

# HS-4600

## Pentium<sup>™</sup> II/III Little Board

- PCI-Slot • PC/104 Bus • VGA/LCD Interface •
  - 100 MHz Bus • DMA33 • WDT • CTA • DOC • TV Out •
  - GPS Socket • Sound • 10/100-based LAN • DIO •
- Embedded Size Industrial Single Board Computer

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# Chapter-1

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## General Information

The HS-4600 is a Little Board size Embedded Intel® Pentium® II/III Industrial Single Board (I.S.B.) The board design combine together with all necessary input and output effects interfaces which makes it an ideal all-in-one industrial single board computer. The board design with 100 MHz internal bus clock rate architecture.

With the PCI-bus slot for provides to a PCI add-on card where necessary. One set of PC/104-bus connector for industrial PC/104 board add-in. For GPS system application, the board provides a 2x10 pin-field internal I/O connector for easy add-in Rockwell's "Jupiter" Global Positioning System (GPS) Receiver. The board also design with an ESS® Solo-1 3D sound interface which provides an ideas sound adapter in any sound application. The IDE interface with DMA33 access of mode 4 to IDE drive interface architecture, supports with maximum 33.3 MB/sec in data transfer rating to 4 pieces IDE drive connection. The board also provides a on-board 10/100-based LAN for easy network connection.

A single Flash chip holds the system BIOS, and you can change the Flash BIOS by the Utility Update. Advanced IR port also provide a faster data transmission. You can also use the DOS version of the "DiskOnChip™" socket by issuing commands from the DOS prompt without the necessity of other software supports up to 144MB.

The board design with INTEL® 69000 VGA provides internal connections to VGA Monitor or LCD Panel. The VGA supports up to 1280x1024 256 colors resolution.

The HS-4600 support SDRAM memory with two pcs DIMM sockets. This gives you the flexibility of configuring your system from 64 to 512 MB SDRAM by using DIMM memory modules for its on board system SDRAM.

If a non-expect program cause halts, the on board Watch-Dog Timer (WDT) will automatically reset the CPU or generate an interrupt. The WDT is designed with pure hardware and doesn't need any arithmetical functions of a real-time clock chip. This ensures the reliability in an unmanned or standalone system.

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## 1.1 Major Features

- ✓ PCI & PC/104 Bus supported.
- ✓ Socket 370 for Intel® Celeron™ / Coppermine™ 266-700 MHz CPU.
- ✓ Intel® 82443BX, Intel® 82371 chipsets.
- ✓ Provides internal bus clock rate at 100 MHz.
- ✓ 2 pieces DIMM supports SDRAM up to 512 MB.
- ✓ Ultra DMA33 Supported four fastest PCI enhanced IDE drives.
- ✓ One FDD Drive connector supports two Floppy disk drives.
- ✓ PnP I/O address & IRQ selection.
- ✓ On board SMC® 37C669 super I/O chipset. Four high-speed serial RS-232 ports (with 16C550 UART 16-byte FIFO) and one RS-422/485 port. One enhanced bi-directional parallel port supports SP/EPP/ECP.
- ✓ On board internal 8-pin header Keyboard & Mouse connector.
- ✓ On board INTEL® 69000 VGA provides internal connections to VGA Monitor or LCD Panel. The VGA supports up to 1280x1024 256 colors resolution.
- ✓ On board 2x10 pin-field internal I/O connector for easy add-in Rockwell's "Jupiter" Global Positioning System (GPS) Receiver.
- ✓ The board also design with an ESS® Solo-1 3D sound interface which provides an ideas sound adapter in any sound application.
- ✓ The board also provides an on board 10/100-based LAN with Intel® 82559 chipset for easy network connection.
- ✓ On board TV Out function support PAL or NTSC System.
- ✓ On board 8 bit digital in & 8 bit digital out function.
- ✓ "DiskOnChip™" socket supports, memory size up to 144 MB.
- ✓ Switch Power Regulator supports all various CPU's core voltage levels.
- ✓ If a non-expect program cause halts, the onboard Watch-Dog Timer (WDT) will automatically reset the CPU or generate an interrupt. The WDT is designed with pure hardware and doesn't need any arithmetical functions of a real-time clock chip. This ensures the reliability in an unmanned or standalone system.
- ✓ Full ATX Power function supported.

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## 1.2 Specifications

- ☐ **CPU:** Intel® Celeron™ / Coppermine™ 266-700 MHz.
- ☐ **Bus interface:** PC/104 & PCI Bus
- ☐ **Chipset:** Intel® 82443BX, Intel® 82371.
- ☐ **Data bus:** 64-bit
- ☐ **Processing ability:** 64-bit
- ☐ **Internal Bus Rate:** 100 MHz
- ☐ **VGA Controller:** INTEL® 69000 chipset. (2MB SGRAM on chip)
- ☐ **VGA Resolution:** Resolutions up to 1280x1024 256 colors resolution. Provides internal connections 16-pin header to VGA Monitor and 50-pin header to LCD Panel.
- ☐ **DMA/33 Enhanced IDE interfaces:** Supports up to four IDE devices. Support Ultra DMA/33 mode with data transfer rate 33MB/Sec.
- ☐ **RAM memory:** Up to 512MB, uses two DIMM sockets supports SDRAM memory modules.
- ☐ **Floppy disk drive interface:** Supports up to two floppy disk drives.
- ☐ **Parallel port:** One bi-directional parallel port. Supports SPP/ECP/EPP.
- ☐ **Serial ports:** Four RS-232 ports and one RS-422/485 port. All including 16C550 compatible UART with 16-byte FIFO.
- ☐ **GPS Connection:** One 2x10 pin-field internal I/O connector for Rockwell's "Jupiter" GPS Receiver module add-in.
- ☐ **Sound Interface:** On board ESS® Solo-1 3D sound interface.
- ☐ **LAN Interface:** On board 10/100-based by Intel® 82559 chipset.
- ☐ **BIOS:** Award Flash BIOS.
- ☐ **Watchdog timer:** Hardware circuit can be set by 1, 2, 10, 20, 110, or 220 seconds period Reset or NMI were generated when CPU did not periodically trigger the timer.
- ☐ **DMA channels:** 7
- ☐ **Interrupt levels:** 15
- ☐ **Keyboard & Mouse:** 8-pin Keyboard & Mouse connector.
- ☐ **ATX Power Support:** Power support 5-pin header supports full ATX function.

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- ☐ **Digital I/O:** 8 bit digital input & 8 bit digital output.
  - ☐ **TV Out:** Support PAL or NTSC system.
  - ☐ **USB:** 2 USB header supported.
  - ☐ **Flash Memory Disk:** Reserved socket for "DiskOnChip™", support up to 144MB Flash memory disk.
  - ☐ **CMOS:** Real-time clock/calendar and battery backup by DS12C887 or equivalent device.
  - ☐ **Power supply voltage:** +5V and +12V power supply.
  - ☐ **Max. Power requirement:** +5V @4A(Celeron™ 350), +12V @20mA.
  - ☐ **Operating temperature:** 0-60°C.
  - ☐ **Board size:** 8"(L) x 5.75" (W) (203mm x 146mm)
- 

## 1.3 Delivery Package

The delivery package of HS-4600 includes all following items:

- ✧ HS-4600 Industrial Single Board
- ✧ One Printer port Flat Cable
- ✧ Two IDE port Flat Cable
- ✧ One FDD port Flat Cable
- ✧ One 40-pin COM ports Cable
- ✧ One Panel Connection Flat Cable
- ✧ One Front Panel Cable
- ✧ One Ethernet Cable
- ✧ One PS/2 Keyboard and Mouse Transfer Cable
- ✧ One MIC/SPK Cable
- ✧ VGA Utility Diskette
- ✧ User's Manual

Please contact with your dealer if any of these items are missing or damaged when purchasing. And please keep all parts of the delivery package with packing materials in case of you want to ship or store the product in future.



# Chapter-2

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## Hardware Installation

This chapter provides the information on how to install the hardware of HS-4600. At first, please follow up sections 1.3, 2.1 and 2.2 in check the delivery package and carefully unpacking. Following after, the jumpers setting of switch, watchdog timer, and the DiskOnChip™ address selection etc.

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### 2.1 Caution of Static Electricity

The HS-4600 has been well package with an anti-static bag in protect its sensitive computer components and circuitry from the damage of static electric discharge.

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

You should follow the steps as following to protect the board in against the static electric discharge whenever you handle the board:

1. Please use a grounding wrist strap on whoever needs to handle the HS-4600. Well clip the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please put on and connect the strap before handle the HS-4600 for harmlessly discharge any static electricity through the strap.
2. Please use anti-static pad for put any components or parts or tools on the pad whenever you work on them outside the computer. You may also in use the anti-static bag instead the pad. Please ask from your local supplier in help up your necessary parts on anti-static requirement.

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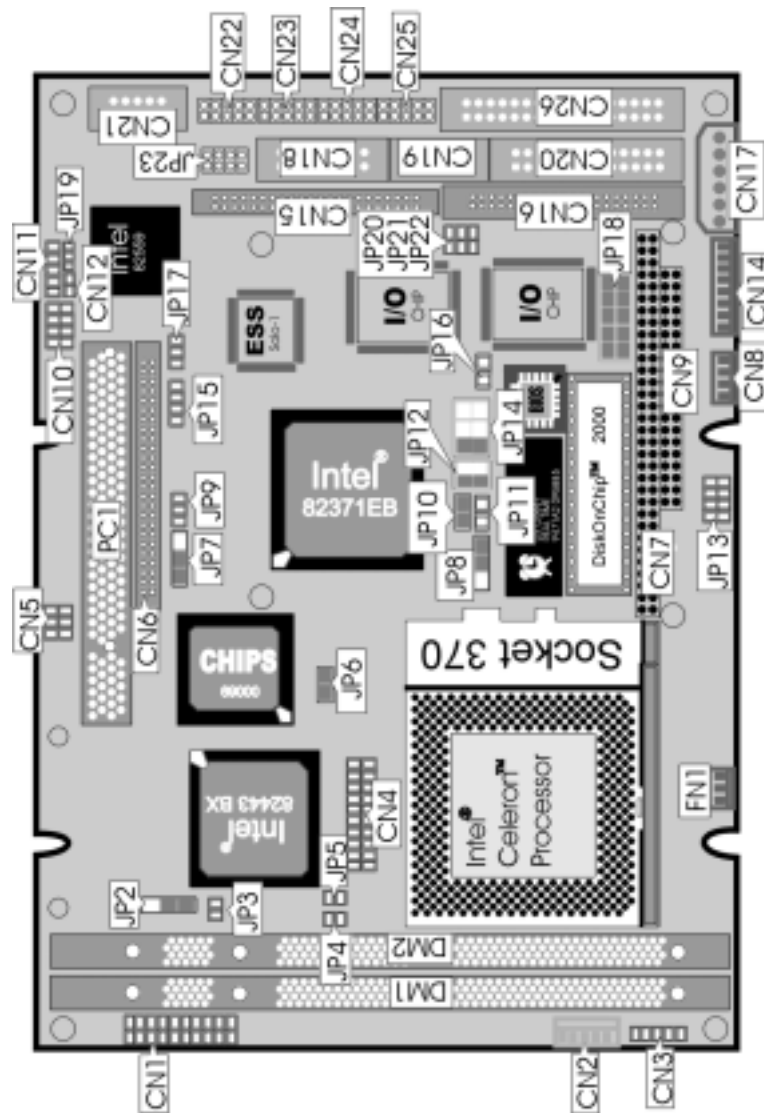
## 2.2 Caution on Unpacking and Before Installation

First of all, please follow with all necessary steps of section 2.1 in protection the HS-4600 from electricity discharge. With refer to section 1.3, please check the delivery package again with following steps:

1. Unpacking the HS-4600, keep well storage of all packing material, manual and diskette etc. if has.
2. Is there any components lose or drop from the board? DO NOT INSTALL IF HAPPENED.
3. Is there any visual damaged of the board? DO NOT INSTALL IF HAPPENED.
4. Well check from your optional parts (i.e. CPU, SRAM, DRAM, ROM-Disk etc.) for completed setting all necessary jumpers setting to jumper pin-set and CMOS setup correctly. Please also reference to all information of jumpers setting in this manual.
5. Well check from your external devices (i.e. Add-On-Card, Driver Type etc.) for completed add-in or connection and CMOS setup correctly. Please also reference to all information of connector connection in this manual.
6. Please keep all necessary manual and diskette in a good condition for your necessary re-installation if you change your Operating System or whatever needs.

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## 2.3 HS-4600's Layout



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## 2.4 Quick Listing of Jumpers

JP2	➤	PAL System or NTSC System
JP3	➤	TV Enable Select
JP4	➤	Host Communications Protocol Select for GPS
JP5	➤	Host Communications Protocol Select for GPS
JP6	➤	CPU Clock Select
JP7	➤	LCD Voltage Select
JP8	➤	Watch-Dog Active Select
JP9	➤	AT/ATX Power Select
JP10	➤	System Clock Select
JP11	➤	Clear CMOS
JP12	➤	RS-422/485 Receiver Enable Controller
JP13	➤	Front Panel Connector
JP14	➤	RS-422/485 Transceiver Enable Controller
JP15	➤	Line In Connector
JP16	➤	Temperature Enable Select
JP17	➤	Aux In Connector
JP18 (1-4)	➤	DiskOnChip™ Address Select
JP18 (5-10)	➤	Watch-Dog Timer Select
JP19	➤	Intel® 82559 Enable/Disable Select
JP20	➤	RS-232 COM 3 Disable Setting
JP21	➤	RS-232 COM 4 Disable Setting
JP22	➤	RS-232 COM 2 Disable Setting
JP23	➤	MIC In / Audio Out

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## 2.5 Quick Listing of Connectors

CN1: Digital I/O Connector  
CN2: 5-pin ATX Power Connector  
CN3: Keylock Connector  
CN4: GPS-Socket  
CN5: TV Out Connector  
CN6: LCD Connector  
CN7: PC/104 64-pin Connector  
CN8: 4-pin EXT Power Connector  
CN9: PC/104 40-pin Connector  
CN10: USB Port Connector  
CN11: IR Connector  
CN12: ATX Power ON/OFF Switch  
CN14: 8-pin Keyboard & Mouse Connector  
CN15: Primary IDE Connector  
CN16: Secondary IDE Connector  
CN17: Power In Connector  
CN18: 16-pin VGA Connector  
CN19: RS-422/485 Connector (5x2 Header)  
CN20: Parallel Connector  
CN21: 10/100 based LAN Connector (5x2 Header)  
CN22: RS-232 COM 1 Connector (5x2 Header)  
CN23: RS-232 COM 2 Connector (5x2 Header)  
CN24: RS-232 COM 3 Connector (5x2 Header)  
CN25: RS-232 COM 4 Connector (5x2 Header)  
CN26: Floppy Connector  
FN1: FAN Connector

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## 2.6 Jumper Setting Description

A jumper pin-set is **ON** as a shorted circuit with a plastic cap inserted over two pins. A jumper pin-set is **OFF** as an open circuit with a plastic cap inserted over one or no pin(s) between pins. The below figure 2.2 shows the examples of different jumper pin-set setting as **ON** or **OFF** in this manual.

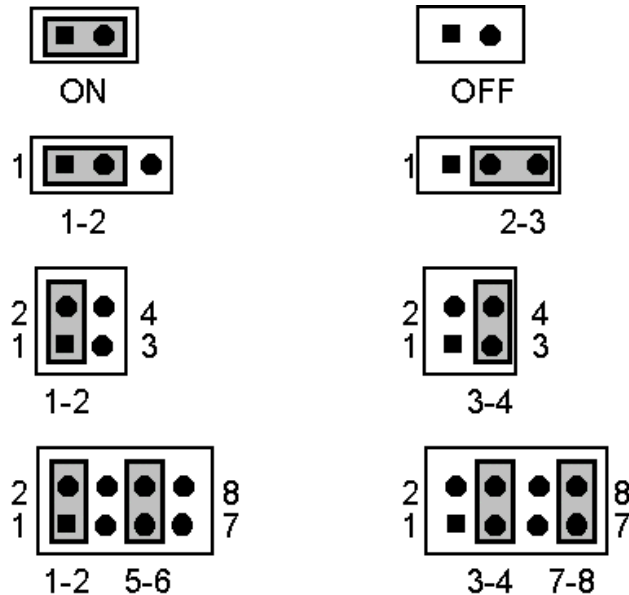


Figure 2.2

All jumper pin-set already has its default setting with the plastic cap inserted as ON, or without the plastic cap inserted as OFF. The default setting may reference in this manual with a " \* " symbol in front of the selected item.

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## 2.7 VGA Controller

The on board INTEL® 69000 chipset provides with up to 1280x1024 256 colors resolution. The board provides to user in auto disable VGA if display card plug in into the PCI-slot.

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## 2.8 DiskOnChip™ Address Setting

The HS-4600 provides a U11 socket for install the DiskOnChip™ module.

A JP18(1-4) may select the starting memory address of the DiskOnChip™ (D.O.C.) for avoid the mapping area with any other memory devices. If you have another extra memory devices in the system, please setting both at different memory address mapping.

- **JP18(1-4) : DiskOnChip™ Address**

PIN NO.	Address
<b>*1-2</b>	<b>D000</b>
3-4	D800

The D.O.C. function allows the system in using without FDD nor HDD. The D.O.C. may formatting as driver C: or driver A:. User may also easily uses the DOS's commands such as FORMAT, SYS, COPY, XCOPY, DISCOPY and DISKCOMP etc. This is means that the D.O.C. may uses as driver-A if the system without FDD-A for ambient application. Please contact with your supplier for different size D.O.C. module.

---

## 2.9 Setting the CPU of HS-4600

The HS-4600 provides all possibility in jumper setting for internal Host Bus Clock Rate with JP6, JP10. **Please contact with your CPU's supplier in getting those information for correctly setting. Any wrong setting may cause CPU defect.**

- **Host Bus Clock select JP6, JP10**

JP6, JP10 used to setting the Host Bus Clock. The setting of internal host bus clock is for defined the operating clock base of the internal bus of core logic.

- **JP6, JP10 : System Clock Select**

System Clock	JP6	JP10
*66.8 MHz	ON	ON
100 MHz	OFF	OFF

\*) : default setting



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## 2.10 Watch-Dog Timer

There are three access cycles of Watch-Dog Timer as Enable, Refresh and Disable. The Enable cycle should proceed by READ PORT 443H. The Disable cycle should proceed by READ PORT 043H. A continue Enable cycle after a first Enable cycle means Refresh.

Once if the Enable cycle activity, a Refresh cycle is request before the time-out period for restart counting the WDT Timer's period. Otherwise, it will assume that the program operation is abnormal when the time counting over the period preset of WDT Timer. A System Reset signal to start again or a NMI cycle to the CPU comes if over.

The JP8 is using for select the active function of watch-dog timer in disable the watch-dog timer, or presetting the watch-dog timer activity at the reset trigger, or presetting the watch-dog timer activity at the NMI trigger.

- **JP8 : Watch-Dog Active Type Setting**

JP8	DESCRIPTION
1-2	Active NMI
*2-3	<b>System Reset</b>
OFF	disable Watch-dog timer

- **JP18(5-10) : WDT Time - Out Period**

PERIOD	5-6	7-8	9-10
*1 sec	ON	ON	ON
2 sec	OFF	ON	ON
10 sec	ON	OFF	ON
20 sec	OFF	OFF	ON
110 sec	ON	ON	OFF
220 sec	OFF	ON	OFF

The watch-dog timer is disabled after the system Power-On. The watch-dog timer can be enabled by a Enable cycle with reading the control port (443H), a Refresh cycle with reading the control port (443H) and a Disable cycle by reading the Watch-dog timer disable control port (043H). After a Enable cycle of WDT, user must constantly proceed a Refresh cycle to WDT before

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its period setting comes ending of every 1, 2, 10, 20, 110 or 220 seconds ( Please reference to the selection table of JP8 for WDT Time-Out period setting ). If the Refresh cycle does not

active before WDT period cycle, the on board WDT architecture will issue a Reset or NMI cycle to the system.

The Watch-Dog Timer is controlled by two I/O ports.

443H	I/O Read	The Enable cycle.
443H	I/O Read	The Refresh cycle.
043H	I/O Read	The Disable cycle.

The following sample programs showing how to Enable, Disable and Refresh the Watch-dog timer:

```
WDT_EN_RF      EQU    0433H
WDT_DIS        EQU    0043H

WT_Enable      PUSH    AX                ; keep AX DX
                PUSH    DX
                MOV     DX,WDT_EN_RF    ; enable the watch-dog timer
                IN      AL,DX
                POP     DX                ; get back AX, DX
                POP     AX
                RET

WT_Refresh      PUSH    AX                ; keep AX, DX
                PUSH    DX
                MOV     DX,WDT_ET_RF    ; refresh the watch-dog timer
                IN      AL,DX
                POP     DX                ; get back AX, DX
                POP     AX
                RET

WT_DISABLE      PUSH    AX
                PUSH    DX
                MOV     DX,WDT_DIS      ; disable the watch-dog timer
                IN      AL,DX
                POP     DX                ; get back AX, DX
                POP     AX
                RET
```

---

## 2.11 CMOS Data Clear

The HS-4600 provides a JP11 for clear the data in CMOS memory. Please keep OFF when normal operating. (only use DS12B887 or DS12887A.)

- **JP11 : CMOS Data Clear**

PIN NO.	Activity
ON	Clear Data
<b>*OFF</b>	<b>Normal Operating</b>

\*) : default setting

---

## 2.12 System Memory DRAM

The HS-4600 provides a wide range on board SDRAM memory by two pieces additional DIMM sockets of maximum 256MB memory capacity, the total memory size may up to 512MB on board.

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## 2.13 PAL System or NTSC System

The HS-4600 provides a TV Out function JP2 & JP3 to enable TV Out and selection PAL or NTSC system.

- **JP2, JP3 : PAL System or NTSC System Select**

Description	JP2	JP3
PAL	1-2	ON
<b>NTSC</b>	<b>2-3</b>	<b>OFF</b>

---

## 2.14 Temperature Enable Select

The HS-4600 provides CPU temperature Alarm function, it will be a warning “beep” come out if the CPU's temperature reached 70°C +/-5%, and it will be stop as the CPU's Temperature going down below 70°C +/-5% again.

The following setting showing how to Enable, Disable the Alarm function.

- **JP16** : Temperature Enable Select

CTA	Description	
	ON	Enable
JP16	OFF	Disable

# Chapter-3

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## Connection

This chapter gives all necessary information of the peripheral's connections, switches and indicators.

---

### 3.1 VGA and LCD Panel Connectors

The HS-4600 provides one internal connector for the VGA monitor connection.

- **CN18 : 16-pin header VGA connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GROUND
3	GREEN	4	GROUND
5	BLUE	6	GROUND
7	GROUND	8	GROUND
9	GROUND	10	HSYNC
11	GROUND	12	VSYNC
13	GROUND	14	NC
15	GROUND	16	NC

The HS-4600 provides a 50-pin 2.0 mm pitch header connector (CN6) for 3.3V Flat panel connection with following pin-assignment.

+12V	1	2	+12V
GND	3	4	GND
+3V PVcc	5	6	ENAVdd
FPVee	7	8	GND
P <sub>0</sub>	9	10	P <sub>1</sub>
P <sub>2</sub>	11	12	P <sub>3</sub>
P <sub>4</sub>	13	14	P <sub>5</sub>
P <sub>6</sub>	15	16	P <sub>7</sub>
P <sub>8</sub>	17	18	P <sub>9</sub>
P <sub>10</sub>	19	20	P <sub>11</sub>
P <sub>12</sub>	21	22	P <sub>13</sub>
P <sub>14</sub>	23	24	P <sub>15</sub>
P <sub>16</sub>	25	26	P <sub>17</sub>
P <sub>18</sub>	27	28	P <sub>19</sub>
P <sub>20</sub>	29	30	P <sub>21</sub>
P <sub>22</sub>	31	32	P <sub>23</sub>
P <sub>24</sub>	33	34	P <sub>25</sub>
SHFCLK	35	36	FLM
M	37	38	LP
GND	39	40	ENABKL
P <sub>26</sub>	41	42	P <sub>27</sub>
P <sub>28</sub>	43	44	P <sub>29</sub>
P <sub>30</sub>	45	46	P <sub>31</sub>
P <sub>32</sub>	47	48	P <sub>33</sub>
P <sub>34</sub>	49	50	P <sub>35</sub>

• **JP7 : Panel Power Selection**

JP7	DESCRIPTION
*1-2	5V Power
2-3	3V Power

---

## 3.2 Serial Ports Connectors

The HS-4600's CN22, 23, 24 and 25 headers provides four high speeds NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports. Please see the following pin assignment. With the delivery package, user may uses the 40-pin COM cable for plug into CN22, 23, 24 and 25 for get COM1 to COM4 connection. The pin number inside the ( ) are for 40-pin cable.

- **CN22, 23, 24, 25 : Serial Port 10-pin Headers (COM1~COM4)**

COM Port	PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
COM 1 ( CN22 )	1(1)	DCD	2(2)	DSR
	3(3)	RXD	4(4)	RTX
	5(5)	TXD	6(6)	CTX
	7(7)	DTR	8(8)	RI
	9(9)	GND	10(10)	NC
COM 2 ( CN 23 )	1(11)	DCD	2(12)	DSR
	3(13)	RXD	4(14)	RTX
	5(15)	TXD	6(16)	CTX
	7(17)	DTR	8(18)	RI
	9(19)	GND	10(20)	NC
COM 3 ( CN24 )	1(21)	DCD	2(22)	DSR
	3(23)	RXD	4(24)	RTX
	5(25)	TXD	6(26)	CTX
	7(27)	DTR	8(28)	RI
	9(29)	GND	10(30)	NC
COM 4 ( CN 25 )	1(31)	DCD	2(32)	DSR
	3(33)	RXD	4(34)	RTX
	5(35)	TXD	6(36)	CTX
	7(37)	DTR	8(38)	RI
	9(39)	GND	10(40)	NC

If the GPS is in used. Please set COM-2 at Disable mode by JP22.

---

- **JP22 : COM2 Selection**

JP22	DESCRIPTION
ON	Disable
<b>*OFF</b>	<b>Enable</b>

- **JP20 : COM3 Selection**

JP20	DESCRIPTION
ON	Disable
<b>*OFF</b>	<b>Enable</b>

\*) : default setting

- **JP21 : COM4 Selection**

JP21	DESCRIPTION
ON	Disable
<b>*OFF</b>	<b>Enable</b>

The HS-4600 also provides for user in select to using the COM4 as an RS-232/422/485. The CN19 for uses as an RS232, the CN25 for uses as an RS422 or RS485.

Please reference to the following for setting the JP12 & JP14 at disable and JP21 at enable if uses as RS232 at CN19. Or setting the JP12 & JP14 at non-disable and JP21 at disable if uses as RS422 or RS485 at CN19. The default setting is RS-232 at CN25.

- **CN19 : RS-422/485**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX-	2	TX+
3	RX+	4	RX-
5	GND	6	RTS-
7	RTS+	8	CTS+
9	CTS-	10	NC



---

- **JP12 : RS-422/485 Receiver Enable Control**

<b>JP12</b>	<b>DESCRIPTION</b>
1-2 ON	Always Enable
3-4 ON	Enable by writing the REG : 2 EFH BIT1=1
<b>*1-2 OFF</b>	<b>Always Disable</b>

- **JP14 : RS-422/485 Transceiver Enable Control**

<b>JP14</b>	<b>DESCRIPTION</b>
1-2 ON	Always Enable
3-4 ON	Enable by "-RTS" signal
5-6 ON	Enable by writing the REG : 2 EFH BIT0=1
<b>*ALL OFF</b>	<b>Always Disable</b>

\*) : default setting

---

### 3.3 Keyboard & Mouse Connector & FAN Power

The HS-4600 offers a possibility for Keyboard & Mouse connection with the Transfer Cable in obtain the connectors for Keyboard & Mouse by connect to header 8-pin CN14 connector.

- **CN14 : 8-pin Header Keyboard & Mouse Connector**

PIN NO.	DESCRIPTION
1	GND
2	VCC
3	MS-DATA
4	MS-CLOCK
5	GND
6	VCC
7	KB-DATA
8	KB-CLOCK

- **FN1 : FAN Power in Connector**

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	N.C.

---

### 3.4 Front Panel Connector

The on board front panel connector JP13 provides a multi connection to Reset Button, WDT Indicator, Speaker Connector and IDE-Drive's Activity Indicator.

A ON between pin-7 and pin-8 may cause a Hardware Reset cycle to system. The Reset Button may connection to pin-7 and pin-8. Normal OFF is necessary for operating.

The pin-5 and pin-6 provides a WDT ( Watch-Dog Timer ) Indicator for the user application. It may also be used as a control signal in WDT activity control.

The pin-3 and pin-4 provides a Speaker out put connection for extra sound out.

The pin-1 and pin-2 provides a IDE-Drive's Activity Indicator connection to a LED for indicate the IDE-Drive activity status. A light ON says Activity.

- **JP13 : Front Panel Connector**

PIN NO.	DESCRIPTION	Input / Output
1	IDE-Drive's Indicator	Output
2	VCC	Power Vcc
3	Speaker-Out	Output
4	GND	Power Ground
5	GND	Power Ground
6	WDT Indicator	Output
7	GND	Power Ground
8	Reset Button	Input

---

### 3.5 PCI E-IDE Drive Connector

One 44-pin connector provides as CN15, and others 40-pin connector provides as CN16 with following pin assignment. Total four IDE (Integrated Device Electronics) drivers may connect.

- **CN15 : 44-Pin IDE Interface Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	BRSTDRVJ	2	GND
3	DD7-1	4	DD8-1
5	DD6-1	6	DD9-1
7	DD5-1	8	DD10-1
9	DD4-1	10	DD11-1
11	DD3-1	12	DD12-1
13	DD2-1	14	DD13-1
15	DD1-1	16	DD14-1
17	DD0-1	18	DD15-1
19	GND	20	N.C.
21	RPDDREQ-	22	GND
23	RPDIOW-	24	GND
25	RPDIOR-	26	GND
27	PIORDY	28	PRIPD1-
29	RPDACK-	30	GND
31	IRQ14	32	N.C.
33	RPDA1-	34	N.C.
35	RPDA0-	36	RPDA2-
37	RPCS1-	38	RPCS3-
39	HLED	40	GND
41	VCC	42	VCC
43	GND	44	VCC

---

- **CN16 : 40-Pin IDE Interface Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET	2	GROUND
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	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE - DEFAULT
29	N/C	30	GROUND# -DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0	38	HDC CS1#
39	HDD ACTIVE	40	GROUND

---

### 3.6 Parallel Port Connector

A standard 26-pin flat cable driver connector provides as CN20 with following pin assignment for connection to parallel printer.

- **CN20 : Parallel Port Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	GROUND

---

### 3.7 Keylock Connector

The following provides the pin information for Keylock with connection from CN3.

- **CN3 : Keylock**

PIN NO.	DESCRIPTION
1	330 $\Omega$ PULL HIGH (VCC)
2	N.C.
3	GND
4	KEYLOCK
5	GND

---

## 3.8 GPS Connector

Caution: The information that provides herein this section is reference only. For detail and correctly information, please reference to your document along with the GPS Receiver that you have.

The HS-4600 provides a 2x10 pin-header optional connector for user place in the Rockwell's "Jupiter" Global Positioning System (GPS) Receiver. Firstly, please reference to the chapter 5 in this manual before using "Jupiter". For detail application, please contact with your nearest Rockwell office.

Please set COM 2 at Disable mode by JP22 when GPS in used.

- **CN4 : GPS Optional Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NOTE <sup>(0)</sup>	2	VCC
3	N.C.	4	N.C.
5	RESET#	6	N.C.
7	NOTE <sup>(1)</sup>	8	NOTE <sup>(1)</sup>
9	N.C.	10	GND
11	RX2	12	TX2
13	GND	14	RX3
15	TX3	16	GND
17	GND	18	GND
19	NOTE <sup>(2)</sup>	20	NOTE <sup>(3)</sup>

Note<sup>(0)</sup>: No use in the first version of GPS application.

Note<sup>(1)</sup>: Please reference to the next table for detail.

Note<sup>(2)</sup>: Test only. 1PPS time mark output, rising edge synchronized with each set valid navigation binary message data.

Note<sup>(3)</sup>: Test only. 10KHz clock waveform, positive logic synchronized to the pin-19.

---

- **JP4 & JP5: Host Communications Protocol Select**

JP4	JP5	DESCRIPTION
OFF	OFF	Data stored in SRAM or EEPROM determines message format, host port communication settings, and default message set.
OFF	ON	Binary message format; host port communication settings=9600bps, no parity, 8 data bits, 1 stop bit. The receiver operates from default initialization values stored in ROM.
ON	OFF	NMEA message format; host port communication settings=4800bps, no parity, 8 data bits, 1 stop bit. The receiver selects the default NMEA output message set and uses initialization values from the data stored in SRAM or EEPROM.
ON	ON	NMEA message format; host port communication settings=4800bps, no parity, 8 data bits, 1 stop bit. The receiver operates from default initialization values stored in ROM and will output the default NMEA message set from ROM.



---

### 3.9 The Floppy Disk Drive Connector

A standard 34-pin header daisy-chain driver connector provides as CN26 with following pin assignment. Total two FDD drivers may connect.

- **CN26 : FDD CONNECTOR**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE DATA#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT
33	GROUND	34	DISK CHANGE#

---

### 3.10 Connectors of the on board Sound Adapter

The HS-4600 has an on board ESS<sup>®</sup> Solo-1 3D sound interface. The following are the connectors of AUX IN, LINE IN and MIC IN / AUDIO OUT connectors.

- **JP15 : LINE IN Connector**

PIN NO.	DESCRIPTION
1	LINEL
2	GND
3	LINER
4	GND

- **JP17 : AUX IN Connector**

PIN NO.	DESCRIPTION
1	AUXBL
2	GND
3	AUXBR

- **JP23 : MIC IN / AUDIO OUT Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	AOUTL	2	AOUTR
3	GND	4	GND
5	MIC	6	N.C.
7	GND	8	GND

With MIC IN / AUDIO OUT cable, user may connect R/L Speaker to the AOUTL and AOUTR pins of JP23, and connect Microphone to the MIC pin of JP23.

---

### 3.11 Fast Ethernet Connector

The Fast Ethernet controller provides with 32-bit performance, PCI bus master capability, and full compliance with IEEE 802.3 10/100Based-T specifications.

For 10/100 Based operation, please connect the network connection by plugging one end of the cable into the 10-pin header of the CN21 connector.

- **CN21 : Ethernet Connector ( header 10-pin )**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	LILED
3	RX+	4	RX-
5	ACTLED	6	GND
7	SPELED	8	GND
9	TX+	10	TX-

\*) : LILED: LINK LED  
ACTLED: ACTIVE LED  
SPELED: SPEED LED

- **JP19 : LAN Connector Enable/Disable Select**

PIN NO.	DESCRIPTION
*1-2	Enable
2-3	Disable

---

### 3.12 PC/104 Bus Connection

The HS-4600's PC/104 expansion bus provides you in connect to all kind of PC/104 modules. The PC/104 bus has been already become the industrial embedded 16-bit PC standard bus. You can easily install to over thousands type of PC/104 modules from hundreds of venders in the world. The detailed pin assignment of the PC/104 expansion bus connectors CN7 and CN9 are specified as following tables:

**Note :** *The PC/104 connector allows to directly plug-in Stack-thru PC/104 modules without the PC/104 mounting kit.*

• **CN7 & CN9 : PC/104 Expansion Bus**

(CN7 = 64-pin female connector; CN9 = 40-pin female connector.)

Pin No.	CN7 Row A	Pin No.	CN7 Row B
1	IOCHECK*	33	0V
2	SD7	34	RESETDRV
3	SD6	35	+5V
4	SD5	36	IRQ9
5	SD4	37	-5V
6	SD3	38	DRQ2
7	SD2	39	-12V
8	SD1	40	NOW*
9	SD0	41	+12V
10	IOCHRDY	42	(KEY)
11	AEN	43	SMEMW*
12	SA19	44	SMEMR*
13	SA18	45	IOW*
14	SA17	46	IOR*
15	SA16	47	DACK3*
16	SA15	48	DRQ3
17	SA14	49	DACK1*
18	SA13	50	DRQ1
19	SA12	51	REFRESH*
20	SA11	52	SYSCLK
21	SA10	53	IRQ7
22	SA9	54	IRQ6
23	SA8	55	IRQ5
24	SA7	56	IRQ4
25	SA6	57	IRQ3
26	SA5	58	DACK2*
27	SA4	59	TC
28	SA3	60	BALE
29	SA2	61	+5V
30	SA1	62	OSC
31	SA0	63	0V
32	0V	64	0V

Pin No.	CN9 Row D	Pin No.	CN9 Row C
1	0V	21	0V
2	MEMCS16*	22	SBHE*
3	IOSC16*	23	LA23
4	IRQ10	24	LA22
5	IRQ11	25	LA21
6	IRQ12	26	LA20
7	IRQ15	27	LA19
8	IRQ14	28	LA18
9	DACK0*	29	LA17
10	DRQ0	30	MEMR*
11	DACK5*	31	MEMW*
12	DRQ5	32	SD8
13	DACK6*	33	SD9
14	DRQ6	34	SD10
15	DACK7*	35	SD11
16	DRQ7	36	SD12
17	+5V	37	SD13
18	MASTER*	38	SD14
19	0V	39	SD15
20	0V	40	(KEY)

---

### 3.13 USB Ports Connector

The HS-4600 provides one 10-pin connector for USB-0 & USB-1 ports. Please refer to the following default pin information.

- **CN10 : USB Ports Connector**

PIN NO.	USB-0	PIN NO.	USB-1
1	VCC	2	VCC
3	USB PO-	4	USB P1-
5	USB PO+	6	USB P1+
7	GND	8	GND

---

### 2.14 IR Connector

The HS-4600 provides a 5-pin internal FIR communication connector as following CN11 pin information.

- **CN11 : IR Connector**

PIN NO.	DESCRIPTION
1	VCC
2	FIRRX
3	IRRX
4	GROUND
5	IRTX

---

### 3.15 ATX Power Function Connector

The HS-4600 reserved a CN2 for ATX Power can control the 5 pin ATX via the extension cable from the Backplane.

- **CN2 : 5-Pin ATX Power Control from Backplane**

PIN NO.	DESCRIPTION
1	+5V
2	5V_SB
3	+12V
4	PS_ON
5	GND

The HS-4600 provides a CN8 connector for the 4-pin EXT power input connection as following pin assignment of -5V and -12V.

The HS-4600 reserved a CN12 for ATX Power ON/OFF control.

- **CN8 : 4-Pin EXT Power Connector**

PIN NO.	DESCRIPTION
1	GND
2	-5V
3	GND
4	-12V

- **JP9 : AT/ATX Power Select**

PIN NO.	DESCRIPTION
*1-2	ATX Power
2-3	AT Power

- **CN12 : Switch Push Button**

PIN NO.	DESCRIPTION
1	VCC5ON
2	PWRBT

---

### 3.16 DIO Connector

The HS-4600 provides a CN1 connector for Digital I/O function.

- **CN1 : Digital I/O Connector**

Digital-In		Digital-Out	
1	GND	2	GND
3	DI0	4	DO0
5	DI1	6	DO1
7	DI2	8	DO2
9	DI3	10	DO3
11	DI4	12	DO4
13	DI5	14	DO5
15	DI6	16	DO6
17	DI7	18	DO7
19	GND	20	GND

---

### 3.17 TV-Out Connector

The HS-4600 provides a CN5 connector for TV-Out connector.

- **CN5 : TV-Out Connector**

PIN NO.	DESCRIPTION
1	CRMA
2	GND
3	GND
4	LUMA
5	CMPS
6	GND



---

### 3.18 Power In Connector

The HS-4600 provides CN17 for Power In Connector, with following pin information.

- **CN17 : Power In Connector**

PIN NO.	DESCRIPTION
1	GND
2	GND
3	-12v
4	+12v
5	VCC
6	VCC

# ***Chapter-4***

---

## **AWARD BIOS Setup**

The HS-4600 uses Award PCI/ISA BIOS for the system configuration. The Award BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options which could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

To access AWARD PCI/ISA BIOS Setup program, press <Del> key during memory testing when first power on. The Main Menu will be displayed at this time.

---

## 4.1 Main Menu

Once you enter the Award 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.

ROM PCI/ISA BIOS (2A69KD2I)  
CMOS SETUP UTILITY  
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANGEMENT SETUP	IDE HDD AUTO DETECTION
PCI CONFIGURATION SETUP	SAVE & EXIT SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
Esc : Quit	↑↓→← : Select Item
F10 : Save & Exit	(Shift)F2 : Change Color

Note that a brief description of each highlighted selection appears at the bottom of the screen.

---

## 4.2 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, please set the HDD mode to **LBA** mode. Please use the IDE Setup Utility in BIOS SETUP to install the HDD correctly.

ROM PCI/ISA BIOS (2A69KD2I)  
STANDARD CMOS SETUP  
AWARD SOFTWARE, INC.

Data (mm:dd:yy) : Fri, Oct 19 1999								
Time (hh:mm:ss) : 00:00:00								
	Type	Size	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	: Auto (	0Mb)	0	0	0	0	0	Auto
Primary Slave	: Auto (	0Mb)	0	0	0	0	0	Auto
Secondary Master	: Auto (	0Mb)	0	0	0	0	0	Auto
Secondary Slave	: Auto (	0Mb)	0	0	0	0	0	Auto
Drive A	: 1.44M , 3.5in.							
Drive B	: None							
LCD&CRT	: Auto							
Halt On	: All, But keyboard							
ESC : Quit				↑↓→← : Select Item		PU/PD/ + / - : Modify		
F1 : Help				(Shift) F2: Change Color				

---

## 4.3 BIOS Features 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.

ROM PCI/ISA BIOS (2A69KD2I)  
BIOS FEATURES SETUP  
AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS	Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF	Shadow	: Disabled
External Cache	: Enabled	CC000-CFFF	Shadow	: Disabled
CPU L2 Cache ECC Checking	: Enabled	D0000-D3FFF	Shadow	: Disabled
		D4000-D7FFF	Shadow	: Disabled
Quick Power On Self Test	: Disabled	D8000-DBFFF	Shadow	: Disabled
Boot From LAN First	: Disabled	DC000-DFFFF	Shadow	: Disabled
Boot Sequence	: A,C,SCSI			
Swap Floppy Drive	: Disabled			
Boot Up Floppy Seek	: Enabled			
Boot Up NumLock Status	: On			
Gate A20 Option	: Fast			
Typematic Rate Setting	: Disabled			
Typematic Rate (Chars/Sec)	: 6			
Typematic Delay (Msec)	: 250			
Security Option	: Setup			
PS/2 Mouse Function Control	: Enabled			
PCI/VGA Palette Snoop	: Disabled			
OS Select For DRAM > 64MB	: Non-OS2			
Report No FDD For WIN 95	: Yes			
		ESC	: Quit	↑↓→←: Select Item
		F1	: Help	PU/PD/+/-: Modify
		F5	: Old Values	(Shift) F2 : Color
		G6	: Load BIOS Defaults	
		G7	: Load Setup Defaults	

---

## 4.4 Chipset Features 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.

ROM PCI/ISA BIOS (2A69KD2I)  
CHIPSET FEATURES SETUP  
AWARD SOFTWARE, INC.

Auto Configuration	: Enabled	Power-Supply Type	: Auto
EDO DRAM Speed Selection	: 60ns	Auto Detect DIMM/PCI Clk	: Enabled
EDO CASx# MA Wait State	: 2	Spread Spectrum	: Disabled
EDO RASx# Wait State	: 2		
SDRAM RAS to CAS Delay	: 3		
SDRAM RAS Precharge Time	: 3		
SDRAM CAS Latency Time	: 3		
SDRAM Precharge Control	: Disabled		
DRAM Data Integrity Mode	: Non-ECC		
System BIOS Cacheable	: Enabled		
Video BIOS Cacheable	: Enabled		
Video RAM Cacheable	: Enabled		
8 bit I/O Recovery Time	: 1		
16 bit I/O Recovery Time	: 1		
Memory Hole At 16M-16M	: Disabled		
Passive Release	: Enabled	ESC : Quit	↑↓→←: Select Item
Delayed Transaction	: Disabled	F1 : Help	PU/PD/+/-: Modify
AGP Aperture Size(MB)	: 64	F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

---

## 4.5 Integrated Peripherals

The IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship which 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).

ROM PCI/ISA BIOS (2A69KD2I)  
INTEGRATED PERIPHERALS  
AWARD SOFTWARE, INC.

IDE HDD Block Mode	: Enabled	Onboard Parallel Port	: 378/IRQ7
IDE Primary Master PIO	: Auto	Parallel Port Mode	: SPP
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	Onboard Serial Port 3	: 3E8
IDE Secondary Master UDMA	: Auto	Serial Port 3 Use IRQ	: IRQ3
IDE Secondary Slave UDMA	: Auto	Onboard Serial Port 4	: 2E8
On-chip Primary PCI IDE	: Enabled	Serial Port 4 Use IRQ	: IRQ3
On-chip Secondary PCI IDE	: Enabled	LCD Panel Type	: Panel 5
USB Keyboard Support	: Disabled		
Init Display First	: PCI Slot		
KBC input clock	: 8MHz		
Onboard FDC Controller	: Enabled		
Onboard Serial Port 1	: 3F8/IRQ4		
Onboard Serial Port 2	: 2F8/IRQ3		
UART Mode Select	: Normal		

Panel#	Panel Type
0	1024*768 Dual Scan STN Color Panel
1	128*1024 TFT Color Panel
2	640*480 Dual Scan STN Color Panel
3	800*600 Dual Scan STN Color Panel
4	640*480 Sharp TFT Color Panel
5	640*480 18-bit TFT Color Panel
6	1024*768 TFT Color Panel
7	800*600 TFT Color Panel
8	800*600 TFT Color Panel (Large BIOS ONLY)
9	800*600 TFT Color Panel (Large BIOS ONLY)
10	800*600 Dual Scan STN Color Panel (Large BIOS ONLY)
11	800*600 Dual Scan STN Color Panel (Large BIOS ONLY)
12	1024*768 TFT Color Panel (Large BIOS ONLY)
13	1280*1024 Dual Scan STN Color Panel (Large BIOS ONLY)
14	1024*600 Dual Scan STN Color Panel (Large BIOS ONLY)
15	1024*600 TFT Color Panel (Large BIOS ONLY)



---

## 4.6 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.

ROM PCI/ISA BIOS (2A69KD2I)  
POWER MANAGEMENT SETUP  
AWARD SOFTWARE, INC.

ACPI function	: Enabled	** Reload Global Timer Events **	
Power Management	: Define	IRQ[3-7,9-15], NMI	: Disabled
PM Control by APM	: Yes	Primary IDE 0	: Disabled
Video Off Method	: V/H SYNC+Blank	Primary IDE 1	: Disabled
Video Off After	: Standby	Secondary IDE 0	: Disabled
MODEN Use IRQ	: 3	Secondary IDE 1	: Disabled
Doze Mode	: Disabled	Floppy Disk	: Disabled
Standby Mode	: Disabled	Serial Port	: Enabled
Suspend Mode	: Disabled	Parallel Port	: Disabled
HDD Power Down	: Disabled		
Throttle Duty Cycle	: 62.5%		
PCL/VGA Act Monitor	: Disabled		
Power On by Ring	: Enabled		
IRQ 8 Break Suspend	: Disabled		
	:	ESC	: Quit
	:	F1	: Help
	:	F5	: Old Values
	:	F6	: Load BIOS Defaults
	:	F7	: Load Setup Defaults

# ***Chapter-5***

---

## **Software Utilities**

This chapter the detailed information of VGA and LAN function. How to install the configuration is also included.

Section include:

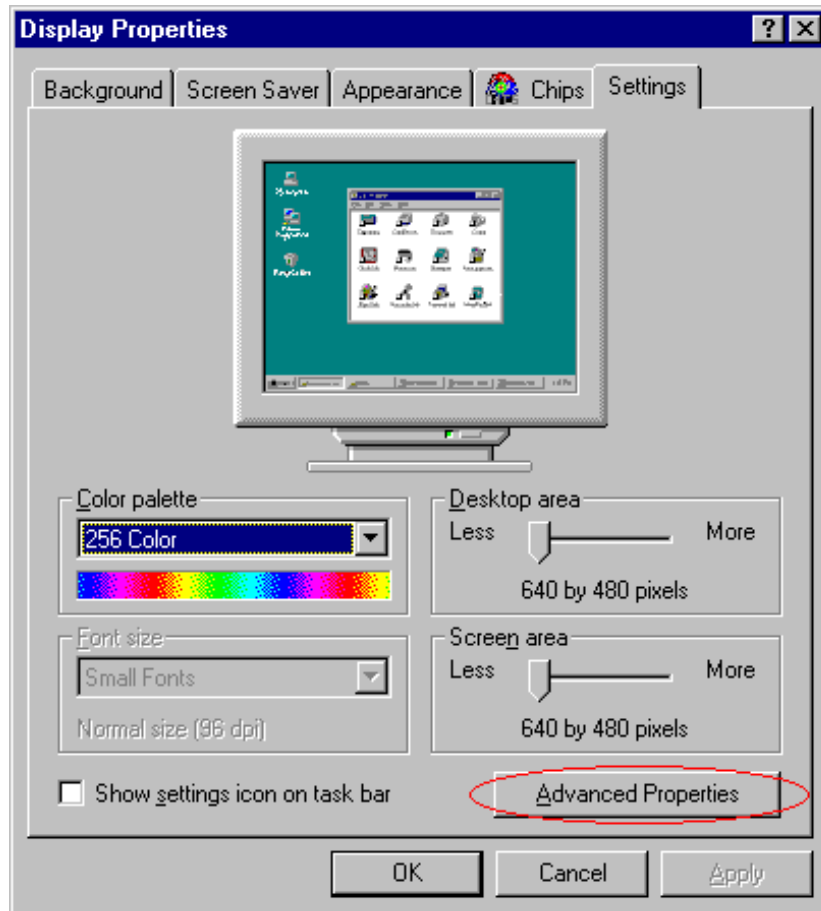
- VGA DRIVER INSTALLATION
- SOUND DRIVER INSTALLATION
- NETWORK DRIVER INSTALLATION

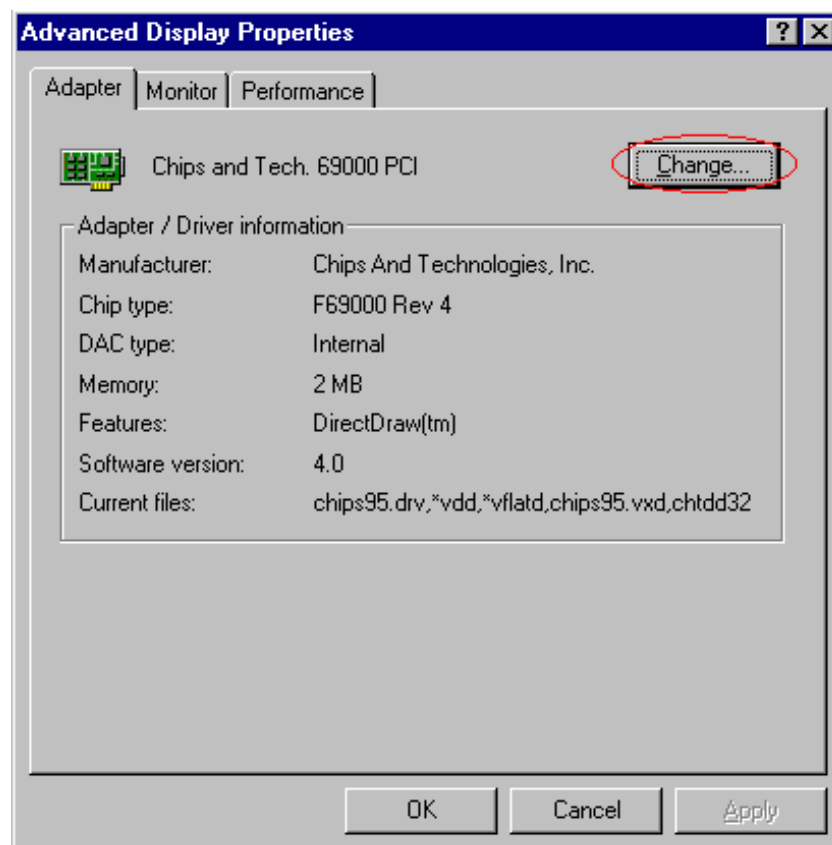
---

## 5.1 VGA DRIVER INSTALL FOR WIN95&98

1. Click Start, then Setting, then Control Panel.
2. Start the Display applet program.
3. Select the setting page, push the Advanced properties button.
4. Push the change button in the adapter area.
5. Continue to click "Next". Select  
Display a list of all drivers in a specific location,  
so you can select the drivers you want.
6. Click "Next".
7. Select the Specify a location checkbox and click "Browse".
8. Specify the path to the new driver and press the ,<ENTER> key.  
(if in driver A:, select a:\win95)
9. The Select device dialog box will appear.  
  
Select **Chips and Tech. 69000 PCI**
10. Continue choosing close until asked to restart machine.
11. After the system has restarted, you can go back into the display applet and select alternate screen resolutions and color depths.

Note: Installation procedure for Windows 98 is similar to Windows95.





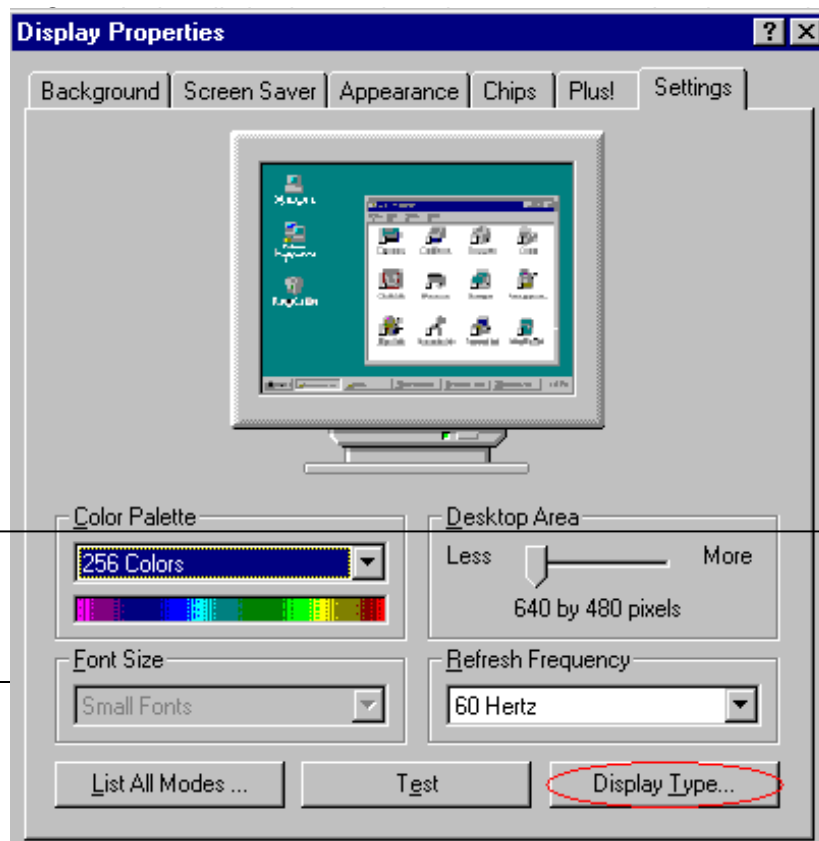
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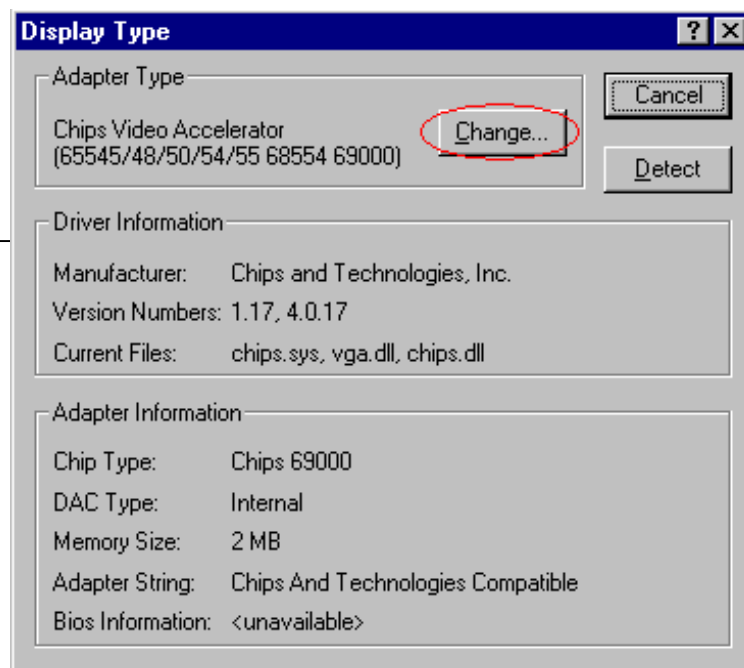
## 5.2 VGA DRIVER INSTALL FOR WIN NT4.0

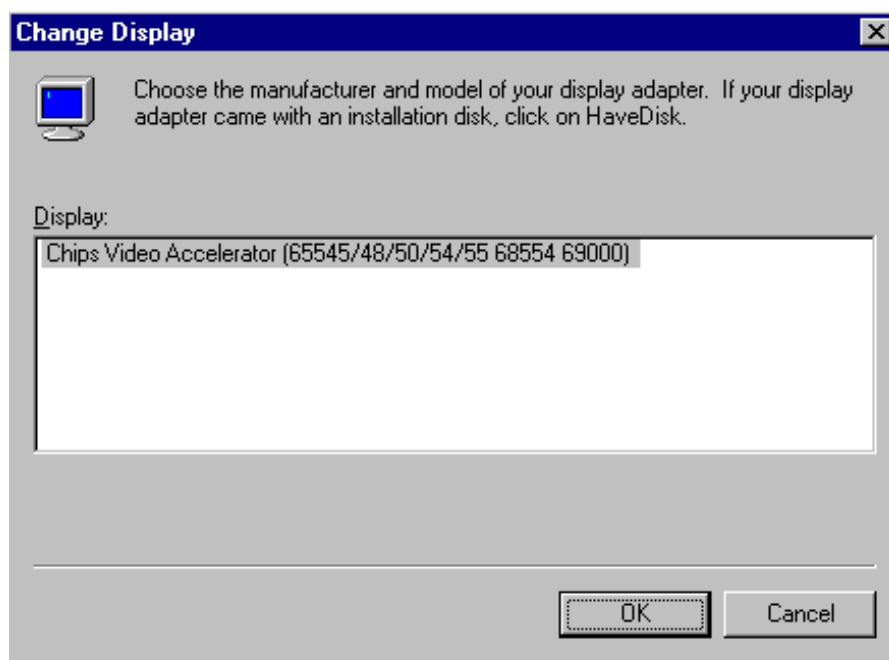
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1. Click the Start button, then go to Settings and click on Control Panel.
2. Click on Display icon to start the Display Properties window.
3. Click on the Settings tab, and then click on Display Type.
4. In the Change Display Type window, click on "Have Disk".
5. Specify the path to the new driver and press the <ENTER>key.  
(if in driver A:, type a:\nt40)  
  
select **Chips Video Accelerator**  
**(655545/48/50/54/55/68554 69000)**
6. click OK or press Enter
7. You will then see warning panel about Third Party Drivers. Click on Yes to finish the install.

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## 5.3 SOUND DRIVER INSTALL FOR WIN98&95

### **Win98**

Windows 98 will detect the network driver automatically.

### **Win95**

1. Click Start, then go to Setting and select Control panel.
2. Click on the Add New Hardware icon to start the applet program.
3. In the window, click "Next", choose "PCI Multimedia Audio Device", and click "Next".
4. In the Driver window, select "Update Driver" then click "Next".
5. This will bring up the Insert Disk Window.
6. Specify the path the new driver and press <ENTER> key.

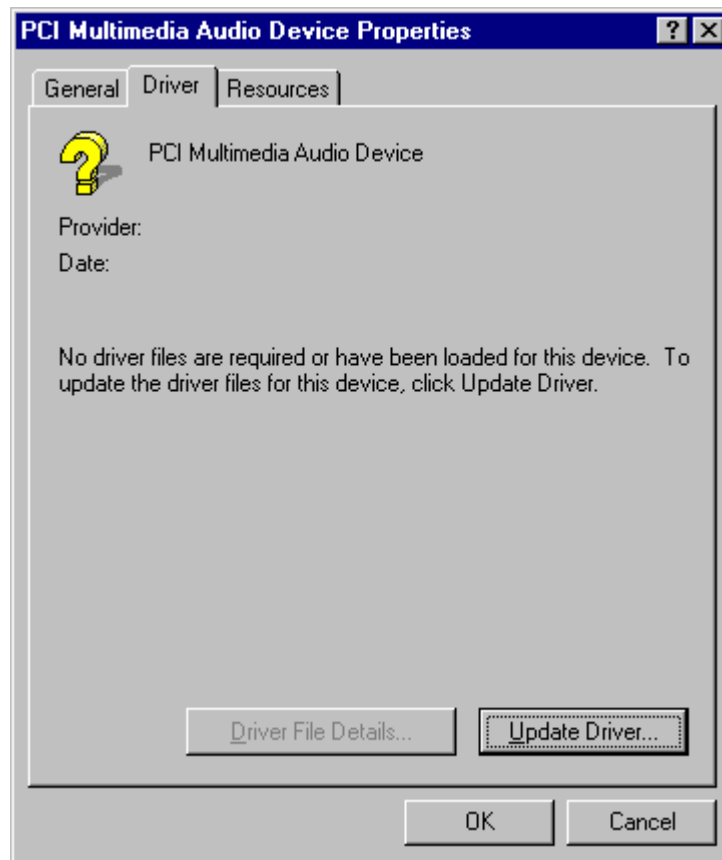
(If in driver a:, type a:\)

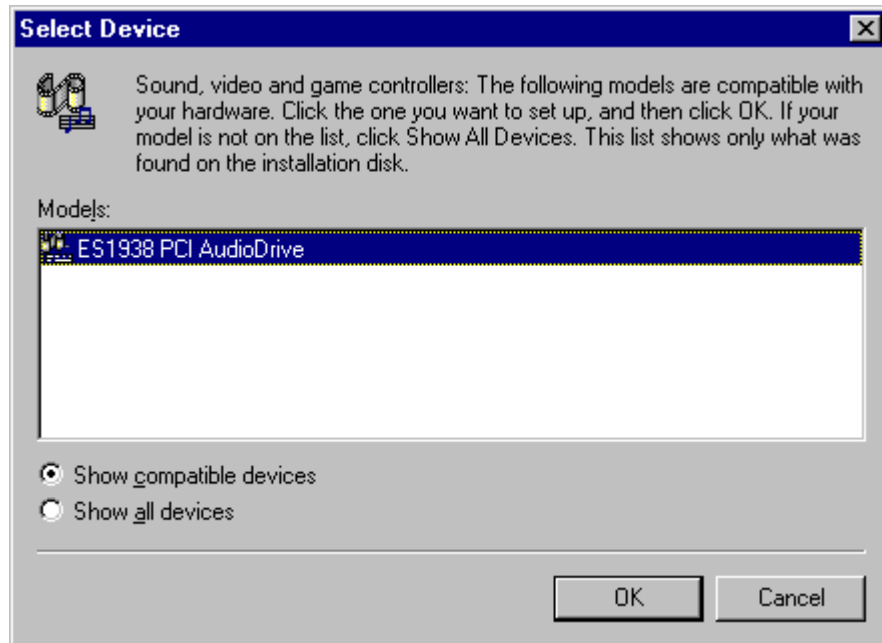
(If you're not sure exactly where the drivers are, choose the "Browse" button and find it)

#### **ES1938 PCI AudioDrive**

7. Click OK.
8. Windows 95 will copy the sound drivers to the proper directories on your system.
9. Continue choosing "OK", until asked to restart your system.
10. After restart, checking on the sound driver, the Properties of the driver should look similar to the following figure.







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## 5.4 SOUND DRIVER INSTALL FOR WIN NT4.0

### **WinNT**

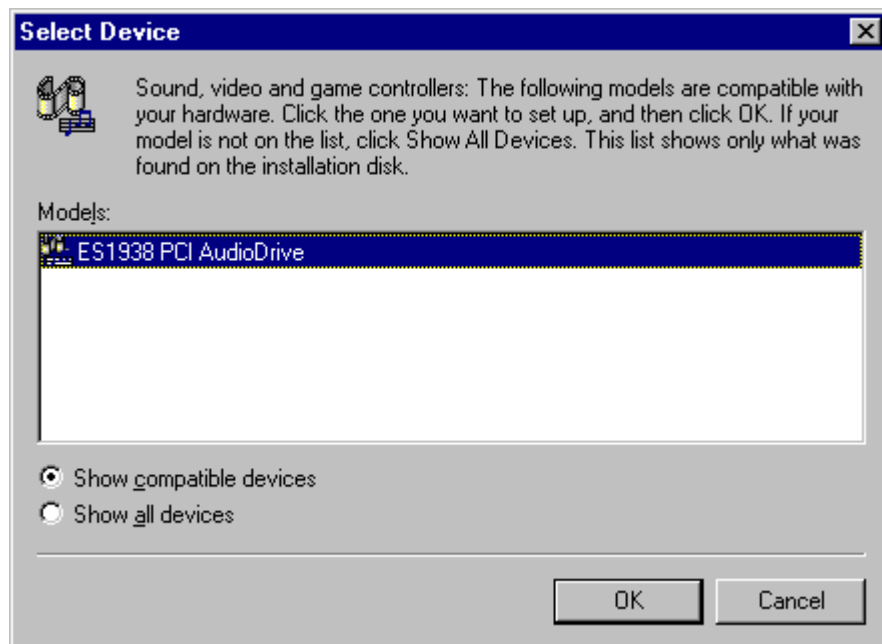
1. Click Start, then go to Setting and select Control panel.
2. Click on the Add New Hardware icon to start the applet program.
3. In the window, click "Next", choose "PCI Multimedia Audio Device", and click "Next".
4. In the Driver window, select "Update Driver" then click "Next".
5. This will bring up the Insert Disk Window.
6. 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)

### **ES1938 PCI AudioDrive**

7. Click OK.
8. Windows 95 will copy the sound drivers to the proper directories on your system.
9. Continue choosing "OK", until asked to restart your system.
10. After restart, checking on the sound driver, the Properties of the driver should look similar to the following figure.



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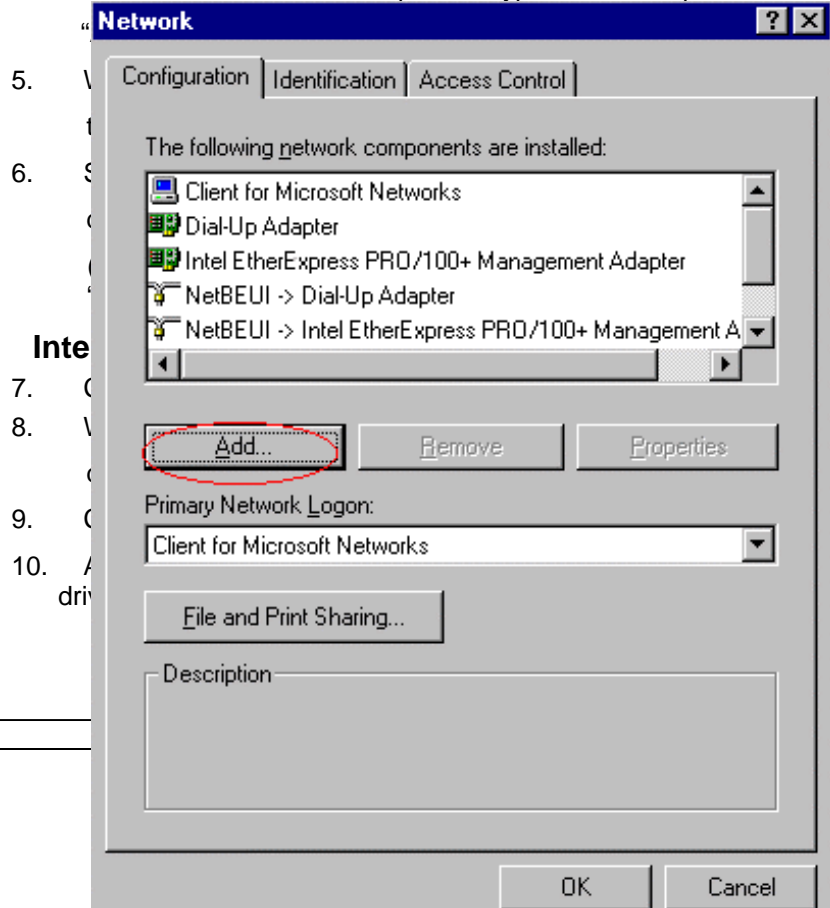
## 5.5 NETWORK DRIVER INSTALL FOR WIN98&95

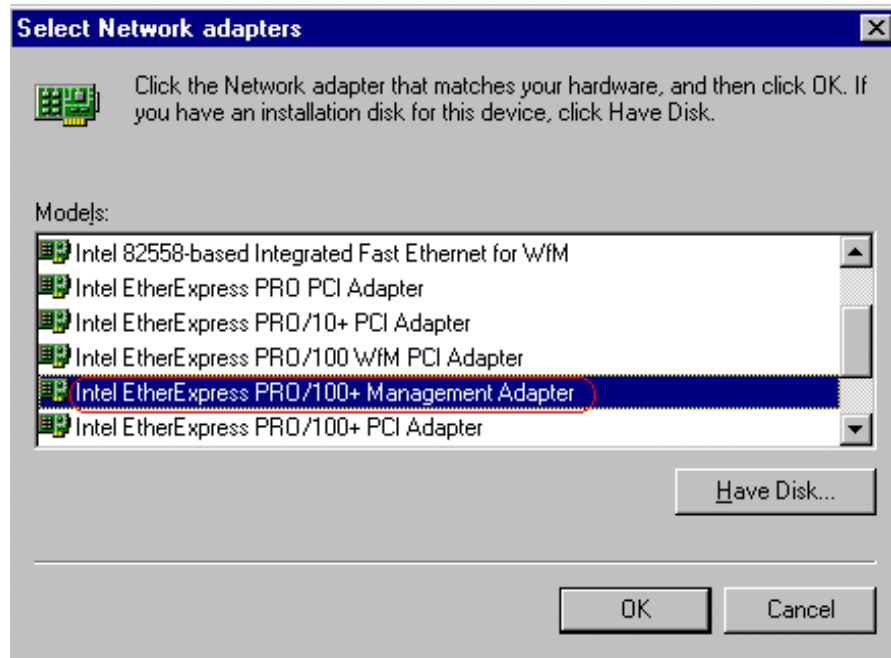
### Win98

Windows 98 will detect the network driver automatically.

### Win95

1. Click Start, then Setting, in the "Setting" select Control panel.
2. Start the network applet program.
3. In the Network window, click "Add".
4. In the Select Network Component Type, select Adapter then click







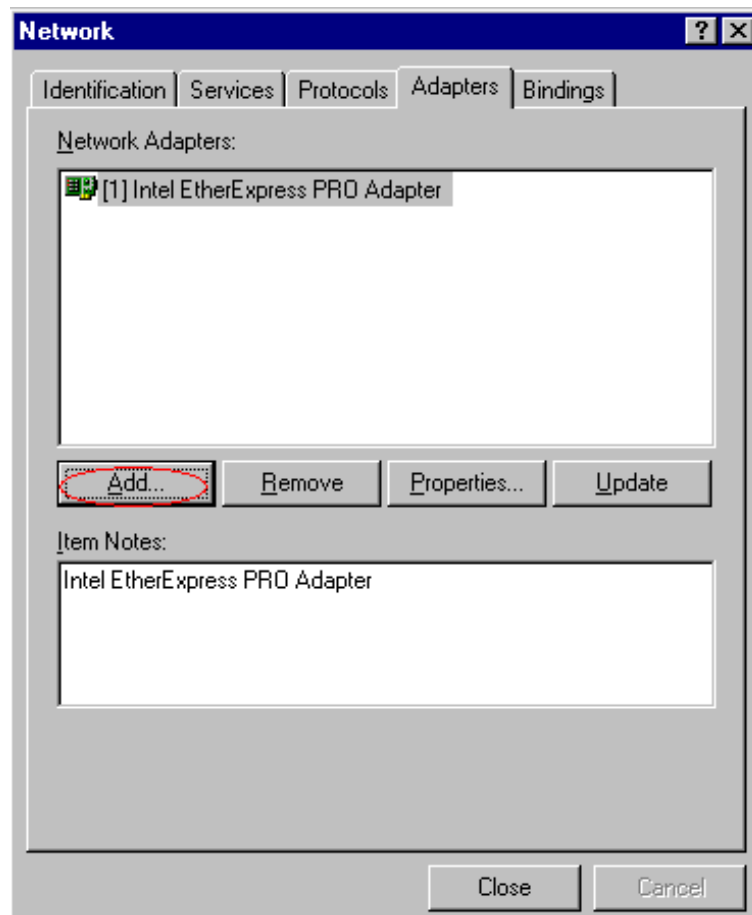
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## 5.6 NETWORK DRIVER INSTALL FOR WIN NT4.0

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, checking on the Network driver, the Properties of the driver should look similar to the following figure.



# Chapter-6

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## The GPS Receiver

The HS-4600 is designed to facilitate options of Rockwell's "Jupiter" Global Positioning System (GPS) receiver engine based on the Zodiac chip set. The HS-4600 with GPS engine can be used in both static and mobile operations for evaluation purposes.

The HS-4600 implements the receiver control operation and input/output (I/O) functions of the GPS receiver through a serial port, external antenna, and LABMON software. The GPS receiver is connecting by a 2x10 header connector to the HS-4600. Please reference to the section 3-8 for pin-assignment.

For detail application, please reference to the attached manual of the GPS engine.

For application information, please contact with your supplier of your GPS engine device, or please browse at <http://www.rockwell.com>