MB837-D25

Intel® Atom™ D2550
5.25-inch SBC

USER'S MANUAL

Version 1.0

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Introduction

Product Description

The MB837-D25 is a small footprint single board computer that is configured with the Intel Atom processor D2550 and Intel® NM10 Chipset.

This 5.25-inch SBC provides greater flexibility for developers of embedded computing solutions. It is ideally suited for rugged and compact designs as in Internet devices and applications in automation, industrial control, data acquisition, thin client and other embedded PC applications.

MB837-D25 features the Intel's Graphics Media Accelerator, making it compatible with Windows Vista Premium. One DDR3 SO-DIMM on board implements up to 4GB of system memory. Four Gigabit LAN ports are also available.

Advanced connectivity and expansion interfaces are provided by one CF socket, one SATA-II, one Mini PCI, one Mini PCI-e and one USB 2.0.

MB837-D25 Features

- Supports 4 Intel® Gigabit LAN ports
- Supports D2550 at 1.86GHz processor
- DDR3 SO-DIMM x1, up to 4GB
- Mini-PCI slot x1
- Mini PCI-E slot x1 (USB signal only)
- Compact Flash socket
- Low power and Fanless, Aluminum enclosure
- LAN Bypass Enable/Disable pre-setting by BIOS (GPIO Control Mode) on Eth 1 & 2

Checklist

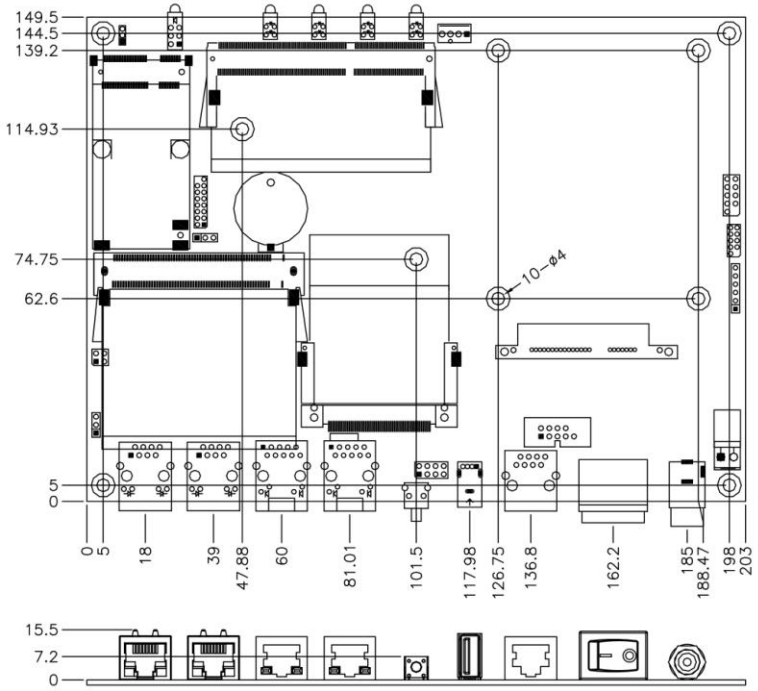
Your MB837-D25 package should include the items listed below.

- The MB837-D25 embedded board
- Driver DVD containing chipset drivers and flash memory utility
- Cables are optional.

MB837-D25 Specifications

Product Name	MB837-D25
Form Factor	5.25" Disk Size SBC
CPU Type Operating Frequency	Intel "Cedar view" Processor, 32nm Bulk Atom D2550 = 1.86 GHz [TDP= 10W], Cores = Dual Core
Chipset	Intel "Tiger Point" PCH, CG82NM10 [TDP = 2.1W, 130 nm]
BIOS	AMI BIOS w/ACPI
Ethernet controller	Intel 82583V PCI Express Gigabit ethernet controller x4
Memory	CPU on-die memory controller supporting up to 4GB One DDR3-1066/1333 SO-DIMM socket, Non-ECC, unbuffered
LAN	• Console: RS-232 @ RJ45 • Eth1, 2, 3 & 4: Intel 82583V @ RJ45 with LED
Network Bypass	One segment hardware Bypass (Eth1 & 2, Optional) Control by GPIO / Watchdog / Electrical Disconnect (Power Off)
Watchdog Timer	Yes (256 segments, 0, 1, 2…255 sec/min)
Storage	• Onboard CF Socket x1 • 22-pin SATA Right Angle Connector Onboard for 2.5" SSD x1
Rear Panel	• Cylindrical (Tip) Connector DC +12V inlet with Screw Lock • Factory Mode Restore Reset Switch (GPIO control) • Power On / Off Switch • Optional opening for Wireless LAN antenna • RJ45 x1 for Console • RJ45 with LED x4 for GLAN • USB 2.0 x1
Front Panel	• LED: Power (Green) / Alarm (Red) / Status (Yellow) • LAN Speed LED (Yellow / Green) x4 • LAN Link / Act LED (Green) x4
USB 2.0	USB 2.0 x4 • External x1 • [2x4] Pin header Onboard x1 • Mini PCI-e Socket x1 (USB Signal Only)
Video	VGA pin header onboard x1
LPC I/O	Nuvoton NCT6627UD: • RS-232 [2x5] Pin Header Onboard x1 • RJ45 Console x1 • KB/Mouse [1x6] Pin header • Hardware monitors • Fan Connector x1
Internal I/O Headers	• 4-pin Smart Fan Connector x1 • 2-pin header for DC-in (12V) x1 • Keyboard + Mouse ([1x6] Pin Header) x1
Expansion Interface	• Mini PCI Socket x1 • Mini PCI-e Socket x1 (USB Signal Only)
Power Supply	Full range 40W Adapter / 12V (Optional)
Dimensions	203(W) x 149.5(D) mm
Operation Temperature	0 ~ 60 ˚C (32 ~ 140 ˚F)
Storage Temperature	-20 ~ 80 ˚C (-4 ~ 176 ˚F)

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on theMB837-D25 in order to set up a workable system. The topics covered are:

Installing the Memory 6
Setting the Jumpers 7
Setting the Connectors 10

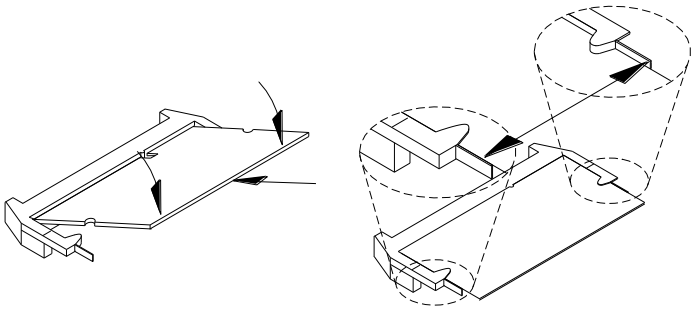
Installing the Memory

The MB837-D25 board supports one DDR3 memory socket that can support up to 4GB memory, DDR3 800/1066/1333 (w/o ECC function).

Installing and Removing Memory Modules

To install the DDR3 module, locate the memory slot on the board and perform the following steps:

1. Hold the DDR3 module so that the key of the DDR3 module aligns with that on the memory slot. Insert the module into the socket at a slight angle (approximately 30 degrees). Note that the socket and module are both keyed, which means that the module can be installed only in one direction.
2. To seat the memory module into the socket, apply firm and even pressure to each end of the module until you feel it slip down into the socket.
3. With the module properly seated in the socket, rotate the module downward. Continue pressing downward until the clips at each end lock into position.
4. To remove the DDR3 module, press the clips with both hands.

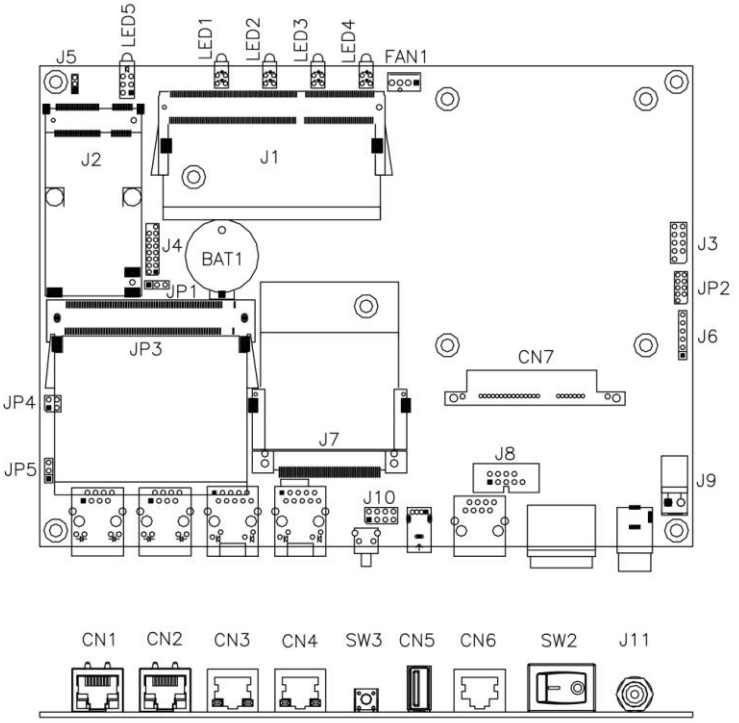


Setting the Jumpers

Jumpers are used on MB837-D25 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 MB837-D25 and their respective functions.

Jumper and Connector Locations on MB837-D25 8
JP1: Clear CMOS Contents 9
JP4, JP5: LAN Bypass & WDT Reboot Setting 9

Jumper and Connector Locations on MB837-D25



Jumper and Connector Locations on MB837-D25..... 8
JP1: Clear CMOS Contents..... 9
JP4, JP5: LAN Bypass & WDT Reboot Setting 9

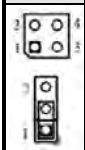
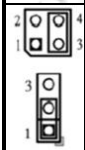
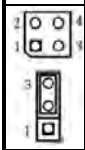
JP1: Clear CMOS Contents

Use JP1 to clear the CMOS contents.

Note that the power connector or jack should be disconnected from the board before clearing CMOS.

JP1	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear CMOS

JP4, JP5: LAN Bypass & WDT Reboot Setting

JP4 JP5	Setting	Function	Power OFF		Power ON		Power ON OS run software	
			Normal	Bypass	Normal	Bypass	Normal	Bypass
	JP4 1-2 & 3-4 Open JP5 1-2 Closed	LAN bypass upon the time out of WDT.	✓		✓			✓
	JP4 1-2 & 3-4 Closed JP5 1-2 Closed	System will reboot upon the time out of WDT.		✓		✓	LAN Always Bypass	
							WDT Reboot System	
	JP4 3-4 Closed 1-2 Open JP5 1-2 Closed	LAN bypass & system reboot upon the time out of WDT.	✓		✓		LAN Always Normal	
							WDT Reboot System	
	JP4 1-2 & 3-4 Open JP5 2-3 Closed	LAN bypass controlled by Super IO GP54 or setting in BIOS.	BIOS Setting ** GP54 Active: Low: Bypass High: Normal					

Default Setting

*** Note that the Bypass setting in BIOS is only working when JP4 & JP5 are set as this configuration.*

Setting the Connectors

FAN1: System Fan Power Connector 11
CN1, CN2, CN3, CN4: 10 / 100 / 1000 LAN Ports 11
CN5: USB Connector 11
CN6: COM1 RJ45 Connector 11
CN7: SATA HDD Dock 12
J1: SO-DIMM DDR3 Socket 12
J2: Mini PCI-e Connector (USB signal only) 12
J3: SPI Debug Port (Factory use only) 12
J4: VGA Header 12
J7: Slim Type II Compact Flash Connector 13
J8: COM2 Serial Port 13
J9: AT_12V Connector 13
J10: USB Header 13
J11: DC Power Jack (+12V only) 14
LED1, LED2, LED3 & LED4: LAN Port Link, Active LEDs 14
LED5: Power, Alarm & Status LEDs 14
SW3: Software Reset Button 14
SW2: Power Switch 14
JP3: Mini-PCI Connector 14

FAN1: System Fan Power Connector

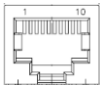
FAN1 is 4-pin header for System fan power. The fan must be a 12V fan.

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

CN1, CN2, CN3, CN4: 10 / 100 / 1000 LAN Ports

CN5: USB Connector

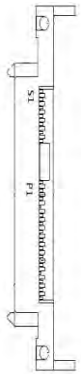
CN6: COM1 RJ45 Connector



Pin #	Signal Name (RS-232)
1	RTS, Request to send
2	DTR, Data terminal ready
3	TXD, Transmit data
4	Ground
5	Ground
6	RXD, Receive data
7	DSR, Data set ready
8	CTS, Clear to send

CN7: SATA HDD Dock

The SATA HDD dock combines a SATA power connector and a SATA interface connector.



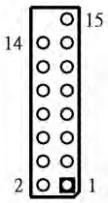
Signal Name	Pin #	Pin #	Signal Name
GND	S1	P1	+3.3V
A+	S2	P2	+3.3V
A-	S3	P3	+3.3V
GND	S4	P4	GND
B+	S5	P5	GND
B-	S6	P6	GND
GND	S7	P7	+5V
		P8	+5V
		P9	+5V
		P10	GND
		P11	GND
		P12	GND
		P13	+12V
		P14	+12V
		P15	+12V

J1: SO-DIMM DDR3 Socket

J2: Mini PCI-e Connector (USB signal only)

J3: SPI Debug Port (Factory use only)

J4: VGA Header



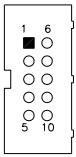
Signal Name	Pin #	Pin #	Signal Name
DACR	1	2	+5VCRT
DACG	3	4	GND
DACB	5	6	NC
NC	7	8	CRT_SPD
GND	9	10	HSYNC_C
+5VCRT	11	12	VSYNC_C
GND	13	14	CRT_SPCLK
GND	15		

J6:PS2 KB/MS Header

Pin #	Signal Name
1	KBDATA
2	KBCLK
3	MSDATA
4	MSCLK
5	GND
6	+5V

J7: Slim Type II Compact Flash Connector

J8: COM2 Serial Port



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.

J9: AT_12V Connector

J9 is a DC-in internal connector supporting +12V.

Pin #	Signal Name
1	+12V
2	Ground

Note: Do not connect J9 and J11 at the same time.

J10: USB Header

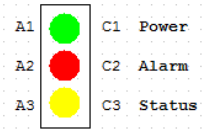
Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	Ground
USB1-	3	4	USB2+
USB1+	5	6	USB2-
Ground	7	8	VCC

J11: DC Power Jack (+12V only)

Note: Do not connect J9 and J11 at the same time.

LED1, LED2, LED3 & LED4: LAN Port Link, Active LEDs

LED5: Power, Alarm & Status LEDs



Signal Name	Pin #	Pin #	Signal Name
PWR LED+	A1	C1	PWR LED-
ALARM LED+	A2	C2	SIO GPIO55
STATUS LED+	A3	C3	SIO GPIO56

SW3: Software Reset Button

Signal Name	Pin #	Pin #	Signal Name
GND	1	2	PCH GPIO7

Note: SW3 is controlled by GPIO only.

SW2: Power Switch

JP3: Mini-PCI Connector

BIOS Setup

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

BIOS Introduction 16
BIOS Setup 16
Advanced Settings 18
Chipset Settings 27
Security Settings 33
Save & Exit Settings 34

BIOS Introduction

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

BIOS Setup

The 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 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.

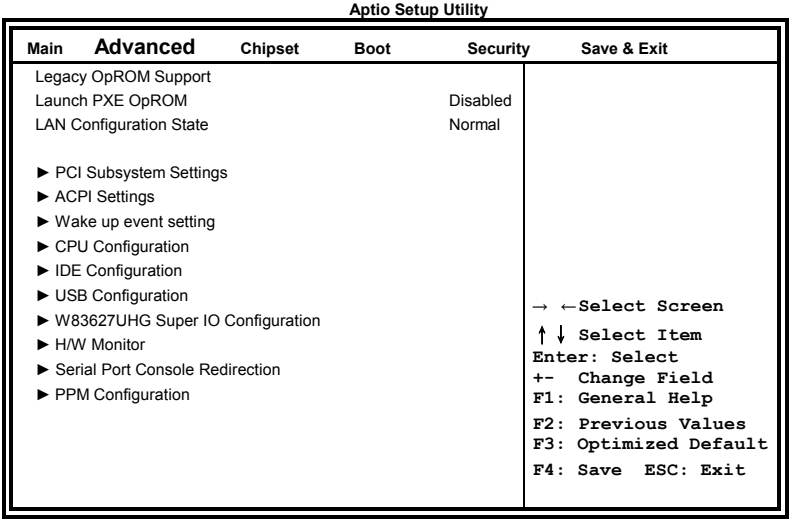
Warning: *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable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

System Date
Set the Date. Use Tab to switch between Data elements.

System Time
Set the Time. Use Tab to switch between Data elements.

Advanced Settings

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



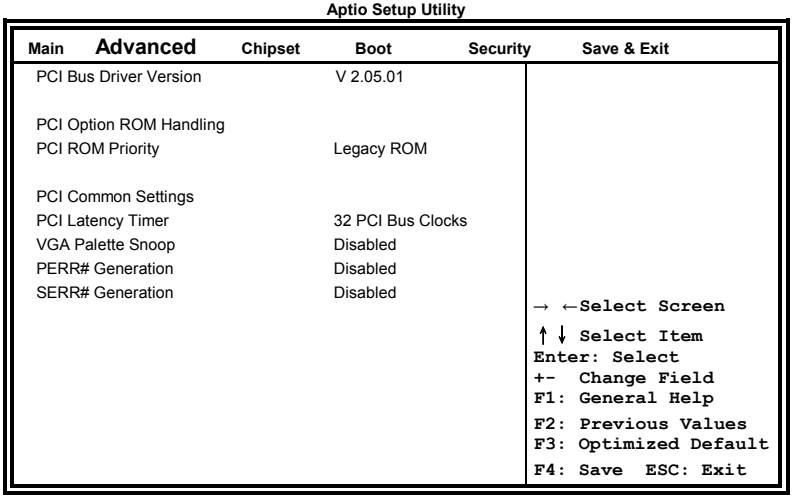
Launch PXE OpROM

Enable or Disable Boot Option for Legacy Network Devices.

LAN Configuration State

Enable (Bypass) or Disable (Normal) LAN Bypass. This function is only working on GPIO control mode.
Refer to page 9 to set JP5 pin 2-3 closed.

PCI Subsystem Settings



PCI ROM Priority
In case of multiple Option ROMs (Legacy and EFI Compatible), specifies what PCI Option ROM to launch.

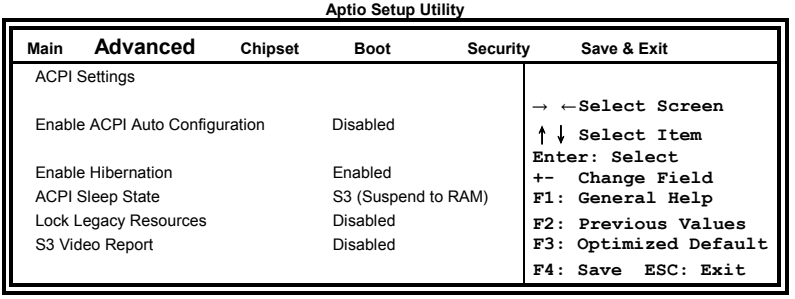
PCI Latency Timer
Value to be programmed into PCI Latency Timer Register.

VGA Palette Snoop
Enables or Disables VGA Palette Registers Snooping.

PERR# Generation
Enables or Disables PCI Device to Generate PERR#.

SERR# Generation
Enables or Disables PCI Device to Generate SERR#.

ACPI Settings



Enabled ACPI Auto Configuration
Enables or Disables BIOS ACPI Auto Configuration.

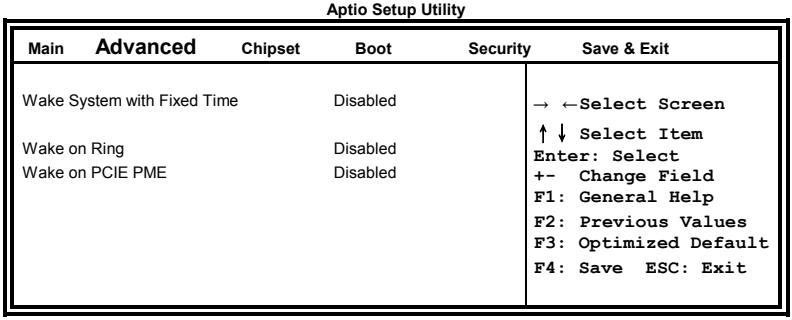
Enable Hibernation
Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State
Select the highest ACPI sleep state the system will enter, when the SUSPEND button is pressed.

Lock Legacy Resources
Enables or Disables Lock of Legacy Resources.

S3 Video Report
Enable or Disable S3 Video Repost.

Wake up event settings



Wake System with Fixed Time

Enabled or Disabled System wake on alarm event. When enabled ,System will wake on the hr : min : sec specified.

Wake on Ring

The options are Disabled and Enabled.

Wake on PCIE PME

The options are Disabled and Enabled.

CPU Configuration

This section shows the CPU configuration parameters.

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
CPU Configuration					
Processor Type			Intel(R) Atom(TM) CPU		
EMT64			Not Supported		
Processor Speed			1865 MHz		
System Bus Speed			533 MHz		
Ratio Status			14		
Actual Ratio			14		
System Bus Speed			533 MHz		
Processor Stepping			30661		
Microcode Revision			265		
L1 Cache RAM			2x56 k		
L2 Cache RAM			2x512 k		
Processor Core			Dual		
Hyper-Threading			Supported		
Hyper-Threading			Enabled		
Execute Disable Bit			Enabled		
Limit CPUID Maximum			Disabled		

→ ←Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

Hyper-threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled, only one thread per enabled core is enabled.

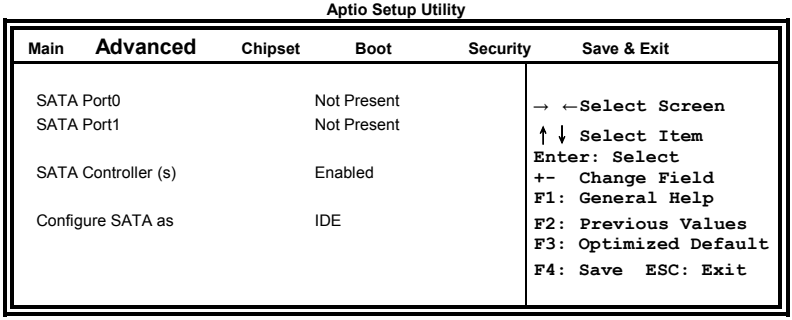
Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, Re33dHat Enterprise 3 Update 3.)

Limit CPUID Maximum

Disabled for Windows XP.

IDE Configuration



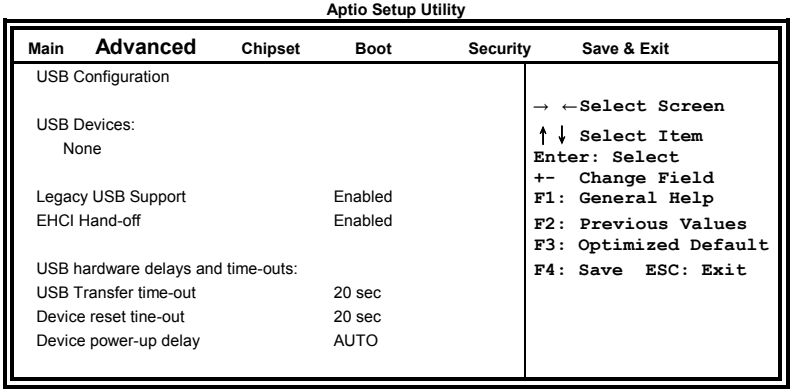
SATA Controller(s)

Enable / Disable Serial ATA Controller.

Configure SATA as

(1) IDE Mode.
(2) AHCI Mode.

USB Configuration



Legacy USB Support

Enables Legacy USB support.
AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

EHCI Hand-off

Enabled/Disabled. This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

USB Transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

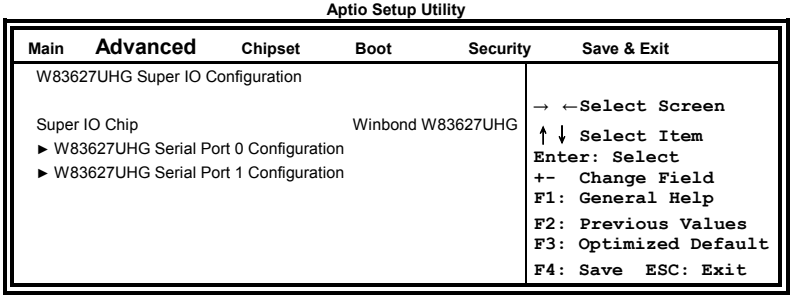
Device reset tine-out

USB mass Storage device start Unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

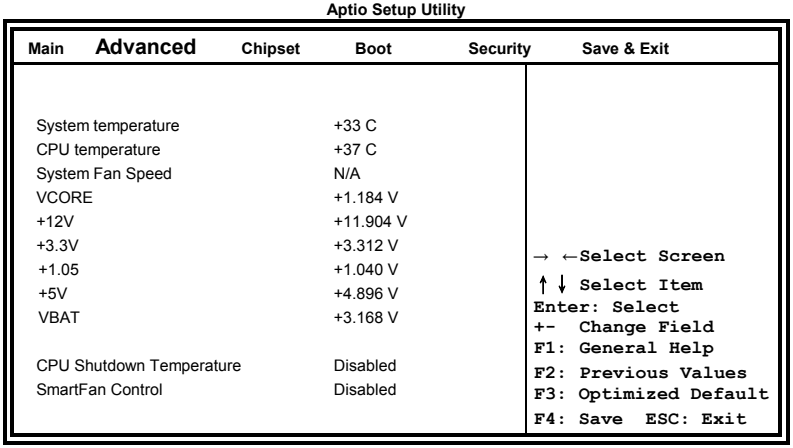
W83627UHG Super IO Configuration



Serial Port Configuration

Set Parameters of Serial Ports. User can Enable/Disable the serial port and Select an optimal settings for the Super IO Device.

H/W Monitor



CPU Smart Fan Control

Disabled (default)
70 ℃
75 ℃
80 ℃
85 ℃
90 ℃
95 ℃

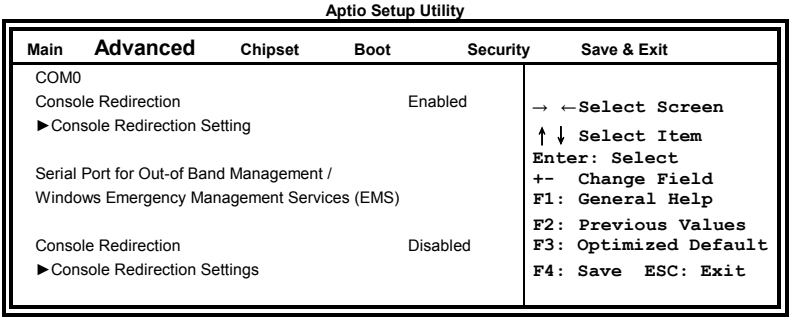
Temperatures/Voltages

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.

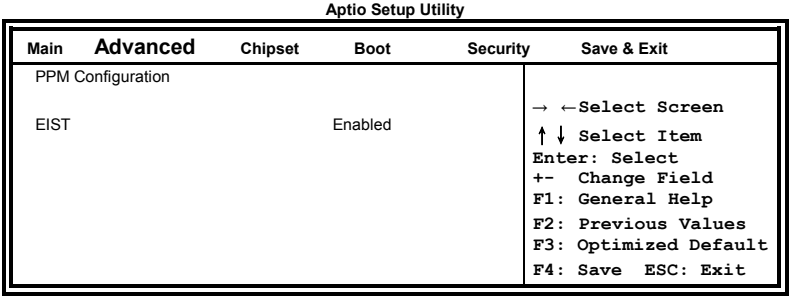
CPU Shutdown Temperature

The default setting is disabled.

Serial Port Console Redirection

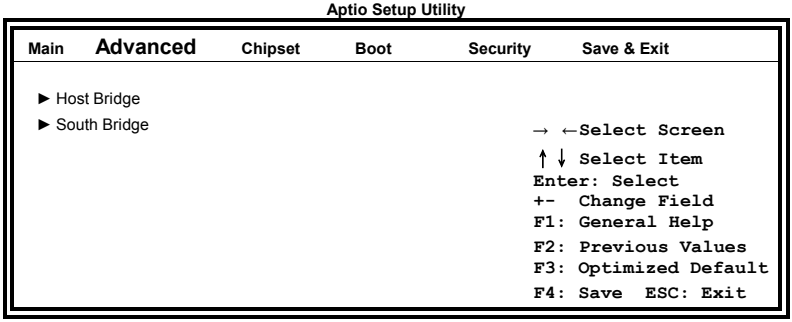


PPM Configuration



Chipset Settings

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



Host Bridge

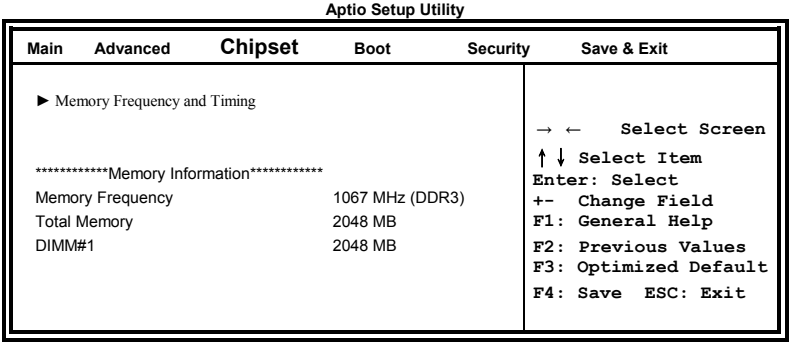
This item shows the Host Bridge Parameters.

South Bridge

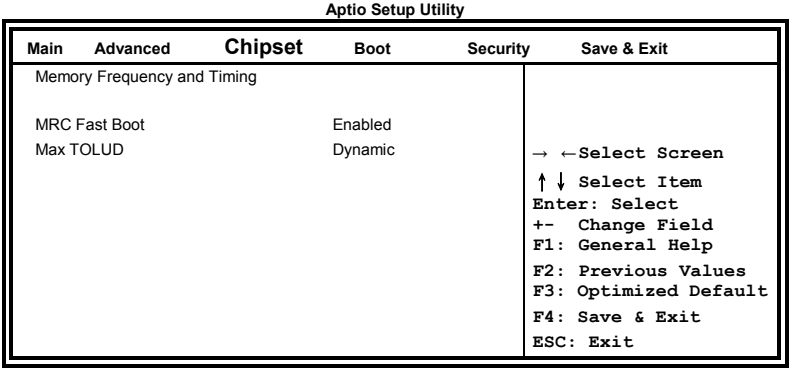
This item shows the South Bridge Parameters.

Host Bridge

This section allows you to configure the Host Bridge Chipset.



Memory Frequency and Timing



MRC Fast Boot

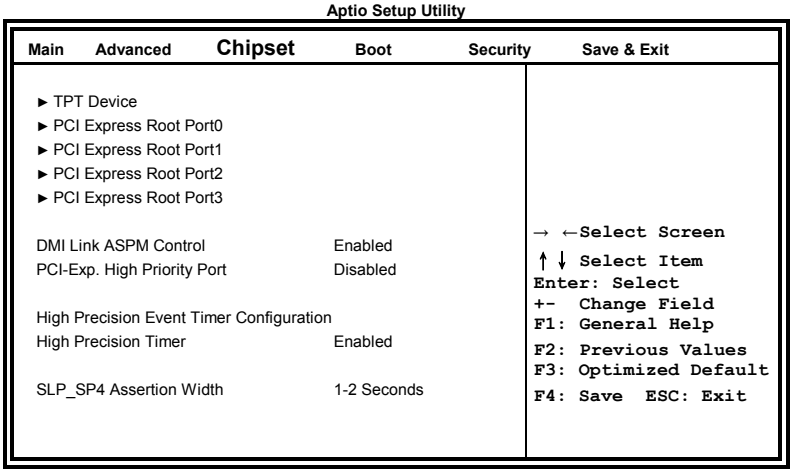
The options are Disabled and Enabled.

Max TOLUD

Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

South Bridge

This section allows you to configure the South Bridge Chipset.



DMI Clink ASPM Control

The control of Active State Power Management on both NB side and SB side of the DMI Link.

PCI-Exp. High Priority Port

The options are Disabled, Port1, Port2, Port3, and Port4.

High Precision Event Timer Configuration

Enable/or Disable the High Precision Event Timer.

SLP_S4 Assertion Stretch Enable

Select a minimum assertion width of the SLP_S4# signal.

TPT Device

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit

Select USB Mode	By Controllers	→ ←Select Screen
UHCI #1 (port 0 and 1)	Enabled	↑ ↓ Select Item
UHCI #2 (port 2 and 3)	Enabled	Enter: Select
UHCI #3 (port 4 and 5)	Enabled	+- Change Field
UHCI #4 (port 6 and 7)	Enabled	F1: General Help
USB 2.0 (EHCI) Support	Enabled	F2: Previous Values
		F3: Optimized Default
		F4: Save ESC: Exit

PCI Express Root Port0

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit

PCI Express Port 0	Enabled	→ ←Select Screen
Port 0 IOxAPIC	Disabled	↑ ↓ Select Item
Automatic ASPM	Manual	Enter: Select
ASPM L0s	Root Port Only	+- Change Field
ASPM L1	Enabled	F1: General Help
		F2: Previous Values
		F3: Optimized Default
		F4: Save ESC: Exit

PCI Express Root Port1

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit

PCI Express Port 1	Auto	→ ←Select Screen
Port 0 IOxAPIC	Disabled	↑ ↓ Select Item
Automatic ASPM	Manual	Enter: Select
ASPM L0s	Root Port Only	+- Change Field
ASPM L1	Enabled	F1: General Help
		F2: Previous Values
		F3: Optimized Default
		F4: Save ESC: Exit

PCI Express Root Port2

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit

PCI Express Port 2	Auto	→ ←Select Screen
Port 0 IOxAPIC	Disabled	↑ ↓ Select Item
Automatic ASPM	Manual	Enter: Select
ASPM L0s	Root Port Only	+- Change Field
ASPM L1	Enabled	F1: General Help
		F2: Previous Values
		F3: Optimized Default
		F4: Save ESC: Exit

PCI Express Root Port3

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit

PCI Express Port 3	Auto	→ ←Select Screen
Port 0 IOxAPIC	Disabled	↑ ↓ Select Item
Automatic ASPM	Manual	Enter: Select
ASPM L0s	Root Port Only	+- Change Field
ASPM L1	Enabled	F1: General Help
		F2: Previous Values
		F3: Optimized Default
		F4: Save ESC: Exit

Boot Settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Boot Configuration					
Setup Prompt Timeout			1		
Bootup NumLock State			On		
Quiet Boot			Disabled		
Fast Boot			Disabled		
CSM16 Module Version			07.68		
GateA20 Active			Upon Request		
Option ROM Messages			Force BIOS		
Interrupt 19 Capture			Enabled		
CSM Support			Enabled		
Boot Option Priorities					

→ ←Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

Setup Prompt Timeout
Number of seconds to wait for setup activation key.
65535(0xFFFF) means indefinite waiting.

Bootup NumLock State
Select the keyboard NumLock state.

Quiet Boot
Enables/Disables Quiet Boot option.

Fast Boot
Enables/Disables boot with initialization of a minimal set of devices to launch active boot option. Has no effect for BBS boot options.

GateA20 Active
UPON REQUEST – GA20 can be disabled using BIOS services.
ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Option ROM Messages
Set display mode. Options: Force BIOS and Keep Current.

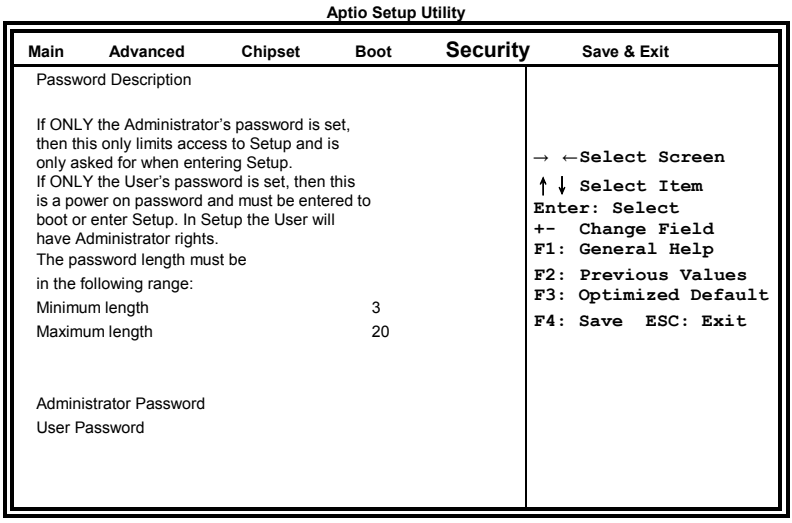
Interrupt 19 Capture
Enable: Allows Option ROMs to trap Int 19.

CSM Support
Enables/Disables/Auto CSM Support.

Boot Option Priorities
Sets the system boot order.

Security Settings

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



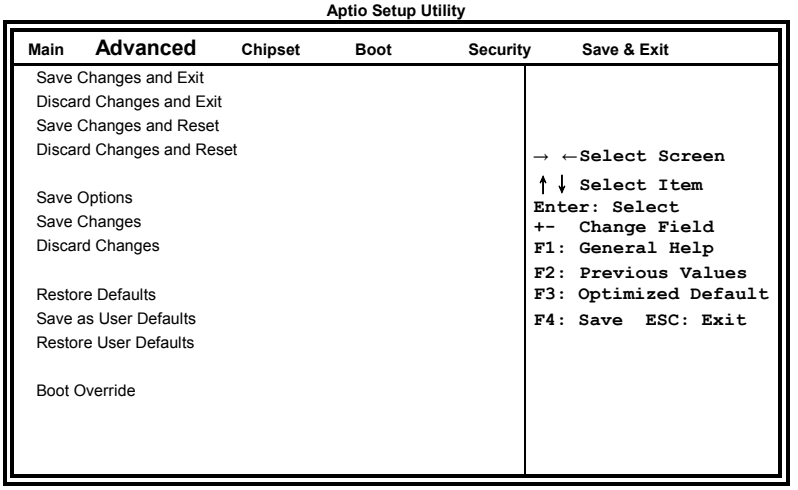
Administrator Password

Set Setup Administrator Password.

User Password

Set User Password.

Save & Exit Settings



Save Changes and Exit
Exit system setup after saving the changes.

Discard Changes and Exit
Exit system setup without saving any changes.

Save Changes and Reset
Reset the system after saving the changes.

Discard Changes and Reset
Reset system setup without saving any changes.

Save Changes
Save Changes done so far to any of the setup options.

Discard Changes
Discard Changes done so far to any of the setup options.

Restore Defaults
Restore/Load Defaults values for all the setup options.

Save as User Defaults
Save the changes done so far as User Defaults.

Restore User Defaults
Restore the User Defaults to all the setup options.

Boot Override
Pressing ENTER causes the system to enter the OS.

This page is intentionally left blank.

Drivers Installation

This section describes the installation procedures for software and drivers. 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:

Intel Chipset Software Installation Utility 38
VGA Drivers Installation..... 39
LAN Drivers Installation 41

IMPORTANT NOTE:
After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

Intel Chipset Software Installation Utility

The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation.

1. Insert the disc that comes with the board. Click ***Intel*** and then ***Intel(R) Cedarview Chipset Drivers***.

2. Click ***Intel(R) Chipset Software Installation Utility.***

3. When the Welcome screen to the Intel® Chipset Device Software appears, click ***Next*** to continue.

4. Click ***Yes*** to accept the software license agreement and proceed with the installation process.

5. On the Readme File Information screen, click ***Next*** to continue the installation.

6. The Setup process is now complete. Click ***Finish*** to restart the computer and for changes to take effect.

VGA Drivers Installation

1. Insert the disc that comes with the board. Click ***Intel*** and then ***Intel(R) Cedarview Chipset Drivers***.

2. Click ***Intel(R) Cedarview Graphics Driver.***

3. When the Welcome screen appears, click ***Next*** to continue.

4. Click ***Yes*** to to agree with the license agreement and continue the installation.

5. On the Readme File Information screen, click ***Next*** to continue the installation of the Intel® Graphics Media Accelerator Driver.

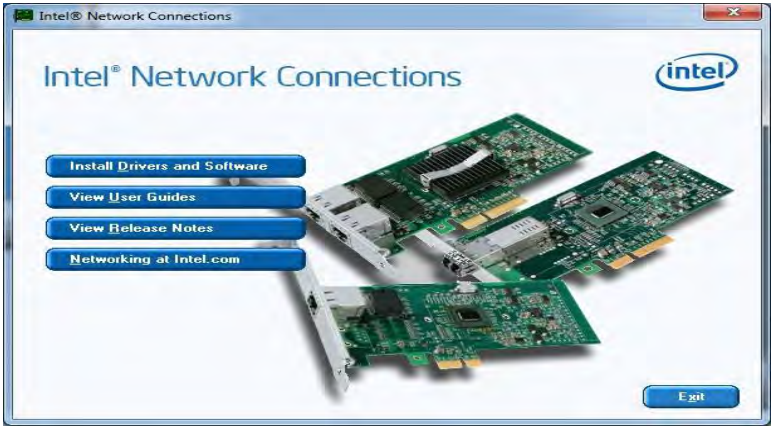
6. On Setup Progress screen, click ***Next*** to continue.

7. Setup complete. Click ***Finish*** to restart the computer and for changes to take effect.

LAN Drivers Installation

1. Insert the disc that comes with the board. Click ***LAN Card*** and then ***Intel LAN Cedarview Drivers***.

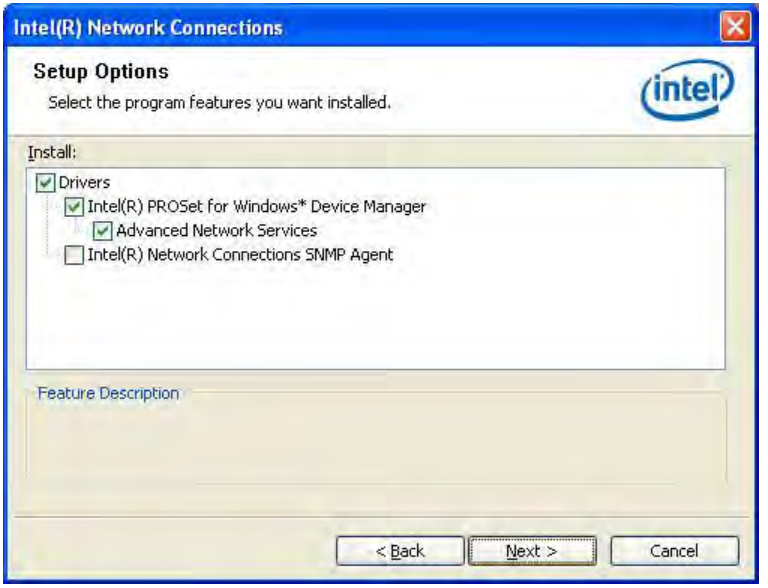
2. On the next screen, click ***Install Drivers and Software***.



3. In the Welcome screen, click ***Next***. On the next screen, click ***Yes*** to to agree with the license agreement.

4. Agree with the license agreement and click ***Next***.

5. Click the checkbox for **Drivers** in the Setup Options screen to select it and click **Next** to continue.



6. The wizard is ready to begin installation. Click ***Install*** to begin the installation.

7. When InstallShield Wizard is complete, click ***Finish***.

Appendix

A. I/O Port Address Map

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

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
2F8h - 2FFh	Serial Port #2(COM2)
2B0h- 2DFh	Graphics adapter Controller
360h - 36Fh	Network Ports
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
IRQ 0	System timer
IRQ 1	Standard PS/2 Keyboard
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 5	Communications Port (COM3)
IRQ 7	Communications Port (COM4)
IRQ 8	System CMOS/real time clock
IRQ 11	Intel(R) N10/ICH7 Family SMBus Controller - 27DA
IRQ 12	Microsoft PS/2 Mouse
IRQ 13	Numeric data processor
IRQ 16	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CB
IRQ 18	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CA
IRQ 19	Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
IRQ 19	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C9
IRQ 22	High Definition Audio Controller
IRQ 23	Intel(R) N10/ICH7 Family USB2 Enhanced Host Controller - 27CC
IRQ 23	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C8
IRQ 4294967290	Intel(R) 82583V Gigabit Network Connection
IRQ 4294967291	Intel(R) 82583V Gigabit Network Connection #2
IRQ 4294967292	Intel(R) Graphics Media Accelerator 3600 Series
IRQ 4294967293	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D2
IRQ 4294967294	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0

C. 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 sorts 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:

```
File of the W627UHG.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 "W627UHG.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int W627UHG_BASE;
void Unlock_W627UHG (void);
void Lock_W627UHG (void);
//---------------------------------------------------------------------------
unsigned int Init_W627UHG(void)
{
        unsigned int result;
        unsigned char ucDid;

        W627UHG_BASE = 0x4E;
        result = W627UHG_BASE;

        ucDid = Get_W627UHG_Reg(0x20);
        if (ucDid == 0xA2)                                      //W83627UHG??
        {       goto Init_Finish;    }

        W627UHG_BASE = 0x2E;
        result = W627UHG_BASE;

        ucDid = Get_W627UHG_Reg(0x20);
        if (ucDid == 0xA2)                                      //W83627UHG??
        {       goto Init_Finish;    }

        W627UHG_BASE = 0x00;
        result = W627UHG_BASE;

Init_Finish:
        return (result);
}
//---------------------------------------------------------------------------
void Unlock_W627UHG (void)
```

```
{
        outportb(W627UHG_INDEX_PORT, W627UHG_UNLOCK);
        outportb(W627UHG_INDEX_PORT, W627UHG_UNLOCK);
}
//-----------------------------------------------------------------------------
void Lock_W627UHG (void)
{
        outportb(W627UHG_INDEX_PORT, W627UHG_LOCK);
}
//-----------------------------------------------------------------------------
void Set_W627UHG_LD( unsigned char LD)
{
        Unlock_W627UHG();
        outportb(W627UHG_INDEX_PORT, W627UHG_REG_LD);
        outportb(W627UHG_DATA_PORT, LD);
        Lock_W627UHG();
}
//-----------------------------------------------------------------------------
void Set_W627UHG_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_W627UHG();
        outportb(W627UHG_INDEX_PORT, REG);
        outportb(W627UHG_DATA_PORT, DATA);
        Lock_W627UHG();
}
//-----------------------------------------------------------------------------
unsigned char Get_W627UHG_Reg(unsigned char REG)
{
        unsigned char Result;
        Unlock_W627UHG();
        outportb(W627UHG_INDEX_PORT, REG);
        Result = inportb(W627UHG_DATA_PORT);
        Lock_W627UHG();
        return Result;
}
//-----------------------------------------------------------------------------
```

File of the W627UHG.H

```
//---------------------------------------------------------------------------
//
// 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.
//
//---------------------------------------------------------------------------
#ifndef __W627UHG_H
#define __W627UHG_H                1
//---------------------------------------------------------------------------
#define       W627UHG_INDEX_PORT            (W627UHG_BASE)
#define       W627UHG_DATA_PORT             (W627UHG_BASE+1)
//---------------------------------------------------------------------------
#define       W627UHG_REG_LD                0x07
//---------------------------------------------------------------------------
#define W627UHG_UNLOCK                0x87
#define       W627UHG_LOCK                  0xAA
//---------------------------------------------------------------------------
unsigned int Init_W627UHG(void);
void Set_W627UHG_LD( unsigned char);
void Set_W627UHG_Reg( unsigned char, unsigned char);
unsigned char Get_W627UHG_Reg( unsigned char);
//---------------------------------------------------------------------------
#endif//__W627UHG_H
```

File of the 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 <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "W627UHG.H"
//---------------------------------------------------------------------------
int main (void);

void WDTInitial(void);
void WDTEnable(unsigned char);
void WDTDisable(void);

//---------------------------------------------------------------------------
int main (void)
{
        char SIO;

        SIO = Init_W627UHG();
        if (SIO == 0)
        {
        ..... printf("Can not detect Winbond 83627UHG, program abort.\n");
        ..... return(1);
        }

        WDTInitial();

        WDTEnable(10);

        WDTDisable();

        return 0;
}
//---------------------------------------------------------------------------
void WDTInitial(void)
{
        unsigned char bBuf;
        Set_W627UHG_LD(0x08); ..... //switch to logic device 8
        bBuf = Get_W627UHG_Reg(0x30);
        bBuf &= (~0x01);
        Set_W627UHG_Reg(0x30, bBuf); ..... //Enable WDTO
}
//---------------------------------------------------------------------------
void WDTEnable(unsigned char NewInterval)
{
        unsigned char bBuf;

        Set_W627UHG_LD(0x08); ..... //switch to logic device 8
        Set_W627UHG_Reg(0x30, 0x01); ..... //enable timer
```

```
        bBuf = Get_W627UHG_Reg(0xF5);
        bBuf &= (~0x08);
        Set_W627UHG_Reg(0xF5, bBuf); ..... //count mode is second

        Set_W627UHG_Reg(0xF6, NewInterval);..... //set timer
}
//-------------------------------------------------------------------------
void WDTDisable(void)
{
        Set_W627UHG_LD(0x08); .....//switch to logic device 8
        Set_W627UHG_Reg(0xF6, 0x00); ..... //clear watchdog timer
        Set_W627UHG_Reg(0x30, 0x00); .....//watchdog disabled
}
//-------------------------------------------------------------------------
```

D. Digital I/O Sample Code

File of the W627UHG.H

```
//---------------------------------------------------------------------------
//
// 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.
//
//---------------------------------------------------------------------------
#ifndef __W627UHG_H
#define __W627UHG_H                1
//---------------------------------------------------------------------------
#define      W627UHG_INDEX_PORT          (W627UHG_BASE)
#define      W627UHG_DATA_PORT           (W627UHG_BASE+1)
//---------------------------------------------------------------------------
#define      W627UHG_REG_LD              0x07
//---------------------------------------------------------------------------
#define W627UHG_UNLOCK                   0x87
#define      W627UHG_LOCK                0xAA
//---------------------------------------------------------------------------
unsigned int Init_W627UHG(void);
void Set_W627UHG_LD( unsigned char);
void Set_W627UHG_Reg( unsigned char, unsigned char);
unsigned char Get_W627UHG_Reg( unsigned char);
//---------------------------------------------------------------------------
#endif//__W627UHG_H
```

File of the W627UHG.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 "W627UHG.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int W627UHG_BASE;
void Unlock_W627UHG (void);
void Lock_W627UHG (void);
//---------------------------------------------------------------------------
unsigned int Init_W627UHG(void)
{
        unsigned int result;
        unsigned char ucDid;

        W627UHG_BASE = 0x4E;
        result = W627UHG_BASE;

        ucDid = Get_W627UHG_Reg(0x20);
        if (ucDid == 0xA2)                                      //W83627UHG??
        {       goto Init_Finish;    }

        W627UHG_BASE = 0x2E;
        result = W627UHG_BASE;

        ucDid = Get_W627UHG_Reg(0x20);
        if (ucDid == 0xA2)                                      //W83627UHG??
        {       goto Init_Finish;    }

        W627UHG_BASE = 0x00;
        result = W627UHG_BASE;

Init_Finish:
        return (result);
}
//---------------------------------------------------------------------------
void Unlock_W627UHG (void)
{
        outportb(W627UHG_INDEX_PORT, W627UHG_UNLOCK);
        outportb(W627UHG_INDEX_PORT, W627UHG_UNLOCK);
}
//---------------------------------------------------------------------------
void Lock_W627UHG (void)
{
        outportb(W627UHG_INDEX_PORT, W627UHG_LOCK);
}
//---------------------------------------------------------------------------
void Set_W627UHG_LD( unsigned char LD)
```

```
{
	Unlock_W627UHG();
	outportb(W627UHG_INDEX_PORT, W627UHG_REG_LD);
	outportb(W627UHG_DATA_PORT, LD);
	Lock_W627UHG();
}
//----------------------------------------------------------------------------
void Set_W627UHG_Reg( unsigned char REG, unsigned char DATA)
{
	Unlock_W627UHG();
	outportb(W627UHG_INDEX_PORT, REG);
	outportb(W627UHG_DATA_PORT, DATA);
	Lock_W627UHG();
}
//----------------------------------------------------------------------------
unsigned char Get_W627UHG_Reg(unsigned char REG)
{
	unsigned char Result;
	Unlock_W627UHG();
	outportb(W627UHG_INDEX_PORT, REG);
	Result = inportb(W627UHG_DATA_PORT);
	Lock_W627UHG();
	return Result;
}
//----------------------------------------------------------------------------
```

File of the 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 <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "W627UHG.H"
//---------------------------------------------------------------------------
int main (void);

void Dio5Initial(void);
void Dio5SetOutput(unsigned char);
unsigned char Dio5GetInput(void);
void Dio5SetDirection(unsigned char);
unsigned char Dio5GetDirection(void);
//---------------------------------------------------------------------------
int main (void)
{
	char SIO;

	SIO = Init_W627UHG();
	if (SIO == 0)
	{
		printf("Can not detect Winbond 83627UHG, program abort.\n");
		return(1);
	}

	Dio5Initial();

	//for GPIO50..57
	Dio5SetDirection(0x0F); //GP50..53 = input, GP54..57=output
	printf("Current DIO direction = 0x%X\n", Dio5GetDirection());

	printf("Current DIO status = 0x%X\n", Dio5GetInput());

	printf("Set DIO output to high\n");
	Dio5SetOutput(0x0F);

	printf("Set DIO output to low\n");
	Dio5SetOutput(0x00);

	return 0;
}
//---------------------------------------------------------------------------
void Dio5Initial(void)
{
	unsigned char ucBuf;

	Set_W627UHG_LD(0x08);                                   //switch to logic device 8
	//enable the GP5 group
	ucBuf = Get_W627UHG_Reg(0x30);
	ucBuf |= 0x02;
	Set_W627UHG_Reg(0x30, ucBuf);
}
```

```
//---------------------------------------------------------------------------
void Dio5SetOutput(unsigned char NewData)
{
	Set_W627UHG_LD(0x08);					//switch to logic device 8
	Set_W627UHG_Reg(0xE1, NewData);
}
//---------------------------------------------------------------------------
unsigned char Dio5GetInput(void)
{
	unsigned char result;

	Set_W627UHG_LD(0x08);					//switch to logic device 8
	result = Get_W627UHG_Reg(0xE1);
	return (result);
}
//---------------------------------------------------------------------------
void Dio5SetDirection(unsigned char NewData)
{
	//NewData : 1 for input, 0 for output
	Set_W627UHG_LD(0x08);					//switch to logic device 8
	Set_W627UHG_Reg(0xE0, NewData);
}
//---------------------------------------------------------------------------
unsigned char Dio5GetDirection(void)
{
	unsigned char result;

	Set_W627UHG_LD(0x08);					//switch to logic device 8
	result = Get_W627UHG_Reg(0xE0);
	return (result);
}
//---------------------------------------------------------------------------
```