FSB-8451VN

High Performance

- Intel 845GV
- 533/400MHz FSB, VGA, LAN, WDT, DOC

Industrial PC Products User's Manual

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CONTENTS

CHAPTER 1 INTRODUCTION

This user's manual is for F8451CPU card, which is designed by expert colony. Please refer to the corresponding contents according to the product you purchased.

This chapter provides you information on the F8451CPU card. It is divided into the following sections:

- **Description**
- **Specifications**
- **F8451Layout**

Description

F8451is the high-performance green Intel Pentium 4 CPU card. The system core logic is based on Intel 82845GV DDR Chipsets. It is integrated with 2D/3D high performance VGA, Dual Intel82559/82559ER Ethernet controller, USB2.0 high speed Protocol, Winbond PCI to ISA Bridge.

Specifications

CPU:

- Support Intel Socket 478 Pentium 4 processor

Chipset:

- Intel 82845GV + ICH4 chipsets
- Winbond LPC I/O W83627HF
- Dual Intel82559/82559ER Ethernet controller (optional)
- Winbond 83628/83629 PCI to ISA bridge
- Supports 533/400MHz FSB (GV: 533/400MHz)

Architecture:

- 2D/3D VGA integrated
- Graphics memory size 64MB (Max.), vary in size as system requirements (Please see Appendix B in detail)

Main Memory:

- Two 184-pin DDR DIMM sockets
- Support DDR200/266 SDRAM up to 2GB

USB 2.0:

- Integrated USB 2.0 controller in ICH4
- Support Hi-speed, Full-speed and Low-speed data transfer-rate. Max. Bandwidth 480Mbits/s

Ethernet (optional):

- Dual Intel 82559ER/82559 10/100 Base-T Ethernet controllers.
- Support full duplex
- Compliant with IEEE802.3, IEEE802.3U
- Two RJ45 connectors
- Without Wake On LAN function

I/O Interface (ICH4):

- Two enhanced PCI IDE channels which support up to 4 IDE devices with ATA-100 transfers up to 100MB/sec
- Two 2X5 pin header USB 2.0 ports

I/O Interface (W83627HF):

- 2 COM ports & 1 Printer port
- 1 FDC supports 1.2M/1.44M/2.88M FDD
- PS/2 mouse and keyboard connectors
- Support CPU & system temperature controller, Fan speed Control.

PCI to ISA Bridge (W83628/83629):

- Use ISA Buffer
- Support 7 ISA slots
- Support DOC2000 (from 16MB to 256MB)

System BIOS:

- Award BIOS with 2MB/4MB Firmware hub
- Built-in Trend™ ChipAway Anti-Virus Program
- ACPI/PnP supported

On Board DOC2000

- On board reserved socket for DOC2000
- To make DOC workable on Win2000/XP/NT operating system, you should install the original driver of DOC before use it.

Watchdog Timer (software)

- 1,2,4…64 seconds time-out intervals
- Operations can be set using BIOS
- Maximum timeout interval: 64 seconds

Other Features

- Supports Internal / External Modem Ring On
- ACPI compatible

Cooling fan (optional):

- Slim size P4 cooling fan (60x60x10mm), with heat sink (83x62x46mm)

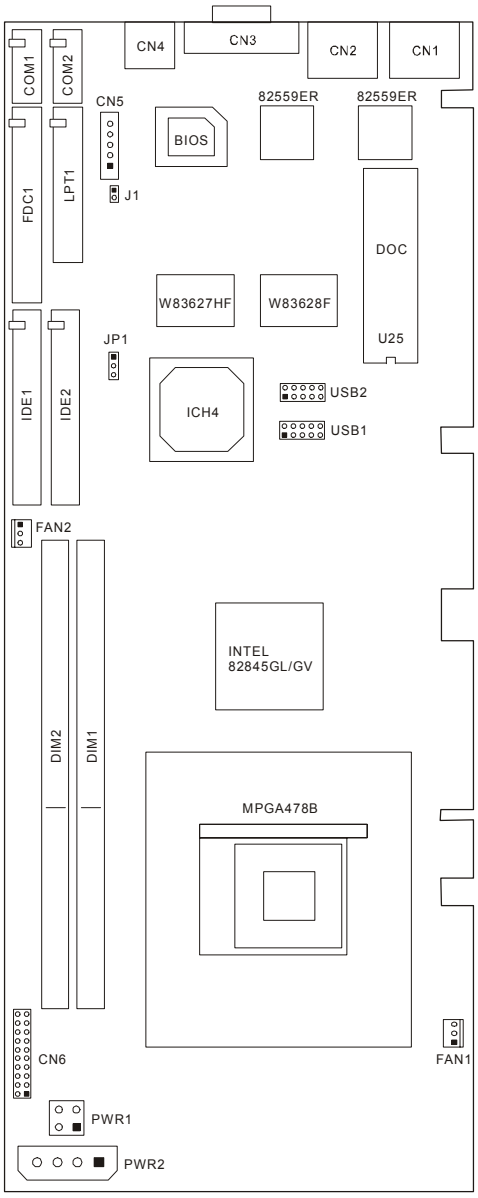
Environment:

- Operating temperature:0 ℃ to 50 ℃
- Storage temperature:-20℃ to 80 ℃
- Relative humidity: 10% to 90% (Non-considering)

Form Factor:

- Full size CPU card, 338 mm × 122 mm, 6 Layers

F8451Layout



■ The square represent Pin 1 of the jumpers/connectors

CHAPTER 2 INSTALLATION

This chapter describes the hardware setup procedures that you have to perform when installing system components.

2.1 CPU Installation

The F8451Industrial CPU Card supports a Socket-478 connector processor socket for MPGA478 Package processors. To install the processor, unlock the mechanism of the socket, push the processor into the socket with right access, and then lock the mechanism of the socket. After doing this, secure the CPU FAN on the socket. This design allows easy installation of the CPU and higher integration for more I/O space. To uninstall the Socket-478 processor, simply push the locking mechanism on the socket and remove the Socket-478 processor. No tool is needed.

2.2 Memory Installation

The F8451Industrial CPU Card comes with Two Double Data Rate (DDR) Dual Inline Memory Module (DIMM) sockets. These sockets support up to 2GB system memory using 184-pin unbuffered non-ECC PC2700/2100/1600 DIMMs.

CAUTION:

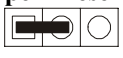
A DDR DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.

2.3 Jumper Settings

The jumpers on the F8451allow you to configure your CPU card according to the needs of your applications. If you have doubts about the best jumper configuration for your needs, contact your dealer or sales representative.

1. Jumper Presentation



Pins 1 and 2 are shorted with a jumper cap.

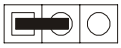
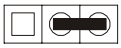
Pins 2 and 3 are shorted with a jumper cap.

The jumper is shorted when the jumper cap is placed over the two pins of the jumper.

The jumper is opened when the jumper cap is removed from jumper.

2. Jumper Settings

JP1 is used to clear the CMOS Data in the RTC.

JP1	Description
	Normal
	Clear CMOS

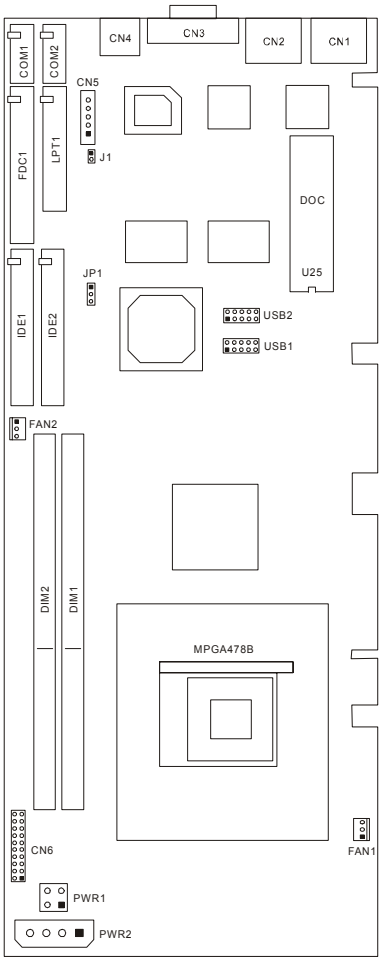
J1 is used to select the power type.

J1	Description
	AT Power
	ATX Power

CHAPTER 3 CONNECTOR CONFIGURATION

The connectors on the F8451are used to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc.

Connector Location



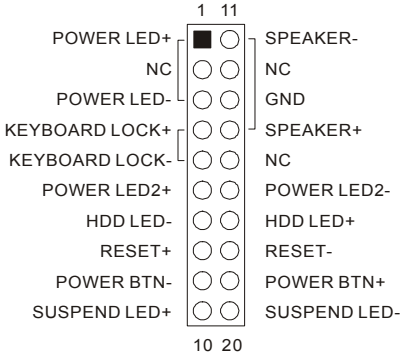
■ The square represent Pin 1 of the jumpers/connectors

The following table lists the connectors on F8451and their respective functions.

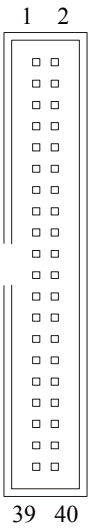
Location	Function
CN1/2	LAN port
CN3	VGA CRT Connector
CN4	Keyboard/Mouse Connector
CN5	ATX Power Control Signal Connector
CN6	System Panel Control Connector
COM1/2	COM Port Connector
FDC1	Floppy Drive Connector
LPT1	Parallel Prot Connector
IDE1/2	IDE Connector
DIM1/2	DIMM Slot
PWR1	ATX 12V Power Supply Connector
PWR2	Power Supply Connector
USB1/2	USB Connector
FAN1/2	CPU fan connector
U25	DOC Socket

3.1 System Panel Connector

CN6 is a 20-pin system panel multi-function connector. The pin assignments are as below:

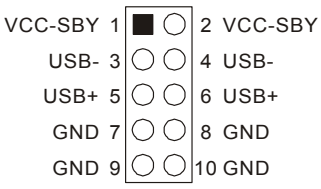


3.2 IDE Connectors – IDE1/IDE2

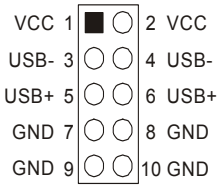


Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	NC
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	NC
Address 1	33	34	NC
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

3.3 USB Connectors



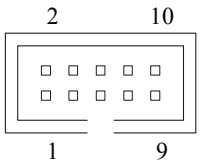
USB1 (5V Standby power)



USB2 (5V power)

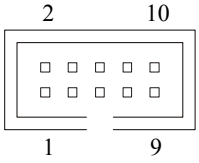
3.4 COM Serial Port

COM1/2 are 10-pin header connectors, which are on board serial ports of the PFM-8450D. The following table shows the pin assignments.



COM1

Pin #	Signal Name	Pin #	Signal Name
1	DCD0	6	CTS0
2	DSR0	7	DTR0
3	RXDD0	8	RI0
4	RTS0	9	GND
5	TXDD0	10	NC



COM2

Pin #	RS232	RS422
1	DCD1	RxD(-)
2	DSR1	NC
3	RXDD1	RxD(+)
4	RTS1	NC
5	TXDD1	TxD(+)
6	CTS1	NC
7	DTR1	TxD(-)
8	RI1	NC
9	GND	GND
10	NC	NC

You can configure the IR mode of COM2 in BIOS. Go to the "UART Mode Select" sub-item in "Integrated Peripherals" item, select "Normal" for RS232 mode, or select "422/485" for RS422/485 mode. Please refer section 4.5 for details.

RS-485 signal wiring

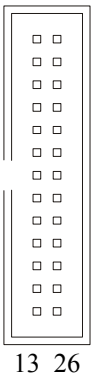
In a typical RS-485 application the host device requests data from a slave module then listens for the response. The host transmits and receives data on the same pair of wires. Software handles the flow control; no other wires are needed.

Pin assignments appear in the following table. Pins 7 and 1 share the Data- wire. Pins 5 and 3 share the Date+ wire.

Computer A (PFM-8450D)			**Device B**	
Pin	Signal		Pin	Signal
7	TX-	Data-	1	TX-
1	RX-		4	RX-
5	TX+	Data+	2	TX+
3	RX+		3	RX+
9	GND		5	GND

3.5 LPT1 - Parallel Port Connector

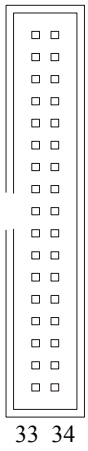
The following table describes the pin assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
P_STB#	1	14	P_AFD#
P_PDR0	2	15	ERR#
P_PDR1	3	16	P_INIT#
P_PDR2	4	17	P_SLIN#
P_PDR3	5	18	GND
P_PDR4	6	19	GND
P_PDR5	7	20	GND
P_PDR6	8	21	GND
P_PDR7	9	22	GND
ACK#	10	23	GND
BUSY	11	24	GND
PE	12	25	GND
SLCT	13	26	NC

3.6 FDC1 - Floppy Drive Connector

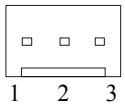
FDC1 is a 34-pin header and will support up to 2.88MB floppy drives.



Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	RM/LC
Ground	3	4	No connect
Ground	5	6	No connect
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

3.7 Fan Power Connector

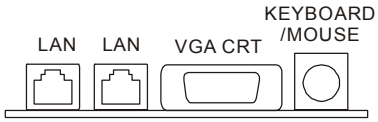
FAN1 and FAN2 are 3-pin headers for the CPU fan.



Pin #	Signal Name
1	GND
2	+12V
3	Rotation

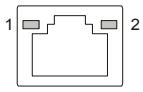
3.8 Rear Panel Connector

The connectors on rear panel include two RJ-45 LAN ports, one VGA CRT port, and the PS/2 mouse/keyboard port.



RJ-45 Connector

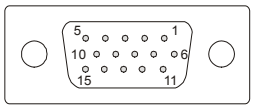
CN1/CN2 are two RJ-45 LAN ports for the 10/100Mbps Ethernet capability of the CPU card.



1: Speed LED		2: Link/ACT LED	
Status	**Function**	**Status**	**Function**
On	100Mbps	On	Link
Off	10Mbps	Blink	Active
		Off	No Link

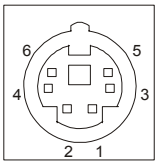
VGA CRT Connector

The pin assignments of VGA CRT connector are as follows:



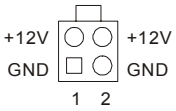
Pin	Signal Name	Pin	Signal Name
1	Red	9	VCC
2	Green	10	GND
3	Blue	11	N.C.
4	VCC.	12	DCCDATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DCCCLK
8	GND		

PS/2 Keyboard/Mouse Connector – CN4

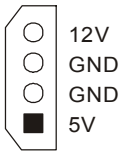


Pin #	Signal Name
1	K_DATA
2	M_DATA
3	GND
4	VCC_KBMS
5	K_CLK
6	M_CLK

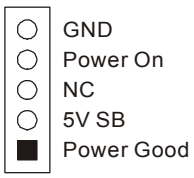
3.9 Power Supply Connectors



PWR1
ATX 12V Connector



PWR2
Power Supply Connector



CN5
ATX Power Control Connector

CHAPTER 4 AWARD BIOS UTILITY

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.

4.1 Main Menu

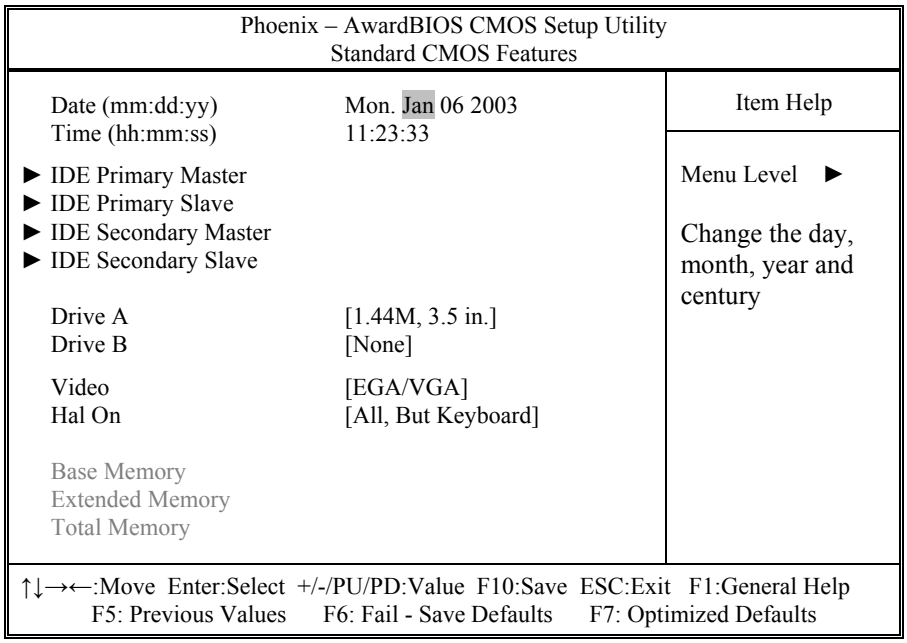
Phoenix – AwardBIOS CMOS Setup Utility	
►Standard CMOS Features	►Frequency/Voltage Control
►Advanced BIOS Features	Load Fail – Safe Defaults
►Advanced Chipset Features	Load Optimized Defaults
►Integrated Peripherals	Set Supervisor Password
►Power Management Setup	Set User Password
►PnP/PCI Configurations	Save & Exit Setup
►PC Health Status	Exit Without Saving
Esc: Quit F9: Menu in BIOS ↑↓→←: Select Item F10: Save & Exit Setup	
Load Optimized Defaults	

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

We strongly recommend 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.

4.2 Standard CMOS Features



Date/Time

Set the system date and time.

IDE Primary/Secondary Master/Slave

Press <Enter> to enter the sub menu of detailed options.

Ordinarily, The BIOS will automatically detect the IDE drives type.

Drive A/B

Set the type of floppy drive installed in your system.

Options:

1.44M, 3.5 in. (default)

2.88M, 3.5 in.

None

360K, 5.25 in.

1.2M, 5.25 in.

720K, 3.5 in.

Video

Select the default video device.

Options:

EGA/ VGA (default): For EGA, VGA, SEGA, SVGA, or PGA monitors adapters.

CGA 40: Color Graphic Adapter, powering up in 40-column mode.

CGA 80: Color Graphic Adapter, powering up in 80-column mode.

MONO: Monochrome adapter, including high-resolution monochrome adapters.

Halt On

Select the situation in which you want the BIOS to stop the POST process and notify you.

Options:

All, But Keyboard (default): Stop and prompt for all other errors but a keyboard error.

All, But Diskette: Stop and prompt for all other errors but a diskette error.

All, But Disk/Key: Stop and prompt for all other errors but a keyboard or disk error.

All errors: Stop and prompt whenever the BIOS detect a non-fatal error.

No errors: The system boot will not stop for any error that may be detected.

Memory

Base Memory: Displays the amount of base (or conventional) memory detected during boot up.

Extended Memory: Displays the amount of extended memory detected during boot up.

Total Memory: Displays the total memory available in the system.

4.3 Advanced BIOS Features

Phoenix – AwardBIOS CMOS Setup Utility
Advanced BIOS Features

Virus Warning	[Disabled]	Item Help
CPU L1 & L2 Cache	[Enabled]	
Quick Power On Self Test	[Enabled]	
First Boot Device	[Floppy]	Menu Level ►
Second Boot Device	[HDD – 0]	
Third Boot Device	[LS120]	Allow you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
Boot Other Device	[Enabled]	
Swap Floppy Drive	[Disabled]	
Boot Up Floppy Seek	[Enabled]	
Boot Up Numlock Status	[On]	
Gate A20 Option	[Fast]	
Typematic Rate Setting	[Disabled]	
x Typematic Rate (Chars/Sec)	6	
x Typematic Delay (Msec)	250	
Security Option	[Setup]	
APIC Mode	[Enabled]	
MPS Version Control For OS	[1.4]	
OS Select For DRAM > 64MB	[Non – OS2]	

↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail - Save Defaults F7: Optimized Defaults

Virus warning

Allow you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area,

BIOS will show a warning message on screen and alarm beep.
Options:
Disabled (default): No warning message will appear when anything attempts to access the boot sector or hard disk partition table.
Enabled: Activates automatically when the system boots up causing a warning message or appear when anything attempts to access the boot sector or hard disk partition table.

CPU L1 & L2 Cache

Speed up memory access. However, it depends on CPU/Chipset design.
Options: Enabled (default), Disabled

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.
Options: Disabled, Enabled (default)

First/Second/Third Boot Device

Select the Boot Device Priority.
Options: Floppy, LS120, HDD-0, SCSI, CDROM, HDD-1, HDD-2, HDD-3, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, Disabled

Boot Other Device

Select the other Boot Device
Options: Enabled (default), Disabled

Swap Floppy Drive

If the system has two floppy drives, you can swap the logical drive name assignments.
Options: Disabled (default), Enabled

Boot Up Floppy Seek

Seeks disk drives during boot up. Disabling speeds boot up.
Options: Enabled (default), Disabled.

Boot Up NumLock Status

Set the power on state for NumLock.
Options: On (default), Off

Gate A20 Option

Options:
Fast (default): Select chipset controller to control GateA20.
Normal: Select keyboard controller to control GateA20. Default is Fast.

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller. When enabled, you can configure the following two items: typematic rate and typematic delay.
Options: Disabled (default), Enabled

Typematic Rate (chars/sec)

Set the rate that the keys are repeats per sec.
Options: 6, 8, 10, 12, 15, 20, 24, 30

Typematic Delay (Msec)

Set the delay time before keystrokes begin to repeat.
Options: 250, 500, 750, 1000

Security Option

Select whether the password is required each time the system boots or only when enters setup.
Options:
System: The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup (default): The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.
Note: To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

APIC Mode

This item allows you to enable or disable the Advanced Programmable Interrupt Controller.
Options: Enabled (default), Disabled

MPS Version Control For OS

Options:
1.4 (default): For Windows 2000
1.1: For Windows NT 4.0

OS Select For DRAM>64MB

Selects the operating system that is running with greater than 64MB of RAM on the system.
Options: Non-OS2 (Default), OS2

Report NO FDD for WIN 95

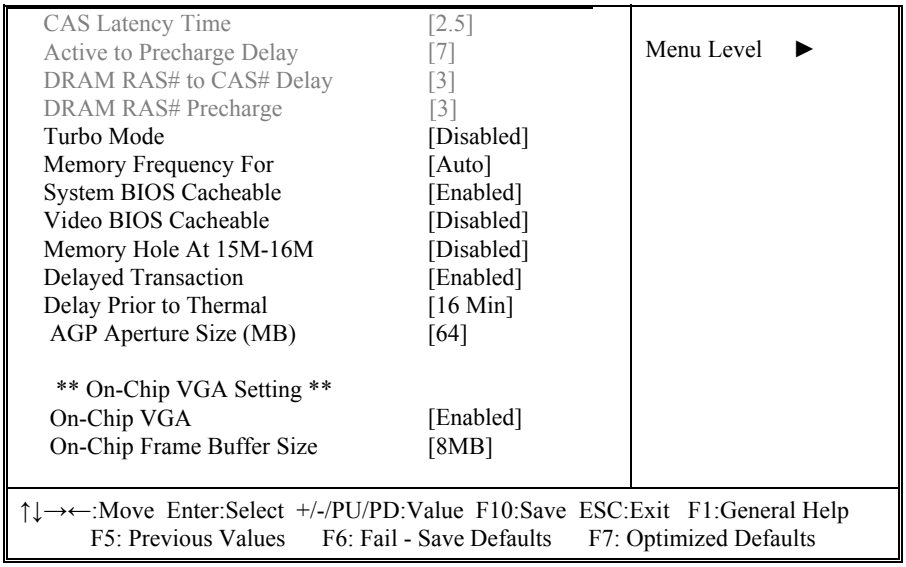
Whether report no FDD for Win95 or not.
Options: No (default), Yes

Small Logo (EPA) Show

Whether display the EPA logo.
Options: Enabled, Disabled (default)

4.4 Advanced Chipset Features

Phoenix – AwardBIOS CMOS Setup Utility Advanced Chipset Features		
DRAM Timing Selectable	[By SPD]	Item Help



DRAM Timing Selectable

For setting DRAM Timing, BY SPD follows Intel PC SDRAM Serial Presence Detect Specification.

Options: By SPD (default), Manual

CAS Latency Time

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing.

Options: 1.5 (default), 2, 2.5, 3

Active to Precharge Delay

Options: 5, 6, 7 (default)

DRAM RAS# to CAS# Delay

This field let you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. *Fast* gives faster performance; and *Slow* gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

Options: 2, 3 (default)

DRAM RAS# Precharge

If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain data. *Fast* gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

Options: 2, 3 (default)

Turbo Mode

Whether choose Turbo Mode.

Options: Enabled, Disabled (default)

Memory Frequency For
Options: Auto, DDR200, DDR266, DDR333.
System BIOS Cacheable
Select Enabled allowed caching of the system BIOS ROM at F0000h-FFFFFh. Result in better system performance. However, if any program writes to this memory area, a system error may result.
Options: Enabled (default), Disabled.
Video BIOS Cacheable
Select Enabled allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may result.
Options: Disabled (default), Enabled
Memory Hole At 15M-16M
You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.
Options: Disabled (default), Enabled
Delayed Transaction
The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.
Options: Enabled (default), Disabled
Delay Prior to Thermal
Options: 16 Min (default), 4 Min, 8 Min, 16 Min, 32 Min
AGP Aperture Size (MB)
Sets the effective size of the Graphics Aperture to be used in the particular GART Configuration.
Options: 4, 8, 16, 32, 64, 128, 256
On-Chip VGA Settings:
On-Chip VGA:
Options: Enabled (default), Disabled
On-Chip Frame Buffer Size:
Options: 8MB (default), 1MB

4.5 Integrated Peripherals

Phoenix – AwardBIOS CMOS Setup Utility Integrated Peripherals		
On-Chip Primary PCI IDE	[Enabled]	Item Help

IDE Primary Master PIO	[Auto]	
IDE Primary Slave PIO	[Auto]	Menu Level ►
IDE Primary Master UDMAO	[Auto]	
IDE Primary Slave UDMA	[Auto]	
On-Chip Secondary PCI IDE	[Enabled]	
IDE Secondary Master PIO	[Auto]	
IDE Secondary Slave PIO	[Auto]	
IDE Secondary Master UDMA	[Auto]	
IDE Secondary Slave UDMA	[Auto]	
USB Controller	[Enabled]	
USB2.0 Controller	[Enabled]	
USB Keyboard Support	[Disabled]	
USB Mouse Support	[Disabled]	
Init Display First	[Onboard/AGP]	
IDE HDD Block Mode	[Enabled]	
POWER ON Function	[BUTTON ONLY]	
KB Power On Password	[Enter]	
Hot Key Power ON	[Ctrl+F1]	
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5: Previous Values F6: Fail - Save Defaults F7: Optimized Defaults		

On-Chip Primary/Secondary PCI IDE

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

Options: Enabled (default), Disabled.

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes o through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

Options: Auto (default), Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support.

Options: Auto (default), Disabled.

USB Controller

Enable or disable both of USB 1.0 and USB2.0 controllers.

Options: Enabled (default), Disabled

USB2.0 Controller

Enables or disables USB2.0 controller only.

Options: Enabled (default), Disabled

USB Keyboard/Mouse Support

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB Keyboard/Mouse Device.
Options: Enabled, Disabled (default)

Init Display First

Options:
PCI Slot: Initializes the PCI VGA first.
Onboard/AGP (default): Initializes the onboard AGP VGA first.

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.
Options: Enabled (default), Disabled.

POWER ON Function

Select one of these various functions as Power On Method for their requirement.
Options:
Button Only (default): Use Power on Button to power on the system. This power on function controlled by CN6 (POWER BTN+, POWER BTN-).
Keyboard 98: Use keyboard 98 to power on the system.
Password: User can Power On the System by password. The password can be entered from 1 to 5 characters. The maximum of password is 5 characters. If user forgot or lost the password, please turn off the system and open case to clear CMOS by JP1 to re-setting the power on function. When set the password to turn on the system, than can't power on by CN6.
Hot key: User can press <Ctrl> + <F1>~ <F12> individually to power on the system.
Mouse Left: Left-click the mouse to power on the system.
Mouse Right: Right-click the mouse to power on the system.
Anykey: Press any key to power on the system.

KB Power ON Password

If you select "Password" in "Power On Function", you can press Enter to set the keyboard password here.

Hot Key Power ON

If you select "Hot Key" in "Power On Function", you can set a combination of keys that can be used to power on the system here.
Options: Ctrl+F1 (default), Ctrl+F2, Ctrl+F3, … Ctrl+F12

Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disable in this field.
Options: Enabled (default), Disabled.

Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports.
Options:

3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3
Auto: Onboard serial port address and IRQ are automatically assigned.
Disabled: Onboard serial port is disabled.

UART Mode Select

This filed allows the users to configure what IR mode the second serial port should use.
Options: Normal (default), 422/485

Onboard Parallel Port

Configure the LPT port.
Options:
378/IRQ7 (default), 278/IRQ5, 3BC/IRQ7
Disabled: Onboard parallel port is disabled.

Parallel Port Mode

Select the parallel port mode.
Options: SPP (default), EPP, ECP, EPP+ECP, Normal.

EPP Mode Select

Determine the IR transfer mode of onboard I/O chip.
Options: EPP1.7 (default), EPP1.9

ECP Mode Use DMA

Select DMA1 or DMA3 for the ECP mode.
Options:
1: This field selects the routing of DMA1 for ECP mode.
3 (default): This field selects the routing of DMA3 for ECP mode.

PWRON After PWR-Fail

The system will stay off or power on after a power interrupt.
Options:
OFF (default): System always stay off after a power interrupt.
ON: System always power on after a power interrupt.
Former-Sts: Stay off or power on depends on system safe shut-down or power fail.

4.6 Power Management Setup

ACPI function

Invalidate or validate the Advanced Configuration and Power Management (ACPI) function.
Options: Enabled (default), Disabled

ACPI Suspend Type:

Set the ACPI suspend type
Options: S1 (POS)
Run VGABIOS if S3 Resume
Options: Auto (default), Yes, No

Power Management

Select the type (or degree) of power saving and it is directly related to “HDD Power Down” and “Suspend Mode”.
Options:

User Define (default): Users can configure their own Power Management Timer.
Min Saving: Minimum power management.
Max Saving: Maximum power management.

Phoenix – AwardBIOS CMOS Setup Utility Power Management Setup		
ACPI Function	[Enabled]	Item Help
ACPI Suspend Type	[S1<POS>]	
x Run VGABIOS if S3 Resume	Auto	
Power Management Option	[User Define]	Menu Level ►
Video Off Method	[DPMS]	
Video Off In Suspend	[Yes]	
Suspend Type	[Stop Grant]	
MODEM Use IRQ	[3]	
Suspend Mode	[Disabled]	
HDD Power Down	[Disabled]	
Soft – Off by PWRBTN	[Instant – Off]	
CPU THRM-Throttling	[50.0%]	
Wake-Up by PCI card	[Enabled]	
Power On by Ring	[Enabled]	
x USB KB Wake-Up From S3	Disabled	
Resume by Alarm	[Disabled]	
x Date<of Month> Alarm	0	
x Time<hh:mm:ss> Alarm	0 : 0 :0	
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5: Previous Values F6: Fail - Save Defaults F7: Optimized Defaults		

Video Off Method
This determines the manner in which the monitor is blanked.
Options:
Blank Screen: The system BIOS will only blank off the screen when disabling video.
V/H SYNC+Blank: In addition to Blank Screen, BIOS will also turn off the V-SYNC & H - SYNC signals from VGA card to monitor.
DPMS (default): This function is enabled only for VGA cards supporting DPMS.
Note: When the green monitor does not detect the V/H-SYNC signals, the electron gun will be turned off.
Video Off in Suspend:
This determines the manner in which the monitor is blanked.
Options:
Yes (default): Disable video when entering suspend mode.
No: Not disable video when entering suspend mode.
Suspend Type
Set the suspend type.
Options: Stop Grant, PwrOn Suspend
MODEM Use IRQ

Set the IRQ number of Modem.
Options: 3 (default), 4, 5, 7, 9, 10, 11 NA

Suspend Mode

Options:
Disabled (default): The system never enters Suspend mode by timer.
1 Min ~ 1Hr: Defines the continuous idle time before the system enters Suspend mode. If any item defined in "PM Events" are on and activated, the system will be woken up.

HDD Power Down

Options:
Disabled (default): HDD's motor will not be off by timer.
1 - 15 Min: Defines the continuous HDD idle time before the HDD enters power saving mode (motor off).

Soft-Off by PWRBTN

Options:
Instant-Off (default): The system will immediately power off once the power button is pressed.
Delay 4 sec.: The system will power off when power button is pressed for 4 seconds.

CPU THRM-Throtting

Select the duty cycle of the STPCLK# signal, and slowing down the CPU speed when the system enters green mode.
Options: 12.5%, ~ 87.5% (default: 50.0%)

Wake-Up by PCI card

Options:
Enabled (default): Allows the system to be waken up by PCI card.
Disabled

Power On by Ring

Options:
Enabled (default): Allows the system to be powered on when an indicator signal comes up to UART1 or UART2 from external modem (to LAN Wake-up Header from LAN adapter or to modem Ring on Header from internal modem card).
Disabled

USB KB Wake-Up From S3

Select wake-up the system by USB Mouse/Keyboard when you save the computer power at S3 mode.
Options: Enabled, Disabled (default)

Resume by Alarm

Options:
Enabled: RTC alarm can be used to generate a wake-up event to power up the system.
Disabled (default): RTC has no alarm function.

Date/Time (of Month/hh:mm:ss) Alarm

Set the alarm date and time.

Reload Global Timer Events

Enabled reload global timer when following event occur.
Primary/Secondary IDE 0/1
FDD, COM. LPT Port
PCI PIRQ [A-D] #
Options: Disabled (Default), Enabled

4.7 PNP/PCI Configuration

Phoenix – AwardBIOS CMOS Setup Utility PnP/PCI Configuration		
Reset Configuration Data	[Disabled]	Item Help
Resources Controlled By	[Auto (ESCD)]	
* IRQ Resources	Press Enter	Menu Level ►
* DMA Resources	Press Enter	
* Memory Resources	Press Enter	
PCI/VGA Palette Snoop	[Disabled]	
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5: Previous Values F6: Fail - Save Defaults F7: Optimized Defaults		

Reset Configuration Data
Select Enabled to reset ESCD when you exit Setup, if you have installed a new add-on and the system reconfiguration has caused serious conflicts preventing the OS from booting.
Options: Disabled (default), Enabled
Resources Controlled By
BIOS can automatically configure all boot and PnP compatible devices.
Options:
Auto<ESCD> (default): BIOS automatically assigns the IRQ DMA and memory base address fields.
Manual: Configure the IRQ DMA and memory Resources manually.
PCI/VGA Palette Snoop
Options:
Disabled (default): Enabled Non-standard VGA cards such as graphics accelerators or MPEG video cars may not show colors properly. Enabling this item can solve this problem.
Enabled

4.8 PC Health Status

Phoenix – AwardBIOS CMOS Setup Utility PC Health Status	
CPU Warning Temperature [Disabled] Current System Temp. Current CPU1 Temperature Current CPUFAN1 Speed Current CPUFAN2 Speed IN0 (V) IN1 (V) +5 V (V) +12 V (V) -12 V (V) -5 V (V) VBAT (V) 5VSB (V) Shutdown Temperature [Disabled]	Item Help Menu Level ►
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5: Previous Values F6: Fail - Save Defaults F7: Optimized Defaults	

CPU Warning Temperature
An alarm will beep when the CPU temperature is over this value.
Options: Disabled (default): No alarm beep
50℃/122℉, 53℃/127℉, 56℃/133℉, 60℃/140℉, 63℃/145℉, 66℃/151℉, 70℃/158℉

Current System Temp.
Display the temperature inside the chassis.

Current CPU1 Temperature
Display the temperature near CPU.

Current CPUFAN1/2 Speed
Display the speed of CPU fan.

Shutdown Temperature
The system will shutdown when the CPU temperature is over this value.
Options: 60℃/140℉, 65℃/149℉, 70℃/158℉,75℃/167℉

4.9 Frequency/Voltage Control

Phoenix – AwardBIOS CMOS Setup Utility Frequency/Voltage Control		
Spread Spectrum CPU Host/PCI Clock	[Disabled] Default	Item Help Menu Level ►
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5: Previous Values F6: Fail - Save Defaults F7: Optimized Defaults		

Spread spectrum

Set the bus frequency/Spread Spectrum/PC133 Spec.

Options: Disabled (default), +/-0.25%, -0.5%, +/-0.5%, +/-0.38%

CPU Host/AGP/PCI Clock

This item's options will auto change based on CPU FSB.

If CPU FSB is 400MHz, the options will be:

Default, 100/33Mhz, 105/35Mhz, 108/36Mhz, 114/38Mhz, 120/40Mhz, 123/41Mhz, 126/36Mhz;

If CPU FSB is 533MHz, the options will be:

Default, 133/33Mhz, 140/35Mhz, 144/36Mhz, 140/37Mhz, 152/38Mhz, 156/39Mhz, 160/40Mhz.

4.10 Load Defaults

Load Optimized Defaults

The Optimized Defaults are common and efficient. It is recommended to load the optimized defaults at first, and then modify the needed configuration settings. Select this item and press <Enter>, the following message will display, type in "Y" to load the default values, type "N" to cancel.

Load Fail-Safe Defaults

The safest default settings. You can use this function to detect the errors. Select this item and press <Enter>, the following message will display, type in "Y" to load the default values, type "N" to cancel.

4.11 Password Setting

When you select "USER PASSWORD" or "SUPERVISOR PASSWORD" and press <Enter>, the following message will appear at the center of the screen:

Input the password, up to eight characters, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection.

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

If you have selected **"System**" in "Security Option" of "BIOS Features Setup" menu, you will be prompted for the password every time the system reboots or any time you try to enter BIOS Setup.
If you have selected **"Setup**" at "Security Option" from "BIOS Features Setup" menu, you will be prompted for the password only when you enter BIOS Setup.
Supervisor Password has higher priority than User Password. You can use Supervisor Password when booting the system or entering BIOS Setup to modify all settings. Also you can use User Password when booting the system or entering BIOS Setup but can not modify any setting if Supervisor Password is enabled.

4.12 Exit BIOS Setup

After you have finished the configuration of BIOS, save your settings and exit setup utility. Select "Save & Exit Setup" and press <Enter>, the following message will display, type "Y" and press <Enter> to confirm.

If you do not want to save the settings, select "Exit Without Saving " to exit setup utility without saving any change.

CHAPTER 5 DRIVER INSTALLATION

The Drivers CD is an AutoRun CD. When you put it into the tray of CD-ROM drive, it will be executed automatically and the "Motherboard Drivers and Utilities Installation" wizard will appear after a while. If it cannot be executed automatically, please double click the "AUTORUN.EXE" in the root directory of CD-ROM.

The related information will list at the right field, such as drivers, utilities, manuals and catalog etc. Click "Browse this CD" button to see the detail contents, or click " Exit to Windows" to exit this wizard.
Following drivers must be installed for PFM-8450DGL/GV:

Intel Chipset Software Installation Utility
Intel Application Accelerator
Intel 82845G/GL/GV VGA Drivers
Intel ICH4 usb2.0 Drivers
Intel 82559 or 82559ER LAN Drivers

Please select the driver according to your operation system, and click "Go!" to install. Other drivers and utilities are optional only and depend on your requirements.

CHAPTER 6 WATCHDOG CONFIGURATION

6.1 Watchdog Timer Application Interface

The watchdog is a timer designed to reset the CPU or generate an interrupt if the system comes to a standstill for any unknown reason. This is useful in applications where the CPU card will be used in an unmanned or standalone situation.

The F8451has a build-in watchdog timer. The super I/O chip, WINBOND® W83627HF, implements it.

The watchdog timer contains a 1-second/minute resolution down counter. The down counter can be programmed within the range from 1 to 255 seconds/minutes. Writing any new non-zero value to the down counter will cause the watchdog timer to reload and start to count down the new value. As the counter reaches zero, the system will be reset or an interrupt generated, which is determined by the time-out event configuration.

6.2 Configuring the watchdog timer

The system accesses the super I/O chip through Intel® LPC (Low Pin Count) interface. A fixed I/O ranged 2E~2Fh supports index access for super I/O configures.

The I/O chip, W83627HF uses compatible PnP protocol to access configuration registers for setting up variable configurations. In W83627HF, there are eleven logic devices. Each logic device has its own configuration registers (above CR30). Host can access those registers by writing an appropriate logic device number into device select register CR7. Watchdog timer shares the same logic number 8 with GPIO port 2.

To program watchdog timer or other W83627HF configuration registers, the following configuration sequence must be followed:

(1) Enter the extended function mode

To place the chip into the extended function mode, two successive writes of 0x87 must be applied to Extended Function Enable Registers (EFERs, i.e. 0x2E).

The following example is encoded with Turbo C 2.0. Symbol `Superio_Config_Port` is the address of EFER and must be predefined as a constant 0x2E.

```
/*****************************************************
 *     Enter Logic Device Program Mode
 *****************************************************/
int Superio_Enter_Config(void)
{
       outp(Superio_Config_Port, 0x87);
```

```
        outp(Superio_Config_Port, 0x87);
        return 0;
}
```

(2) Configure the configuration registers

The chip selects the logical device and activates the desired logical devices through Extended Function Index Register (EFIR) and Extended Function Data Register (EFDR). EFIR is located at the same address as EFER (0x2E), and EFDR is located at address (EFIR+1).

```
#define NEWIODELAY() asm OUT 0EBh,AL   /* delay for I/O access */

int Superio_Set_Reg(int RegInx,     int ReGEal)
{
        outp(Superio_Config_Port, RegInx);
        NEWIODELAY();
        outp(Superio_Config_Port+1, ReGEal);
        NEWIODELAY();
        return 0;
}

int Superio_Get_Reg(int RegInx)
{
        int     ReGEal;
    outp(Superio_Config_Port, RegInx);
    NEWIODELAY();
    ReGEal = inp(Superio_Config_Port+1);
    NEWIODELAY();
    return     ReGEal;
}
```

First, write the device select register number (0x07) to the EFIR and then write the number of the desired logical device (0x08 for watchdog timer/GPIO port 2) to the EFDR. If accessing the Chip (Global) Control Registers, this step is not required.

Invoking following routine performs a logic device selection for watchdog. The entry parameter `LgcDevNum` *is predefined as 0x8.*

```
int Set_Logic_Device(int LgcDevNum)
{
   Superio_Set_Reg(0x7, LgcDevNum);  /* LgcDevNum=8 for watchdog */
   return      0;
}
```

Secondly, write the address of the desired configuration register within the logical device to the EFIR and then write (or read) the desired configuration register through EFDR.

The detail of watchdog configuration register programming will be described in the next paragraph.

(3) Exit the extended function mode.

To exit the extended function mode, one write of 0xAA to EFER is required. Once

the chip exits the extended function mode, it is in the normal running mode and is ready to enter the configuration mode.

```
/**********************************************************
 *      Exit Logic Device Program Mode
 **********************************************************/
int Superio_Exit_Config(void)
{
       outp(Superio_Config_Port, 0xaa);
       return 0;
}
```

6.3 The detail of watchdog programming

The Watchdog timer output pin, WDTO shares the same physical pin with GPIO24. The status of GPIO24 configuration registers must be programmed to a known value whatever the application configures the watchdog time-out event as system reset or interrupt.

(1) Configure watchdog time-out event

The watchdog can be configured as system reset output or generate an interrupt if the system comes to a standstill for any unknown reason. If it is set as system interrupt, the following lines, predefinitions must be implemented.

```
#defineWDTIRQMod
/* Select time-out event IRQ number (0 to 15, 2 for SMI) */
#defineIRQSource 5/*eg. Select Watchdog interrupt connect to IRQ5*/
```

The counter resolution of the watchdog timer should be predefined too. `WDTCntMod=0` is for 1-sec resolution and 1 for 1-min resolution.

```
#defineWDTCntMod     0      /* 0 -- 1-second resolution */
                          /* 1 -- 1-minute resolution */
```

The following is an example to initialize the watchdog.

```
int ConfigWDT(void)
{
    int       iRetVal;

    /* Enter super I/O chip configuration mode */
    Superio_Enter_Config();

    /* Select logic device 8, watchdog to configure */
    Set_Logic_Device(0x8);

    /* Configure GPIO24 as output pin */
    iRetVal = Superio_Get_Reg(0xf0);
    iRetVal &= ~0x10;       /* clear bit4, GPIO24 as output */
    Superio_Set_Reg(0xf0, iRetVal);

    /* Configure GPIO24 output LOW level */
    iRetVal = Superio_Get_Reg(0xf1);
    iRetVal &= ~0x10;       /* clear bit4, GPIO24 output 0 */
    Superio_Set_Reg(0xf1, iRetVal);
```

```
    /* Configure GPIO24 output non-inversion */
    iRetVal = Superio_Get_Reg(0xf2);
    iRetVal &= ~0x10;       /* clear bit4, GPIO24 non-inversion */
    Superio_Set_Reg(0xf2, iRetVal);
#ifdef WDTIRQMod

   /* Select GPIO/WDTO pin as GPIO */
   iRetVal = Superio_Get_Reg(0x2b);
   iRetVal |= 0x10;     /* Set bit4,Select GPIO/WDTO pin as GPIO */
   Superio_Set_Reg(0x2b, iRetVal);

   /* Note: Application should provide an interrupt service */
   /* Select time-out event IRQ number (0 to 15, 2 for SMI) */
   Superio_Set_Reg(0xf7, IRQSource);

#else

   /* Select GPIO/WDTO pin as WDTO */
   iRetVal = Superio_Get_Reg(0x2b);
   iRetVal &= ~0x10; /* Clear bit4, Select GPIO/WDTO pin as WDTO */
   Superio_Set_Reg(0x2b, iRetVal);

#endif

   /* Select watchdog timer count mode (sec/min) */
   iRetVal = Superio_Get_Reg(0xf5);
   iRetVal &= ~0x8;          /* Count mode config bit */
   if (WDTCntMod)
      iRetVal |= 0x8;
   Superio_Set_Reg(0xf5, iRetVal);

   /* Set watchdog time-out value, disabled */
   Superio_Set_Reg(0xf6, 0);

   /* Exit super I/O chip configuration mode */
   Superio_Exit_Config();

   return     0;
}
```

(2) Enable/Refresh the watchdog timer

The following codes show how to refresh the watchdog timer. It must be invoked at least once every cycle in application. The entry parameter `iTimOutVal` is ranged `0x1` to `0xff`. The watchdog timer should be initialized before it is enabled or refreshed.

```
int RefWDT(int iTimOutVal)
{
    /* Enter super I/O chip configuration mode */
    Superio_Enter_Config();

    /* Select logic device 8 to configure */
    Set_Logic_Device(0x8);
```

```
    /* Set watchdog time-out value, disabled */
    Superio_Set_Reg(0xf6, iTimOutVal);

    /* Exit super I/O chip configuration mode */
    Superio_Exit_Config();

    return    0;
}
```

(3) Disable the watchdog timer

Invoke `RefWDT()` with parameter `iTimOutVal=0` will disable the watchdog timer.

```
    RefWDT(0x0);
```

(4) How to check watchdog timer status

If the watchdog is configured as a system time-out reset. Bypass the section.
If the watchdog time-out event is configured as a system interrupt, the application program should handle the preset IRQ and provide an interrupt service routine. Following routine shows how to check if the generated interrupt is required from watchdog.

```
int ChkWdtIrq(void)
{
    int    iRetVal;

    /* Enter super I/O chip configuration mode */
    Superio_Enter_Config();

    /* Select logic device 8 to configure */
    Set_Logic_Device(0x8);

    /* Check watchdog timer status */
    iRetVal = Superio_Get_Reg(0xf7);
    iRetVal &= 0x10; /* Check bit4, 1 - Time-out event occurred */

    /* Exit super I/O chip configuration mode */
    Superio_Exit_Config();

       if     (iRetVal)
              return 1;     /* Watchdog time-out occurred */
    return    0;            /* Watchdog timer counting */
}
```

APPENDIX A POWER-ON SETTING

1 Power-On with AT Power Supply

To power on with AT power supply, please insert two standard 4-pin connectors of AT Power Supply to PWR1 and PWR2.

Note:

The two 4-pin connectors must have different output line from AT power supply.
The 3.3V voltage of PCI slot must be provided by the system motherboard.

2 Power-On with ATX Power Supply

To power on with ATX power supply, you must have corresponding connectors of CN5/CN6 on the system motherboard or panel.

Check the signal, pin line order and shape of corresponding connectors on motherboard or panel. If they accord with CN5/CN6 completely, then connect them to CN5/CN6, and you can power on the system via the switch on panel.

If not, please change the line order of connector to make sure that following signal pins of CN5/CN6 are connected to the same signal pins on motherboard or panel at least, or you cannot power on the system.

CN5: Pin2 (5V StandBy), Pin4 (PowerOn), Pin5 (GND)
CN6: Pin9 (PowerButton-), Pin19 (PowerButton+)

APPENDIX B DYNAMIC VIDEO MEMORY TECHNOLOGY

The video memory size is not static, it will vary in size as system requirements and demands vary. This is the most efficient memory utilization.

DVMT (Dynamic Video Memory Technology) ensures the most efficient use of available memory – regardless of frame buffer or main memory sizing – for maximum 2D/3D Graphics performance.

Maximum Allocations

The Intel 845GL/GV chipset-based platform supports a minimum of 128 MB of system memory.
With **128 MB** of system memory, the Intel Extreme Graphics Driver will limit the video memory to **32 MB**.
The video memory for systems with **greater than 128 MB** is increased to **64 MB**, This was done to improve graphics performance.

Note:
You must install "Intel 82845G/GL/GV VGA Drivers" first before you use DVMT. Refer Chapter 5 for details about driver installation.