

# MI953

Intel® Arrandale™ /PCH  
Mini-ITX Motherboard

## USER'S MANUAL

Version 1.0

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***IMPORTANT NOTE: When the system boots without the CRT being connected, there will be no image on screen when you insert the CRT/VGA cable. To show the image on screen, the hotkey must be pressed (CTRL-ALT-F1).***

# Introduction

## Product Description

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The MI953 Mini ITX board incorporates the Intel® Chipset for Embedded Computing, consisting of the Intel® Arrandale DC mobile processor (integrated Graphic and Memory Controller) and Intel® Ibox Peak-M (PCH), an optimized integrated graphics solution with a 800/1066MHz front-side bus. Dimensions of the board are 170mm x 170mm.

The integrated graphics controller contains a refresh of the 5<sup>th</sup> generation graphics core support Intel® Dynamic Video Memory Technology, Smart 2D Display Technology, Clear Video Technology. It features a low-power design, is validated with the Intel® Arrandale DC mobile processors on 45nm process. With dual channel DDR3 800/1066MHz two SoDIMM sockets on board, the board supports up to 8GB of DDR3 system memory.

The main features of the board are:

- Supports Intel® Arrandale DC mobile processor
- Supports up to 3.0GHz, 1066MHz FSB
- Two DDR3 SoDIMM, Max. 8GB memory
- Onboard Gigabit PHY and Intel PCI-Express Gigabit LAN
- Integrated Graphics VGA for CRT /DVI/ LVDS
- 4x SATA, 10x USB 2.0, 4x COM, Watchdog timer
- 1x Mini PCI-E (Mini Card), 1x PCI, 1xPCI-E(x1) slots

## **Checklist**

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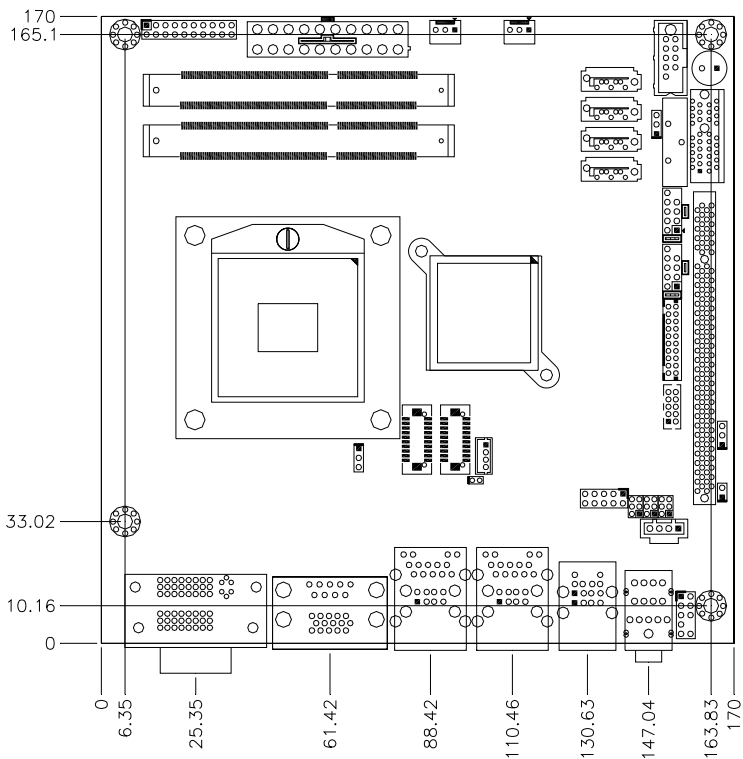
Your MI953 package should include the items listed below.

- The MI953 Mini-ITX motherboard
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Cable kit (IDE cable, Serial ATA cable)

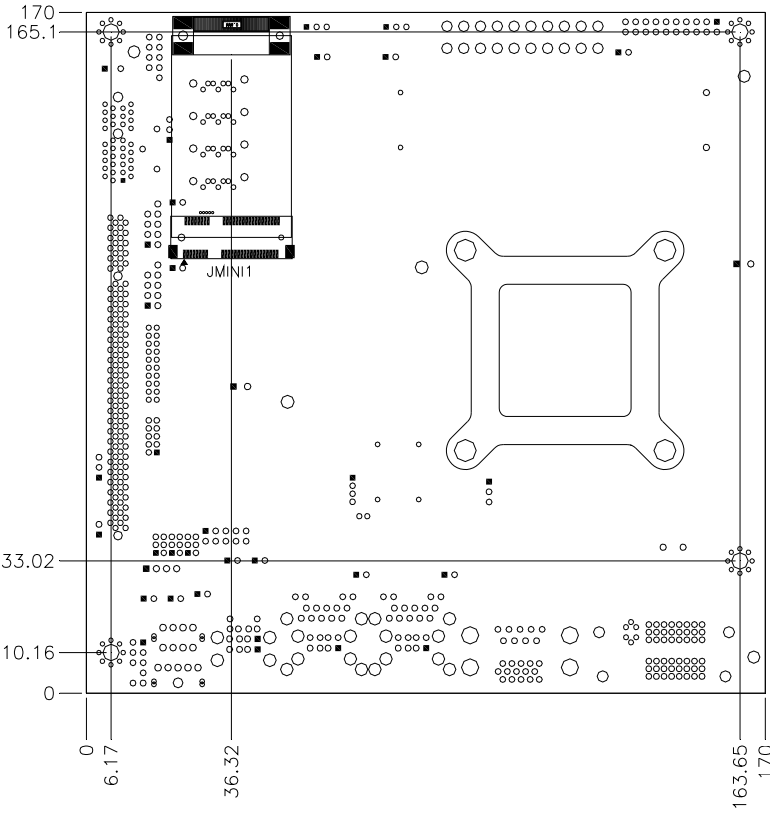
## MI953 Specifications

|                                  |   |
|----------------------------------|---|
| <b>CPU Supported</b>             | Intel® Arrandale DC mobile processor  |
| <b>CPU Voltage</b>               | 0.700V ~ 1.5V (IMVP-6.5)  |
| <b>System Speed</b>              | Up to 3.0GHz or above   |
| <b>CPU FSB</b>                   | 1066MHz FSB   |
| <b>Cache</b>                     | Up to 4MB shared L3 Cache   |
| <b>Green /APM</b>                | APM1.2  |
| <b>CPU Socket</b>                | rPGA Socket 989   |
| <b>Chipset</b>                   | Intel Ibex Peak-M (PCH) Chipset<br>PCH: 25mm x 27mm, 1071-pin FCBGA   |
| <b>BIOS</b>                      | AMI BIOS, supports ACPI function  |
| <b>Memory</b>                    | DDR3 800/1066 SoDIMM x2 (w/o ECC function), Max. 8GB  |
| <b>VGA</b>                       | Arrandale DC mobile processor integrated graphics<br>Supports CRT<br>Supports DVI single or Dual  |
| <b>LVDS LCD Panel</b>            | Arrandale DC mobile processor built-in, supports 24-bit, single or dual channel LVDS  |
| <b>LAN</b>                       | 1. PCH 10/100/gigabit MAC + PHY <ul style="list-style-type: none"> <li>Intel 82577LM 10/100/1000</li> </ul> 2. Intel 82574L PCI-e Gigabit LAN controller x1 (MI953F)  |
| <b>USB</b>                       | PCH built-in USB 2.0 host controller, support 10 ports  |
| <b>Serial ATA Ports</b>          | PCH built-in SATA controller, supports 4 ports  |
| <b>IAMT6.0</b>                   | PCH built-in Intel Active Management Technology VER 6.0 with HW KVM (MI953RF only)  |
| <b>Audio</b>                     | PCH built-in High Definition audio controller:ALC888 w/ 7.1 channels  |
| <b>LPC I/O</b>                   | F81865F: COM1, COM2 (RS232/RS422/RS485), COM3 and COM4<br>Hardware monitor (3 thermal, 4 voltage monitor inputs, 2 fan headers)   |
| <b>Digital IO</b>                | 4 in & 4 out  |
| <b>Keyboard/Mouse</b>            | Supports PS/2 keyboard/mouse connector  |
| <b>Expansion Slots</b>           | PCI slot x1, PIC-E (x1) slot x1 and Mini PCIE socket x1   |
| <b>Edge Connector</b>            | PS/2 connector x1 for keyboard/mouse and dual USB stack connector<br>Gigabit LAN RJ-45 + dual USB stack connector x2<br>DVI-D and DVI-I stack connector x1<br>DB9 x1 for COM 1; DB15 x1 for VGA<br>RCA Jack 3x1 for Audio (Front-Out, Line-In, Mic)   |
| <b>Onboard Header/ Connector</b> | 10-pin headerx1 for Digital I/O; 10-pin header x1 for COM2<br>20-pin header x1 for COM3, COM4<br>10-pin header x 2 for USB 7,8; 9,10<br>DF13 connector x2 for LVDS;<br>10-pin header x1 for audio Line-Out & Mic<br>4-pin header x1 for CD in, SPDIF-out connector x1<br>SATA connector x4 for SATA ports |
| <b>Watchdog Timer</b>            | Yes (256 segments, 0, 1, 2...255 sec/min)   |
| <b>System Voltage</b>            | +5V, +3.3V, +12V, -12V, 5VSB (2A)   |
| <b>Others</b>                    | Modem Wakeup, LAN Wakeup  |
| <b>Board Size</b>                | 170mm x 170mm (Mini ITX)  |

# Board Dimensions







## Installations

This section provides information on how to use the jumpers and connectors on the MI953 in order to set up a workable system. The topics covered are:

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| Installing the Memory..... | 8  |
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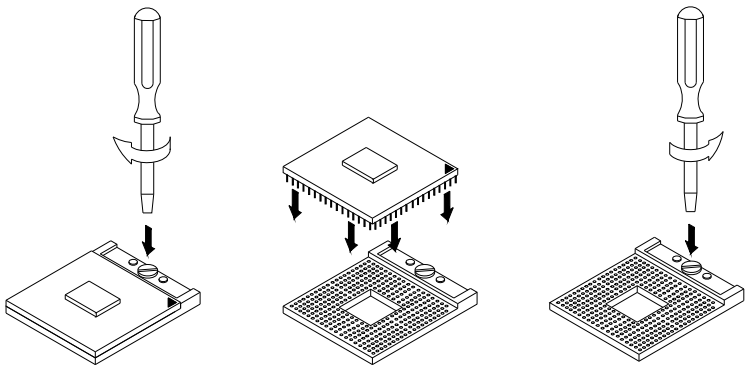
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## Installing the CPU

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The MI953 board supports rPGA989 socket for Intel® Arrandale Dual Core mobile processors.

The processor socket comes with a screw to secure the processor. As shown in the left picture below, loosen the screw first before inserting the processor. Place the processor into the socket by making sure the notch on the corner of the CPU corresponds with the notch on the inside of the socket. Once the processor has slide into the socket, fasten the screw. Refer to the figures below.



**NOTE:** Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.

## Installing the Memory

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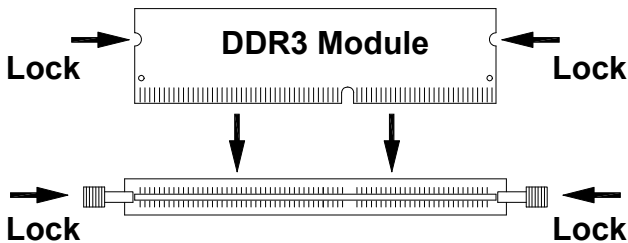
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The MI953 board supports two DDR3 memory socket for a maximum total memory of 8GB in DDR3 SO-DIMM memory type.

### Installing and Removing Memory Modules

To install the DDR3 modules, 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 aligned with that on the memory slot.
2. Gently push the DDR3 module in an upright position until the clips of the slot close to hold the DDR3 module in place when the DDR3 module touches the bottom of the slot.
3. To remove the DDR3 module, press the clips with both hands.



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## Setting the Jumpers

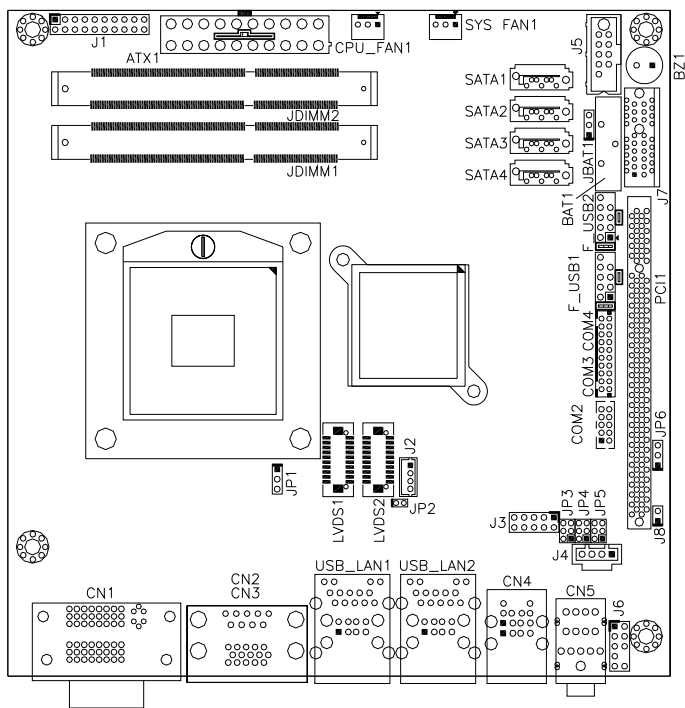
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Jumpers are used on MI953 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MI953 and their respective functions.

|   |    |
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***IMPORTANT NOTE: When the system boots without the CRT being connected, there will be no image on screen when you insert the CRT/VGA cable. To show the image on screen, the hotkey must be pressed.***

Jumper Locations on MI953



Jumpers on MI953 ..... Page

JP1: LCD Panel Power Selection..... 11



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**JP1: LCD Panel Power Selection**

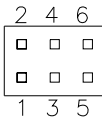
| JP1   | LCD Panel Power |
|---|-----------------|
|  | 3.3V            |
|  | 5V              |

**JP3, JP4, JP5: RS232/422/485 (COM2) Selection**

COM1 is fixed for RS-232 use only.

COM2 is selectable for RS232, RS-422 and RS-485.

The following table describes the jumper settings for COM2 selection.





| COM2 Function                  | RS-232            | RS-422            | RS-485            |
|--------------------------------|-------------------|-------------------|-------------------|
| Jumper Setting<br>(pin closed) | JP3:<br>1-2       | JP3:<br>3-4       | JP3:<br>5-6       |
|                                | JP4:<br>3-5 & 4-6 | JP4:<br>1-3 & 2-4 | JP4:<br>1-3 & 2-4 |
|                                | JP5:<br>3-5 & 4-6 | JP5:<br>1-3 & 2-4 | JP5:<br>1-3 & 2-4 |



COM2 is jumper selectable for RS-232, RS-422 and RS-485.

| Pin # | Signal Name |        |        |
|-------|-------------|--------|--------|
|       | RS-232      | R2-422 | RS-485 |
| 1     | DCD         | TX-    | DATA-  |
| 2     | RX          | TX+    | DATA+  |
| 3     | TX          | RX+    | NC     |
| 4     | DTR         | RX-    | NC     |
| 5     | Ground      | Ground | Ground |
| 6     | DSR         | RTS-   | NC     |
| 7     | RTS         | RTS+   | NC     |
| 8     | CTS         | CTS+   | NC     |
| 9     | RI          | CTS-   | NC     |
| 10    | NC          | NC     | NC     |



### JP6: PCI/PCIE Riser Card Selection

| JP6  | Riser Card                         |
|--|------------------------------------|
| <br>1 2 3 | IP390 Riser Card<br>Install        |
| <br>1 2 3 | IP151, IP240 Riser Card<br>Install |

### JBAT1: Clear CMOS Setting

| JBAT1  | Setting    |
|--|------------|
| <br>1 2 3  | Normal     |
| <br>1 2 3 | Clear CMOS |

### JP8: PS/2 Keyboard/Mouse Power Selection

| JP8  | KB/MS Power |
|--|-------------|
| <br>1 2 3 | +5V         |
| <br>1 2 3 | 5V_DUAL     |



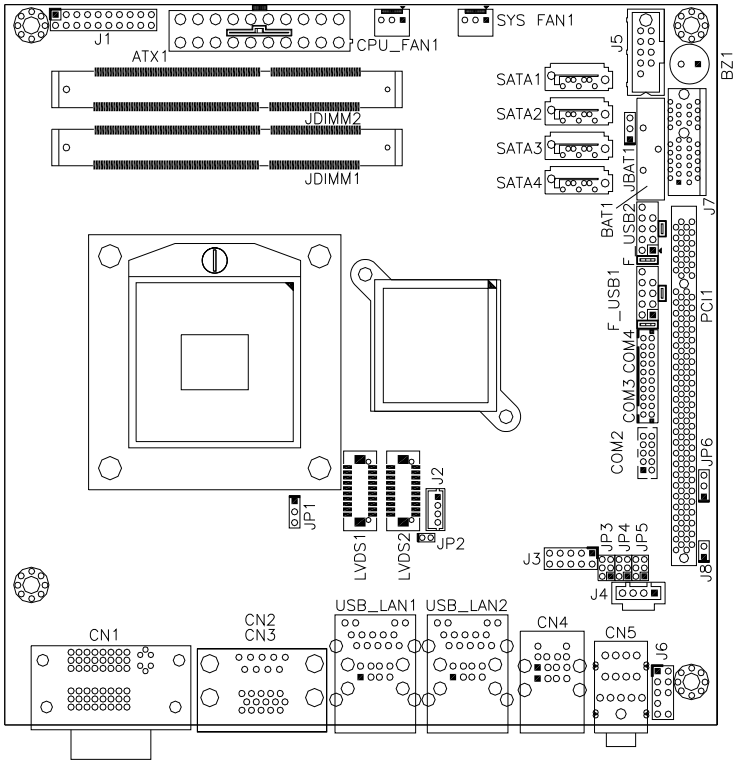
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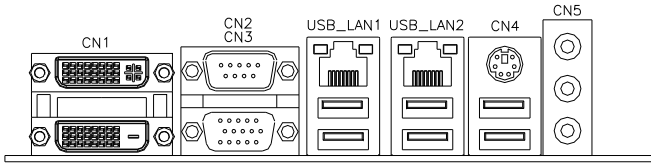
## Connectors on MI953

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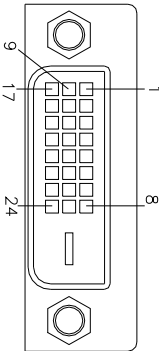
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| JMINI: Mini PCIE Connector .....                               | 22 |
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Connector Locations on MI953

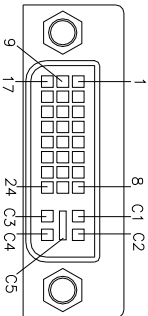




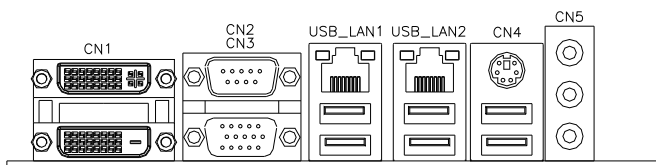
**CN1: DVI-D and DVI-I Connector**



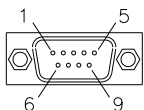
| Signal Name | Pin # | Pin # | Signal Name |
|-------------|-------|-------|-------------|
| DATA 2-     | 1     | 16    | HOT POWER   |
| DATA 2+     | 2     | 17    | DATA 0-     |
| Shield 2/4  | 3     | 18    | DATA 0+     |
| DATA 4-     | 4     | 19    | SHIELD 0/5  |
| DATA 4+     | 5     | 20    | DATA 5-     |
| DDC CLOCK   | 6     | 21    | DATA 5+     |
| DDC DATA    | 7     | 22    | SHIELD CLK  |
| N.C         | 8     | 23    | CLOCK -     |
| DATA 1-     | 9     | 24    | CLOCK +     |
| DATA 1+     | 10    | C1    | N.C.        |
| SHIELD 1/3  | 11    | C2    | N.C.        |
| DATA 3-     | 12    | C3    | N.C.        |
| DATA 3+     | 13    | C4    | N.C.        |
| DDC POWER   | 14    | C5    | N.C.        |
| A GROUND 1  | 15    | C6    | N.C.        |



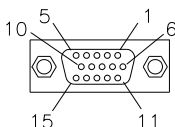
| Signal Name | Pin # | Pin # | Signal Name |
|-------------|-------|-------|-------------|
| DATA 2-     | 1     | 16    | HOT POWER   |
| DATA 2+     | 2     | 17    | DATA 0-     |
| Shield 2/4  | 3     | 18    | DATA 0+     |
| DATA 4-     | 4     | 19    | SHIELD 0/5  |
| DATA 4+     | 5     | 20    | DATA 5-     |
| DDC CLOCK   | 6     | 21    | DATA 5+     |
| DDC DATA    | 7     | 22    | SHIELD CLK  |
| N.C         | 8     | 23    | CLOCK -     |
| DATA 1-     | 9     | 24    | CLOCK +     |
| DATA 1+     | 10    | C1    | N.C         |
| SHIELD 1/3  | 11    | C2    | N.C         |
| DATA 3-     | 12    | C3    | N.C         |
| DATA 3+     | 13    | C4    | N.C         |
| DDC POWER   | 14    | C5    | A GROUND2   |
| A GROUND 1  | 15    | C6    | A GROUND3   |



**CN2, CN3: COM1 and VGA Connector**

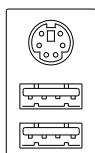


| Signal Name | Pin # | Pin # | Signal Name |
|-------------|-------|-------|-------------|
| DCD         | 1     | 6     | DSR         |
| RXD         | 2     | 7     | RTS         |
| TXD         | 3     | 8     | CTS         |
| DTR         | 4     | 9     | RI          |
| GND         | 5     | 10    | Not Used    |



| Signal Name | Pin # | Pin # | Signal Name |
|-------------|-------|-------|-------------|
| Red         | 1     | 2     | Green       |
| Blue        | 3     | 4     | N.C.        |
| GND         | 5     | 6     | GND         |
| GND         | 7     | 8     | GND         |
| N.C.        | 9     | 10    | GND         |
| N.C.        | 11    | 12    | DDC_DATA    |
| HSYNC       | 13    | 14    | VSYNC       |
| DDC_CLK     | 15    |       |             |

**CN4: PS/2 Keyboard/Mouse Connectors and USB5/6 Ports**



KB/MS PS/2 Keyboard & Mouse

USB6 USB Port5 /Port6

USB5

| Signal Name    | Keyboard/Mouse |
|----------------|----------------|
| Keyboard data  | 1              |
| Mouse data     | 2              |
| GND            | 3              |
| 5V             | 4              |
| Keyboard clock | 5              |
| Mouse clock    | 6              |

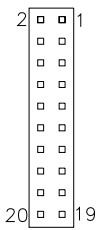
**USB\_LAN1: 10/100/1000 RJ-45 (MI953F) and USB3/4 Ports**

**USB\_LAN2: 10/100/1000 RJ-45 (MI953) and USB1/2 Ports**

**CN5: Audio Connector**

The audio connector, from top to bottom, is composed of Line in, Line out and Microphone jacks.

**COM3\_COM4: COM3, COM4 Serial Port**



| Signal Name | Pin # | Pin # | Signal Name |
|-------------|-------|-------|-------------|
| DSR         | 2     | 1     | DCD         |
| RTS         | 4     | 3     | RXD         |
| CTS         | 6     | 5     | TXD         |
| RI          | 8     | 7     | DTR         |
| NA          | 10    | 9     | Ground      |
| DSR         | 12    | 11    | DCD         |
| RTS         | 14    | 13    | RXD         |
| CTS         | 16    | 15    | TXD         |
| RI          | 18    | 17    | DTR         |
| NA          | 20    | 19    | Ground      |

**SYS\_FAN1: System Fan Power Connector**

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



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

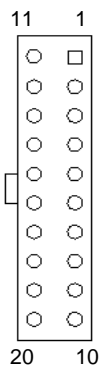
**CPU\_FAN1: CPU Fan Power Connector**

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



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

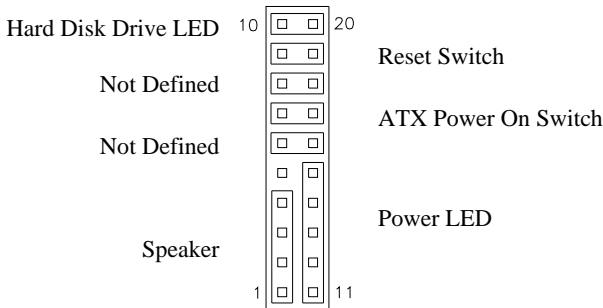
**ATX1: ATX Power Supply Connector**



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

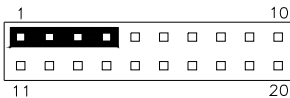
**J1 (F\_PANEL): System Function Connector**

J1 provides connectors for system indicators that provide light indication of the computer activities and switches to change the computer status. J2 is a 20-pin header that provides interfaces for the following functions.



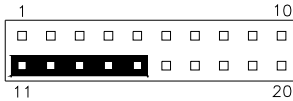
**Speaker: Pins 1 - 4**

This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.



| Pin # | Signal Name |
|-------|-------------|
| 1     | Speaker out |
| 2     | No connect  |
| 3     | Ground      |
| 4     | +5V         |

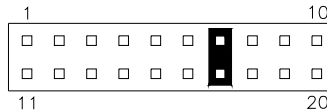
**Power LED: Pins 11 - 15**



| Pin # | Signal Name |
|-------|-------------|
| 11    | Power LED   |
| 12    | No connect  |
| 13    | Ground      |
| 14    | No connect  |
| 15    | Ground      |

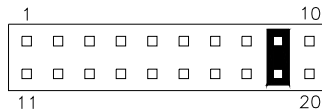
**ATX Power ON Switch: Pins 7 and 17**

This 2-pin connector is an “ATX Power Supply On/Off Switch” on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.



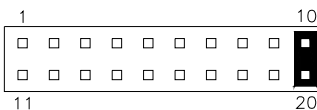
**Reset Switch: Pins 9 and 19**

The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.



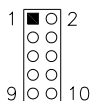
**Hard Disk Drive LED Connector: Pins 10 and 20**

This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



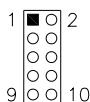
| Pin # | Signal Name |
|-------|-------------|
| 10    | HDD Active  |
| 20    | 5V          |

### F\_USB1: USB7/USB8 Connector



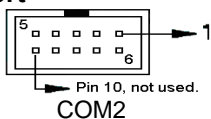
| Signal Name | Pin | Pin | Signal Name |
|-------------|-----|-----|-------------|
| Vcc         | 1   | 2   | Vcc         |
| D0-         | 3   | 4   | D1-         |
| D0+         | 5   | 6   | D1+         |
| Ground      | 7   | 8   | Ground      |
| NC          | 9   | 10  | Ground      |

### F\_USB2: USB9/USB10 Connector



| Signal Name | Pin | Pin | Signal Name |
|-------------|-----|-----|-------------|
| Vcc         | 1   | 2   | Vcc         |
| D0-         | 3   | 4   | D1-         |
| D0+         | 5   | 6   | D1+         |
| Ground      | 7   | 8   | Ground      |
| NC          | 9   | 10  | Ground      |

### COM2: COM2 Serial Port

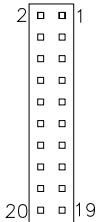


| Signal Name              | Pin # | Pin # | Signal Name          |
|--------------------------|-------|-------|----------------------|
| DCD, Data carrier detect | 1     | 6     | DSR, Data set ready  |
| RXD, Receive data        | 2     | 7     | RTS, Request to send |
| TXD, Transmit data       | 3     | 8     | CTS, Clear to send   |
| DTR, Data terminal ready | 4     | 9     | RI, Ring indicator   |
| GND, ground              | 5     | 10    | Not Used             |




**LVDS1, LVDS2: LVDS Connectors (1st channel, 2nd channel)**

The LVDS connectors on board consist of the first channel (LVDS1) and second channel (LVDS2).



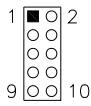
| Signal Name | Pin # | Pin # | Signal Name |
|-------------|-------|-------|-------------|
| TX0-        | 2     | 1     | TX0+        |
| Ground      | 4     | 3     | Ground      |
| TX1-        | 6     | 5     | TX1+        |
| 5V/3.3V     | 8     | 7     | Ground      |
| TX3-        | 10    | 9     | TX3+        |
| TX2-        | 12    | 11    | TX2+        |
| Ground      | 14    | 13    | Ground      |
| TXC-        | 16    | 15    | TXC+        |
| 5V/3.3V     | 18    | 17    | ENABKL      |
| +12V        | 20    | 19    | +12V        |

**J2: LCD Backlight Connector**




| Pin # | Signal Name        |
|-------|--------------------|
| 1     | +12V               |
| 2     | Backlight Enable   |
| 3     | Brightness Control |
| 4     | Ground             |

**J3: Digital I/O**



| Signal Name | Pin | Pin | Signal Name |
|-------------|-----|-----|-------------|
| GND         | 1   | 2   | VCC         |
| OUT3        | 3   | 4   | OUT1        |
| OUT2        | 5   | 6   | OUT0        |
| IN3         | 7   | 8   | IN1         |
| IN2         | 9   | 10  | IN0         |

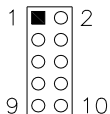
**J4: CD-In Pin Header**



| Pin # | Signal Name |
|-------|-------------|
| 1     | CD Audio R  |
| 2     | Ground      |
| 3     | Ground      |
| 4     | CD Audio L  |

**J5: SPI Flash Connector (factory use only)**

**J6: Front Audio Connector**



| Signal Name | Pin # | Pin # | Signal Name |
|-------------|-------|-------|-------------|
| MIC2_L      | 1     | 2     | Ground      |
| MIC2_R      | 3     | 4     | Presence#   |
| Line2_L     | 5     | 6     | MIC2_ID     |
| Sense       | 7     | 8     | NC          |
| Line2_R     | 9     | 10    | Line2_ID    |

**J7: PCI-E(x1) Slot**

**J8: SPDIF Out Connector**

**PCI1: PCI Slot (supports 2 Master)**

**JMINI: Mini PCIE Connector**

**SATA1, SATA2, SATA3, SATA4: SATA Connectors**

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# 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 .....    | 24 |
| BIOS Setup .....           | 24 |
| Main BIOS Setup .....      | 25 |
| Advanced Settings .....    | 26 |
| Chipset Settings .....     | 37 |
| Boot Settings .....        | 41 |
| Security Settings .....    | 42 |
| Save & Exit Settings ..... | 43 |

## 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 provides 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.

## Main BIOS Setup

This setup allows you to record some basic hardware configurations in your computer system and set the system clock.

| Aptio Setup Utility     |          |         |                     |          |                       |
|-------------------------|----------|---------|---------------------|----------|-----------------------|
| Main                    | Advanced | Chipset | Boot                | Security | Save & Exit           |
| <b>BIOS INFORMATION</b> |          |         |                     |          |                       |
| Memory Information      |          |         |                     |          |                       |
| Total Memory            |          |         | 4096 MB (DDR3 1066) |          | → ← Select Screen     |
| System Language         |          |         | [English]           |          | ↑ ↓ Select Item       |
| System Date             |          |         | [Tue 01/06/2009]    |          | Enter: Select         |
| System Time             |          |         | [00:08:21]          |          | + - Change Field      |
| Access Level            |          |         | Administrator       |          | F1: General Help      |
|                         |          |         |                     |          | F2: Previous Values   |
|                         |          |         |                     |          | F3: Optimized Default |
|                         |          |         |                     |          | F4: Save ESC: Exit    |

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

**Warning:** It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both 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 Language

Choose the system default language.

### System Date

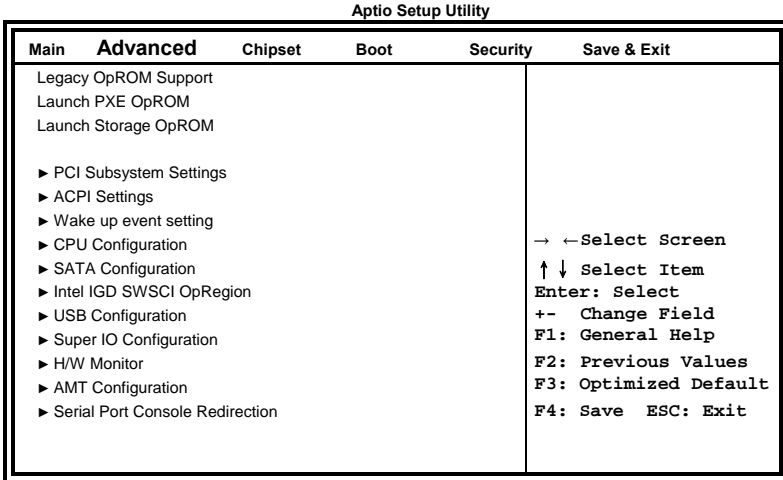
Set the Date. Use Tab to switch between Data elements.

### 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.

### Launch Storage OpROM

Enable or Disable Boot Option for Legacy Mass Storage Devices with Option ROM.

#### ▶ Wake up event setting

Enable/Disable Wake up event.

#### ▶ Intelligent Power Sharing

Intelligent Power Sharing configuration menu.

*NOTE: DTS must be enabled for Power Sharing to function.*

#### ▶ MXM 3.0/Hybrid Graphics

Enable/Disable the MXM 3.0 support..

## PCI Subsystem Settings

This section allows you to configure the PCI, PCI-X and PCI Express settings.

### Aptio Setup Utility

| Main | Advanced               | Chipset | Boot               | Security | Save & Exit  |
|------|------------------------|---------|--------------------|----------|--|
|      | PCI Bus Driver Version |         | V 2.02.01          |          |  |
|      | PCI ROM Priority       |         | EFI Compatible ROM |          |  |
|      | PCI Common Settings    |         |                    |          |  |
|      | PCI Latency Timer      |         | 32 PCI Bus Clocks  |          |  |
|      |                        |         |                    |          | → ← Select Screen<br>↑ ↓ Select Item<br>Enter: Select<br>+- Change Field<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Default<br>F4: Save ESC: Exit |

### 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.

## ACPI Settings

Aptio Setup Utility

| Main               | Advanced | Chipset | Boot                 | Security | Save & Exit           |
|--------------------|----------|---------|----------------------|----------|-----------------------|
| Enable Hibernation |          |         | Enabled              |          |                       |
| ACPI Sleep State   |          |         | S3 (Suspend to R...) |          |                       |
|                    |          |         |                      |          | → ← Select Screen     |
|                    |          |         |                      |          | ↑ ↓ Select Item       |
|                    |          |         |                      |          | Enter: Select         |
|                    |          |         |                      |          | + - Change Field      |
|                    |          |         |                      |          | F1: General Help      |
|                    |          |         |                      |          | F2: Previous Values   |
|                    |          |         |                      |          | F3: Optimized Default |
|                    |          |         |                      |          | F4: Save ESC: Exit    |

### 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.



## Wake up event settings

Aptio Setup Utility

| Main | Advanced                    | Chipset | Boot     | Security | Save & Exit           |
|------|-----------------------------|---------|----------|----------|-----------------------|
|      | Wake system with Fixed Time |         | Disabled |          |                       |
|      | Wake up hour                |         | 0        |          | → ← Select Screen     |
|      | Wake up minute              |         | 0        |          | ↑ ↓ Select Item       |
|      | Wake up second              |         | 0        |          | Enter: Select         |
|      | Wake on Ring                |         | Enabled  |          | + - Change Field      |
|      | Wake on PME                 |         | Enabled  |          | F1: General Help      |
|      |                             |         |          |          | F2: Previous Values   |
|      |                             |         |          |          | F3: Optimized Default |
|      |                             |         |          |          | F4: Save ESC: Exit    |

### Wake system with Fixed Time

Enables or Disables 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 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) Core(TM) i5 CPU |      |          |  |
| EMT64                           |          | Supported                |      |          |  |
| Processor Speed                 |          | 2394 MHz                 |      |          |  |
| Processor Stepping              |          | 20652                    |      |          |  |
| Microcode Revision              |          | 9                        |      |          |  |
| Processor Cores                 |          | 2                        |      |          |  |
| Intel HT Technology             |          | Supported                |      |          |  |
| Hyper-threading                 |          | Enabled                  |      |          |  |
| Active Processor Cores          |          | All                      |      |          |  |
| Limit CPUID Maximum             |          | Disabled                 |      |          |  |
| Hardware Prefetcher             |          | Enabled                  |      |          |  |
| Adjacent Cache Line Prefetch    |          | Enabled                  |      |          |  |
| Intel Virtualization Technology |          | Disabled                 |      |          |  |
| Power Technology                |          | Energy Efficient         |      |          |  |
| TDC Limit                       |          | 0                        |      |          |  |
| TDP Limit                       |          | 0                        |      |          |  |
|                                 |          |                          |      |          | → ← Select Screen<br>↑ ↓ Select Item<br>Enter: Select<br>+- Change Field<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Default<br>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.

### Active Processor Cores

Number of cores to enable in each processor package.

### Limit CPUID Maximum

Disabled for Windows XP.

### Hardware Prefetcher

To turn on/off the MLC streamer prefetcher.

## Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

## Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

## Power Technology

Enable the power management features.

## TDC Limit / TDP Limit

Turbo-XE Mode Processor TDC Limit in 1/8 A granularity. 0 means using the factory-configured value.

## SATA Configuration

SATA Devices Configuration.

| Aptio Setup Utility     |          |                          |      |                       |                   |
|-------------------------|----------|--------------------------|------|-----------------------|-------------------|
| Main                    | Advanced | Chipset                  | Boot | Security              | Save & Exit       |
| SATA Configuration      |          |                          |      |                       | → ← Select Screen |
| SATA Port0              |          | Hitachi HDS721 (160.0GB) |      | ↑ ↓ Select Item       |                   |
| SATA Port1              |          | Not Present              |      | Enter: Select         |                   |
| SATA Port2              |          | Not Present              |      | +- Change Field       |                   |
| SATA Port3              |          | Not Present              |      | F1: General Help      |                   |
| SATA Port4              |          | Not Present              |      | F2: Previous Values   |                   |
| SATA Port5              |          | ATAPI iHDS11 ATAPI       |      | F3: Optimized Default |                   |
| SATA Mode               |          | IDE Mode                 |      | F4: Save ESC: Exit    |                   |
| Serial-ATA Controller 0 |          | Compatible               |      |                       |                   |
| Serial-ATA Controller 1 |          | Enhanced                 |      |                       |                   |

## SATA Mode

- (1) IDE Mode.
- (2) AHCI Mode.
- (3) RAID Mode.

## Serial-ATA Controller

Enable / Disable Serial ATA Controller.

## Intel IGD SWSCI OpRegion

| Aptio Setup Utility                    |                    |         |                 |          |                       |
|--|--------------------|---------|-----------------|----------|-----------------------|
| Main                                   | Advanced           | Chipset | Boot            | Security | Save & Exit           |
| Intel IGD SWSCI OpRegion Configuration |                    |         |                 |          |                       |
|  | DVMT/FIXED Memory  |         | 256MB           |          |                       |
|  | IGD – Boot Type    |         | VBIOS Default   |          |                       |
|  | Active LFP         |         | No LVDS         |          | → ← Select Screen     |
|  | Panel Color Depth  |         | 18 Bit          |          | ↑ ↓ Select Item       |
|  | LFP LCD Panel Type |         | 1024 x 768 LVDS |          | Enter: Select         |
|  | Panel Scaling      |         | Auto            |          | + - Change Field      |
|  |                    |         |                 |          | F1: General Help      |
|  |                    |         |                 |          | F2: Previous Values   |
|  |                    |         |                 |          | F3: Optimized Default |
|  |                    |         |                 |          | F4: Save ESC: Exit    |

### DVMT/FIXED Memory

Select DVMT/FIXED Mode Memory size used by Internal Graphics Device. Options are 128MB, 256MB and Maximum.

### IGD – Boot Type

Select the Video Device which will be activated during POST. This has no effect if external graphics present. Options are VBIOS Default, CRT, LFP, CRT+LFP, EFP and CRT+EFP.

### Active LFP

Select the Active LFP Configuration.

No LVDS: VBIOS does not enable LVDS.

Int-LVDS: VBIOS enables LVDS driver by Integrated encoder.

SDVO LVDS : VBIOS enables LVDS driver by SDVO encoder.

eDP: LVDS Driven by Int-DisplayPort encoder.

### Panel Scaling

Select the LCD panel scaling option used by the Internal Graphics Device. Options are Auto, Force Scaling, Off and Maintain Aspect Ratio.

## USB Configuration

Aptio Setup Utility

| Main                   | Advanced | Chipset | Boot | Security | Save & Exit           |
|------------------------|----------|---------|------|----------|-----------------------|
| USB Configuration      |          |         |      |          |                       |
| USB Devices:<br>2 Hubs |          |         |      |          | → ← Select Screen     |
| Legacy USB Support     |          |         |      |          | ↑ ↓ Select Item       |
| EHCI Hand-off          |          |         |      |          | Enter: Select         |
| Device Reset Timeout   |          |         |      |          | + - Change Field      |
| Enabled                |          |         |      |          | F1: General Help      |
| Enabled                |          |         |      |          | F2: Previous Values   |
| 20 sec                 |          |         |      |          | F3: Optimized Default |
|                        |          |         |      |          | F4: Save ESC: Exit    |

### 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.

### Device Reset Timeout

USB mass storage device Start Unit command timeout.

Options are: 10 sec / 20 sec / 30 sec / 40 sec.

## Super IO Configuration

Aptio Setup Utility

| Main                           | Advanced | Chipset | Boot          | Security | Save & Exit           |
|--------------------------------|----------|---------|---------------|----------|-----------------------|
| Super IO Configuration         |          |         |               |          |                       |
| Super IO Chip                  |          |         | Fintek F81865 |          | → ← Select Screen     |
| -> Serial Port 0 Configuration |          |         |               |          | ↑ ↓ Select Item       |
| -> Serial Port 1 Configuration |          |         |               |          | Enter: Select         |
| -> Serial Port 2 Configuration |          |         |               |          | + - Change Field      |
| -> Serial Port 3 Configuration |          |         |               |          | F1: General Help      |
| Power Failure                  |          |         | Always off    |          | F2: Previous Values   |
| Power ON Function              |          |         | Disabled      |          | F3: Optimized Default |
| ACPI Shutdown Temperature      |          |         | Disabled      |          | F4: Save ESC: Exit    |

## 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.

## Power Failure

Options are:

Keep last state

Bypass mode

Always on

Always off (default)

## H/W Monitor

## Aptio Setup Utility

| Main                   | Advanced | Chipset   | Boot | Security   | Save & Exit |
|------------------------|----------|-----------|------|--|-------------|
| PC Health Status       |          |           |      |  |             |
| System Temperature1    |          | +51 C     |      |  |             |
| System Temperature 2   |          | +35 C     |      |  |             |
| System FAN1 Speed      |          | N/A       |      |  |             |
| System FAN2 Speed      |          | 7109 RPM  |      |  |             |
| VCC3V                  |          | +3.408 V  |      |  |             |
| Vin0                   |          | +0.928 V  |      |  |             |
| Vin2                   |          | +5.087 V  |      |  |             |
| Vin3                   |          | +12.232 V |      |  |             |
| VSB3V                  |          | +3.424 V  |      |  |             |
| VBAT                   |          | +3.184 V  |      |  |             |
| Fan1 Smart Fan Control |          | 50 C      |      |  |             |
| Fan2 Smart Fan Control |          | Disabled  |      |  |             |
|                        |          |           |      | → ← Select Screen<br>↑ ↓ Select Item<br>Enter: Select<br>+- Change Field<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Default<br>F4: Save ESC: Exit |             |

### 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.

### Fan1/Fan2 Smart Fan Control

This field enables or disables the smart fan feature. At a certain temperature, the fan starts turning. Once the temperature drops to a certain level, it stops turning again.

## AMT Configuration

| Aptio Setup Utility |          |         |      |  |             |
|---------------------|----------|---------|------|--|-------------|
| Main                | Advanced | Chipset | Boot | Security   | Save & Exit |
| AMT                 |          | Enabled |      | → ← Select Screen<br>↑ ↓ Select Item<br>Enter: Select<br>+- Change Field<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Default<br>F4: Save ESC: Exit |             |

### AMT

Options are Enabled and Disabled.

## Serial Port Console Redirection

| Aptio Setup Utility  |          |                  |      |  |             |
|--|----------|------------------|------|--|-------------|
| Main   | Advanced | Chipset          | Boot | Security   | Save & Exit |
| COM0 (Disabled)  |          | Port is Disabled |      | → ← Select Screen<br>↑ ↓ Select Item<br>Enter: Select<br>+- Change Field<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Default<br>F4: Save ESC: Exit |             |
| Console Redirection  |          | Enabled          |      |  |             |
| Serial Port for Out-of-Band Management/<br>Windows Emergency Management Services (EMS) |          | COM0 (Disabled)  |      |  |             |
| Out-of-Band Mgmt Port  |          | 8                |      |  |             |
| Data Bits  |          | None             |      |  |             |
| Parity   |          | 1                |      |  |             |
| Stop Bits  |          | VT-UTF8          |      |  |             |
| Terminal Type  |          |                  |      |  |             |

### Console Redirection

Console Redirection Enable/Disable.

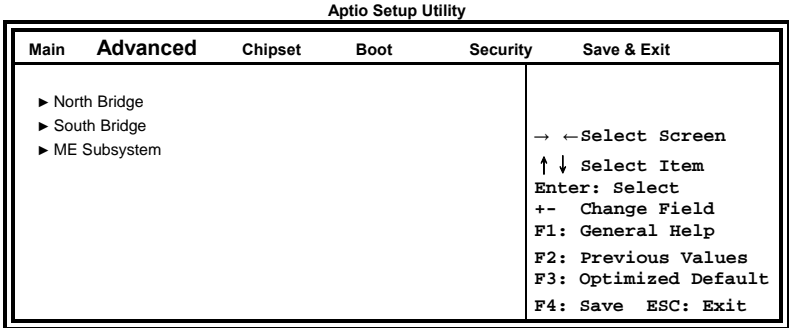
### Terminal Type

VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100.



## 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.



### North Bridge

This item shows the North Bridge Parameters.

### South Bridge

This item shows the South Bridge Parameters.

### ME Subsystem

This item shows the ME Subsystem Parameters.

## North Bridge

This section allows you to configure the North Bridge Chipset.

| Aptio Setup Utility           |          |                     |      |                       |             |
|-------------------------------|----------|---------------------|------|-----------------------|-------------|
| Main                          | Advanced | Chipset             | Boot | Security              | Save & Exit |
| Memory Information            |          |                     |      |                       |             |
| CPU Type                      |          | Arrandale           |      |                       |             |
| Total Memory                  |          | 4096 MB (DDR3 1066) |      |                       |             |
| Memory Slot0                  |          | 2048 MB (DDR3 1066) |      |                       |             |
| Memory Slot1                  |          | 0                   |      |                       |             |
| Memory Slot2                  |          | 2048 MB (DDR3 1066) |      |                       |             |
| Memory Slot3                  |          | 140                 |      |                       |             |
| CAS# Latency(tCL)             |          | 7                   |      |                       |             |
| RAS# Active Time(tRAS)        |          | 20                  |      | → ← Select Screen     |             |
| Row Precharge Time(tRP)       |          | 7                   |      | ↑ ↓ Select Item       |             |
| RAS# to CAS# Delay(tRCD)      |          | 7                   |      | Enter: Select         |             |
| Row Refresh Cycle Timea(tRFC) |          | 60                  |      | +- Change Field       |             |
| Write to Read Delay(tWTR)     |          | 4                   |      | F1: General Help      |             |
| Active to Active Delay(tRRD)  |          | 4                   |      | F2: Previous Values   |             |
| Read CAS# Precharge(tRTP)     |          | 5                   |      | F3: Optimized Default |             |
|                               |          |                     |      | F4: Save ESC: Exit    |             |
| Low MMIO Align                |          | 64M                 |      |                       |             |
| Initiate Graphic Adapter      |          | PEG/IGD             |      |                       |             |
| Graphics Turbo IMON Current   |          | 31                  |      |                       |             |
| VT-d                          |          | Disabled            |      |                       |             |
| PCI Express Port              |          | Auto                |      |                       |             |
| IGD Memory                    |          | 32M                 |      |                       |             |
| PAVP Mode                     |          | Disabled            |      |                       |             |
| PEG Force Gen1                |          | Disabled            |      |                       |             |

### Low MMIO Align

Low MMIO resources align at 64MB/1024MB.

### Initiate Graphic Adapter

Select which graphics controller to use as the primary boot device. Options are IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI and SG.

### Graphics Turbo IMON Current

Graphics turbo IMON current values supported (14-31).

### VT-d

VT-d Enable/Disable.

**PCI Express Port**

Options are Disabled, Enabled and Auto.

**IGD Memory**

IGD Share Memory Size. Options are Disable, 32M, 64M and 128M.

**PAVP Mode**

Select PAVP Mode used by Internal Graphics Device. Options are Disabled and Enabled.

**PEG Force Gen1**

PCI Express Port Force Gen1. Options are Disabled and

## SB Chipset Configuration

This section allows you to configure the South Bridge Chipset.

| Aptio Setup Utility             |          |             |      |  |             |
|---------------------------------|----------|-------------|------|--|-------------|
| Main                            | Advanced | Chipset     | Boot | Security   | Save & Exit |
| SB Chipset Configuration        |          |             |      |  |             |
| SMBus Controller                |          | Enabled     |      |  |             |
| GbE Controller                  |          | Enabled     |      |  |             |
| Wake on LAN from S5             |          | Enabled     |      |  |             |
| SLP_S4 Assertion Stretch Enable |          | Enabled     |      |  |             |
| SLP_S4 Assertion Width          |          | 4-5 Seconds |      |  |             |
| Audio Configuration             |          |             |      |  |             |
| Azalia HD Audio                 |          | Enabled     |      | → ← Select Screen<br>↑ ↓ Select Item<br>Enter: Select<br>+- Change Field<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Default<br>F4: Save ESC: Exit |             |

### SMBus Controller

SMBus Controller help.

### GbE Controller

This is constantly enabled.

### Wake on LAN from S5

Wake on LAN from S5 help.

### Restore AC Power Loss

Options are Power Off, Power On and Last State.

### SLP\_S4 Assertion Stretch Enable

Select a minimum assertion width of the SLP\_S4# signal.

### Audio Configuration

The Audio Configuration settings Enable/Disable the Azalia HD Audio and the Azalia internal HDMI codec.

## Boot Settings

This section allows you to configure the boot settings according to your preference.

| Aptio Setup Utility       |          |         |                    |          |  |
|---------------------------|----------|---------|--------------------|----------|--|
| Main                      | Advanced | Chipset | Boot               | Security | Save & Exit  |
| Boot Configuration        |          |         |                    |          |  |
| Quiet Boot                |          |         | Disabled           |          | → ← Select Screen<br>↑ ↓ Select Item<br>Enter: Select<br>+- Change Field<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Default<br>F4: Save ESC: Exit |
| Fast Boot                 |          |         | Disabled           |          |  |
| Setup Prompt Timeout      |          |         | 1                  |          |  |
| Bootup NumLock State      |          |         | On                 |          |  |
| CSM16 Module Version      |          |         | 07.60              |          |  |
| GateA20 Active            |          |         | Upon Request       |          |  |
| Option ROM Messages       |          |         | Force BIOS         |          |  |
| Interrupt 19 Capture      |          |         | Disabled           |          |  |
| Boot Option Priorities    |          |         |                    |          |  |
| Boot Option #1            |          |         | SATA: ATAPI iH...) |          |  |
| Hard Drive BBS Priorities |          |         |                    |          |  |

### Quiet Boot

Enables/Disables Quiet Boot option.

### Fast Boot

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

### 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.

### 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 for Option ROM. Options are Force BIOS and Keep Current.

### Interrupt 19 Capture

Enable: Allows Option ROMs to trap Int 19.

### Boot Option Priorities

Sets the system boot order.

### Hard Drive BBS Priorities

Set the order of the legacy devices in this group.

## 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.

| Aptio Setup Utility   |          |         |      |          |                       |
|---|----------|---------|------|----------|-----------------------|
| Main  | Advanced | Chipset | Boot | Security | Save & Exit           |
| Password Description  |          |         |      |          |                       |
| If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.                                     |          |         |      |          |                       |
| If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights |          |         |      |          |                       |
| Administrator Password  |          |         |      |          |                       |
| User Password   |          |         |      |          |                       |
|   |          |         |      |          | → ← Select Screen     |
|   |          |         |      |          | ↑ ↓ Select Item       |
|   |          |         |      |          | Enter: Select         |
|   |          |         |      |          | + - Change Field      |
|   |          |         |      |          | F1: General Help      |
|   |          |         |      |          | F2: Previous Values   |
|   |          |         |      |          | F3: Optimized Default |
|   |          |         |      |          | F4: Save ESC: Exit    |

### Administrator Password

Set Setup Administrator Password.

### User Password

Set User Password.

## Save & Exit Settings

| Aptio Setup Utility  |          |         |      |          |  |
|--|----------|---------|------|----------|--|
| Main   | Advanced | Chipset | Boot | Security | Save & Exit  |
| Save Changes and Exit<br>Discard Changes and Exit<br>Save Changes and Reset<br>Discard Changes and Reset |          |         |      |          | → ← Select Screen<br>↑ ↓ Select Item<br>Enter: Select<br>+- Change Field<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Default<br>F4: Save ESC: Exit |
| Save Options<br>Save Changes<br>Discard Changes  |          |         |      |          |  |
| Restore Defaults<br>Save as User Defaults<br>Restore User Defaults                                       |          |         |      |          |  |
| Boot Override<br>SATA: ATAPI iHDS116 4<br>SATA: Hitachi HDS721616PLA380                                  |          |         |      |          |  |
| Launch EFI Shell from filesystem device  |          |         |      |          |  |
| Save Options<br>▶ Reset System with ME disable Mode  |          |         |      |          |  |
|  |          |         |      |          |  |
|  |          |         |      |          |  |
|  |          |         |      |          |  |
|  |          |         |      |          |  |

### 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.

### **Launch EFI Shell from filesystem device**

Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

### **Reset System with ME disable Mode**

ME will run into the temporary disable mode.



---

## Drivers Installation

This section describes the installation procedures for software and drivers under the Windows 2000 and Windows XP. 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 ..... | 46 |
| VGA Drivers Installation .....                    | 48 |
| Realtek HD Audio Driver Installation .....        | 50 |
| LAN Drivers Installation .....                    | 51 |
| Intel® Management Engine Interface .....          | 54 |

### **IMPORTANT NOTE:**

After installing your Windows operating system (Windows 2000/ XP), 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 CD that comes with the board. Click **Intel** and then **Intel(R) QM57 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.

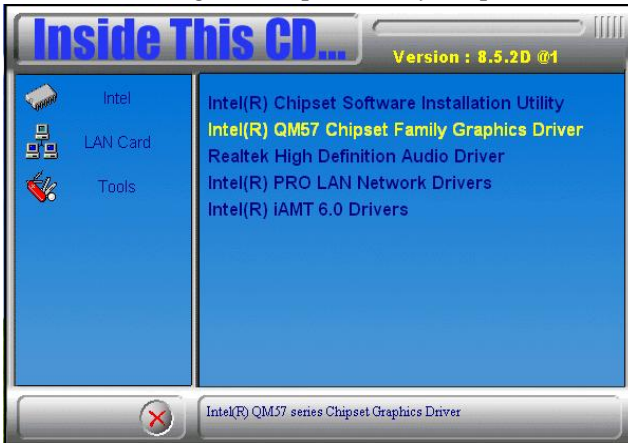
4. Click ***Yes*** to accept the software license agreement and proceed with the installation process.
  
5. On the Readme File Information screen, click ***Next*** to continue the installation.
  
6. The Setup process is now complete. Click ***Finish*** to restart the computer and for changes to take effect.

## VGA Drivers Installation

**NOTE:** Before installing the *Intel(R) QM57 Chipset Family Graphics Driver*, the Microsoft .NET Framework 3.5 SPI should be first installed.

To install the VGA drivers, follow the steps below.

1. Insert the CD that comes with the board. Click *Intel* and then *Intel(R) QM57 Chipset Drivers*.
2. Click *Intel(R) QM57 Chipset Family Graphics Driver*.



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



4. Click **Yes** 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.



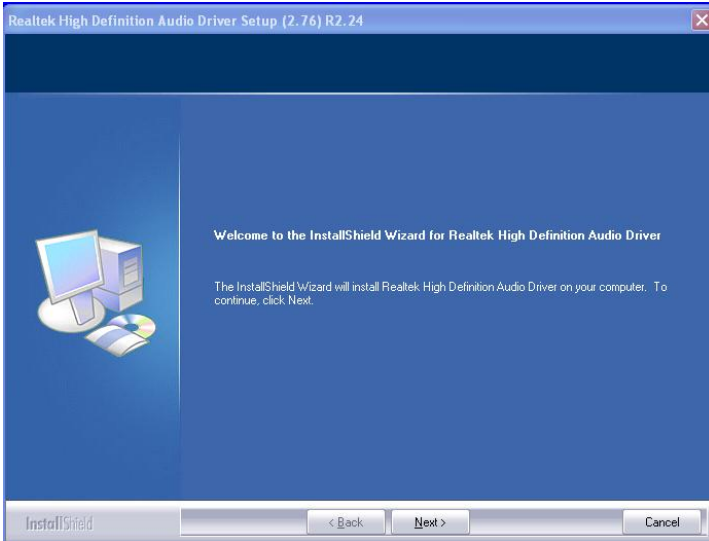
## Realtek HD Audio Driver Installation

Follow the steps below to install the Realtek HD Audio Drivers.

1. Insert the CD that comes with the board. Click **Intel** and then **Intel(R) QM57 Chipset Drivers**.
2. Click **Realtek High Definition Audio Driver**.



3. On the Welcome to the InstallShield Wizard screen, click **Next**.



3. InstallShield Wizard is complete. Click **Finish** to restart the computer.

## LAN Drivers Installation

Follow the steps below to install the Intel LAN drivers.

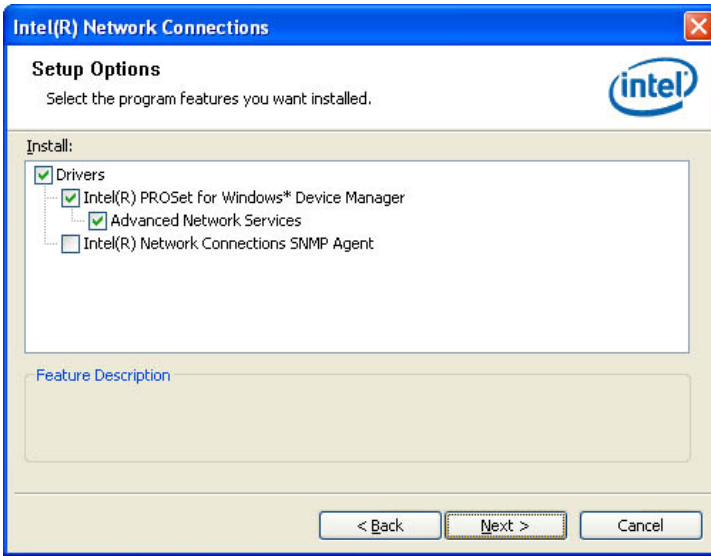
1. Insert the CD that comes with the board. Click *Intel* and then *Intel(R) QM57 Chipset Drivers*.
2. Click *Intel(R) PRO LAN Network Driver*.



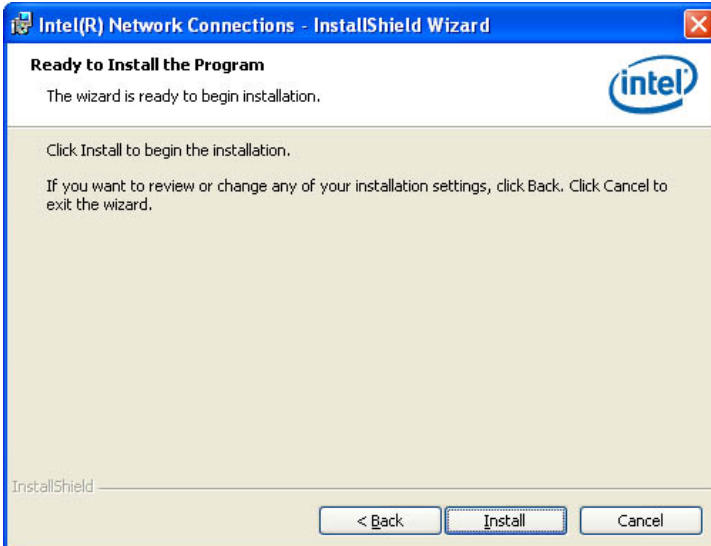
3. When the Welcome screen appears, click *Next*. On the next screen, click *Yes* to to agree with the license agreement.



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

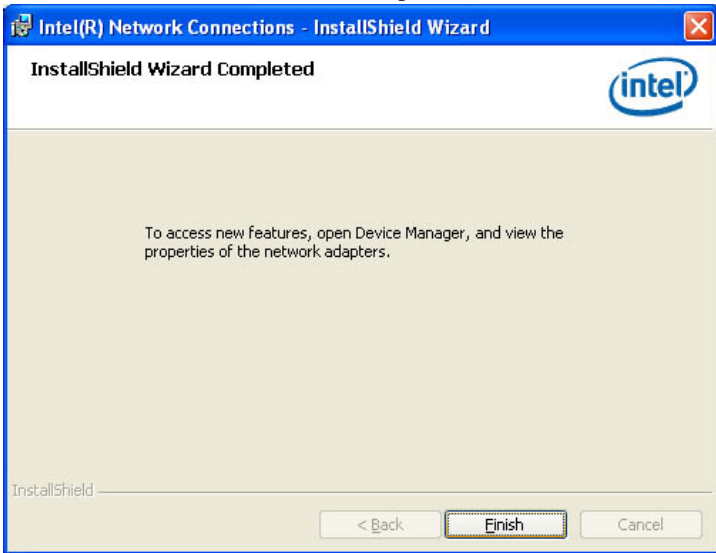


5. The wizard is ready to begin installation. Click **Install** to begin the installation.





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



## Intel® Management Engine Interface

**NOTE:** Before installing the *Intel(R) AMT 6.0 Drivers*, the Microsoft .NET Framework 3.5 SPI should be first installed.



Follow the steps below to install the Intel Management Engine.

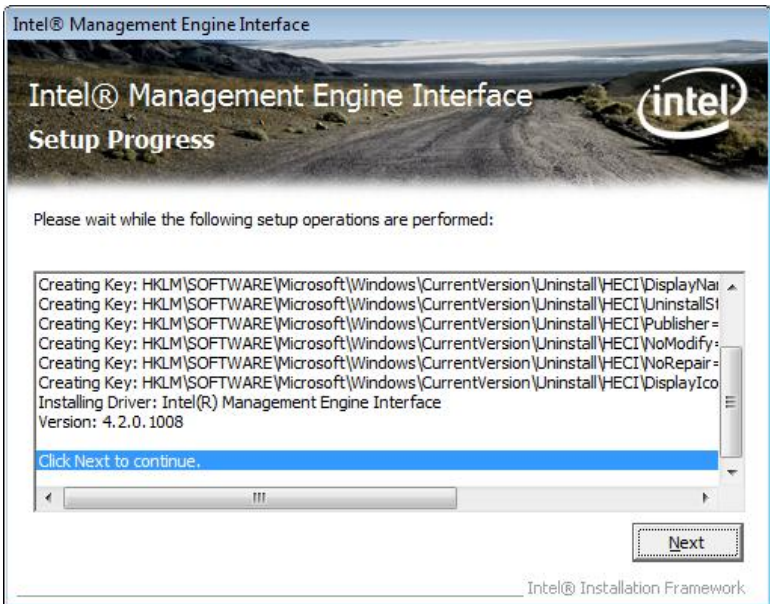
1. Insert the drivers disc that comes with the motherboard. Click *Intel* and then *Intel(R) AMT 6.0 Drivers*.



2. When the Welcome screen to the InstallShield Wizard for Intel® Management Engine Components, click *Next*. On the next screen, click *Yes* to agree with the license agreement.



2. When the Setup Progress screen appears, click *Next*. Then, click *Finish* when the setup progress has been successfully installed.





# 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                      |
| 278h - 27Fh | Parallel Port #2(LPT2)             |
| 2E8h - 2EFh | Serial Port #4(COM4)               |
| 2F8h - 2FFh | Serial Port #2(COM2)               |
| 2B0h - 2DFh | Graphics adapter Controller        |
| 360h - 36Fh | Network Ports                      |
| 3B0h - 3BFh | Monochrome & Printer adapter       |
| 3C0h - 3CFh | EGA adapter                        |
| 3D0h - 3DFh | CGA adapter                        |
| 3E8h - 3EFh | Serial Port #3(COM3)               |
| 3F8h - 3FFh | Serial Port #1(COM1)               |

## B. Interrupt Request Lines (IRQ)

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

| Level | Function            |
|-------|---------------------|
| IRQ0  | System Timer Output |
| IRQ1  | Keyboard            |
| IRQ2  | Interrupt Cascade   |
| IRQ3  | Serial Port #2      |
| IRQ4  | Serial Port #1      |
| IRQ5  | Reserved            |
| IRQ6  | Reserved            |
| IRQ7  | Reserved            |
| IRQ8  | Real Time Clock     |
| IRQ9  | Reserved            |
| IRQ10 | Serial Port #3      |
| IRQ11 | Serial Port #4      |
| IRQ12 | PS/2 Mouse          |
| IRQ13 | 80287               |
| IRQ14 | Primary IDE         |
| IRQ15 | Secondary IDE       |

## 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:

```
//-----
//
// 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 "F81865.H"
//-----
int main (int argc, char *argv[]);
void EnableWDT(int);
void DisableWDT(void);
//-----
int main (int argc, char *argv[])
{
    unsigned char bBuf;
    unsigned char bTime;
    char **endptr;

    char SIO;

    printf("Fintek 81865 watch dog program\n");

    SIO = Init_F81865();
    if (SIO == 0)
    {
        printf("Can not detect Fintek 81865, program abort.\n");
        return(1);
    }/if (SIO == 0)

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

    bTime = strtol (argv[1], endptr, 10);
    printf("System will reset after %d seconds\n", bTime);

    if (bTime)
    {   EnableWDT(bTime); }
    else
    {   DisableWDT();   }

    return 0;
}
```

## APPENDIX

---

```
//-----  
void EnableWDT(int interval)  
{  
    unsigned char bBuf;  
  
    bBuf = Get_F81865_Reg(0x2B);  
    bBuf &= (~0x20);  
    Set_F81865_Reg(0x2B, bBuf); //Enable WDTO  
  
    Set_F81865_LD(0x07); //switch to logic device 7  
    Set_F81865_Reg(0x30, 0x01); //enable timer  
  
    bBuf = Get_F81865_Reg(0xF5);  
    bBuf &= (~0x0F);  
    bBuf |= 0x52;  
    Set_F81865_Reg(0xF5, bBuf); //count mode is second  
  
    Set_F81865_Reg(0xF6, interval); //set timer  
  
    bBuf = Get_F81865_Reg(0xFA);  
    bBuf |= 0x01;  
    Set_F81865_Reg(0xFA, bBuf); //enable WDTO output  
  
    bBuf = Get_F81865_Reg(0xF5);  
    bBuf |= 0x20;  
    Set_F81865_Reg(0xF5, bBuf); //start counting  
}  
//-----  
void DisableWDT(void)  
{  
    unsigned char bBuf;  
  
    Set_F81865_LD(0x07); //switch to logic device 7  
  
    bBuf = Get_F81865_Reg(0xFA);  
    bBuf &= ~0x01;  
    Set_F81865_Reg(0xFA, bBuf); //disable WDTO output  
  
    bBuf = Get_F81865_Reg(0xF5);  
    bBuf &= ~0x20;  
    bBuf |= 0x40;  
    Set_F81865_Reg(0xF5, bBuf); //disable WDT  
}  
//-----
```



```

//-----
//
// 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 "F81865.H"
#include <dos.h>
//-----
unsigned int F81865_BASE;
void Unlock_F81865 (void);
void Lock_F81865 (void);
//-----
unsigned int Init_F81865(void)
{
    unsigned int result;
    unsigned char ucDid;

    F81865_BASE = 0x4E;
    result = F81865_BASE;

    ucDid = Get_F81865_Reg(0x20);
    if (ucDid == 0x07) //Fintek 81865
    {
        goto Init_Finish;
    }

    F81865_BASE = 0x2E;
    result = F81865_BASE;

    ucDid = Get_F81865_Reg(0x20);
    if (ucDid == 0x07) //Fintek 81865
    {
        goto Init_Finish;
    }

    F81865_BASE = 0x00;
    result = F81865_BASE;

Init_Finish:
    return (result);
}
//-----
void Unlock_F81865 (void)
{
    outportb(F81865_INDEX_PORT, F81865_UNLOCK);
    outportb(F81865_INDEX_PORT, F81865_UNLOCK);
}
//-----
void Lock_F81865 (void)
{
    outportb(F81865_INDEX_PORT, F81865_LOCK);
}
//-----
void Set_F81865_LD( unsigned char LD)
{
    Unlock_F81865();
    outportb(F81865_INDEX_PORT, F81865_REG_LD);
    outportb(F81865_DATA_PORT, LD);
    Lock_F81865();
}
//-----
void Set_F81865_Reg( unsigned char REG, unsigned char DATA)
{
    Unlock_F81865();
    outportb(F81865_INDEX_PORT, REG);
    outportb(F81865_DATA_PORT, DATA);
    Lock_F81865();
}
//-----
unsigned char Get_F81865_Reg(unsigned char REG)
{
    unsigned char Result;
    Unlock_F81865();
}

```

## APPENDIX

---

```
    outportb(F81865_INDEX_PORT, REG);
    Result = inportb(F81865_DATA_PORT);
    Lock_F81865();
    return Result;
}
//-----

//-----
//
// 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 __F81865_H
#define __F81865_H                1
//-----
#define F81865_INDEX_PORT        (F81865_BASE)
#define F81865_DATA_PORT        (F81865_BASE+1)
//-----
#define F81865_REG_LD            0x07
//-----
#define F81865_UNLOCK            0x87
#define F81865_LOCK              0xAA
//-----
unsigned int Init_F81865(void);
void Set_F81865_LD(unsigned char);
void Set_F81865_Reg(unsigned char, unsigned char);
unsigned char Get_F81865_Reg(unsigned char);
//-----
#endif // __F81865_H
```