/66/100 to IDE drive interface architecture allows the HS-4650 to support data transfers of 33, 66 or 100MB/sec. to two IDE drive connection. Designed with the VIA VT8606 core logic chipset, the board supports Socket 370 Intel® Celeron/Coppermine/Tualatin and VIA C3 800MHz~1.3GHz CPU. The VIA VT8606 integrated S3 3D supporting CRT/Panel displays up to 1920 x 1440.

System memory is also sufficient with the two DIMM sockets that can support up to 1GB.

Additional onboard connectors include two advanced USB ports providing faster data transmission. And four external RJ-45 connectors for 10/100 Based Ethernet use.

1.1 Major Features



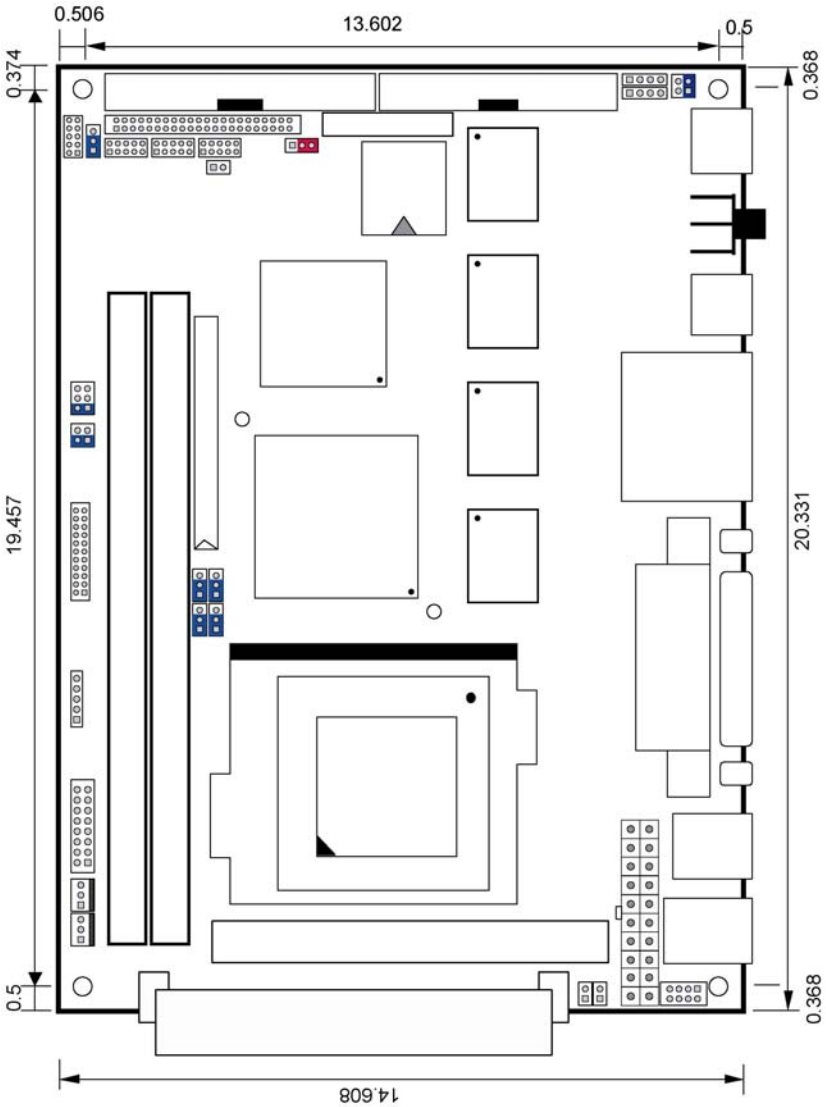
The HS-4650 comes with the following features:

- Socket 370 for Intel® Celeron/Coppermine/Tualatin and VIA C3 800MHz~1.3GHz CPU
- VIA VT8606/VT82C686B system chipset
- Supports 66/100/133MHz FSB
- Two DIMM sockets with a max. capacity of 1GB
- SMC 37E760, VIA VT82C686B super I/O chipset
- One vertical and one horizontal PCI Slots
- Fast PCI ATA/33/66/100 IDE controller
- Three RS-232 and one RS-232/422/485 serial ports
- VIA VT8606 CRT/Panel display controller
- Four RealTek RTL8100 or Intel® 82559 (optional) 10/100 Based LAN
- AC97 3D audio controller
- Four USB connectors
- Supports TV-Out function (optional)
- Supports Hardware Monitor function

1.2 Specifications

- **CPU:** Socket 370 for Intel® Celeron/Coppermine/Tualatin and VIA C3 800MHz~1.3GHz CPU
- **Bus Interface:** PCI Bus
- **Bus Clock Rate:** 66/100/133MHz FSB
- **Memory:** Two DIMM sockets supporting up to 1GB
- **Chipset:** VIA VT8606/VT82C686B
- **I/O Chipset:** SMC 37E760, VIA VT82C686B
- **PCI Slot:** Two standard PCI Slots, vertical x 1 and horizontal x 1
- **VGA:** VIA VT8606 integrated S3 3D supporting CRT/Panel displays up to 1920 x 1440
- **IDE:** Four IDE disk drives supporting ATA/33/66/100 and with transfer rates of up to 33/66/100MB/sec.
- **FDD:** Supports up to two floppy disk drives
- **Parallel:** One enhanced bi-directional parallel port supporting SPP/ECP/EPP
- **LAN:** Four RealTek RTL8100 or Intel 82559 (optional) 10/100 Based LAN
- **Audio:** AC97 3D audio controller
- **Serial Port:** 16C550 UART-compatible RS-232/422/485 x 1 and RS-232 x 3 serial ports with 16-byte FIFO
- **IrDA:** One IrDA TX/RX header
- **USB:** Four USB connectors
- **TV-Out:** Supports PAL or NTSC TV systems (optional)
- **Keyboard:** PS/2 6-pin Mini DIN
- **Mouse:** PS/2 6-pin Mini DIN
- **BIOS:** AMI PnP Flash BIOS
- **CMOS:** Battery backup
- **DMA Channels:** 7
- **Interrupt Levels:** 15
- **Power:** Supports ATX power function
- **Operating Temperature:** 0~+60°C
- **Hardware Monitor:** VIA VT82C686B
- **Board Size:** 20.33 x 14.6 cm

1.3 Board Dimensions



Chapter 2

Unpacking

2.1 Opening the Delivery Package

The HS-4650 is packed in an anti-static bag. The board has components that are easily damaged by static electricity. Do not remove the anti-static wrapping until proper precautions have been taken. Safety Instructions in front of this manual describe anti-static precautions and procedures.

2.2 Inspection

After unpacking the board, place it on a raised surface and carefully inspect the board for any damage that might have occurred during shipment. Ground the board and exercise extreme care to prevent damage to the board from static electricity.

Integrated circuits will sometimes come out of their sockets during shipment. Examine all integrated circuits, particularly the BIOS, processor, memory modules, ROM-Disk, and keyboard controller chip to ensure that they are firmly seated. The HS-4650 delivery package contains the following items:

- **HS-4650 Board x 1**
- **Utility CD Disk x 1**
- **ATA/100 IDE flat cable x 1**
- **2.0m/m IDE transfer to 2.0m/m and 2.54m/m cable x 1**
- **FDD flat cable x 1**
- **One RS-232 COM Port cable x 3**
- **8-pin USB split type cable x 1**
- **Jumper Bag x 1**
- **User's Manual**

It is recommended that you keep all the parts of the delivery package intact and store them in a safe/dry place for any unforeseen event requiring the return shipment of the product. In case you discover any missing and/or damaged items from the list of items, please contact your dealer immediately.

Chapter 3

Hardware Installation

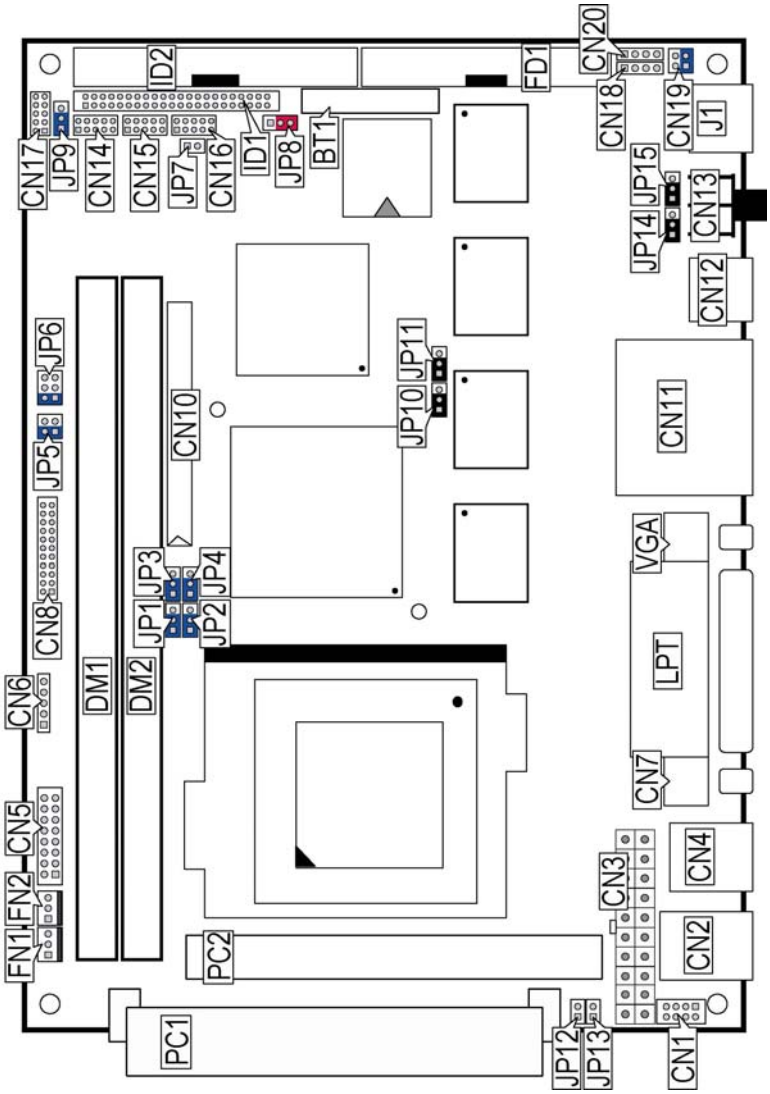
This chapter provides the information on how to install the hardware using the HS-4650. This chapter also contains information related to jumper settings of switch, jumpers and connectors.

3.1 Before Installation

After confirming your package contents, you are now ready to install your hardware. The following are important reminders and steps to take before you begin with your installation process.

1. Make sure that all jumper settings match their default settings and CMOS setup correctly. Refer to the sections on this chapter for the default settings of each jumper.
2. Go through the connections of all external devices and make sure that they are installed properly and configured correctly within the CMOS setup. Refer to the sections on this chapter for the detailed information on the connectors.
3. Keep the manual and diskette in good condition for future reference and use.

3.2 Board Layout



NOTE: *JP10/JP11/JP14/JP15 only for Intel 82559.*

3.3 Jumper List

Jumper	Default Setting	Setting	Page
JP1~JP4	RS-232 Enabled/Disabled Select: *Enabled*	Short 1-2	16
JP5	RS-422/485 Receiver Enabled/Disabled Select: *Disabled*	Short 1-2	16
JP6	RS-422/485 Transceiver Enabled/ Disabled Select: *Disabled*	Short 1-2	16
JP7	COM2 Use RS-232 or RS-422/485 Select: *RS-232*	Open	16
JP8	Panel Voltage Select: *+3.3V*	Short 2-3	11
JP9	Clear CMOS: *Normal Operation*	Short 1-2	20
JP10	LAN1 Enabled/Disabled Select: *Enabled*	Short 1-2	19
JP11	LAN2 Enabled/Disabled Select: *Enabled*	Short 1-2	19
JP12	CPU Host Clock Select: *Auto Detect*	Open	10
JP13	CPU Host Clock Select: *Auto Detect*	Open	10
JP14	LAN3 Enabled/Disabled Select: *Enabled*	Short 1-2	19
JP15	LAN4 Enabled/Disabled Select: *Enabled*	Short 1-2	19
CN19	Video/Audio Output Connector	Short 1-2	25

3.4 Connector List

Connector	Definition	Page
CN1/CN4	USB Connector	20
CN2	PS/2 6-pin Mini DIN KB/MS Connector	21
CN3	20-pin ATX Power In Connector	21
CN5	System Front Panel Connector	22
CN6	IrDA Connector	23
CN7	COM1 Connector (DB9)	16
CN8	Digital I/O Connector	23
CN11	Dual RJ-45 Connector	19
CN10	50-pin Panel Connector	11
CN12	Video Jack Connector	25
CN13	RCA Connector	25
CN14	COM 2 Connector (5x2 header)	16
CN15	COM 3 Connector (5x2 header)	16
CN16	COM 4 Connector (5x2 header)	16
CN17	RS-422/485 Connector (5x2 header)	16
CN18	CD-In Connector	24
CN20	Line In Connector	24

. . . More on next page . . .

Connector	Definition	Page
CN21	LVDS Connector	11
DM1/DM2	168-pion DIMM Socket	10
FN1/FN2	Fan Power Connector	21
FD1	Floppy Connector	15
ID1/ID2	Primary/Secondary IDE Connectors	13
J1	MIC In/Audio Out Connector	24
LPT	Parallel Connector	18
PC1/PC2	PCI Expansion Slot	25
VGA	15-pin CRT Connector	11

3.5 Configuring the CPU

The HS-4650 provides all necessary by jumper setting in using CPU Host Clock as the system bus clocking with *JP12* and *JP13*.

- **JP12, JP13: CPU Host Clock Select**

Options	JP12	JP13
66MHz	Short	Short
100MHz	Open	Short
133MHz (default)	Open	Open

The HS-4650 offers the convenience in CPU installation with its auto-detect feature. After installing a new microprocessor onboard, the HS-4650 automatically identifies the frequency and clock speed of the installed microprocessor chip, thereby eliminating the need for user to do additional CPU configuration or hardware settings related to it.

3.6 System Memory

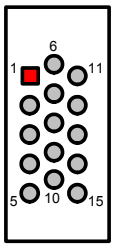
The HS-4650 provides two DIMM sockets at locations *DM1* and *DM2*. The maximum capacity of the onboard memory is 1GB.

3.7 VGA Controller

The HS-4650 provides three connection methods of a VGA device. *VGA* offers a single standard CRT connector while *CN10* is the 50-pin panel connector and *CN21* is the LVDS interface connector reserved for flat panel installation.

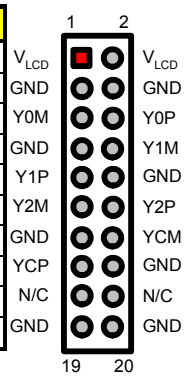
- **VGA: 15-pin CRT Connector**

PIN	Description	PIN	Description
1	Red	2	Green
3	Blue	4	N/C
5	GND	6	GND
7	GND	8	GND
9	N/C	10	GND
11	N/C	12	SDA
13	HSYNC	14	VSYNC
15	SCL		



- **CN21: LVDS Connector**

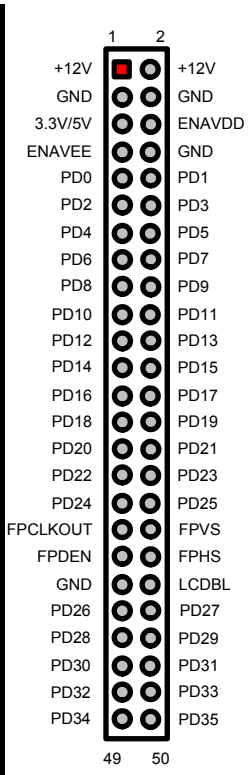
PIN	Description	PIN	Description
1	V_{LCD}	2	V_{LCD}
3	GND	4	GND
5	Y0M	6	Y0P
7	GND	8	Y1M
9	Y1P	10	GND
11	Y2M	12	Y2P
13	GND	14	YCM
15	YCP	16	GND
17	N/C	18	N/C
19	GND	20	GND



NOTE: *Please set the proper voltage of your panel using JP8 before proceeding on installing it.*

- **CN10: 50-pin Panel Connector**

PIN.	Description	PIN	Description
1	+12V	2	+12V
3	GND	4	GND
5	3.3V / 5V Note	6	ENAVDD
7	ENAVEE	8	GND
9	PD0	10	PD1
11	PD2	12	PD3
13	PD4	14	PD5
15	PD6	16	PD7
17	PD8	18	PD9
19	PD10	20	PD11
21	PD12	22	PD13
23	PD14	24	PD15
25	PD16	26	PD17
27	PD18	28	PD19
29	PD20	30	PD21
31	PD22	32	PD23
33	PD24	34	PD25
35	FPCLKOUT	36	FPVS
37	FPDEN	38	FPHS
39	GND	40	LCDBL
41	PD26	42	PD27
43	PD28	44	PD29
45	PD30	46	PD31
47	PD32	48	PD33
49	PD34	50	PD35

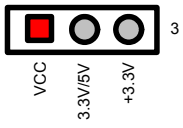


NOTE: *Please set the proper voltage of your panel using JP8 before proceeding on installing it.*

The HS-4650 has an onboard jumper that selects the working voltage of the flat panel connected to the system. Jumper *JP8* offers two voltage settings for the user.

- **JP8: Panel Voltage Select**

Options	Settings
+5V	Short 1-2
+3.3V (default)	Short 2-3

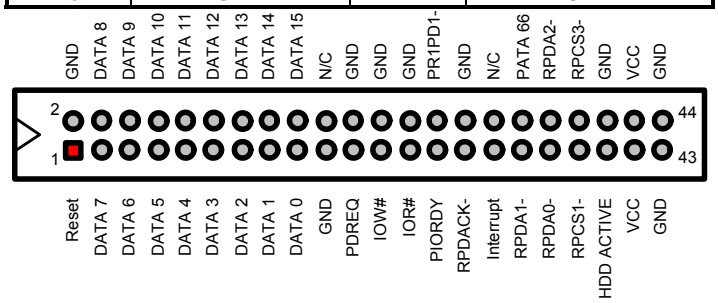


3.8 PCI E-IDE Drive Connector

ID1 is a standard 44-pin 2.0mm pitch and *ID2* is 40-pin 2.54mm pitch connectors daisy-chain driver connector serves the PCI E-IDE drive connection to HS-4650. A maximum of four ATA/33/66/100 IDE drives can connect to the HS-4650 via *ID1* and *ID2*.

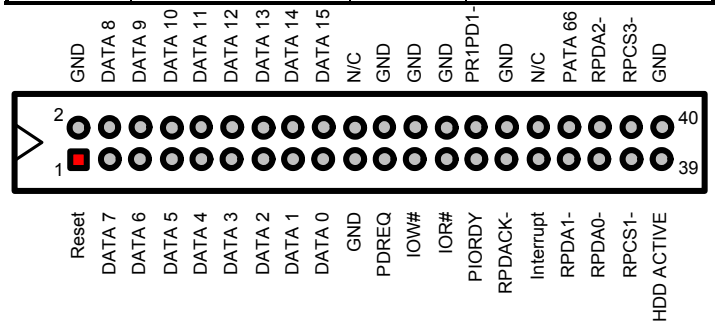
- **ID1: Primary IDE Connector**

PIN	Description	PIN	Description
1	Reset	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	PDREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	PIORDY	28	PR1PD1-
29	RPDACK-	30	GND
31	Interrupt	32	N/c
33	RPDA1-	34	PATA 66
35	RPDA0-	36	RPDA2-
37	RPCS1-	38	RPCS3-
39	HDD Active	40	GND
41	VCC	42	VCC
43	GND	44	GND



- **ID2: Secondary IDE Connector**

PIN	Description	PIN	Description
1	Reset	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	PDREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	PIORDY	28	PR1PD1-
29	RPDACK-	30	GND
31	Interrupt	32	N/C
33	RPDA1-	34	PATA 66
35	RPDA0-	36	RPDA2-
37	RPCS1-	38	RPCS3-
39	HDD Active	40	GND

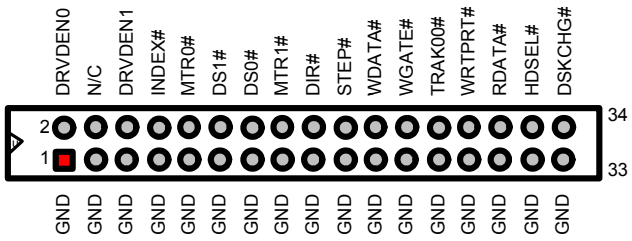


3.9 Floppy Disk Drive Connector

The HS-4650 uses a standard 34-pin header connector, *FD1*, for floppy disk drive connection. A total of two FDD drives may be connected to *FD1* at any given time.

- **FD1: Floppy Connector**

PIN	Description	PIN	Description
1	GND	2	DRVDEN0
3	GND	4	N/C
5	GND	6	DRVDEN1
7	GND	8	INDEX#
9	GND	10	MTR0#
11	GND	12	DS1#
13	GND	14	DS0#
15	GND	16	MTR1#
17	GND	18	DIR#
19	GND	20	STEP#
21	GND	22	WDATA#
23	GND	24	WGATE#
25	GND	26	TRAK00#
27	GND	28	WRTPRT#
29	GND	30	RDATA#
31	GND	32	HDSEL#
33	GND	34	DSKCHG#

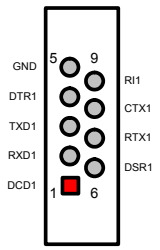


3.10 Serial Port Connectors

The HS-4650 offers two NS16C550 compatible UARTs with Read/Receive 16-byte FIFO serial ports and three internal 10-pin headers, one DB9 connector, and one RS-422/485 connector.

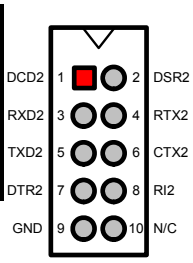
- **CN7: COM1 Connector (DB9)**

PIN	Description	PIN	Description
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTX1	8	CTX1
9	RI1		



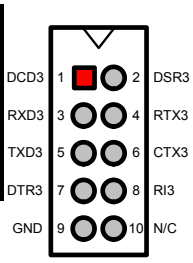
- **CN14: COM2 Connector (5x2 Header)**

PIN	Description	PIN	Description
1	DCD2	2	DSR2
3	RXD2	4	RTX2
5	TXD2	6	CTX2
7	DTR2	8	RI2
9	GND	10	N/C



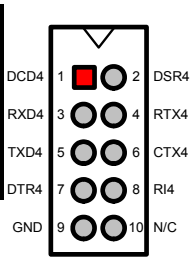
- **CN15: COM3 Connector (5x2 Header)**

PIN	Description	PIN	Description
1	DCD3	2	DSR3
3	RXD3	4	RTX3
5	TXD3	6	CTX3
7	DTR3	8	RI3
9	GND	10	N/C



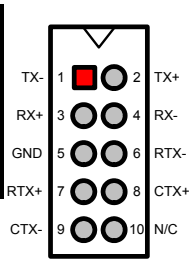
- **CN16: COM4 Connector (5x2 Header)**

PIN	Description	PIN	Description
1	DCD4	2	DSR4
3	RXD4	4	RTX4
5	TXD4	6	CTX4
7	DTR4	8	RI4
9	GND	10	N/C



- **CN17: RS-422/485 Connector (5x2 Header)**

PIN	Description	PIN	Description
1	TX-	2	TX+
3	RX+	4	RX-
5	GND	6	RTX-
7	RTX+	8	CTX+
9	CTX-	10	N/C



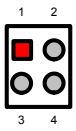
NOTE: *The terminal resistance of RX & TX is set in 180 Ω.*

- **JP1~JP4: COM2 use RS-232 or RS-422/485 Select**

Options	Settings
RS-232 (default)	Short 1-2
RS-422/485	Short 2-3

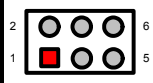
- **JP5: RS-422/485 Receiver Enabled/Disabled Select**

Options	Settings
Always Enabled (default)	Short 1-2
Enable by "-RTS" Signal	Short 3-4
Always Disabled	All Open



- **JP6: RS-422/485 Transceiver Enabled/Disabled Select**

Options	Settings
Always Enabled (default)	Short 1-2
Enable by "-RTS" Signal	Short 3-4
Enable by writing the REG:2 EFH BIT0=1	Short 5-6
Always Disabled	All Open



- **JP7: COM2 use RS-232 or RS-422/485 Select**

Options	Settings
RS-232 (default)	Open
RS-422/485	Short

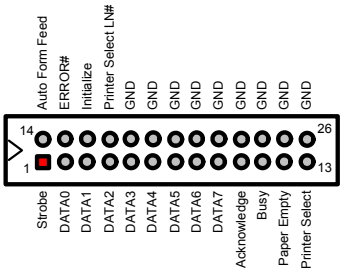
NOTE: *RS-422/485 port use COM2. RS-232 of COM2 cannot be used while RS-422/485 enable.*

3.11 Parallel Connector

LPT is a standard 26-pin flat cable connector deigned to accommodate parallel port connection to HS-4650.

- **LPT: Parallel Connector**

PIN	Description	PIN	Description
1	Strobe	14	Auto Form Feed
2	DATA 0	15	ERROR#
3	DATA 1	16	Initialize
4	DATA 2	17	Printer Select LN#
5	DATA 3	18	GND
6	DATA 4	19	GND
7	DATA 5	20	GND
8	DATA 6	21	GND
9	DATA 7	22	GND
10	Acknowledge	23	GND
11	Busy	24	GND
12	Paper Empty	25	GND
13	Printer Select	26	GND

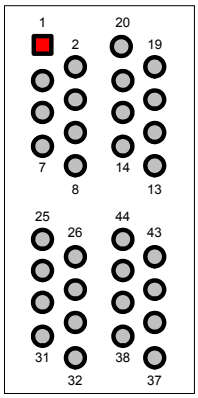


3.12 Ethernet Connector

The HS-4650 provides two external dual RJ-45 interface connectors. Please refer to the following for its pin information.

- **CN11: RJ-45 Connector**

PIN	Description	PIN	Description
1	TX+	2	TX-
3	RX+	4	N/C
5	N/C	6	RX-
7	N/C	8	N/C
9	1LED1	10	VDD3
11	1LED0	12	VDD3
13	TX+	14	TX-
15	RX+	16	N/C
17	N/C	18	RX-
19	N/C	20	N/C
21	2LED1	22	VDD3
23	2LED0	24	VDD3
25	TX+	26	TX-
27	RX+	28	N/C
29	N/C	30	RX-
31	N/C	32	N/C
33	3LED1	34	VDD3
35	3LED0	36	VDD3
37	TX+	38	TX-
39	RX+	40	N/C
41	N/C	42	RX-
43	N/C	44	N/C
45	4LED1	46	VDD3
47	4LED0	48	VDD3



- **JP10/JP11/JP14/JP15: LAN1/LAN2/LAN3/LAN4 Enabled/ Disabled Select (for Intel 82559 only)**

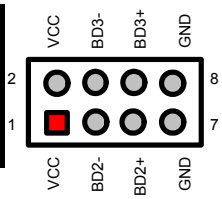
Options	Settings
Enabled (default)	Short 1-2
Disabled	Short 2-3

3.13 USB Connector

The HS-4650 provides one 8-pin and two external connectors, at locations *CN1* and *CN4*, for four USB connections to the HS-4650.

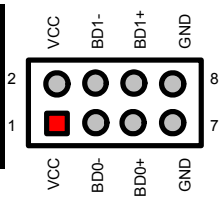
- **CN1: USB Connector**

PIN	Description	PIN	Description
1	VCC	2	VCC
3	BD2-	4	BD3-
5	BD2+	6	BD3+
7	GND	8	GND



- **CN4: USB Connector**

PIN	Description	PIN	Description
1	VCC	2	VCC
3	BD0-	4	BD1-
5	BD0+	6	BD1+
7	GND	8	GND

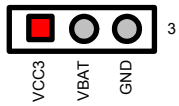


3.14 CMOS Data Clear

The HS-4650 has a Clear CMOS jumper on *JP9*.

- **JP9: Clear CMOS**

Options	Settings
Normal Operation (default)	Short 1-2
Clear CMOS	Short 2-3



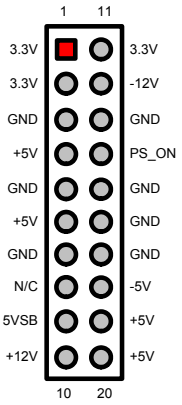
IMPORTANT: *Before you turn on the power of your system, please set JP9 to Short 1-2 for normal operation.*

3.15 Power and Fan Connectors

HS-4650 provides one 20-pin power connectors at *CN3.*And two 3-pin fan power in at *FN1* and *FN2*.

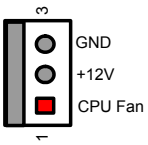
- **CN3: 20-pin ATX Power In Connector**

PIN	Description	PIN	Description
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V



- **FN1, FN2: Fan Power Connector**

PIN	Description
1	CPU Fan1/2
2	+12V
3	GND



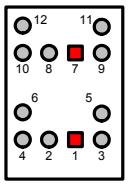
Connector *FN1* and *FN2* onboard HS-4650 are 3-pin fan power output connectors.

3.16 Keyboard and Mouse Connectors

The HS-4650 offers one possibility for keyboard and mouse connections. The connections are via *CN2* for an external PS/2 type keyboard and mouse.

- **CN2: PS/2 6-pin Mini DIN Keyboard/Mouse Connector**

PIN	Description	PIN	Description
1	Keyboard Data	7	Mouse Data
2	N/C	8	N/C
3	GND	9	GND
4	+5V	10	+5V
5	Keyboard Clock	11	Mouse Clock
6	N/C	12	N/C



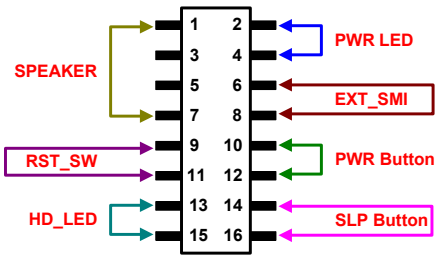
3.17 System Front Panel Connectors

The HS-4650 has one LED at location *CN5* that indicates the power-on status. This visual feature of the IDE LED may also be connected to an external IDE LED, Speaker, Reset Switch, Power LED, EXT SMI, Power Button, and SLP Button via connector *CN5 (13-15), CN5 (1-3-5-7)*, *CN5 (9-11)*, *CN5 (2-4)*, *CN5 (6-8)*, *CN5 (10-12)*, *CN5(14-16)*.

- **CN5: System Front Panel Connector**

PIN	Description	PIN	Description
1	+5V	2	330Ω Pull +5V
3	GND	4	GND
5	N/C	6	EXT SMI
7	Speaker	8	GND
9	GND	10	PW Button
11	Reset	12	GND
13	330Ω Pull +5V	14	SLP Button
15	HDD LED	16	GND

Connector CN5 Orientation

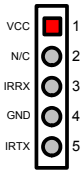


3.18 IrDA Connector

CN6 is a 5-pin internal FIR communication connector for connection of an IrDA device.

- **CN6: IrDA Connector**

PIN	Description
1	VCC
2	N/C
3	IRRX
4	GND
5	IRTX

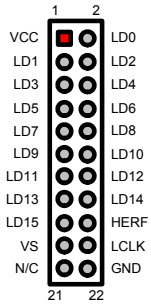


3.19 Digital I/O Connector

The HS-4650 provides a *CN8* connector for Digital I/O function.

- **CN8: Digital I/O Connector**

PIN	Description	PIN	Description
1	VCC	2	LD0
3	LD1	4	LD2
5	LD3	6	LD4
7	LD5	8	LD6
9	LD7	10	LD8
11	LD9	12	LD10
13	LD11	14	LD12
15	LD13	16	LD14
17	LD15	18	HREF
19	VS	20	LCLK
21	N/C	22	GND

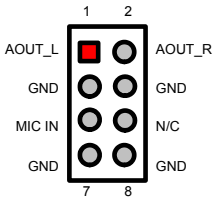


3.20 Audio Connectors

The HS-4650 has an onboard AC97 3D audio interface. The following tables list the pin assignments of the CD In, Line In, and MIC In/Audio Out connectors.

- **J1: MIC In/Audio Out Connector**

PIN	Description	PIN	Description
1	AOUTL	2	AOUTR
3	GND	4	GND
5	MIC IN	6	N/C
7	GND	8	GND

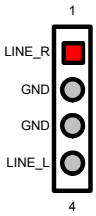


- **CN18: CD In Connector**

PIN	Description
1	CDL
2	GND
3	GND
4	CDR

- **CN20: Line In Connector**

PIN	Description
1	Line_R
2	GND
3	GND
4	Line_L

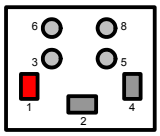


3.21 TV Out Function

HS-4650 can support TV-Out function which input could be up to 800 x 600 graphics resolutions. World Wide Video standards are supported including NTSC-M (North America, Taiwan), NTSC-J (Japan), PAL-B, D, G, H, I (Europe, Asia), PAL-M (Brazil), PAL-N (Uruguay, Paraguay) and PAL-NC (Argentina).

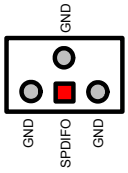
- **CN12: Video Jack Connector**

PIN	Description	PIN	Description
1	GND	2	GND
3	C	4	GND
5	Y	6	GND
8	GND		



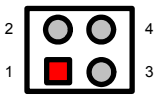
- **CN13: RCA Jack Connector**

PIN	Description	PIN	Description
1	CVBS/SPDIFO	2	GND
3	GND	4	GND



- **CN19: Video/Audio Output Select**

Setting	Description
Short 1-2 (default)	CVSB
Short 3-4	SPDIFO



3.22 PCI Expansion Slot

HS-4650 provides two standard PCI expansion slots, one is vertical and one is horizontal. We will ship this board with the horizontal slot installed, and you can use another slot for expansion when necessary.

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Chapter 4

AMI BIOS Setup

The HS-4650 uses AMI BIOS for the system configuration. The AMI BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options that could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

4.1 Starting Setup

The AMI BIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after switching the system on, or
2. By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test).

Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

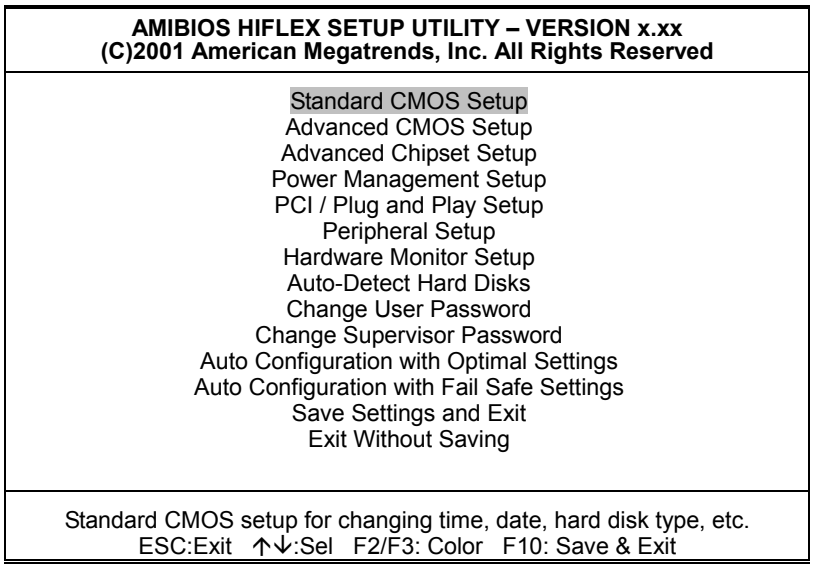
4.2 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the <PageUp> and <PageDown> keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

↑	Move to previous item
↓	Move to next item
←	Move to previous item
→	Move to previous item
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp key	Decrease the numeric value or make changes
PgDn key	Increase the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	Reserved
F2 key	Change color from total 8 colors. F2 to select color forward
F3 key	F2 to select color backward
F4 key	Reserved
F5 key	Reserved
F6 key	Reserved
F7 key	Reserved
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.3 Main Menu

Once you enter the AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to enter the sub-menu.



NOTE: *A brief description of the highlighted choice appears at the bottom of the screen.*

4.4 Standard CMOS Setup

The Standard Setup is used for the basic hardware system configuration. The main function is for Data/Time and Floppy/Hard Disk Drive settings. Please refer to the following screen for the setup. When the IDE hard disk drive you are using is larger than 528MB, you must set the HDD mode to **LBA** mode. Please use the IDE Setup Utility in BIOS SETUP to install the HDD correctly.

AMIBIOS SETUP – STANDARD CMOS SETUP
(C)2001 American Megatrends, Inc. All Rights Reserved

Date (mm/dd/yyyy) : Thu May 08, 2003 — Base Memory : 639KB
Time (hh/mm/ss) : 19:04:12 — Extd Memory : 247MB

Floppy Drive A: 1.44MB 3 1/2
Floppy Drive B: Not Installed

	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO Mode	32Bit Mode
Pri Master	: Auto									On
Pri Slave	: Auto									On
Sec Master	: Auto									On
Sec Slave	: Auto									On

Boot Sector Virus Protection: Disabled

Month: Jan - Dec — ESC:Exit ↑↓:Sel
Day: 01 – 31 — PgUp/PgDn: Modify
Year: 1980 - 2099 — F2/F3:Color

4.5 Advanced CMOS Setup

This section allows you to configure your system for the basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

AMIBIOS SETUP – ADVANCED CMOS SETUP
(C)2001 American Megatrends, Inc. All Rights Reserved

Quick Boot	Enabled	▲	Available Options:
1st Boot Device	Floppy		▸ Disabled
2nd Boot Device	IDE-0		Enabled
3rd Boot Device	CD-ROM		
Try Other Boot Devices	Yes		
S.M.A.R.T. for Hard Disks	Disabled		
BootUp Num-Lock	On		
Floppy Drive Swap	Disabled		
Floppy Drive Seek	Disabled		
PS/2 Mouse Support	Enabled		
Primary Display	VGA/EGA		
Password Check	Setup		
Boot To OS/2	No		
CPU MicroCode Updation	Enabled		
CPU Serial Number	Disabled		
L1 Cache	Enabled		
L2 Cache	Enabled		
System BIOS Cacheable	Enabled		
C000,32k Shadow	Cached		
C800,16k Shadow	Disabled		
CC00,16k Shadow	Disabled		
D000,16k Shadow	Disabled		
D400,16k Shadow	Disabled		ESC: Exit ↑↓: Sel
D800,16k Shadow	Disabled		PgUp/PgDn: Modify
DC00,16k Shadow	Disabled	▼	F2/F3: Color

4.6 Advanced Chipset Setup

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and the access to the system memory resources, such as DRAM and the external cache. It also coordinates the communications between the conventional ISA and PCI buses. It must be stated that these items should never be altered. The default settings have been chosen because they provide the best operating conditions for your system. You might consider and make any changes only if you discover that the data has been lost while using your system.

AMIBIOS SETUP – ADVANCED CHIPSET SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
******** DRAM Timing ********		Available Options:
Configure SDRAM Timing by SPD	Enabled	▸ Disabled
DRAM Frequency	100Mhz	Enabled
SDRAM CAS# Latency	3	
DRAM Bank Interleave	Enabled	
Memory Hole	Disabled	
AGP Mode	4x	
AGP Fast Write	Disabled	
AGP Aperture Size	64MB	
AGP Master 1 W/S Write	Disabled	
AGP Master 1 W/S Read	Disabled	
Search for MDA Resources	Yes	
PCI Delay Transaction	Enabled	
ISA Bus Clock	PCICLK/4	
USB Controller	All USB Port	ESC: Exit ↑↓: Sel
USB Device Legacy Support	Disabled	PgUp/PgDn: Modify
Port 64/60 Emulation	Disabled	F2/F3: Color

4.7 Power Management Setup

The Power Management Setup allows user to configure the system for saving energy in a most effective way while operating in a manner consistent with his own style of computer use.

AMIBIOS SETUP – POWER MANAGEMENT SETUP
(C)2001 American Megatrends, Inc. All Rights Reserved

ACPI Aware O/S	Yes	Available Options:
ACPI Standby State	Auto	No
USB Device Wakeup From S3-S5	Disabled	▸ Yes
Re-Call VGA BIOS at S3 Resuming	Disabled	
Power Management/APM	Disabled	
Video Power Down Mode	Disabled	
Hard Disk Power Down Mode	Disabled	
Standby Time Out (Minute)	Disabled	
Suspend Time Out (Minute)	Disabled	
Throttle Slow Clock Ratio	50%-56.25%	
Display Activity	Ignore	
IRQ3	Monitor	
IRQ4	Monitor	
IRQ5	Ignore	
IRQ7	Monitor	
IRQ9	Ignore	
IRQ10	Ignore	
IRQ11	Ignore	
IRQ13	Ignore	
IRQ14	Monitor	
IRQ15	Ignore	
System Thermal	Disabled	
Thermal Active Temperature	65°C/149°F	
Thermal Slow Clock Ratio	50%-56.25%	
Power Button Function	On/Off	
Restore on AC / Power Loss	Last State	
Resume On Ring	Disabled	
Resume On LAN	Disabled	
Resume On PME#	Disabled	
Resume On KBC	N/A	
Wake-Up Key	N/A	
Wake-Up Password	N/A	
Resume On PS/2 Mouse	N/A	
Resume On RTC Alarm	Disabled	
RTC Alarm Date	15	
RTC Alarm Hour	12	ESC: Exit ↑↓: Sel
RTC Alarm Minute	30	PgUp/PgDn: Modify
RTC Alarm Second	30	F2/F3: Color

4.8 PCI / Plug and Play Setup

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system that allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

AMIBIOS SETUP – PCI / PLUG AND PLAY SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	No	Available Options:
Clear NVRAM	No	▸ No
OnChip VGA Frame Buffer Size	8MB	Yes
PCI Latency Timer (PCI Clocks)	32	
Primary Graphics Adapter	OnChip AGP	
Boot Screen Select	CRT	
TV Out Type	U.S. NTSC	
LCD Panel Type	1 800x600 TFT	
PCI IDE BusMaster	Enabled	
Off Board PCI IDE Card	Auto	
Off Board PCI IDE Primary IRQ	Disabled	
Off Board PCI IDE Secondary IRQ	Disabled	
DMA Channel 0	PnP	
DMA Channel 1	PnP	
DMA Channel 3	PnP	
DMA Channel 5	PnP	
DMA Channel 6	PnP	
DMA Channel 7	PnP	
IRQ3	PCI/PnP	
IRQ4	PCI/PnP	
IRQ5	PCI/PnP	
IRQ7	PCI/PnP	
IRQ9	PCI/PnP	
IRQ10	PCI/PnP	
IRQ11	PCI/PnP	ESC: Exit ↑↓: Sel
IRQ14	PCI/PnP	PgUp/PgDn: Modify
IRQ15	PCI/PnP	F2/F3: Color

4.9 Peripheral Setup

The IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship that is determined by the cabling configuration used to attach them to the controller. Your system supports two IDE controllers--a primary and a secondary--so you can install up to four separate hard disks.

PIO means Programmed Input/Output. Rather than having the BIOS issue a series of commands to affect the transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by them. This is much simpler and more efficient (also faster).

AMIBIOS SETUP – PERIPHERAL SETUP **(C)2001 American Megatrends, Inc. All Rights Reserved**		
OnBoard Serial Port3	3E8/COM3	Available Options:
Serial Port3 IRQ	11	▸ Disabled
OnBoard Serial Port4	2E8/COM4	Primary
Serial Port4 Mode	Normal	Secondary
Serial Port4 IRQ	10	Both
OnBoard FDC	Enabled	
OnBoard Serial Port1	3F8/COM1	
OnBoard Serial Port2	2F8/COM2	
Serial Port2 Mode	Normal	
IR Pins	N/A	
Duplex Mode	N/A	
Receiver Polarity	N/A	
Transmitter Pdarity	N/A	
OnBoard Prarllel Port	378	
Parallel Port Mode	Normal	
EPP Version	N/A	
Parallel Port DMA Channel	3	
Parallel Port IRQ	7	
OnBoard IDE	Both	
OnBoard AC'97 Audio	Enabled	
		ESC: Exit ↑↓: Sel
MPU-401	Disabled	PgUp/PgDn: Modify
MPU-401 I/O Address	330h-333h	F2/F3: Color

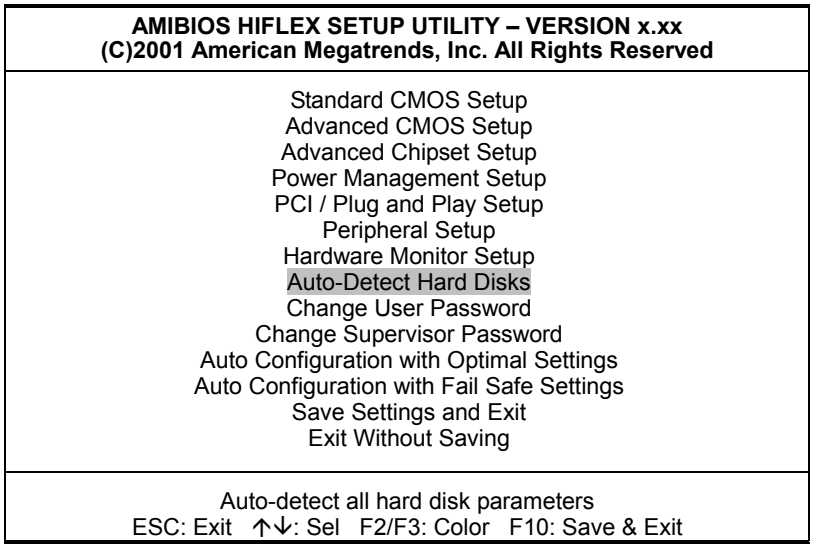
4.10 Hardware Monitor Setup

AMIBIOS SETUP – HARDWARE MONITOR SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
*** System Hardware Monitor ***		Available Options:
Chassis Intrusion	Disabled	▸ Disabled
TSENS1 Temperature		Enabled
TSENS2 Temperature		Reset
TSENS3 Temperature		
CPU Fan Speed		
Chassis Fan Speed		
Vcore		
+ 2.500V		
+ 3.300V		ESC: Exit ↑↓: Sel
+ 5.000V		PgUp/PgDn: Modify
+12.000V		F2/F3: Color

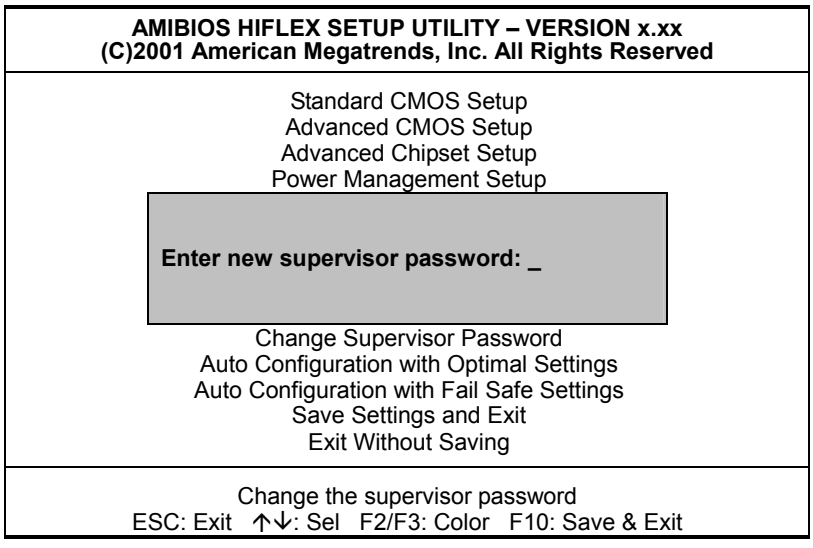
4.11 Auto-Detect Hard Disks

This option detects the parameters of an IDE hard disk drive, and automatically enters them into the Standard CMOS Setup screen.

Up to four IDE drives can be detected, with parameters for each appearing in sequence inside a box. To accept the displayed entries, press the "Y" key; to skip to the next drive, press the "N" key. If you accept the values, the parameters will appear listed beside the drive letter on the screen.



4.12 Change Supervisor/User Password



You can set either supervisor or user password, or both of then. The differences between are:

- **supervisor password:** can enter and change the options of the setup menus.
- **user password:** just can only enter but do not have the right to change the options of the setup menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

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

PASSWORD DISABLED.

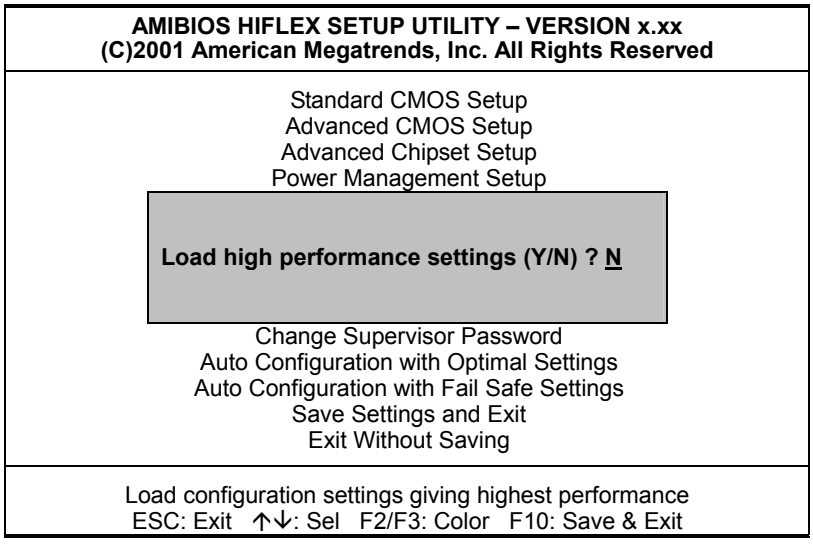
When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

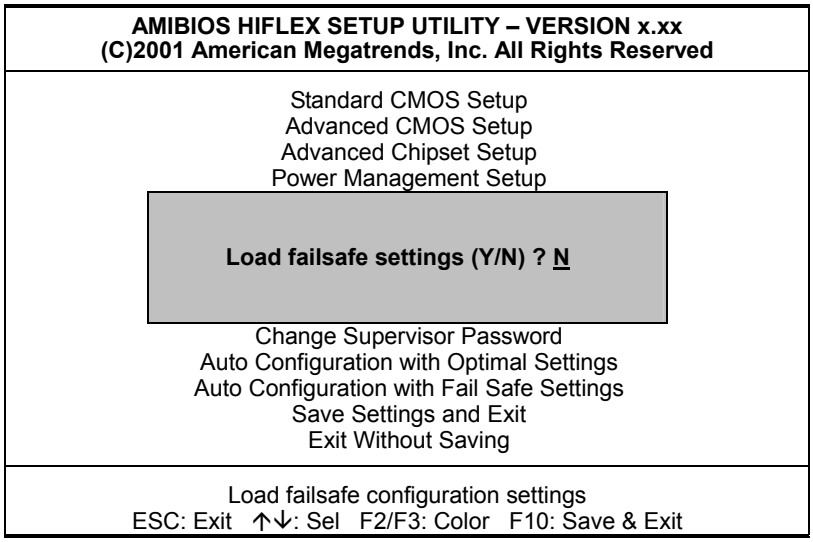
4.13 Auto Configuration with Optimal Settings

When you press <Enter> on this item you will get a confirmation dialog box with a message shown below. This option allows you to load/restore the BIOS default values permanently stored in the BIOS ROM. Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.



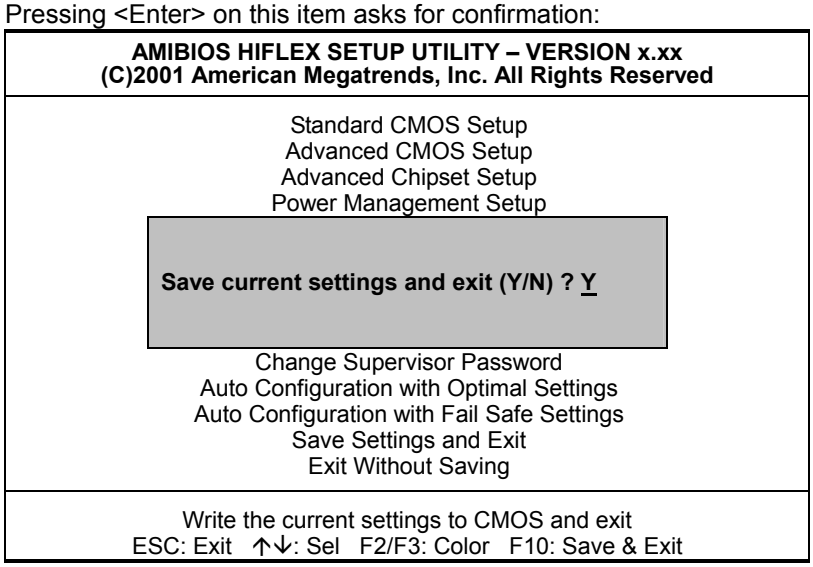
4.14 Auto Configuration with Fail Safe Settings

When you press <Enter> on this item you get a confirmation dialog box with a message similar to the figure below. This option allows you to load/restore the default values to your system configuration, optimizing and enabling all high performance features. Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.



4.15 Save Settings and Exit

Pressing <Enter> on this item asks for confirmation:



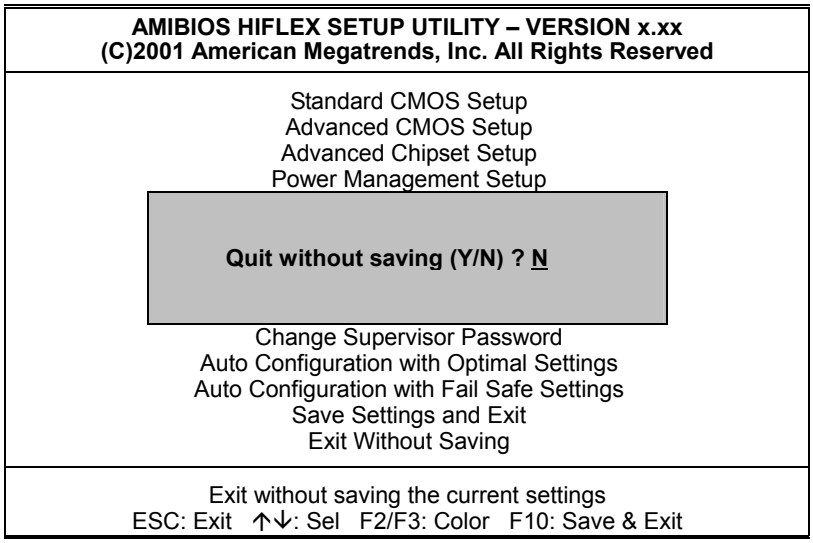
Pressing “Y” stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

4.16 Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.



Chapter 5

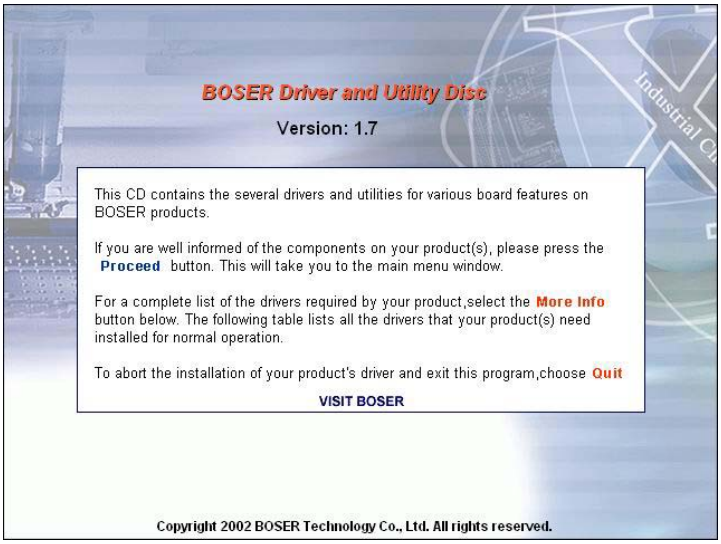
Software Utilities

This chapter contains the detailed information of IDE, VGA, Audio and LAN driver installation procedures.

5.1 VIA 4 in 1 Driver Installation

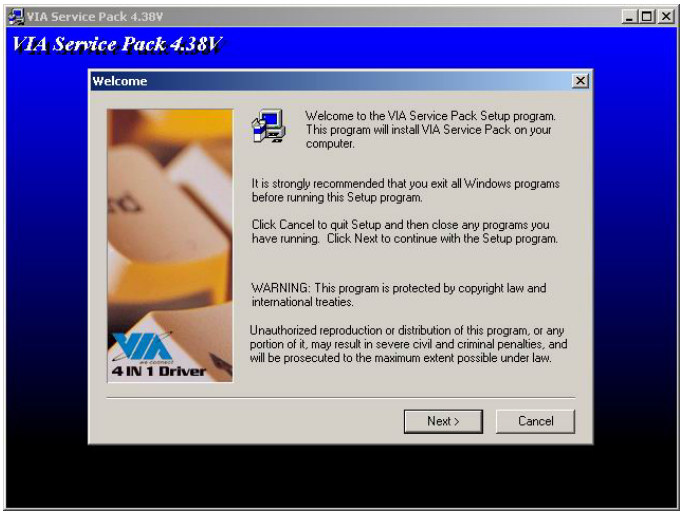
The utility disk that came with the delivery package contains an auto-run program that invokes the installation programs for the VIA 4 in 1 driver. The following describes the installation procedures of each driver.

1. Insert Utility CD Disk to your CD ROM. The main menu will pop up as shown below.

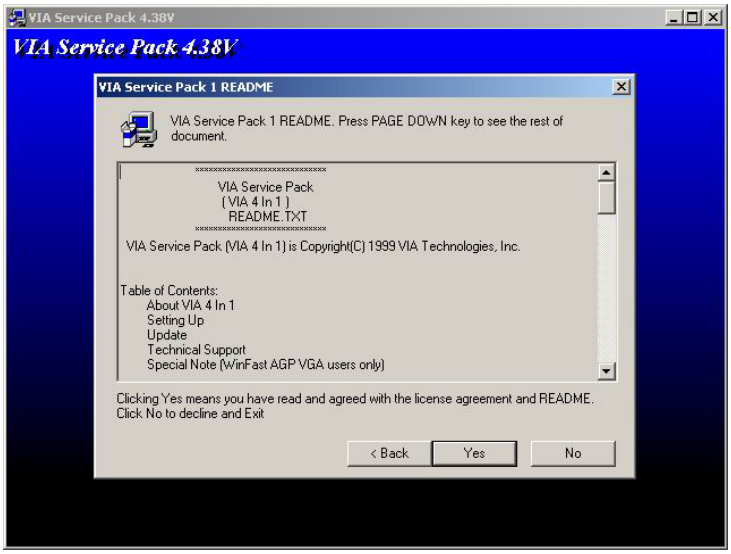


2. Press “VIA 4 IN 1” and to go Setup.

3. Once the Welcome screen appears on the screen, make sure to close any applications running and then click on the Next button.

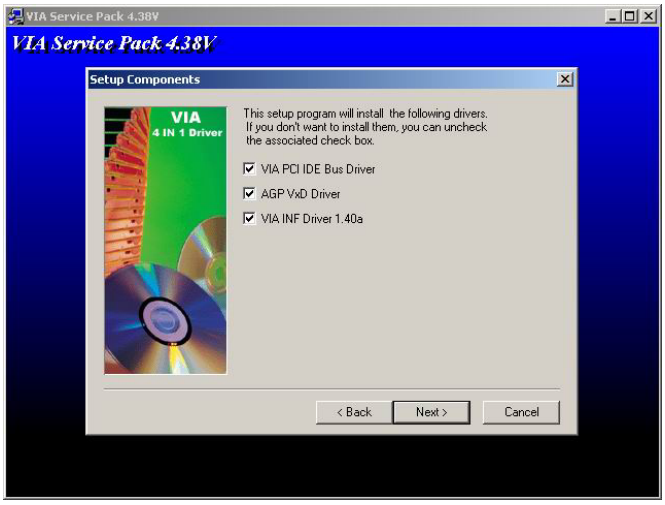


4. When the Readme window pops on the screen, you may read the whole document including the license agreement or just press Yes to skip through and continue installation.

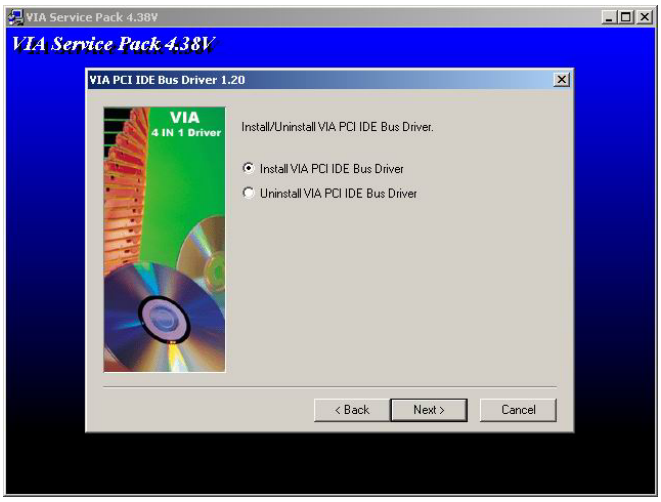


5. The 4 in 1 Setup dialog is now displayed. Select on Normally Install and then click on Next.

6. The next window lists all components detected in your system and asks you to select the ones requiring drivers. Tick on all items then proceed by clicking on the Next button below the screen.

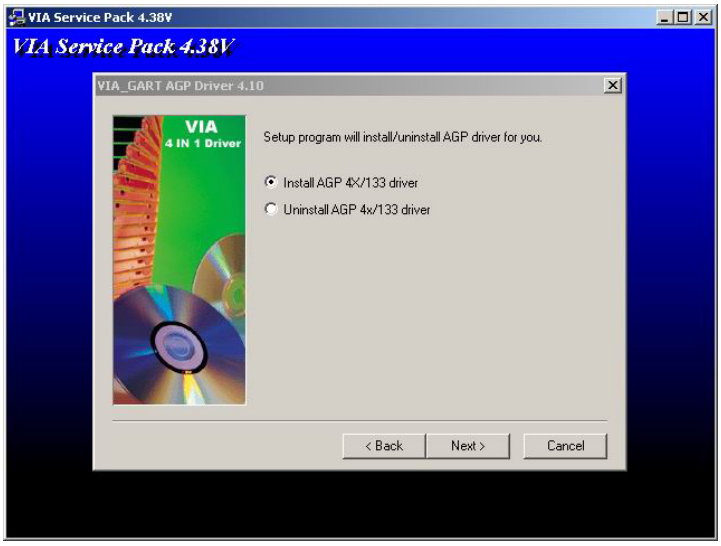


7. The program starts to install the ATAPI driver when you click the Next button on the screen below.

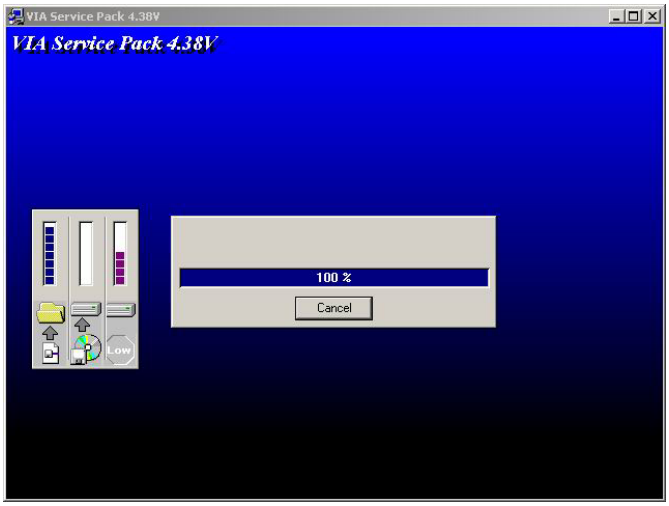


8. When the ATAPI driver is completely installed. The utility then displays your DMA mode status and allows you to enable it. Tick on the box and press on the Next button to continue.

9. The following screen then gives you the choice of installing the AGP driver in standard o turbo mode. Select on the Standard Mode and then click on Next to proceed.



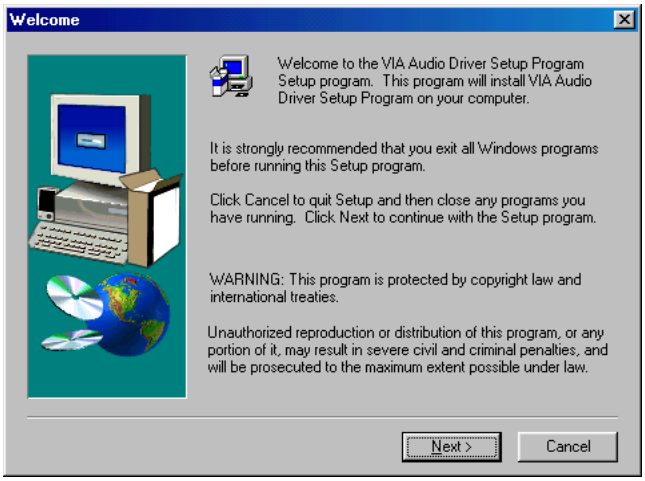
10. Installation of the AGP driver is now complete. Once the screen below appears, select on restarting your computer to activate all drivers/settings completed.



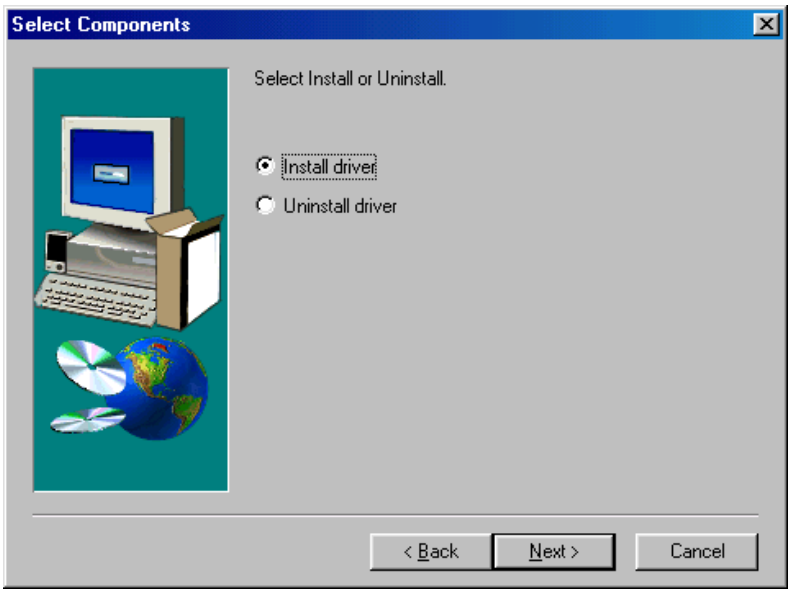
5.2 Audio Driver Installation

1. With the Utility CD Disk still in your CD ROM drive, open the File Manager and then select the CD-ROM drive. As soon as the system reads the disk, the VGA Menu screen below will appear on your display. Click on VIA_AC97 from the main menu.

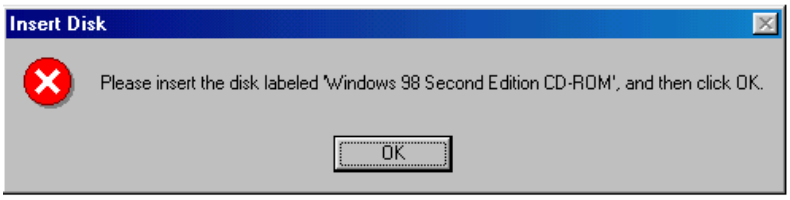
2. Once the Welcome screen appears on the screen, make sure to close applications that are running and then click the Next button.



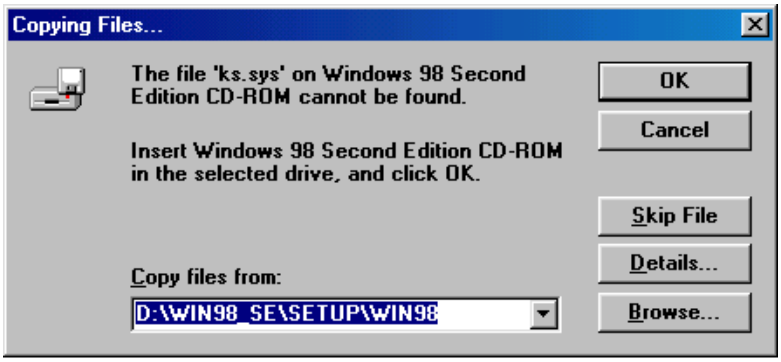
3. The Select Components dialog box is now displayed. Select on Install driver and then click on Next.



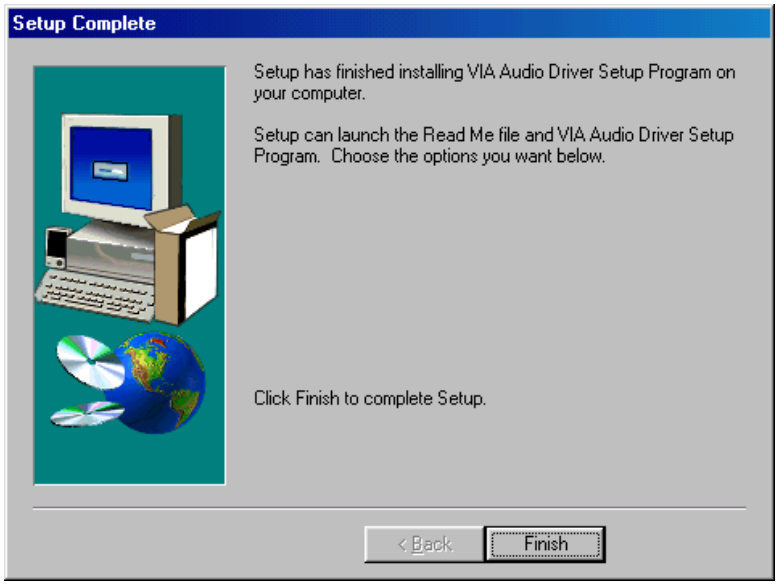
4. The program will now require the Windows installation disk for proper hardware installation. Insert the CD and then click on Next.



5. When the display below appears on your screen, Setup is already installing and copying the related files onto your hard drive. Click on the Next button to proceed.



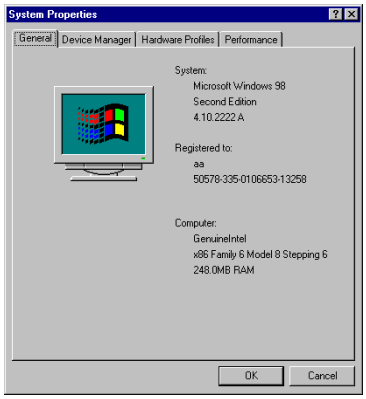
6. After the audio driver installation finishes, select the Finish button to complete the installation process.



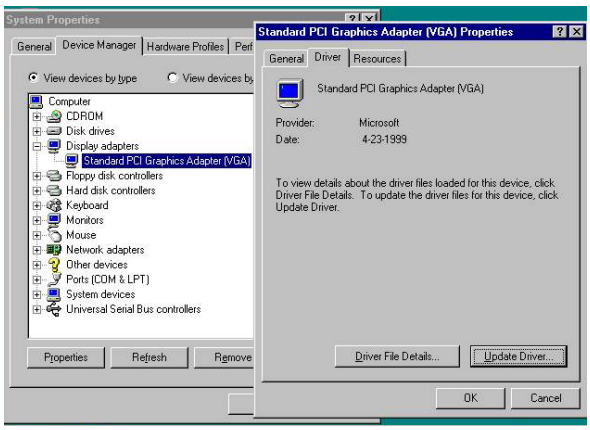
5.3 VGA Driver Installation

5.3.1 VGA Driver Installation for WIN98

1. With the Utility CD Disk still in your CD ROM drive, right click on My Computer icon from the Windows menu. Select on System Properties and then proceed to the Device Manager from the main menu.

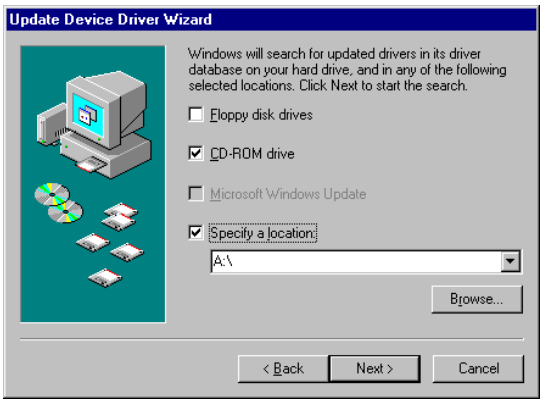


2. Select on Display Adapters from the list of devices then double-click on Standard PCI Graphics Adapter (VGA). The Standard PCI Graphics Adapter (VGA) Properties screen then appears, allowing you to re-install the driver. Select Driver from the main menu to proceed.

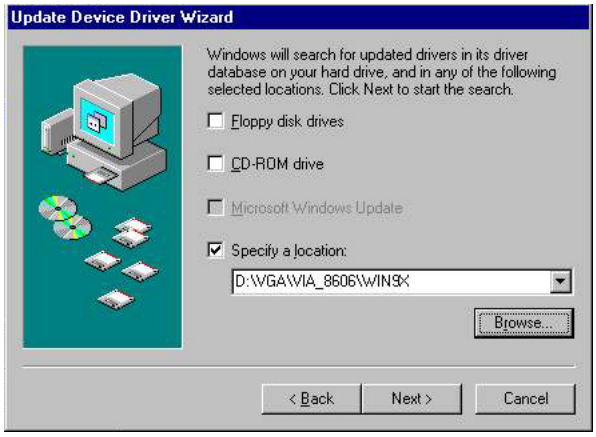


3. The window then displays the current status of your VGA driver. Press on Update Driver button to continue. The program will then launch the Update Device Driver Wizard window that will install your device driver. Click on the Next button to proceed to the next step.
4. When the succeeding window asks you what you wish Windows to do, tick on the "Search for a better driver…." Click on the Next button to proceed.

5. The Update Device Driver Wizard will then ask you to specify, by ticking, the path of the new driver. Tick on the open boxes where you require the program to search for the device driver then click on the Browse button to manually specify the path.



6. Press on the OK button as soon as you have located the path of your driver.
7. Once the program returns to the Add New Hardware Wizard screen, your specified location will appear. Press on the Next button to continue.



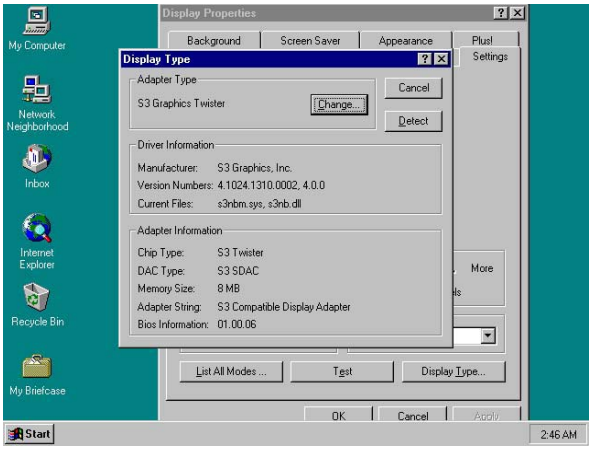
8. Once the program detects the device driver (*.inf) file from your specified location, it will automatically copy the files into your hard drive.

9. When copying of driver files finishes, the program will then ask you to insert your Windows.
10. The program then copies the necessary files from your Windows installation disk to complete the driver setup process. Once the driver is completely installed, the following message appears on your display. Click on the Finish button to proceed.

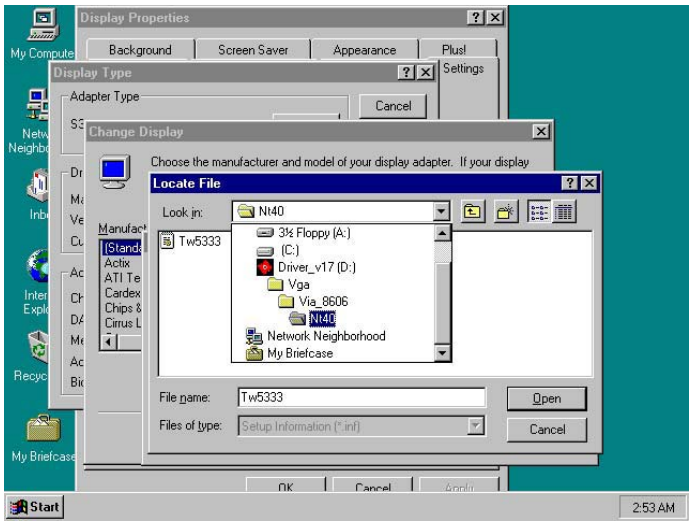
11. Restart your computer to make the new system settings take effect. Click on the Yes button when the screen below appears and your VGA Driver for Win98 are now completely installed.

5.3.2 VGA Driver Installation for WIN NT4.0

1. Click the **Start** button on the lower left hand corner of your screen, then select **Setting**. Choose **Control Panel** and double-click on the **Display** icon to launch its **Display Properties** window. Click on the **Settings** tab, and then choose **Display Type**. In the **Change Display Type** window, click on **Have Disk**.

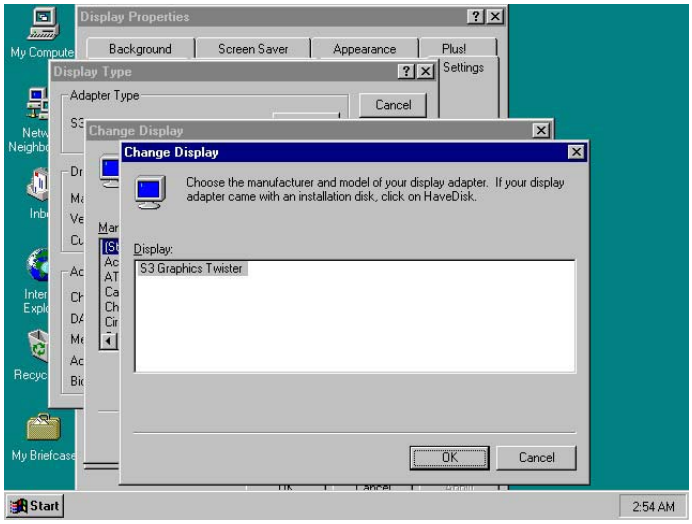


2. Specify the path of the new driver and then press on **Enter**. (If in driver D:, type d:\Vga/Via_8606/Nt40)

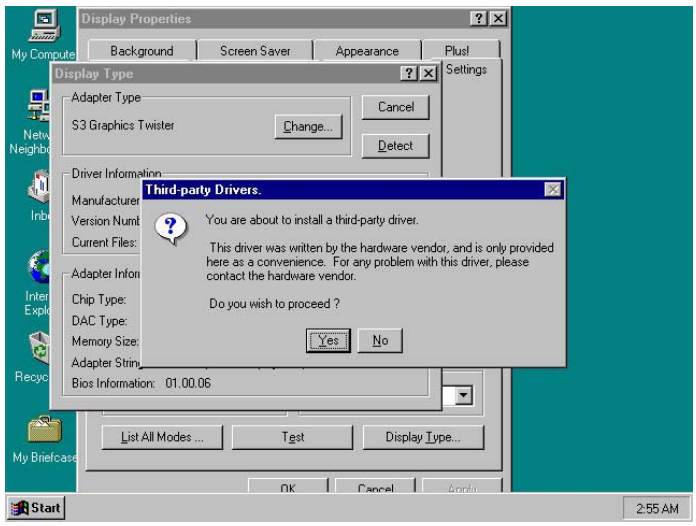


3. Select

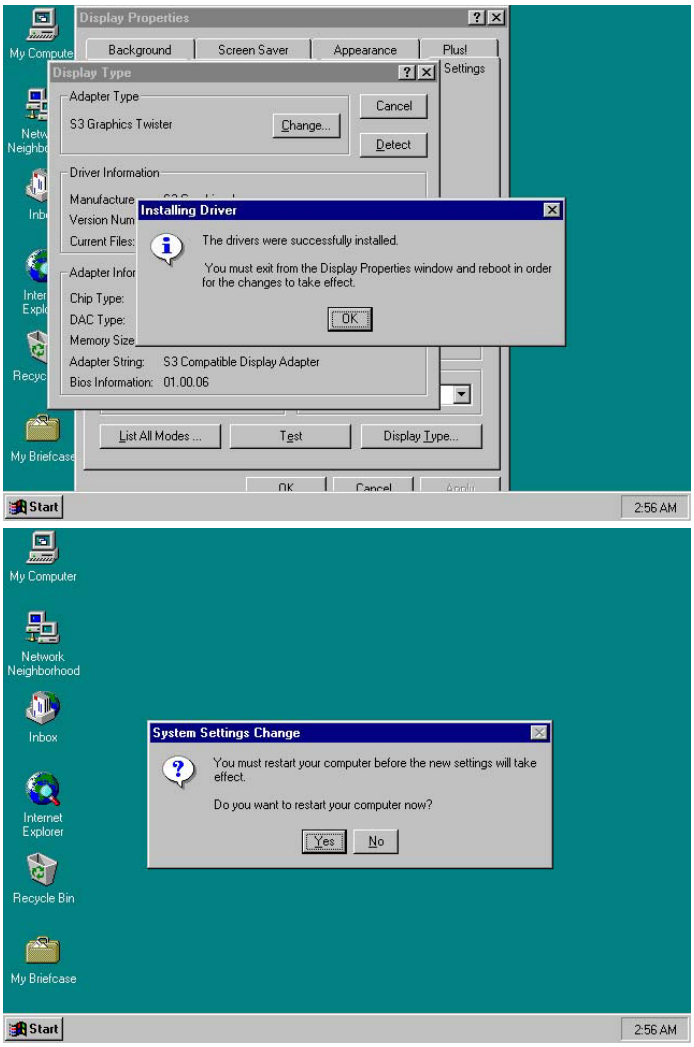
S3 Graphics Twister



4. Click **OK** or press **Enter**.
5. You will see warning panel about **Third Party Drivers**. Click on **Yes** to finish the installation.



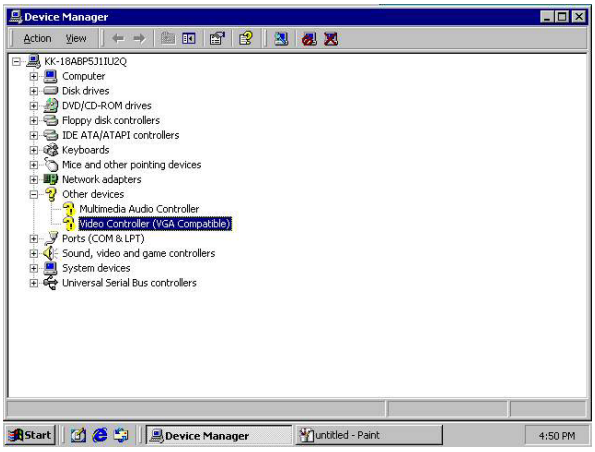
6. Once the installation is completed, you must shut down the system and restart for the new driver to take effect.



5.3.3 VGA Driver Installation for WIN 2K

1. With the Utility CD Disk still in your CD ROM drive, right click on My Computer icon from the Windows menu. Select on System Properties and then proceed to the Device Manager from the main menu.

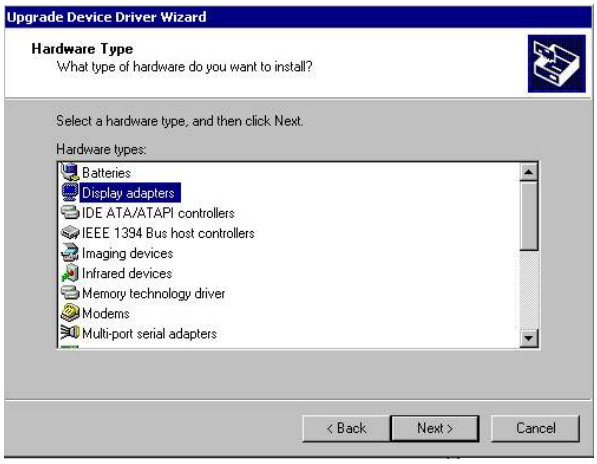
2. Select on Other Devices from the list of devices then double-click on Video Controller (VGA Compatible).



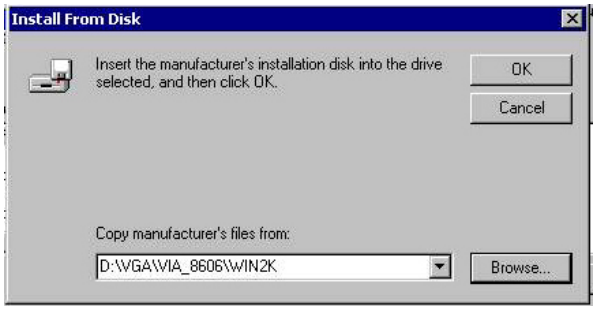
3. The Video Controller (VGA Compatible) Properties screen then appears, allowing you to re-install the driver. Select Driver from the main menu to proceed.

4. When the succeeding window asks you what you wish Windows to do, tick on the "Search for a better driver…." Click on the Next button to proceed.

5. Upgrade Device Driver Wizard screen appear, select Display adapters and click on Next.



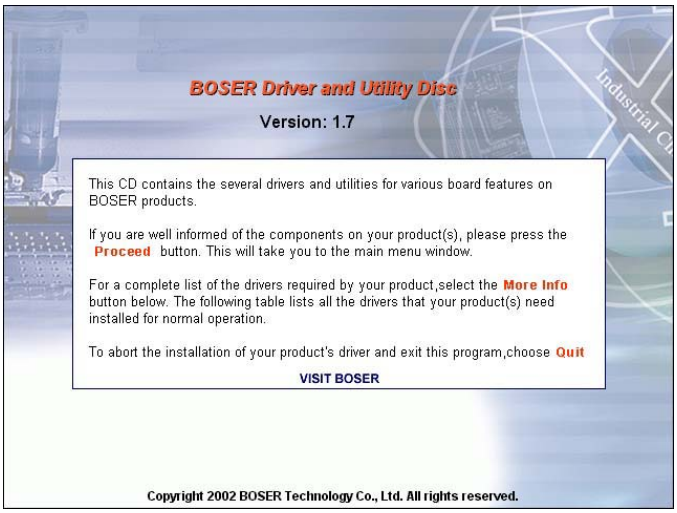
6. Once the program returns to the Add New Hardware Wizard screen, your specified location will appear. Press on the Next button to continue.

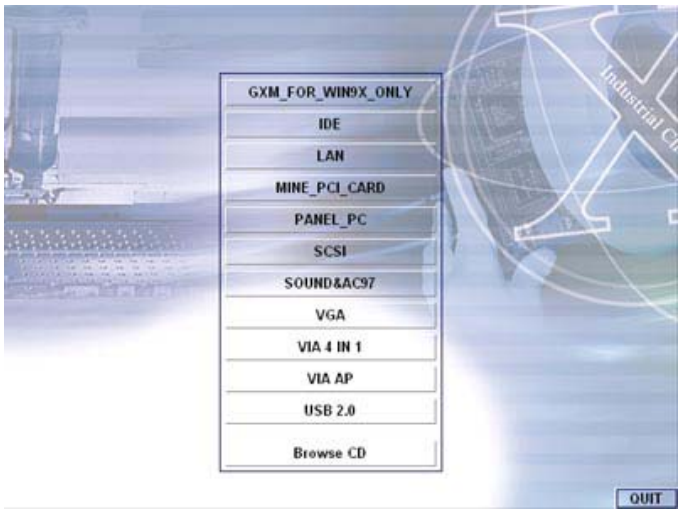


7. The program then copies the necessary files from your Windows installation disk to complete the driver setup process. Once the driver is completely installed, the following message appears on your display. Click on the Finish button to proceed.

5.3.4 VGA Driver Installation for WIN XP

1. With the Utility CD Disk still in your CD ROM drive, open the File Manager and then select the CD-ROM drive. As soon as the system reads the disk, the VGA Menu screen below will appear on your display. Click on VIA_8606 from the main menu.

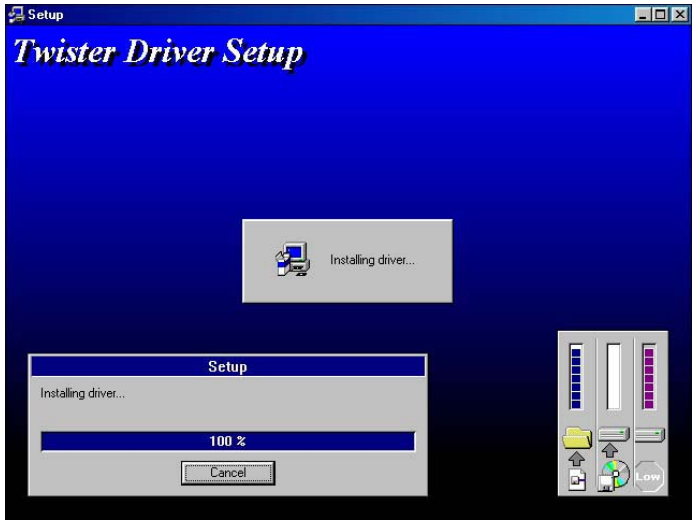




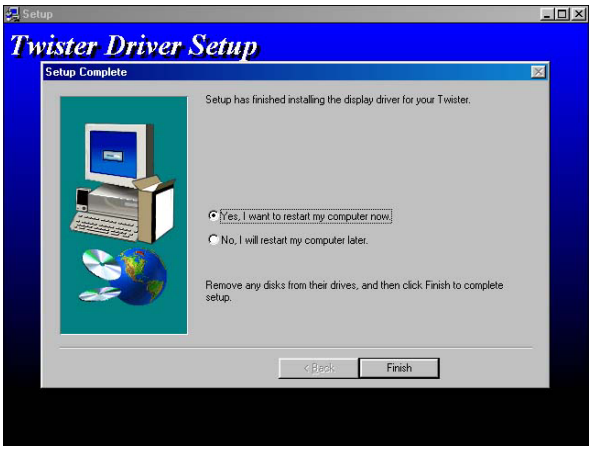
2. Select the operating system of your computer to proceed with the installation process.

3. Once the Welcome screen appears on the screen, make sure to close applications that are running and then click the Next button.

4. When the display below appears on your screen, Setup is already ready to install and copy the related files onto your hard drive. Click on the Next button to proceed.



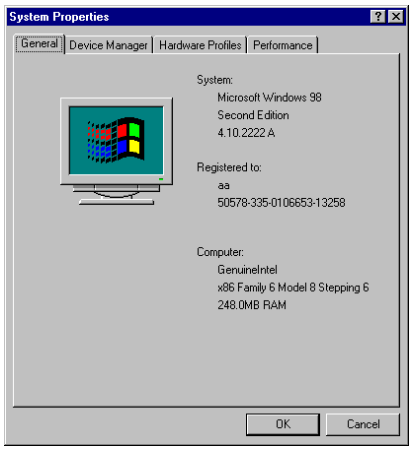
5. After the installation finishes, you will be prompted to restart your system. We recommend you to reboot your computer to allow the new settings to take effect. Click on the Finish button to reboot.



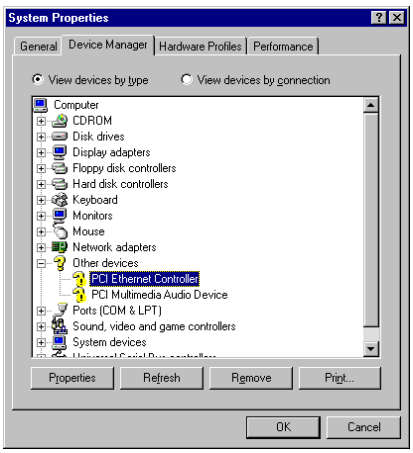
5.4 LAN Driver Installation

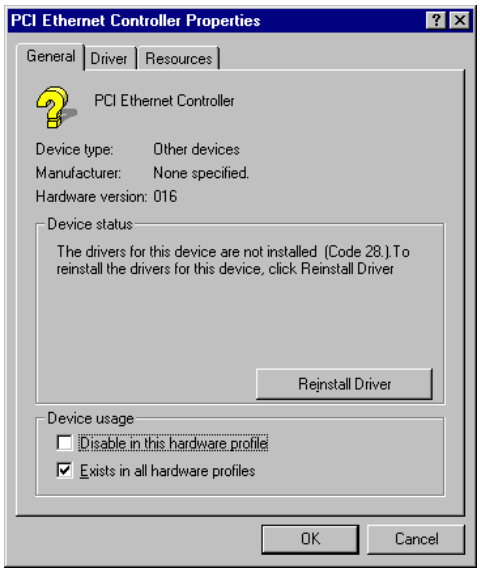
5.4.1 RTL8100 Driver Installation for WIN98

1. With the Utility CD Disk still in your CD ROM drive, right click on My Computer icon from the Windows menu. Select on System Properties and then proceed to the Device Manager from the main menu.



2. Select on Other Devices from the list of devices then double-click on PCI Ethernet Controller.





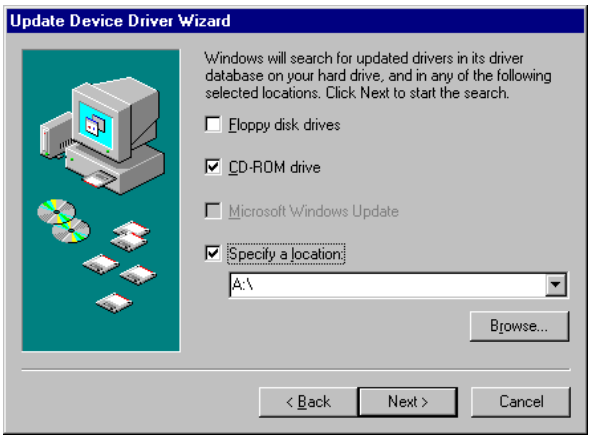
3. The PCI Ethernet Controller Properties screen then appears, allowing you to re-install the driver. Select Driver from the main menu to proceed.

4. The window then displays the current status of your LAN driver. Press on Update Driver button to continue.

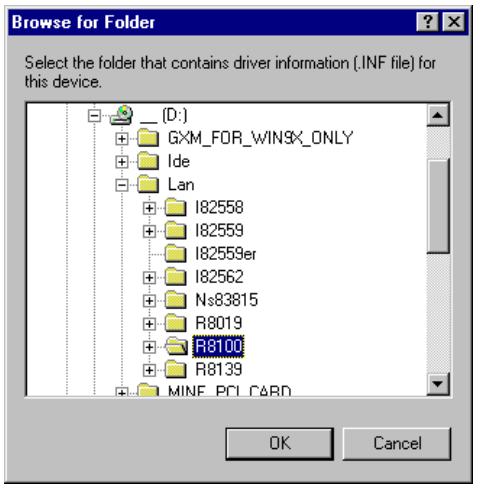
5. The program will then launch the Update Device Driver Wizard window that will install your device driver. Click on the Next button to proceed to the next step.

6. When the succeeding window asks you what you wish Windows to do, tick on the "Search for a better driver…." Click on the Next button to proceed.

7. The Update Device Driver Wizard will then ask you to specify, by ticking, the path of the new driver. Tick on the open boxes where you require the program to search for the device driver then click on the Browse button to manually specify the path.



8. Press on the OK button as soon as you have located the path of your driver.

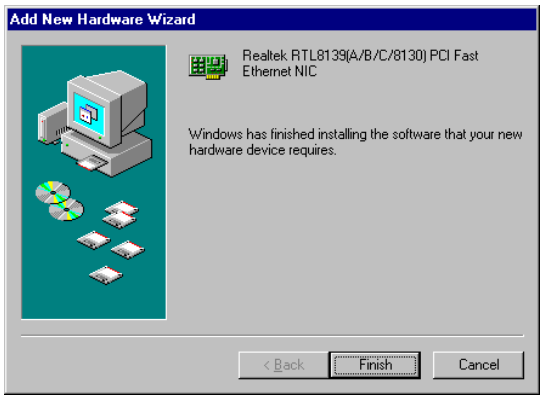


9. Once the program returns to the Add New Hardware Wizard screen, your specified location will appear. Press on the Next button to continue.

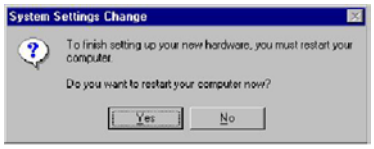
10. Once the program detects the device driver (*.inf) file from your specified location, it will automatically copy the files into your hard drive.

11. When copying of driver files finishes, the program will then ask you to insert your Windows.

12. The program then copies the necessary files from your Windows installation disk to complete the driver setup process. Once the driver is completely installed, the following message appears on your display. Click on the Finish button to proceed.

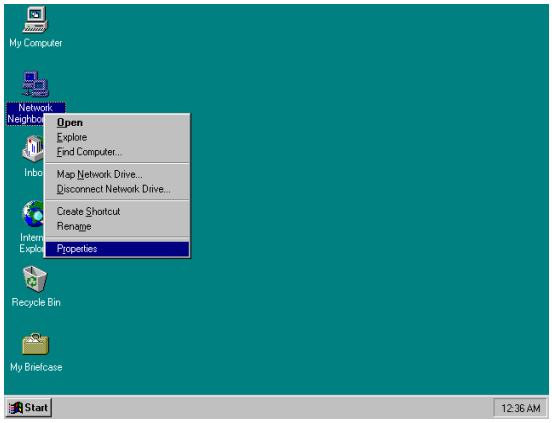


13. Restart your computer to make the new system settings take effect. Click on the Yes button when the screen below appears and your LAN Driver for Win95 and Win98 are now completely installed.

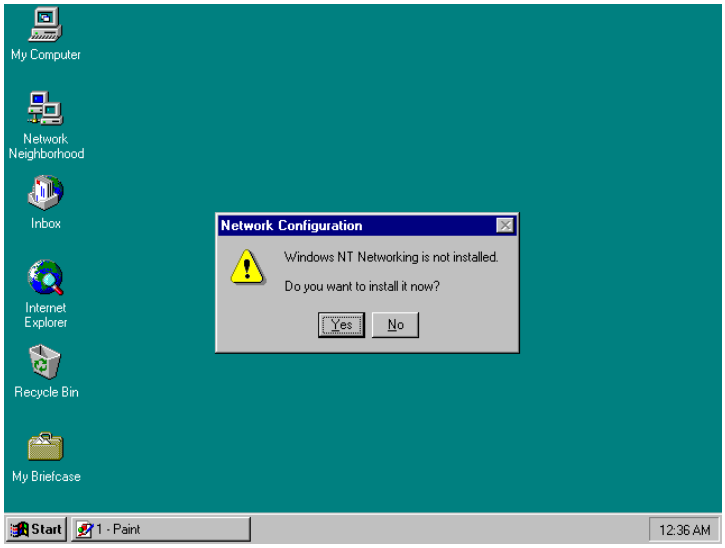


5.4.2 RTL8100 Driver Installation for WIN NT4.0

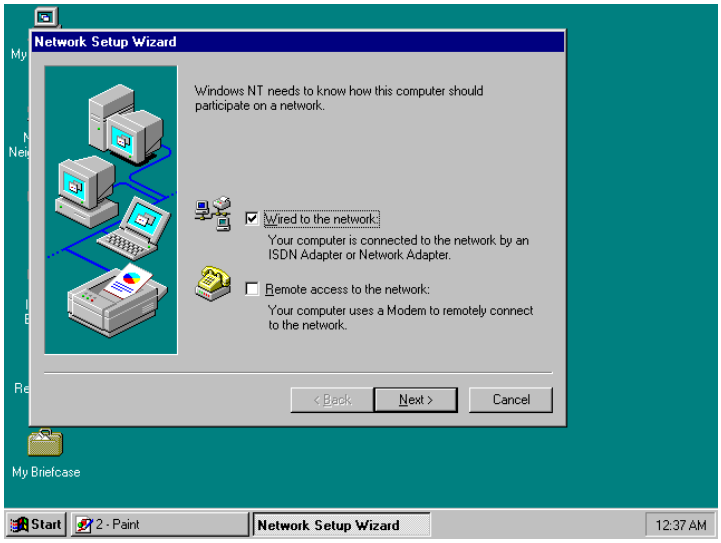
1. With the Utility CD Disk still in your CD ROM drive, right click on Network Neighborhood icon from the Windows menu. Select on Properties.



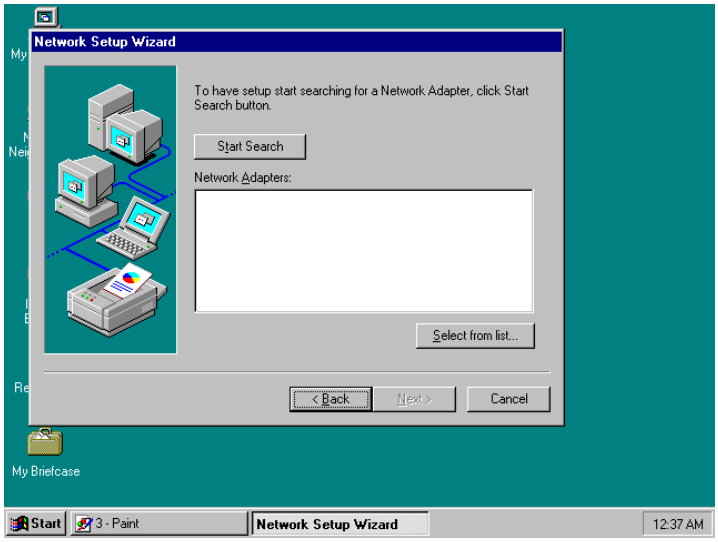
2. The system automatically detects the absence of Windows NT Networking. Click on the Yes button to start installation.



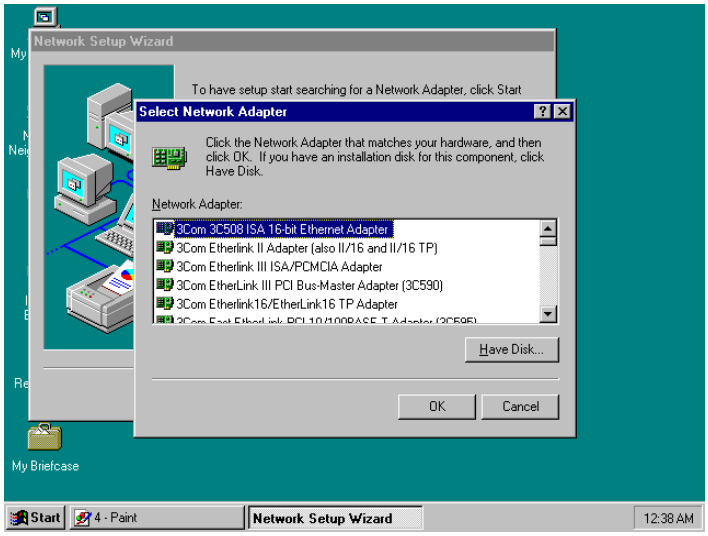
3. Tick on the "Wired to Network" once the following screen appears. Click on the Next to proceed.



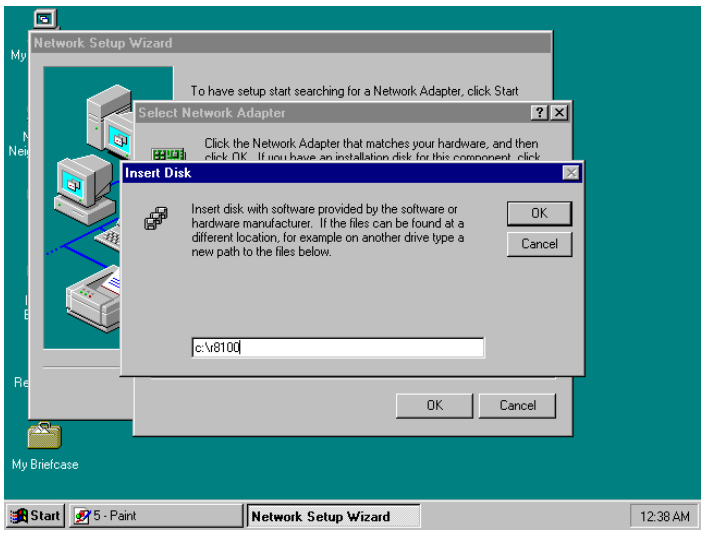
4. Click on the Start Search button for the program to locate the Network Adapter.



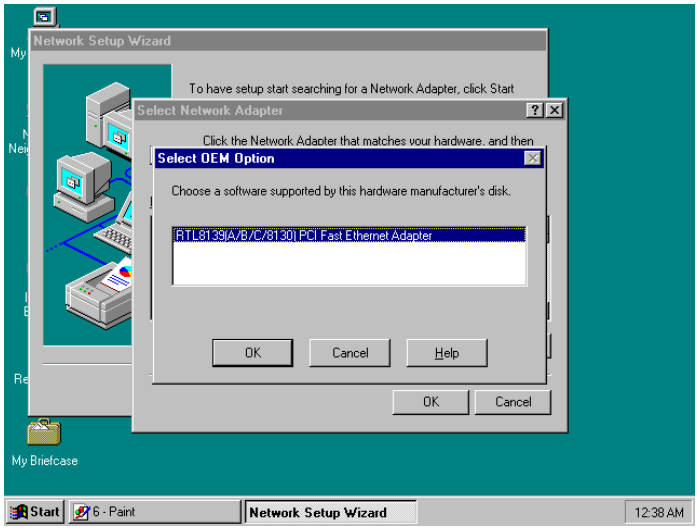
5. Once setup finishes the search, it will list a number of adapters for you to choose from. Press on the Have Disk button to assign the driver path location.



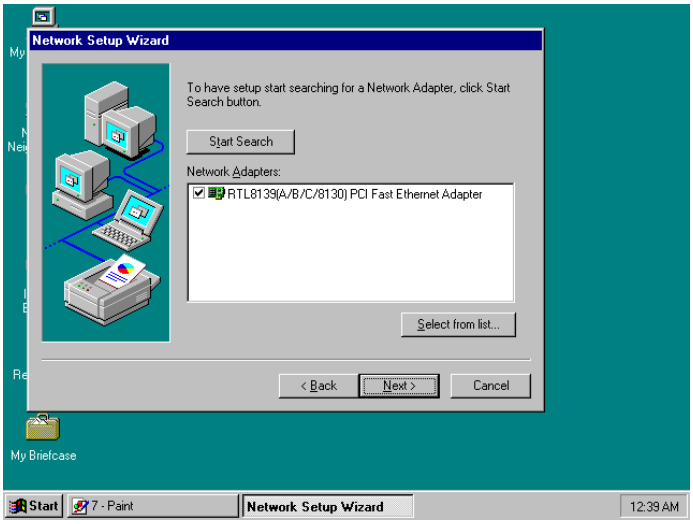
6. Setup now asks you for the location of the driver. When you have entered the new driver path, press on the OK button to continue.



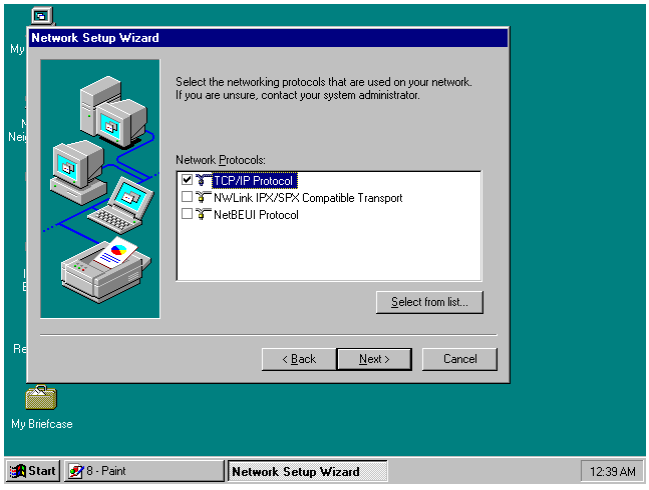
7. When Setup finds the information it needs about the new driver, it will display the device it found on the following screen. Press on the OK button to accept and proceed.



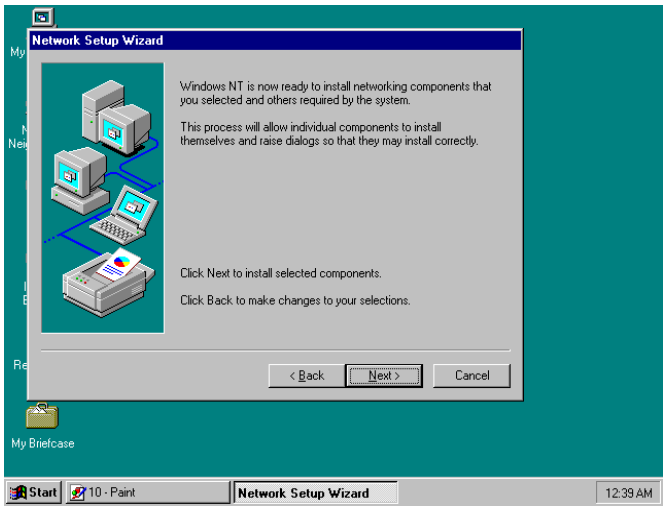
8. Setup then returns to Network Setup Wizard screen and displays your new Network Adapter. Click on Next to continue.



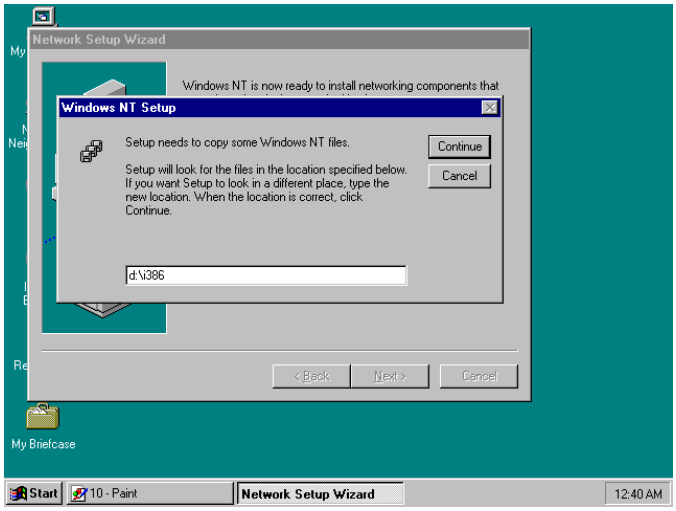
9. The Network Setup Wizard then allows you to set the Network Protocols on your network. Select the appropriate protocol and then click on Next to continue.



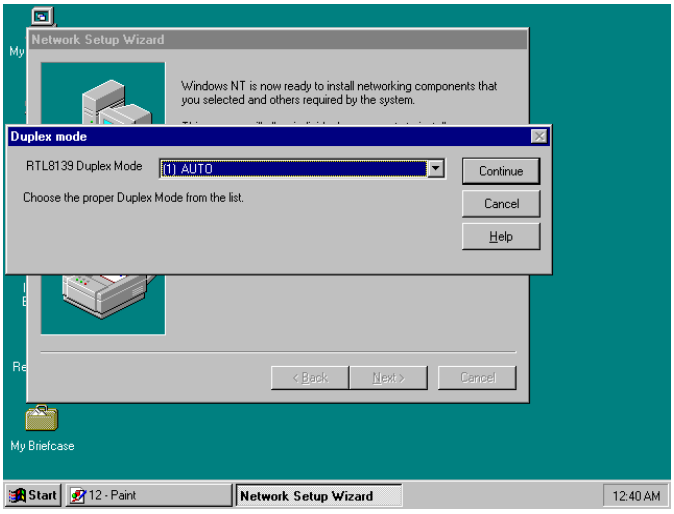
10. Before Setup starts installing the components found and the settings you made, it will give you the option to proceed or go back for changes from the following screen. Click on the Next button once you are sure of your devices.



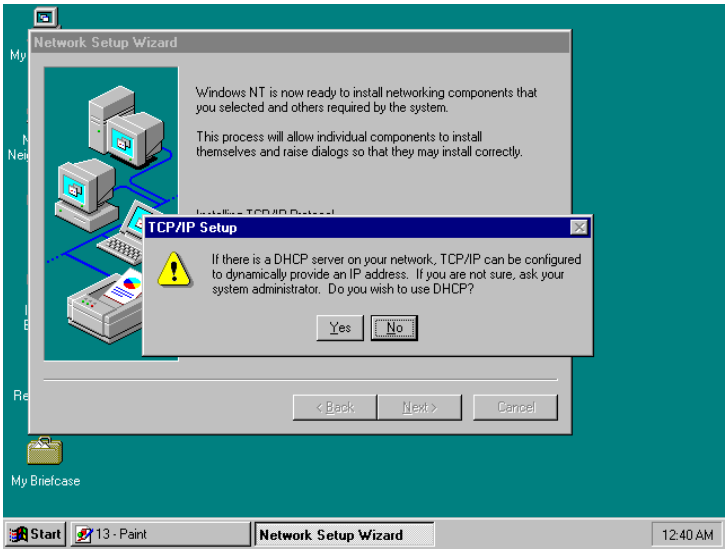
11. Windows NT Setup will then need to copy files necessary to update the system information. Specify the path then press Continue.



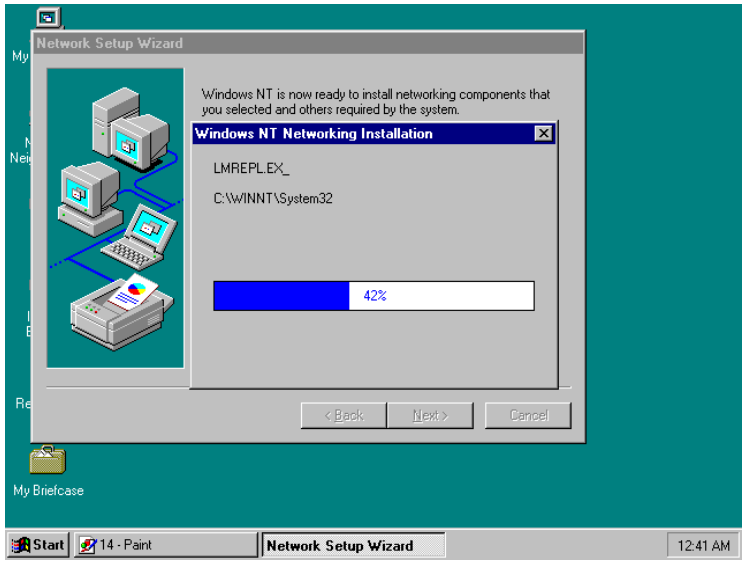
12. Once it finishes copying the files, Setup will now allow you to choose the Duplex Mode of your LAN controller. Press on the Continue button after making your selection.



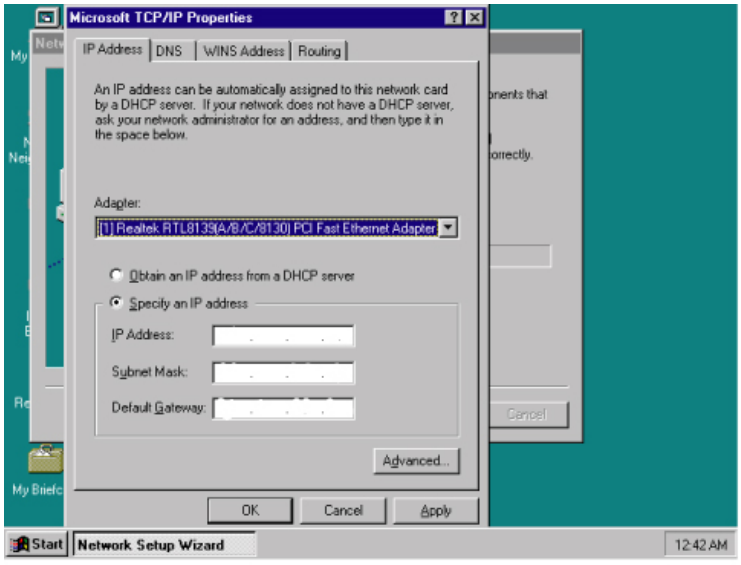
13. When Setup asks if you wish to change the TCP/IP settings of your system, select the appropriately. The default choice is No.



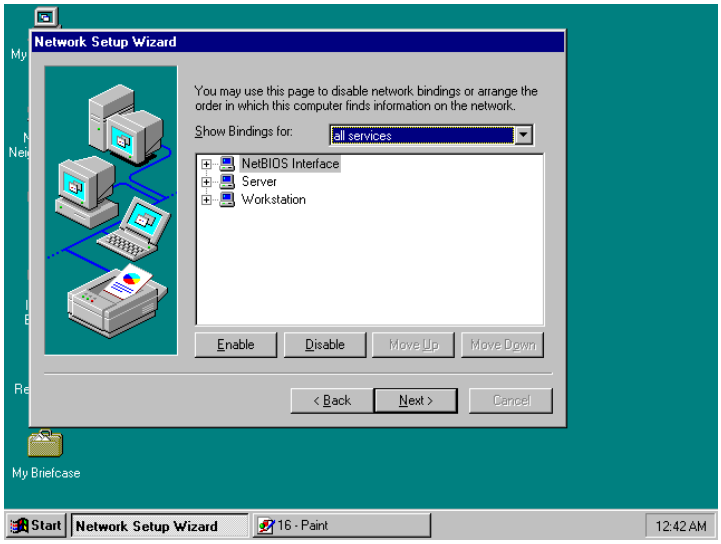
14. Setup then starts the Networking installation and copies the files.



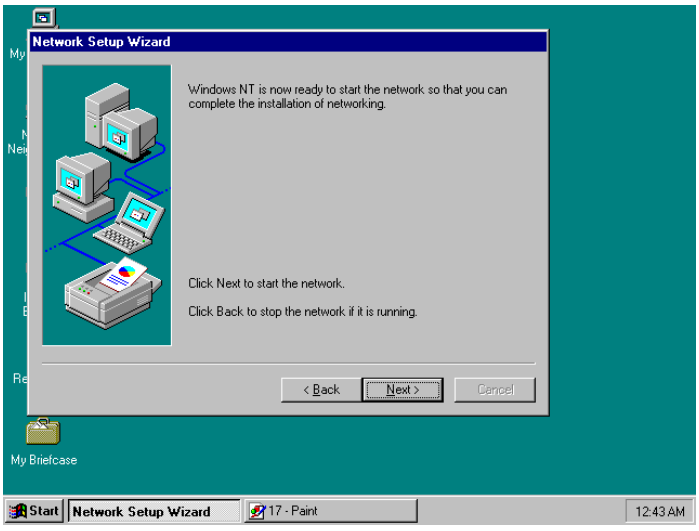
15. When Setup finishes copying, the TCP/IP properties of your system will then pop up on your screen like the one shown below. Make the necessary changes then click on OK to continue.



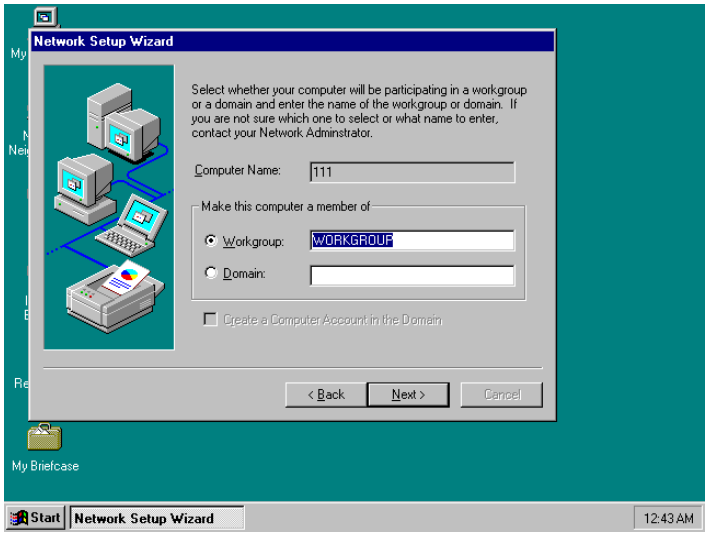
16. When the screen below appears, click on Next to continue.



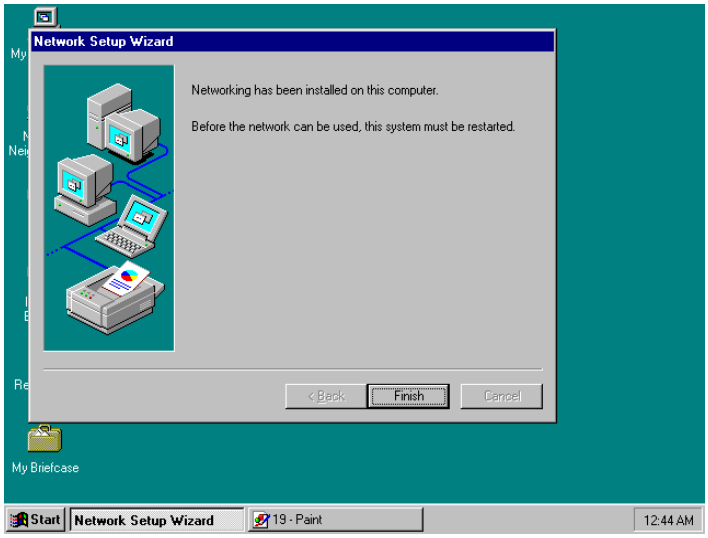
17. Setup then prompts you that it is ready to start the network. You may complete the installation thereafter. Click on Next to continue.



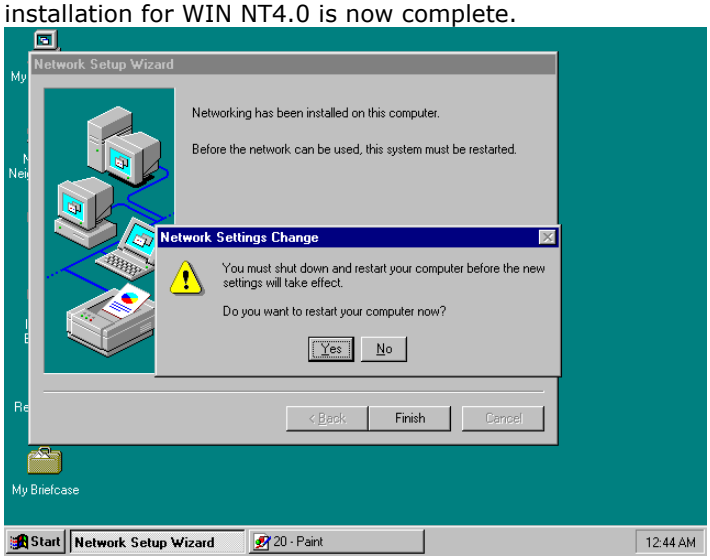
18. Assign the workgroup or domain setting of your computer. Click on Next to continue.



19. Restart your computer once the screen below appears. Click on Finish to continue.



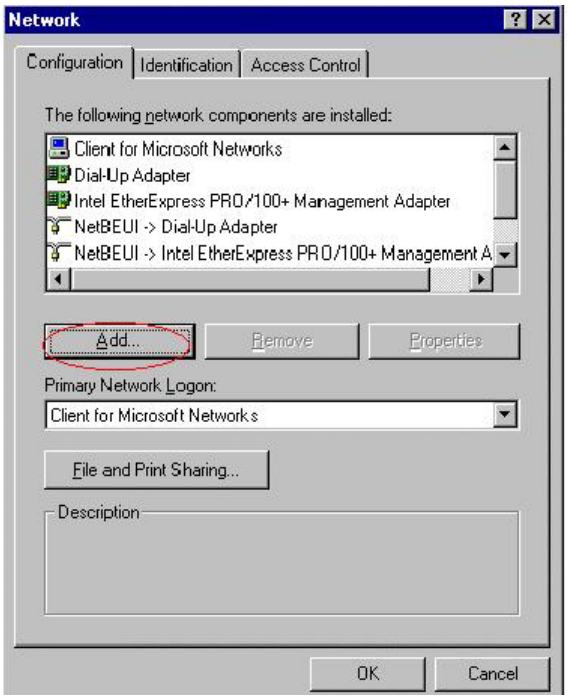
20. Click on the Yes button to restart your computer. The LAN driver installation for WIN NT4.0 is now complete.



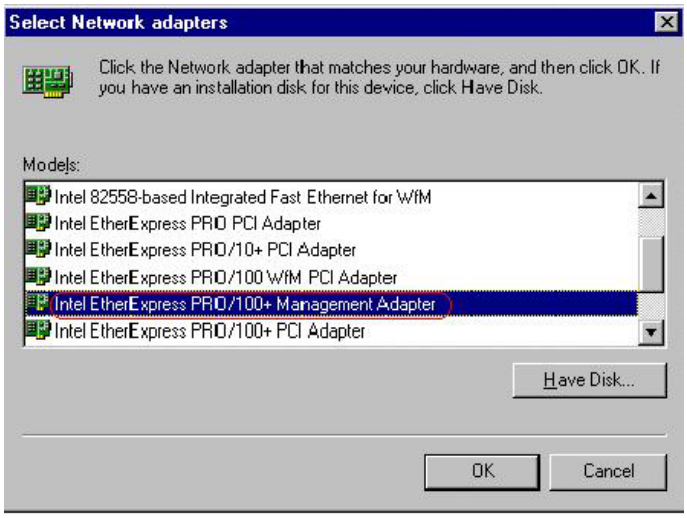
5.4.3 82559 Driver Installation for WIN 98

Windows 98 will detect the network driver automatically therefore there is no need for further configuration.

1. Click **Start**, then **Setting** then select **Control panel**.
2. Start the network applet program.
3. In the Network window, click **Add**.



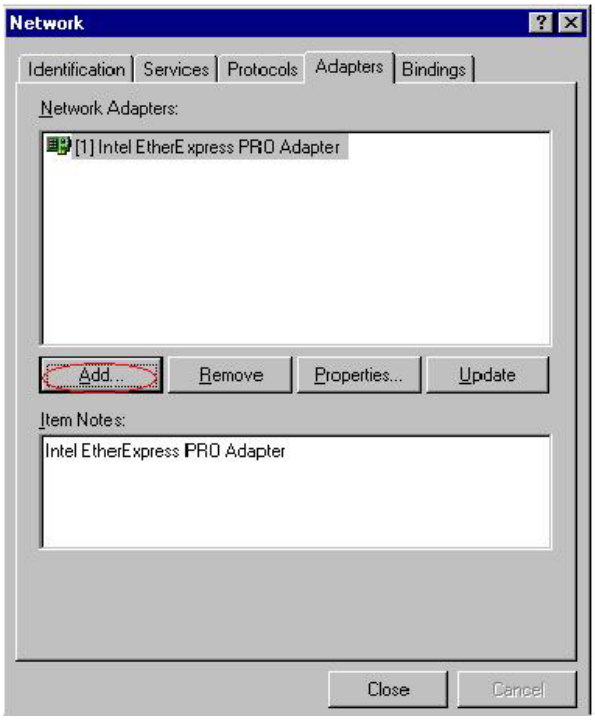
4. From the **Select Network Component Type**, select **Adapter** then click **Add**.
5. Specify the path the new driver and press <ENTER> key (if in driver a:, type a:\). If you're not sure exactly where the drivers are, choose the **Browse** button and find it.



6. Click **OK.**
7. Windows 95 will copy the network drivers to the proper directories into your system.
8. Continue choosing **OK** until asked to restart your system.
9. After restarting your computer, check the network driver and its properties. Be sure it looks similar with the following figure.

5.4.4 82559 Driver Installation for WIN NT4.0

1. Click the **Start** button, then go to **Setting** and click on **Control Panel**.
2. Click on the **Network** icon to start the **Network Window**.
3. Click on the **Adapters** tab, and then click **Add**.



4. In the **Select Network Adapter** window, click **Have Disk**.
5. This will bring up the **Insert Disk** window.
6. Supply the directory where the Windows NT driver files are located (If in driver a: type a:\).
7. The Select OEM Option window will show up. Select

Intel EtherExpress PRO Adapter

8. Click **OK** to finish the installation.
9. Once the installation is completed, the system must be shut down and restarted for the new driver to take effect.
10. After restart, confirm the network driver and its properties.

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