MB720

VIA CN333/ CN400

Mini ITX Motherboard

USER'S MANUAL

Version 1.0

Acknowledgments

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Introduction

Product Description

The MB720 Mini ITX board incorporates the VIA CN333/CN400 chipset. Currently, the board is available in two models, namely:

1. MB720 - VIA C3 800MHz/1GHz, CN333 chipset, Mini-ITX w/ 10/100 LAN, VGA, Mini PCI, SATA

2. VIA Eden 1GHz, CN400 chipset, Mini-ITX w/ 10/100 LAN, Gigabit LAN, VGA, Mini PCI, SATA, 1394, TV

Optional for the MB720/MB720F is the ID380 daughter card that supports 18/24-bit LVDS.

Basically, the MB720 has the following features:

- VIA CN333/ CN400 Chipset with VIA CPU

- Up to 1GHz speed and 1GB DDR memory

- Integrated VGA, support 18/24-bit LVDS LCD

- 10/100 LAN1 on board, 10/100 or Gigabit LAN for LAN2

- 2 x 1394, 6 x USB, 2 x SATA ports

- 4 COM ports, Watchdog timer

- TV Out, PCI and Mini PCI slots on board

Remarks: The onboard PCI slot support 2 masters.

Checklist

Your MB720 package should include the items listed below.

- The MB720 Mini ITX board
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Accompanying cables such as:
    - 1 COM Port Cable
    - 2 IDE Ribbon Cables (40-pin & 44-pin)
    - 1 Serial ATA Cable
    - 1 Slim FDD Cable (for MB720F only)
    - 1 1394/Firewire Cable (for MB720F only)
- I/O Shield

Remarks: Optional is the USB2K-4 USB 2.0 cable.

Specifications

CPU Type	VIA EDEN EBGA / C3 EBGA
CPU Voltage	1.05V ~ 1.20V
CPU Frequency / FSB	300MHz ~ 1.0GHz w/ FSB 100/133/200MHz
Green / APM	APM1.2
Chipset	VIA CN400/8237 chipset North bridge: CN400 (MB720F) / CN333 (MB720) 681-pin HSBGA South bridge: VT8237 539-pin PBGA
BIOS	Award BIOS supports ACPI function
Cache	64K L2 (CPU integrated)
Memory Type	One DDR DIMM socket, supports up to 1GB (CN400: DDR200/266/333/400. CN333: DDR200/266/333)
VGA	VIA CN400/CN333 built-in 128-bit Unichrome Pro 3D/2D controller, supports 16/32/64 MB frame buffer size
LVDS	Through ID380 card (VIA VT1631L for 18/24 dual channel LVDS)
LAN	LAN1: Via 8237 built-in 10/100 LAN MAC + Via VT6103 PHY LAN2: Realtek RTL8100C (10/100) LAN controller x1 co-layout w/ RTL8110S-32 Gigabit LAN controller (MB720F only)
1394(MB720F only)	VIA VT6307 1394 controller LQFP package for two ports
USB	VIA VT8237 built-in USB 2.0, 6 ports
Serial ATA	VIA VT8237 built-in SATA controller, 2 ports for RAID 0, 1
IDE Interface	Two channels; support Ultra DMA 33/66/100/133
Sound	VIA VT8237 built-in Sound controller + AC97 Codec ALC 655 5.1 Channel (Line-out, Line-in & Mic.)
LPC I/O	Winbond W83697HF: Parallel port x1, COM1, COM2 (RS-232), FDC 1.44MB, IrDA & hardware monitor (2 thermal inputs, 5 voltage monitor inputs, 1 chassis open detection & 2 fan headers)
Secondary I/O	Fintek F81216D for COM3, 4 (RS-232)
RTC/CMOS	VIA VT8237 built-in RTC with on board Lithium Battery
KB/Mouse	Supports PS/2 Keyboard/Mouse
Expansion Slots	PCI slot x 1 (supports 2 bus masters) and Mini-PCI x 1
Edge Connectors	Mini-DIN x 1 for PS/2 KB & MS DB15 x 1 for VGA CRT DB9 x 1 for COM1 DB25 x 1 for parallel port RJ45 + dual USB connector x 1 for LAN 2 and USB 1 & 2 RJ45 x1 for LAN 1 RCA jack x 1 for TV-Out (MB720F only) Phone jack x 1 for Audio (SPKR, Line-In & MIC)
On Board Connector / Header	Serial ATA connector x 2 40 pins box-header x 1 (IDE1) 44 pins pin-header x 1 (IDE2) 48 pins pin-header x 1 for LCD interface 30 pins pin-header x 1 for COM2, 3 & 4 12 pins pin-header x 1 for audio 8 pins pin-header x 2 for USB x 4 12 pins pin-header x 1 for 1394 x 2 26 pins slim type header x 1 for Floppy 5 pins pin-header x 1 for IrDA 20 pins pin-header for power switch, reset, speaker, etc.
Power Connector	ATX power connector x 1
Watchdog Timer	Yes (256 segments: 0, 1, 2,..., 255 sec/min)

Form Factor	Mini ITX (170mm x 170mm)

Board Dimensions

Installations

This section provides information on how to use the jumpers and connectors on the MB720 in order to set up a workable system. The topics covered are:

Installing the Memory

The MB720 embedded board supports one DDR memory sockets for a maximum total memory of 1GB in DDR memory type. The memory module capacities supported are 128MB, 256MB, 512MB and 1GB.

Installing and Removing Memory Modules

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

1. Hold the DDR module so that the key of the DDR module aligns with those on the memory slot.

2. Gently push the DDR module in an upright position until the clips of the slot close to hold the DDR module in place when the DDR module touches the bottom of the slot.

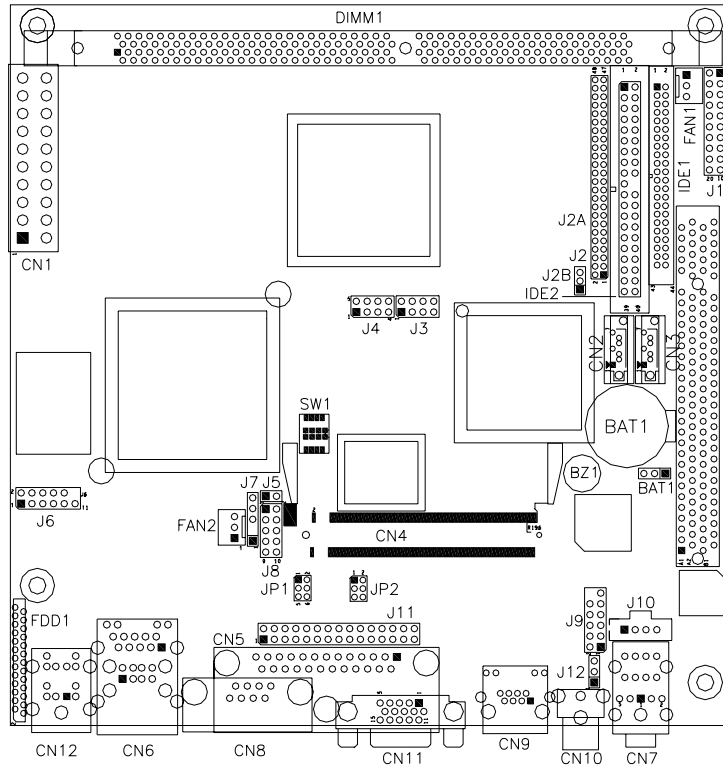3. To remove the DDR module, press the clips with both hands.
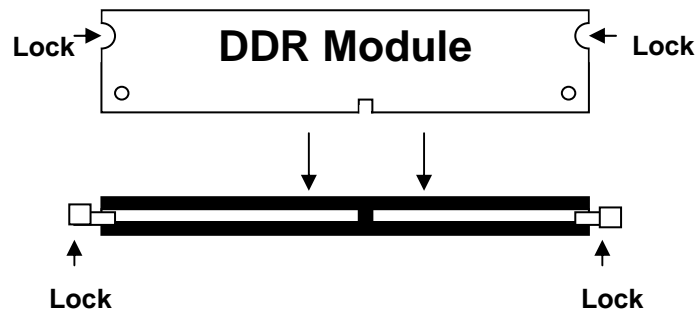
Setting the Jumpers

Jumpers are used on MB720 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MB720 and their respective functions.

Jumper Locations on MB720

JBAT1: Clear CMOS Contents

Use JBAT1 to clear the CMOS contents. *Note: Disconnect the ATX-power connector from the board before clearing CMOS.*

JBAT1	Setting	Function
□ □ □ 1 2 3	Pin 1-2 Short/Closed	Normal
□ □ □ 1 2 3	Pin 2-3 Short/Closed	Clear CMOS

JP1: COM3 RS232 +5V / +12V Power Setting

Pin #	Signal Name	JP1	Signal Name	Pin #
1	RI		+12V	2
3	RI (Default)		RI (Default)	4
5	RI		+5V	6

COM3 Settings: Pin 1-2 short = +12V, Pin 5-6 short = +5V, Pin 3-4 Standard COM Port

JP2: COM4 RS232 +5V / +12V Power Setting

Pin #	Signal Name	JP2	Signal Name	Pin #
1	RI		+12V	2
3	RI (Default)		RI (Default)	4
5	RI		+5V	6

COM4 Settings: Pin 1-2 short = +12V, Pin 6-5 short = +5V, Pin 3-4 Standard COM Port

Connectors on MB720

The connectors on MB720 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on MB720 and their respective functions.

Connector Locations on MB720

FDD1: Floppy Drive Connector

FDD1is a slim 26-pin connector and will support up to 2.88MB FDD.
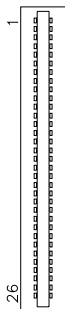
Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	INDEX
VCC	3	4	DRV_SEL
VCC	5	6	DSK_CH
NC	7	8	NC
NC	9	10	MOTOR
DINST	11	12	DIR
NC	13	14	STEP
GND	15	16	WDATA
GND	17	18	WGATE
GND	19	20	TRACK
NC	21	22	WPROT
GND	23	24	RDATA
GND	25	26	SIDE

IDE1, IDE2: Secondary and Primary IDE Connectors
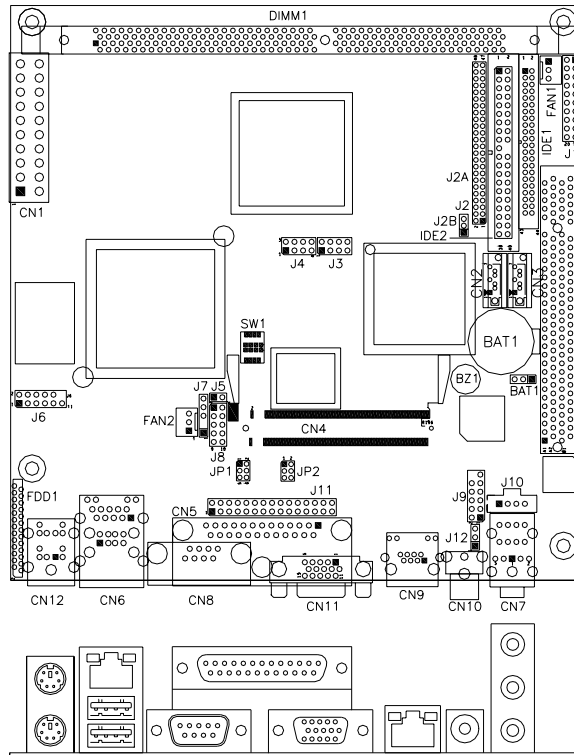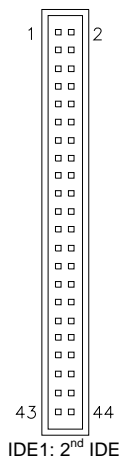
Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground
Vcc	41	42	Vcc
Ground	43	44	N.C.

IDE1: 2nd IDE

IDE2: Primary IDE Connector
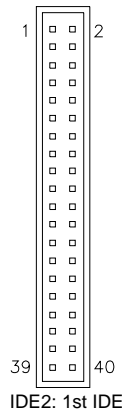
Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Protect pin
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

1 ☐ 2
39 ☐ 40
IDE2: 1st IDE

FAN1: System Fan Power Connector

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

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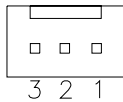
Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

FAN2: CPU Fan Power Connector

FAN2 is a 3-pin header for the CPU fan. The fan must be a 12V fan.

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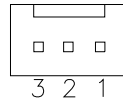
Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

CN1: ATX Power Supply Connector
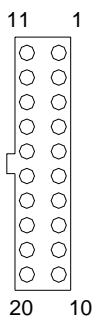
Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

CN2, CN3: Serial ATA (SATA) Connectors
The SATA connectors support serial ATA 150. Each connector can only use one serial ATA hard disk. CN2 is port 1 and CN3 is port 2. *These connectors are located beside the PCI slot.*

CN4: Mini PCI Connector

CN5: Parallel Port Connector
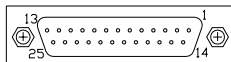
Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A
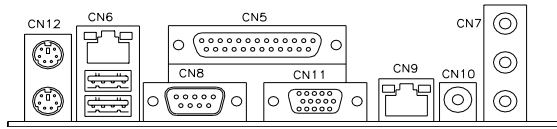
CN6: RJ45 and 2 USB Ports

CN6 is a stacked connector with RJ45 on top and 2 USB ports at the bottom.

CN7: Line Out, Line In, Mic Connector

◎ Line in
◎ Line out
◎ Microphone
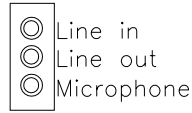
CN8: COM1 Serial Port

CN8 (COM1) is a DB-9 connector serial port.
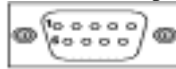
Signal Name	Pin #	Pin #	Signal Name
DCD, Data carrier detect	1	6	DSR, Data set ready
RXD, Receive data	2	7	RTS, Request to send
TXD, Transmit data	3	8	CTS, Clear to send
DTR, Data terminal ready	4	9	RI, Ring indicator
GND, ground	5	10	Not Used

CN9: RJ45 Connector for LAN1 (10/100)

TD+(Pin#1)
TD-(Pin#2)
RD+(Pin#3)

RD-(Pin#6)
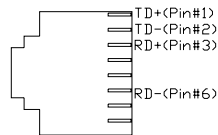
CN10, J12: TV out Connector (RCA Jack/CN10 and 3-pin Header/J12)

Pin #	Signal Name
1	Y
2	Ground
3	C

CN11: VGA CRT connector
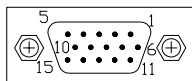
Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	N.C.
HSYNC	13	14	VSYNC
NC	15		

CN12: PS/2 Keyboard and Mouse Connectors
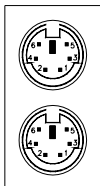
PS/2 Mouse

PS/2 Keyboard

Signal Name	Keyboard	Mouse	Signal Name
Keyboard data	1	1	Mouse data
N.C.	2	2	N.C.
GND	3	3	GND
5V	4	4	5V
Keyboard clock	5	5	Mouse clock
N.C.	6	6	N.C.

J1: System Function Connector

Hard Disk Drive LED
Not Defined
SMI / Hardware Switch
Speaker

Reset Switch
ATX Power On Switch
Power LED
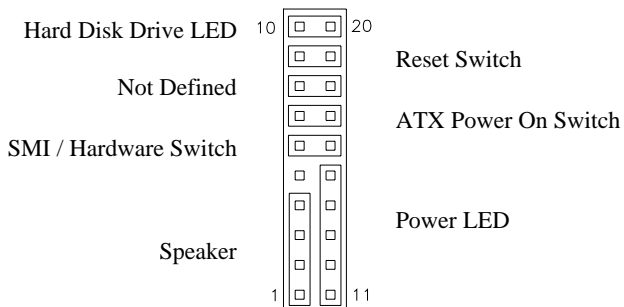
Speaker: Pins 1 - 4
This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.
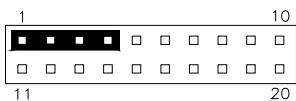
Pin #	Signal Name
1	Speaker out
2	No connect
3	Ground
4	+5V

Power LED: Pins 11 - 15
The power LED indicates the status of the main power switch.
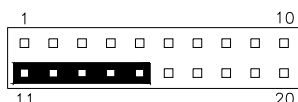
Pin #	Signal Name
11	Power LED
12	No connect
13	Ground
14	No connect
15	Ground

SMI/Hardware Switch: Pins 6 and 16
This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system into the power-saving mode immediately.
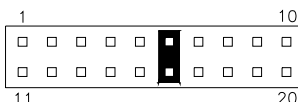
Pin #	Signal Name
6	SMI
16	Ground

ATX Power ON Switch: Pins 7 and 17
This 2-pin connector is an "ATX Power Supply On/Off Switch" on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.
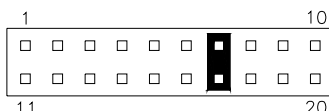
Reset Switch: Pins 9 and 19
The reset switch allows the user to reset the system without
turning the main power switch off and then on again.

Hard Disk Drive LED Connector: Pins 10 and 20
This connector connects to the hard drive activity LED on
control panel. This LED will flash when the HDD is being
accessed.
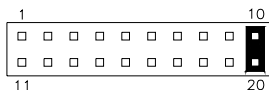
Pin #	Signal Name
10	HDD Active
20	5V

J2A, J2B: Flat Panel Interface Connectors

The MB720 embedded board supports 18/24 bits dual channel LVDS
Panel through the daughter card ID380.

J2A is used with the ID380 daughter card to connect to the LCD Panel.
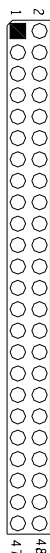
Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	+12V
Ground	3	4	Ground
+LCD	5	6	+LCD
ENPVEE	7	8	Ground
FPD0	9	10	FPD1
FPD2	11	12	FPD3
FPD4	13	14	FPD5
FPD6	15	16	FPD7
FPD8	17	18	FPD9
FPD10	19	20	FPD11
FPD12	21	22	FPD13
FPD14	23	24	FPD15
FPD16	25	26	FPD17
FPD18	27	28	FPD19
FPD20	29	30	FPD21
FPD22	31	32	FPD23
Ground	33	34	Ground
FP CLK	35	36	FP VS
FP DE	37	38	FP HS
Ground	39	40	FP BKLP
FP CLKN	41	42	+1.5V
ENVDD	43	44	+LCD
SB CLK	45	46	SB DATA
+2.5V	47	48	+2.5V

J2B is used with the ID380 daughter card to select the level +5V or +3.3V for LCD Panel Power +LCD.

Pin #	Signal Name
1	+3.3V
2	+LCD
3	+5V

J3, J4: USB Connector (USB3/USB4, USB5/USB6)
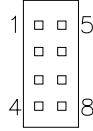
Signal Name	Pin	Pin	Signal Name
Vcc	1	5	Ground
USB0-	2	6	USB1+
USB0+	3	7	USB1-
Ground	4	8	Vcc

J6: 1394 Connector
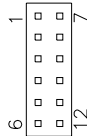
Signal Name	Pin #	Pin #	Signal Name
Port0 TPA+	1	7	Port1 TPA+
Port0 TPA-	2	8	Port1 TPA-
Port0 TPB+	3	9	Port1 TPB+
Port0 TPB-	4	10	Port1 TPB-
1394 VDD	5	11	1394 VDD
Ground	6	12	Protect Pin

J7: IrDA Connector
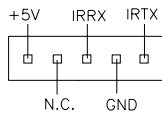
Pin #	Signal Name
1	+5V
2	No connect
3	Ir RX
4	Ground
5	Ir TX

J8: Digital 4-in 4-out I/O Connector
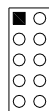
Signal Name	Pin	Pin	Signal Name
Ground	1	2	Vcc
Out3	3	4	Out1
Out2	5	6	Out0
IN3	7	8	IN1
IN2	9	10	IN0

J9: External Audio Connector
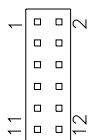
Signal Name	Pin #	Pin #	Signal Name
LINEOUT_R	1	2	LINEOUT_L
Ground	3	4	Ground
LINEIN_R	5	6	LINEIN L
Ground	7	8	Ground
Mic-In	9	10	VREFOUT
Ground	11	12	Protect pin

J10: CD-In Audio Connector
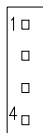
Pin #	Signal Name
1	CD Audio R
2	Ground
3	Ground
4	CD Audio L

J11: Serial Ports
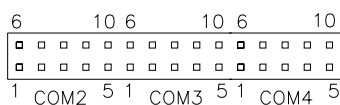
Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	Ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	No Connect.

Watchdog Timer Configuration

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

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

```
Filename   Main.cpp
//=====================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//=====================================================================
#include <stdio.h>
#include <stdlib.h>
#include "W697HF.H"
//=====================================================================
int main (int argc, char *argv[]);
void copyright(void);
void EnableWDT(int);
void DisableWDT(void);
//=====================================================================
int main (int argc, char *argv[])
{
        unsigned char bBuf;
        unsigned char bTime;
        char **endptr;

        copyright();

        if (argc != 2)
        {
                printf(" Parameter incorrect!!\n");
                return 1;
        }

        if (Init_W697HF() == 0)
        {
                printf(" Winbond 83697HF is not detected, program abort.\n");
                return 1;
        }
        bTime = strtol (argv[1], endptr, 10);
        printf("System will reset after %d seconds\n", bTime);

        EnableWDT(bTime);

        return 0;
}
//=====================================================================
void copyright(void)
{
        printf("\n======= Winbond 697HF Watch Timer Tester (AUTO DETECT) =======\n"\
               "        Usage : W697WD reset_time\n"\
               "        Ex : W697WD 3  => reset system after 3 second\n"\
               "             W697WD 0  => disable watch dog timer\n");
}
//=====================================================================
void EnableWDT(int interval)
```

```
{
        unsigned char bBuf;

        bBuf = Get_W697HF_Reg(0x29);
        bBuf &= (~0x60);
        bBuf |= 0x20;
        Set_W697HF_Reg(0x29, bBuf);                    //enable WDTO

        Set_W697HF_LD(0x08);                           //switch to logic device 8

        bBuf = Get_W697HF_Reg(0xF3);
        bBuf &= (~0x04);
        Set_W697HF_Reg( 0xF3, bBuf);                   //count mode is second

        Set_W697HF_Reg( 0xF4, interval);               //set timer
        Set_W697HF_Reg( 0x30, 0x01);                   //enable timer
}
//=================================================================
void DisableWDT(void)
{
        Set_W697HF_LD(0x08);                           //switch to logic device 8
        Set_W697HF_Reg(0x30, 0x00);                    //watchdog disabled
        Set_W697HF_Reg(0xF4, 0x00);                    //clear watchdog timer
}
//=================================================================


Filename    W697hf.cpp
//======================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//======================================================================
#include "W697HF.H"
#include <dos.h>
//======================================================================
unsigned int W697HF_BASE;
void Unlock_W697HF (void);
void Lock_W697HF (void);
//======================================================================
unsigned int Init_W697HF(void)
{
        unsigned int result;
        unsigned char ucDid;

        W697HF_BASE = 0x2E;
        result = W697HF_BASE;

        ucDid = Get_W697HF_Reg(0x20);
        if ( ucDid == 0x60)
        {        goto Init_Finish;        }

        W697HF_BASE = 0x4E;
        result = W697HF_BASE;

        ucDid = Get_W697HF_Reg(0x20);
        if ( ucDid == 0x60)
        {        goto Init_Finish;        }

        W697HF_BASE = 0x00;
        result = W697HF_BASE;

Init_Finish:
        return (result);
}
//======================================================================
void Unlock_W697HF (void)
{
        outportb(W697HF_INDEX_PORT, W697HF_UNLOCK);
        outportb(W697HF_INDEX_PORT, W697HF_UNLOCK);
}
//======================================================================
```

```
void Lock_W697HF (void)
{
        outportb(W697HF_INDEX_PORT, W697HF_LOCK);
}
//===========================================================================
void Set_W697HF_LD( unsigned char LD)
{
        Unlock_W697HF();
        outportb(W697HF_INDEX_PORT, W697HF_REG_LD);
        outportb(W697HF_DATA_PORT, LD);
        Lock_W697HF();
}
//===========================================================================
void Set_W697HF_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_W697HF();
        outportb(W697HF_INDEX_PORT, REG);
        outportb(W697HF_DATA_PORT, DATA);
        Lock_W697HF();
}
//===========================================================================
unsigned char Get_W697HF_Reg(unsigned char REG)
{
        unsigned char Result;
        Unlock_W697HF();
        outportb(W697HF_INDEX_PORT, REG);
        Result = inportb(W697HF_DATA_PORT);
        Lock_W697HF();
        return Result;
}
//===========================================================================

Filename   W697hf.h
//===========================================================================
//
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// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//===========================================================================
#ifndef __W697HF_H
#define __W697HF_H                      1
//===========================================================================
#define      W697HF_INDEX_PORT          (W697HF_BASE)
#define      W697HF_DATA_PORT           (W697HF_BASE+1)
//===========================================================================
#define      W697HF_REG_LD              0x07
//===========================================================================
#define W697HF_UNLOCK          0x87
#define      W697HF_LOCK                    0xAA
//===========================================================================
unsigned int Init_W697HF(void);
void Set_W697HF_LD( unsigned char);
void Set_W697HF_Reg( unsigned char, unsigned char);
unsigned char Get_W697HF_Reg( unsigned char);
//===========================================================================
#endif //__W697HF_H
```

Digital I/O Sample Code

Filename   Main.cpp

```cpp
//-------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-------------------------------------------------------------------------
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "W697HF.H"
//-------------------------------------------------------------------------
void ClrKbBuf(void);
int main (int argc, char *argv[]);
void SetDioInupt(unsigned char);
unsigned char GetDioOutpt(void);


//-------------------------------------------------------------------------
int main (int argc, char *argv[])
{
        if (Init_W697HF() == 0)
        {
                printf("Can not detect Winbond 83697HF, program abort.\n");
                return(1);
        }

        printf("Current DIO input is 0x%X\n|, GetDioOutpt());

        printf("Set DIO output to high\n");
        SetDioInupt(0x0F);

        printf("Set DIO output to low\n");
        SetDioInupt(0x00);

        return 0;
}
//-------------------------------------------------------------------------
void SetDioInupt(unsigned char data)
{
        Set_W697HF_LD( 0x07);                              //switch to logic device 7
        Set_W697HF_Reg(0xF1, ((data & 0x0F) << 4));
}
//-------------------------------------------------------------------------
unsigned char GetDioOutpt(void)
{
        unsigned char result;

        Set_W697HF_LD( 0x07);                              //switch to logic device 7
        result = Get_W697HF_Reg(0xF1, (data & 0x0F));
        return (result);
}
//-------------------------------------------------------------------------
void ClrKbBuf(void)
{
        while(kbhit())
        {       getch();        }
}
//-------------------------------------------------------------------------
```

Filename   W697hf.cpp

```
//==============================================================================
//
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// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//==============================================================================
#include "W697HF.H"
#include <dos.h>
//==============================================================================
unsigned int W697HF_BASE;
void Unlock_W697HF (void);
void Lock_W697HF (void);
//==============================================================================
unsigned int Init_W697HF(void)
{
        unsigned int result;

        W697HF_BASE = 0x2E;
        result = W697HF_BASE;
        if (Get_W697HF_Reg(0x20) == 0x60)
        {       goto Init_Finish;       }

        W697HF_BASE = 0x4E;
        result = W697HF_BASE;
        if (Get_W697HF_Reg(0x20) == 0x60)
        {       goto Init_Finish;       }

        W697HF_BASE = 0x00;
        result = W697HF_BASE;

Init_Finish:
        return (result);
}
//==============================================================================
void Unlock_W697HF (void)
{
        outportb(W697HF_INDEX_PORT, W697HF_UNLOCK);
        outportb(W697HF_INDEX_PORT, W697HF_UNLOCK);
}
//==============================================================================
void Lock_W697HF (void)
{
        outportb(W697HF_INDEX_PORT, W697HF_LOCK);
}
//==============================================================================
void Set_W697HF_LD( unsigned char LD)
{
        Unlock_W697HF();
        outportb(W697HF_INDEX_PORT, W697HF_REG_LD);
        outportb(W697HF_DATA_PORT, LD);
        Lock_W697HF();
}
//==============================================================================
void Set_W697HF_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_W697HF();
        outportb(W697HF_INDEX_PORT, REG);
        outportb(W697HF_DATA_PORT, DATA);
        Lock_W697HF();
}
//==============================================================================
unsigned char Get_W697HF_Reg(unsigned char REG)
```

```
{
        unsigned char Result;
        Unlock_W697HF();
        outportb(W697HF_INDEX_PORT, REG);
        Result = inportb(W697HF_DATA_PORT);
        Lock_W697HF();
        return Result;
}
//=========================================================================
Filename    W697hf.h
//=========================================================================
//
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// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//=========================================================================
#ifndef __W697HF_H
#define __W697HF_H                      1
//=========================================================================
#define       W697HF_INDEX_PORT         (W697HF_BASE)
#define       W697HF_DATA_PORT          (W697HF_BASE+1)
//=========================================================================
#define       W697HF_REG_LD             0x07
//=========================================================================
#define W697HF_UNLOCK           0x87
#define       W697HF_LOCK                     0xAA
//=========================================================================
unsigned int Init_W697HF(void);
void Set_W697HF_LD( unsigned char);
void Set_W697HF_Reg( unsigned char, unsigned char);
unsigned char Get_W697HF_Reg( unsigned char);
//=========================================================================
#endif //__W697HF_H
```

BIOS Setup

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

BIOS Introduction

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

BIOS Setup

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

```
Press <DEL> to Enter Setup
```

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

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

Phoenix - Award WorkstationBIOS CMOS Setup Utility

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

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

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

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

Standard CMOS Setup

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

Phoenix - Award WorkstationBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Wed, Feb 18 2004	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level
IDE Primary Master		Change the day, month,
IDE Primary Slave		Year and century
IDE Secondary Master	None	
IDE Secondary Slave		
Drive A	None	
Video	EGA/VGA	
Halt On	All, but keyboard	
Base Memory	640K	
Extended Memory	129024K	
Total Memory	130048K	

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

Date
The date format is:

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

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

Time

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

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

IDE Primary HDDs / IDE Secondary HDDs

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

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

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

The Access Mode selections are as follows:
                        Auto
                        Normal (HD < 528MB)
                        Large   (for MS-DOS only)
                        LBA   (HD > 528MB and supports
                                 Logical Block Addressing)

Drive A

These fields identify the types of floppy disk drive that has been installed
in the computer. The available specifications are:
         360KB   1.2MB   720KB   1.44MB   2.88MB
         5.25 in. 5.25 in. 3.5 in.   3.5 in.   3.5 in.

Video

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

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

Halt On

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

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

Advanced BIOS Features

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

Phoenix - Award WorkstationBIOS CMOS Setup Utility
Advanced BIOS Features

Hard Disk Booty Priority	Press Enter	ITEM HELP
Virus Warning	Disabled	Menu Level
CPU Internal Cache	Enabled	
CPU External Cache	Enabled	
CPU L2 Cache ECC Checking	Enabled	
Quick Power On Self Test	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	CDROM	
Second Boot Device	Hard Disk	
Third Boot Device	LS120	
Boot Other Device	Enabled	
Boot Up Floppy Seek	Disabled	
Boot Up Numlock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
APIC Mode	Enabled	
MPS Version Control for OS	1.4	
OS Select For DRAM>64MB	Non-OS2	
HDD S.M.A.R.T. Capabitility	Disabled	

Hard Disk Booty Priority

This item allows you to arrange the priority of the devices where the system boots from.

Virus Warning

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

CPU Internal /External Cache

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

CPU L2 Cache ECC Checking
When enabled, it allows ECC checking of the CPU L2 cache. Enabling this feature is recommended because it will detect and correct single-bit errors in data stored in the L2 cache. It will also detect double-bit errors but not correct them.

Processor Number Feature
This feature enables the reading of the CPU's serial number read by external programs. Enable this if your secure transactions require you to use such a feature.

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

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

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

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

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

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

Typematic Rate Setting

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

Typematic Rate (Chars/Sec)

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

Typematic Delay (Msec)

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

Security Option

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

MPS Version Control for OS

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

OS Select for DRAM > 64MB

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

Video BIOS Shadow

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

Small Logo (EPA) Show

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

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

		ITEM HELP
DRAM Clock / Drive Control	Press Enter	
AGP & P2P Bridge Control	Press Enter	Menu Level
CPU & PCI Bus Control	Press Enter	
Memory Hole	Disabled	
System BIOS Cacheable	Enabled	
Video RAM Cacheable	Disabled	
Init Display First	PCI Slot	

Phoenix - AwardBIOS CMOS Setup Utility
DRAM Clock/Driver Control

		ITEM HELP
Current FSB Frequency		
Current DRAM Frequency		Menu Level
DRAM Clock	By SPD	
DRAM Timing	Auto By SPD	
DRAM CAS Latency	2.5	
Bank Interleave	Disabled	
Precharge to Active (Trp)	4T	
Active to Precharge (Tras)	9T	
Active to CMD(Trcd)	3T	
REF to ACT/REF to REF(Trfc	3T	
ACT(0) to ACT(1) TRRD)	3T	
DRAM Command Rate	2T Command	

Phoenix - AwardBIOS CMOS Setup Utility
AGP & P2P Bridge Control

		ITEM HELP
AGP Aperture Size	128M	
AGP Mode	8X	
AGP Driving Control	Auto	Menu Level
AGP Driving Value	DA	
AGP Fast Write	Enabled	
AGP Master 1 WS Write	Disabled	
AGP Master 1 WS Read	Disabled	
AGP 3.0 Calibration cycle	Disabled	
VGA Share Memory Size	64M	
Direct Frame Buffer	Enabled	
Select Display Device	CRT	
Panel Type	02	
TV H/W Layout	Default	
HDTV Type	HDTV 720P	
TV Encoder Input Mode	RGB Input	
TV Type	NTSC	
TV Output AUTO Detect	Disabled	
TV Output Connector	Press Enter	
Anti-DotCrawl	Disabled	

Phoenix - AwardBIOS CMOS Setup Utility
CPU & PCI Bus Control

		ITEM HELP
PCI Master 0 WS Write	Enabled	
PCI Delay Transaction	Enabled	Menu Level
Vlink mode selection	Mode 1	Menu Level
Vlink 8x Support	Enabled	

DRAM Clock / Drive Control

This field provides settings related to DRAM. The fields are listed below.

Current FSB Frequency

The default setting of the FSB Frequency is 100MHz.

Current DRAM Frequency

The default setting of the DRAM Frequency is 133MHz.

DRAM Clock

The default setting of the DRAM clock is SPD.

DRAM Timing

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

DRAM CAS Latency

This is the period between when the chipset requests data from memory and when the memory is ready to send the data across the bus.

Bank Interleave

This decides how multiple memory modules communicate. It will only make a difference if you have more than one memory module.

Precharge to Active(Trp)

Theamount of time from a bank precharge request to when it can be activated.

Active to Precharge(Tras)

The Active to Precharge timing controls the length of the delay between the activation and precharge commands – the length of time after activation can the access cycle be started again.

Active to CMD(Trcd)

This is the time between a row access request and a column access request.

REF to ACT/REF to REF(Trfc)

The default setting is 15T.

ACT(0) to ACT(1) (TRRD)

The default time setting is 3T..

DRAM Command Rate

The time to wait after a chip select before activate and read can be started.

AGP & P2P Bridge Control

The fields related to AGP & P2P Bridge Control are listed below.

AGP Aperture Size

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

AGP3.0 Mode

The default setting is 8X.

AGP Driving Value

This decides how multiple memory modules communicate. It will only make a difference if you have more than one memory module.

AGP Fast Write
> This accelerates memory write transactions from the chipset to the AGP device.

AGP Master 1 WS Write
> When enabled, this changes the default from a 2ws to a 1ws which will increase AGP Writing.

AGP Master 1 WS Read
> By default, the AGP busmastering device waits for at least 2 wait states before it starts a write transaction. When enable, this option sets the delay to 1 wait state.

AGP 3.0 Calibration cycle
> By default, this field is disabled.

VGA Share memory Size
> By default, this field is set to 64M.

Direct Frame Buffer
> By default, this field is Enabled.

Select Display Device
> By default, this field is set to CRT.

Panel Type
> By default, this field is set to 02.

TV H/W Layout
> By default, this field is set to Default.

HDTV Type
> By default, this field is set to HDTV 720P.

TV Encoder Input
> By default, this field is set to RGB Input.

TV Type
> By default, this field is set to NTSC.

TV Output AUTO Detect
> By default, this field is set to Disabled.

TV Output Connector
> The field allows you to choose the TV output connector to be used.

Anti-Dot Crawl
> By default, this field is set to Disabled.

CPU & PCI Bus Control

The fields related to CPU & PCI Bus Control are listed below.

PCI Master 0 WS Write
> This determines whether the chipset inserts a delay before any writes from the PCI bus.

PCI Delay Transaction
> This is used to meet the latency of PCI cycles to and from the ISA bus.

Vlink mode selection
> The default is set to Mode 1.

Vlink 8X Support
> By default, this field is enabled.

Integrated Peripherals

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

VIA OnChip IDE Device	Press Enter	ITEM HELP
VIA OnChip PCI Device	Press Enter	Menu Level
SuperIO Device	Press Enter	
2nd SuperIO Device	Press Enter	

VIA OnChip IDE Device

Upon pressing Enter on this field, another window appears. Below are the fields shown with their respective default settings:

OnChip SATA – Enabled
SATA Mode – RAID
OnChip IDE Channel0 – Enabled
OnChip IDE Channel1 – Enabled
IDE Prefetch Mode – Enabled
Primary Master PIO – Auto
Primary Slave PIO – Auto
Secondary Master PIO – Auto
Secondary Slave PIO – Auto
Primary Master UDMA – Auto
Primary Slave UDMA – Auto
Secondary Master UDMA – Auto
Secondary Slave UDMA – Auto
IDE HDD Block Mode – Enabled

VIA OnChip PCI Device

Upon pressing Enter on this field, another window appears. Below are the fields shown with their respective default settings:

VIA-3058 AC97 Audio – Auto
VIA-3043 OnChip LAN – Enabled
Onboard Lan Boot ROM – Disabled
OnChip USB Controller – All Enabled
OnChip EHCI Controller – Enabled
USB Device Function – Disabled
USB Emulation – OFF
USB Keyboard Support – Disabled

SuperIO Device

Upon pressing Enter on this field, another window appears. Below are the fields shown with their respective default settings:

  Onboard FDC Controller – Disabled
  Onboard Serial Port 1 – 3F8/IRQ4
  Onboard Serial Port 2 – 2F8/IRQ3
  UART Mode Select – Normal
  Onboard Parallel port – 278/IRQ5
  Parallel Port Mode – SPP

2nd PCI Device

Upon pressing Enter on this field, another window appears. Below are the fields shown with their respective default settings:

  Onboard Serial Port 3 – 3E8h
  Serial Port 3 Use IRQ – IRQ11
  Onboard Serial Port 4 – Disabled
  Serial Port 4 Use IRQ – IRQ11

REMARKS: Please note that the onboard FDC controller and serial port 4, by default, are both DISABLED.

Power Management Setup

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

Phoenix - Award WorkstationBIOS CMOS Setup Utility
Power Management Setup

		ITEM HELP
ACPI Function	Enabled	
Power Management Option	User Define	Menu Level
HDD Power Down	Disabled	
Suspend Mode	Disable	
Video Off Option	Suspend -> Off	
Video Off Method	V/H SYNC+Blank	
Modem Use IRQ	3	
Soft-Off by PWR-BTTN	Instant-Off	
Ac Loss Auto Restart	Off	
IRQ/Event Activity Detect	Press Enter	

Phoenix - AwardBIOS CMOS Setup Utility
IRQs Activity Monitoring

		ITEM HELP
Primary INTR	ON	
IRQ3 (COM2)	Enabled	Menu Level
IRQ4 (COM1)	Enabled	
IRQ5 (LPT 2)	Enabled	
IRQ6 (Floppy Disk)	Enabled	
IRQ7 (LPT 1)	Enabled	
IRQ8 (RTC Alarm)	Disabled	
IRQ9 (IRQ2 Redir)	Disabled	
IRQ10 (Rserved)	Disabled	
IRQ11 (Reserved)	Disabled	
IRQ12 (PS/2 Mouse)	Enabled	
IRQ13 (Coprocessor)	Enabled	
IRQ14 (Hard Disk)	Enabled	
IRQ15 (Reserved)	Disabled	

ACPI Function

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

Power Management Option

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

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

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

Suspend Mode
BIOS will turn the HDD's motor off when system is in SUSPEND mode. By default, this field is disabled.

Video Off Option
This field sets the video off option. By default, video goes into suspend state and then Off.

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

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

Modem Use IRQ
The default setting of this field is 3.

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

AC Loss Auto Restart
This field sets the auto restarting function of the system when there is AC power loss.

IRQ/Event Activity Detect

The items under this field are I/O events that can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

Phoenix - AwardBIOS CMOS Setup Utility
IRQ/Event Activity Detect

		ITEM HELP
PS2KB Wakeup Select	Hot key	
PS2KB Wakeup from S3/S4/S5	Disabled	Menu Level
PS2MS Wakeup from S3/S4/S5	Disabled	
USB Resume from S3	Disabled	
VGA	OFF	
LPT & COM	LPT / COM	
HDD & FDD	ON	
PCI Master	OFF	
PowerOn by PCI Card	Disabled	
Modem Ring Resume	Disabled	
RTC Alarm Resume	Disabled	
IRQs Activity Monitoring	**Press Enter**	

IRQ Activity Monitoring

When you press Enter on this field, the following window appears.

Phoenix - AwardBIOS CMOS Setup Utility
IRQs Activity Monitoring

		ITEM HELP
Primary INTR	ON	
IRQ3 (COM2)	Enabled	Menu Level
IRQ4 (COM1)	Enabled	
IRQ5 (LPT 2)	Enabled	
IRQ6 (Floppy Disk)	Enabled	
IRQ7 (LPT 1)	Enabled	
IRQ8 (RTC Alarm)	Disabled	
IRQ9 (IRQ2 Redir)	Disabled	
IRQ10 (Rserved)	Disabled	
IRQ11 (Reserved)	Disabled	
IRQ12 (PS/2 Mouse)	Enabled	
IRQ13 (Coprocessor)	Enabled	
IRQ14 (Hard Disk)	Enabled	
IRQ15 (Reserved)	Disabled	

PNP/PCI Configurations

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

Phoenix - Award WorkstationBIOS CMOS Setup Utility
PnP/PCI Configurations

Reset Configuration Data	Disabled	ITEM HELP
		Menu Level
Resources Controlled By	Auto (ESCD)	
IRQ Resources	Press Enter	Default is Disabled. Select Enabled to reset Extended System
PCI/VGA Palette Snoop	Disabled	Configuration Data
Assign IRQ for VGA	Enabled	(ESCD) when you exit Setup if you have
Assign IRQ for USB	Enabled	installed a new add-on
PCI Latency Time(CLK)	64	and the system reconfiguration has caused such a serious conflict that the OS cannot boot

Reset Configuration Data

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

Resources Controlled by

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

PCI/VGA Palette Snoop

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

Assign IRQ for VGA

This field enables the assigning of an IRQ for VGA.

Assign IRQ for USB

This field enables the assigning of an IRQ for USB.

PCI Latency Timer

This field sets the PCI latency clock. By default, the setting is *64*.

PC Health Status

Phoenix - Award WorkstationBIOS CMOS Setup Utility
PC Health Status

PC Health Status		ITEM HELP
Thermal Duty Cycle	Disabled	
CPU Warning Temperature	Disabled	
Current System Temp.	39°C/102°F	
Current CPU Temp.	32°C/89°F	
Current CPU FAN Speed	0 RPM	
Current Chassis FAN Speed	0 RPM	
Vcore (V)	1.63V	
Vcc3(V)	3.37V	
+5V	5.05V	
+12V	12.09V	
-12V	-12.03V	
-5V	- 4.79V	
VBAT(V)	3.21V	
5VSB(V)	5.05V	
Shutdown Temperature	Disabled	
CPU Fan Failure Warning	Disabled	
Cha Fan Failure Warning	Disabled	

Thermal Duty Cycle
By default, this field is disabled.

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

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

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

Fan Failure Warning
The fan failure warning feature applies to the CPU and chassis. When enabled, it can give a warning to protect the CPU and system from damage due to overheating.

Frequency/Voltage Control

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

Phoenix - Award WorkstationBIOS CMOS Setup Utility
Frequency/Voltage Control

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

VIA C3 Clock Ratio

This field will function only if the motherboard supports clock ratio to be adjusted.

Auto Detect PCI/DIMM Clk

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

Spread Spectrum

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

Load Fail-Safe Defaults

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

Load Optimized Defaults

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

Set Supervisor/User Password

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

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

Save & Exit Setup

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

Exit Without Saving

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

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Drivers Installation

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

IMPORTANT NOTE:
Please also install Serial ATA and RAID drivers with the included floppy disks.

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

VIA CN400 4 in 1 Driver Installation

Follow the steps below to install the chipset drivers of the VIA CN400/CN333 chipset under Windows 98/98SE/ME/2000/XP.

1. Insert the CD that comes with the motherboard and the screen below would appear. Click VIA CN400 Chipset Drivers.
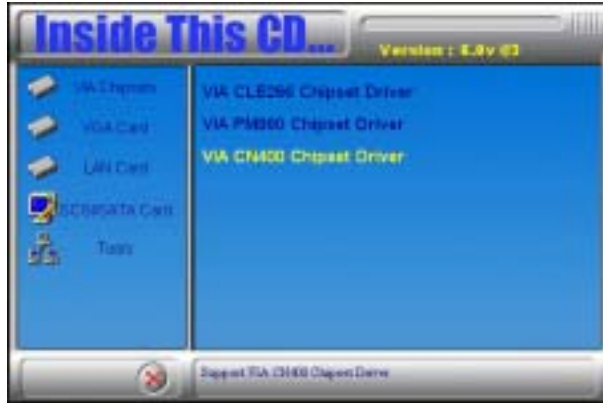
2. Click on VIA 4 IN 1 Drivers.
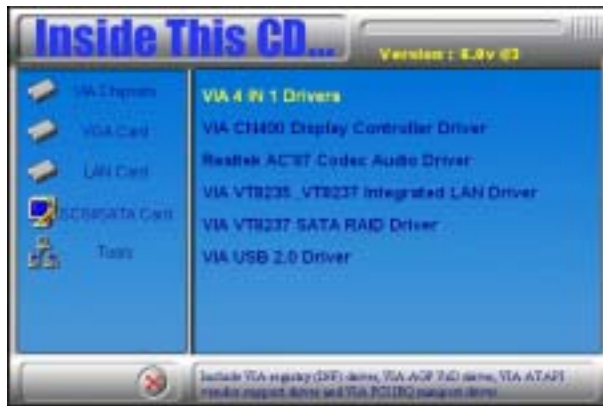
3. Click Next when the welcome screen appears.

4. Click Next when the VIA Service Pack README screen appears.

5. Select Normal Installation and click Next.

6. In the Setup Component window, check all the items and click Next.

7. Click Next to install the VIA PCI IDE Bus Driver.

8. Click Next to install the VIA GART AGP Driver.

9. On the next window, click OK to restart the computer and for changes to take effect.

Realtek AC'97 Codec Audio Driver Installation

Follow the steps below to install the Realtek AC'97 Codec Audio Driver under Windows 98/98SE/ME/2000/XP.

1. Insert the CD that comes with the motherboard and the screen below would appear. Click VIA CN400 Chipset Drivers.

2. Click on Realtek AC'97 Codec Audio Driver to start the installation.
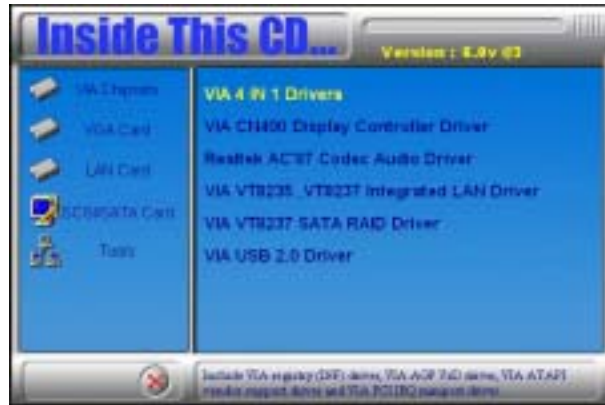
2. To complete the installation process, click Next to restart the computer and for changes to take effect.

VIA VT8237 LAN Driver Installation

Follow the steps below to install the Realtek AC'97 Codec Audio Driver under Windows 98/98SE/ME/2000/XP.

1. Insert the CD that comes with the motherboard and the screen below would appear. Click VIA CN400 Chipset Drivers.

2. Click on VIA VT8235 VT8237 Integrated LAN Driver and the drivers will automatically be installed.
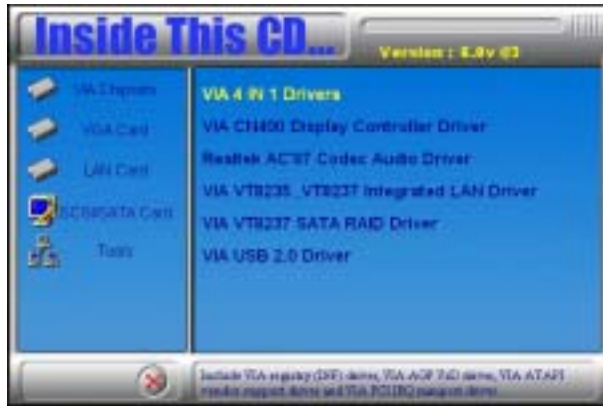
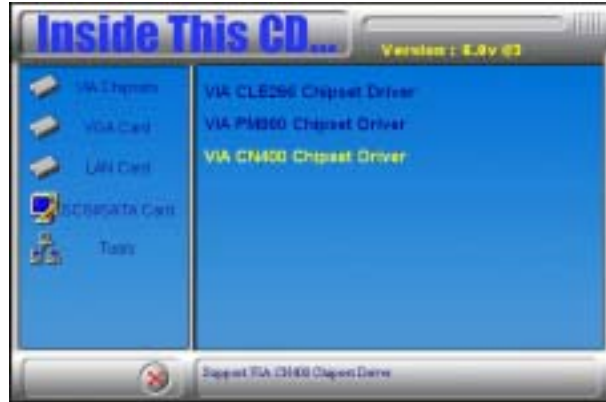# Realtek Gigabit LAN Driver Installation

Follow the steps below to install the Realtek LAN Driver under Windows 98/98SE/ME/2000/XP.

1. Insert the CD that comes with the motherboard and the screen below would appear. Click on LAN Card. On the next screen, click on Realtek Network Interface Controller Drivers to start the installation process.
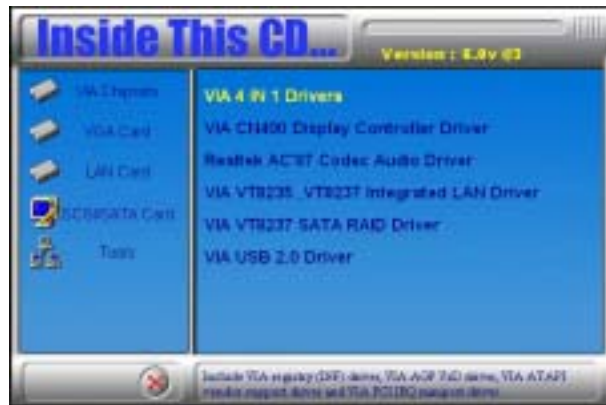
VIA RAID Driver Installation

Follow the steps below to install the VIA RAID Driver under Windows 98/98SE/ME/2000/XP.
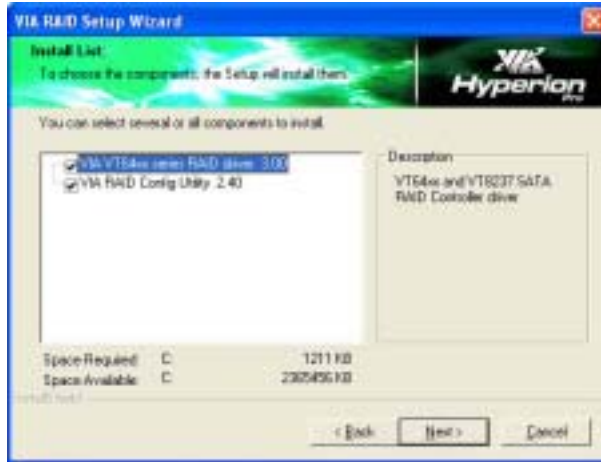
1. Insert the CD that comes with the motherboard and the screen below would appear. Click VIA CN400 Chipset Drivers.

2. Click on VIA VT8237 RAID Driver.

3. When the welcome screen appears, click Next.

4. When the VIA Software License Agreement screen appears, check the "I agree" checkbox and click Next.

5. Select all components and click Next.

5. Select all components and click Next.

6. The following screen shows you the status of the installation. Click Next to continue. When prompted, restart the computer for changes to take effect and complete the installation process.
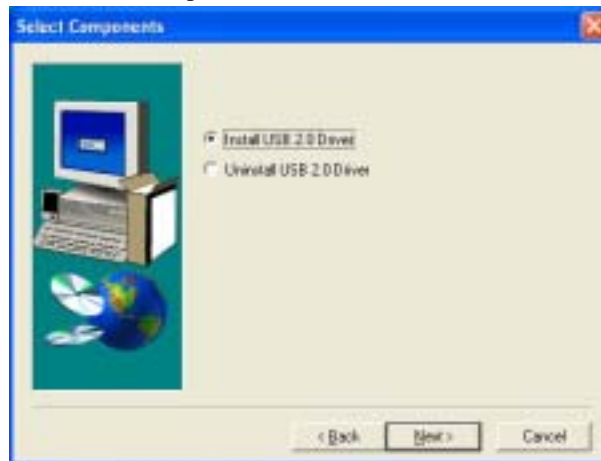
VIA USB 2.0 Driver Installation

Follow the steps below to install the VIA USB 2.0 Driver under Windows 98/98SE/ME/2000/XP.

1. Insert the CD that comes with the motherboard and the screen below would appear. Click VIA CN400 Chipset Drivers.

2. Click on VIA USB 2.0 Driver.
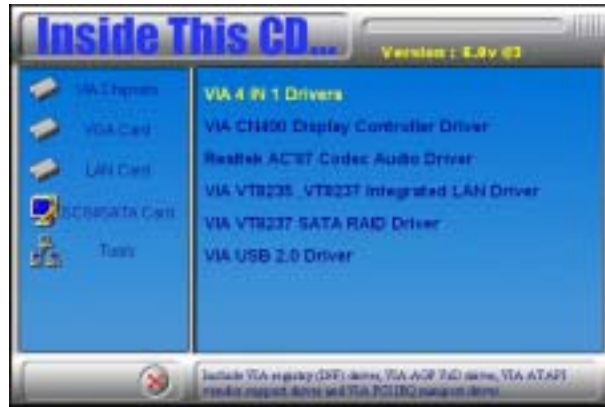
3. When the welcome screen appears, click Next.

4. Click Next to proceed with the installation.

VIA CN400 VGA Driver Installation

Follow the steps below to install the VIA CN400 VGA Driver under Windows 98/98SE/ME/2000/XP.

1. Insert the CD that comes with the motherboard and the screen below would appear. Click VIA CN400 Chipset Drivers.

2. Click on VIA CN400 Display Controller Driver to start the installation.
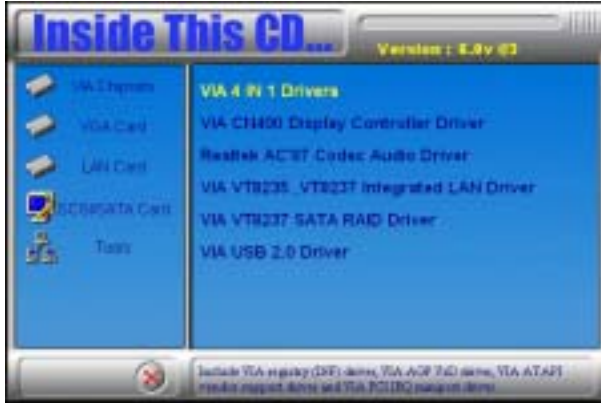
2. Click Finish to complete the installation.

Appendix

A. I/O Port Address Map

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

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

B. Interrupt Request Lines (IRQ)

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

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