# USER'S MANUAL

## MM-7017

**17" All-in-One Fanless Slim Medical Panel PC With Intel® Atom™ Dual Core D2550 1.86 GHz**

**MM-7017 M1**

# *MM-7017*
# *Intel® Atom™ Dual Core D2550*
## *17" Fanless Slim Medical Panel PC*

### COPYRIGHT NOTICE & TRADEMARK



### DISCLAIMER

This user's manual is meant to assist you in installing and setting up the system. The information contained in this document is subject to change without any notice.

### CE NOTICE

This is a class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

## FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

**CAUTION!** Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
**WARNING!** Some internal parts of the system may have high electrical voltage. And therefore we strongly recommend that qualified engineers can open and disassemble the system. The LCD and touch screen are easily breakable, please handle them with extra care.

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## CHAPTER 2 SYSTEM CONFIGURATION

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## APPENDIX B TECHNICAL SUMMARY

# *INTRODUCTION*

*CHAPTER*

***1***

This chapter gives you the information for MM-7017. It also outlines the System specification.

Section includes:

- About This Manual
- System Specifications
- Safety Precautions

**Experienced users can skip to chapter 2 on page 2-1 for Quick Start.**

# 1-1. ABOUT THIS MANUAL

Thank you for purchasing our MM-7017 Intel® *Atom*™ Dual Core D2550 CPU, 17" fanless slim medical panel PC with VGA/2LAN/6USB. MM-7017 provides faster processing speed, greater expandability and can handle more task than before. This manual is designed to assist you how to install and set up the system. It contains four chapters. The user can apply this manual for configuration according to the following chapters:

***Chapter 1 Introduction***

This chapter introduces you to the background of this manual, and the specifications for this system. The final page of this chapter will indicate how to avoid damaging this board.

***Chapter 2 Hardware Configuration***

This chapter outlines the component locations and their functions. In the end of this chapter, you will learn how to set jumper and how to configure this card to meet your own needs.

***Chapter 3 Software Utilities***

This chapter contains helpful information for proper installations of the VGA utility, LAN utility and Sound utility.

***Chapter 4 BIOS Setup***

This chapter indicates you how to set up the BIOS configurations.

***Appendix A System Diagrams***

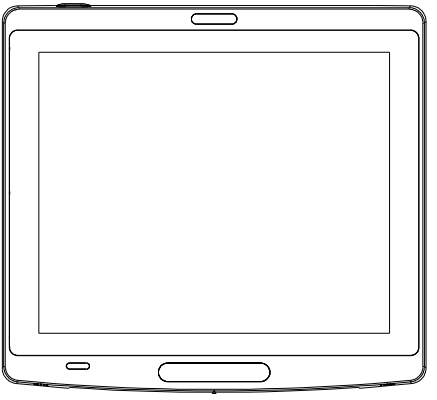
This appendix gives you the exploded diagrams and part numbers of the MM-7017.

***Appendix B Technical Summary***

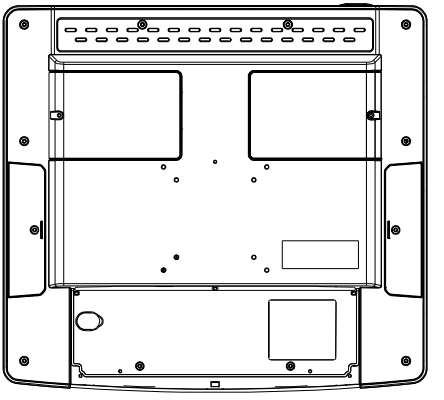
This appendix gives you the information about the Technical maps, Watchdog-timer configuration, and Flash BIOS Update.

## 1-2. SYSTEM ILLUSTRATION

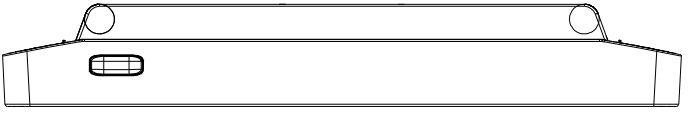
**Front View**



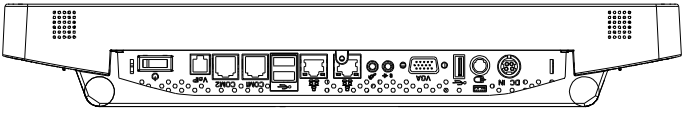
**Rear View**



**Top View**

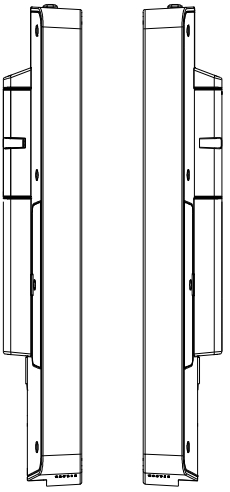


**Bottom View**

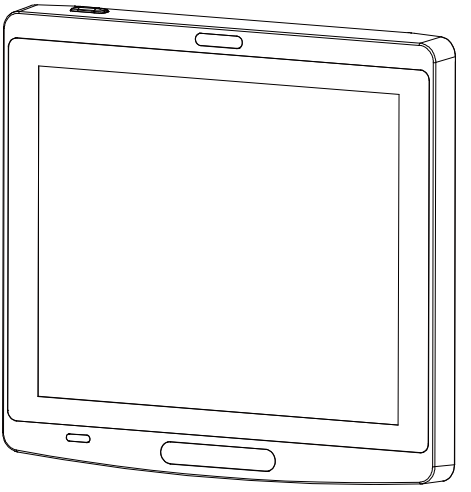


Unit: mm

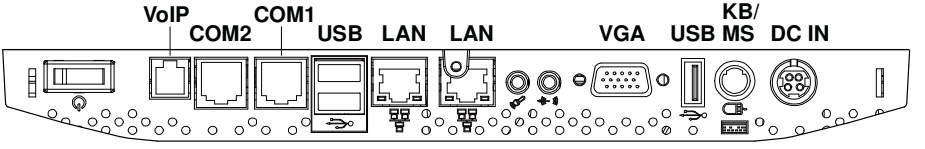
**Side View**



**Quarter View**



**I/O View**




Unit: mm

## 1-3. SYSTEM SPECIFICATION

**System**

| | |
|---|---|
| CPU Support | Intel® Atom™ D2550 1.86 GHz Dual Core (10W); reserved for N2600/N2800 co-layout |
| Chipset | Intel® NM10 |
| OS Support | Windows 7 (32 bit) |
| Memory | ▪ **N2600:** 1 x DDR3 SO-DIMM, up to 1067 MHz & 2GB<br>▪ **D2550/N2800:** 2 x DDR3 SO-DIMM, up to 1067 MHz & 4GB |
| Graphics | Intel® Atom™ D2550 |
| Drive Bay | ▪ 1 x 2.5" SATA HDD<br>▪ 1 x 2.5" SATA SSD (Optional) |
| Wireless LAN | 802.11 b/g/n (Mini-PCIe interface) |
| Power Supply | Medical grade adaptor:<br>AC 100~240V input<br>DC-in 19~24V |
| IP65 | Front panel only |
| Mounting Type | VESA 75 x 100 mm |
| System Weight | 5.95 kg |
| Dimension (W x H x D) | 410.7 x 374.6 x 62 mm |
| Certificate | ▪ Medical Certification: CE/FCC Class B (EN60601-1-2)<br>▪ CE MDD (EN60601-1), UL60601-1 |

**I/O Ports**

| | |
|---|---|
| Serial Port | 4 x COM ports (RI/5V/12V selectable):<br>▪ 2 ports with isolation design (COM1: RS-232; COM2: RS-232/422/485)<br>▪ 2 ports for internal wafer (COM3: external MSR/Smart Card module; COM4: external RFID module or 1D/2D barcode scanner module) |

| | |
|---|---|
| USB | 6 x USB 2.0<br>▪ 3 ports for I/O (USB0/1/2)<br>▪ 3 ports for internal wafer<br>(USB3: VoIP Phone;<br>USB6: camera;<br>USB7: Bluetooth) |
| VGA | 1 x VGA |
| LAN | 2 x LAN (10/100/1000 Mbps), Realtek RTL8111DL-VB-GR |
| Audio | High Definition: Realtek ALC888<br>▪ 1 x Line-out<br>▪ 1 x MIC-in |
| Expansion slot | ▪ 1 x Mini-PCIe slot (for Wireless LAN) |

**Display**

| | |
|---|---|
| LCD Panel Size | 17" TFT 1280 x 1024 LCD with LED backlight |
| Resolution (Brighness) | 1280 x 1024 SXGA 350 nits<br>Max. color up to 16.7M<br>Contrast 700:1 |
| Touchscreen | 5-wire Bezel Free Resistive or Projected Capacitive |
| Life Cycle | 50000 hrs |

**Environment**

| | |
|---|---|
| Operation Temp. | 0 ~ 40°C (32 ~ 104°F) |
| Storage Temp. | -20 ~ 60°C (-4 ~ 140°F) |
| Humidity | 20 ~ 90% |

## 1-4. SAFETY PRECAUTIONS

Follow the messages below to avoid your systems from damage:

1. Keep your system away from static electricity on all occasions.

2. Prevent electric shock. Don't touch any components of this card when the card is power-on. Always disconnect power when the system is not in use.

3. Disconnect power when you change any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

CHAPTER

2

# *HARDWARE CONFIGURATION*

# *** QUICK START ***

Helpful information describes the jumper & connector settings, and component locations.

Section includes:

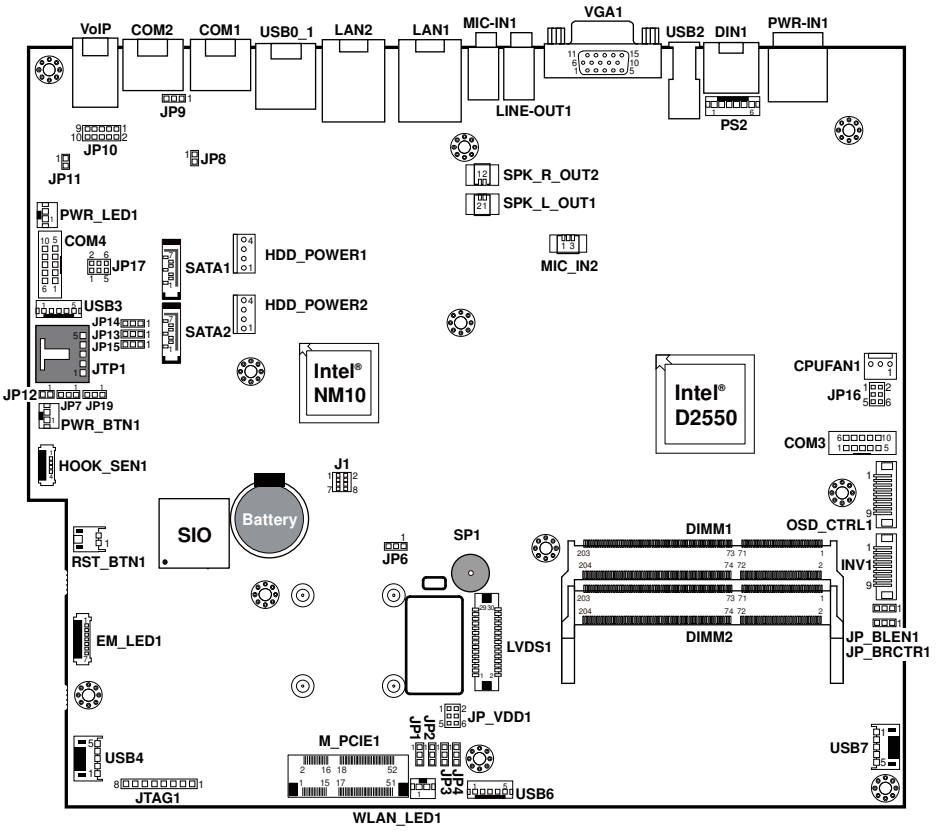
- Jumper & Connector Quick Reference Table
- Component Locations
- Configuration and Jumper settings
- Connector's Pin Assignments

## 2-1. JUMPER & CONNECTOR QUICK REFERENCE TABLE

| JUMPER/CONNECTOR | NAME |
|---|---|
| COM Ports | COM1, COM2, COM3, COM4 |
| COM Ports RI & Voltage Selection | JP8, JP11, JP16, JP17 |
| RS-485 DIR Control Selection | JP9 |
| COM2 RS-232/422/485 Selection | JP10 |
| VGA Port | VGA1 |
| LAN Port | LAN1, LAN2 |
| USB Port & Connector | USB0_1, USB2, USB3, USB4, USB6, USB7 |
| Audio Connector | LINE-OUT1, MIC-IN1, MIC_IN2, SPK_L_OUT1, SPK_R_OUT2 |
| Keyboard & Mouse Connectors | DIN1, PS2 |
| VoIP Connector | VOIP1 |
| VoIP Selection | JP14, JP15 |
| Power Input Connector | PWR_IN1 |
| Power Mode Selection | JP12 |
| Power Button Connector | PWR_BTN1 |
| Power Reset Connector | RST_BTN1 |
| Power LED Connector | PWR_LED1 |
| Clear CMOS Data Selection | JP6 |
| LCD Resolution Setting | JP1, JP2, JP3, JP4 |
| Brightness Control Selection | JP_BRCTR1 |
| Backlight Voltage Selection | JP_BLEN1, |
| LCD Power Connector | OSD_CTRL1 |
| LED Backlight Control Connector | INV1 |
| Touch Panel Connector | JTP1 |
| SATA Connector | SATA1, SATA2 |
| HDD Power Connector | HDD_POWER1, HDD_POWER2 |
| Fan Connector | CPU_FAN1 |
| CPLD Connector | JTAG1 |
| SPI Connector | J1 |

| JUMPER/CONNECTOR | NAME |
|---|---|
| Hook Connector | HOOK_SEN1 |
| Hook Control Selection | JP7 |
| Hook Function Selection | JP19 |
| LED Connector | EM_LED1 |
| Wireless LED Connector | WLAN_LED1 |
| LVDS Connector | LVDS1 |
| LVDS Voltage Selection | JP_VDD1 |
| Mini-PCIe Connector | M_PCIE1 |

# 2-2. COMPONENT LOCATIONS



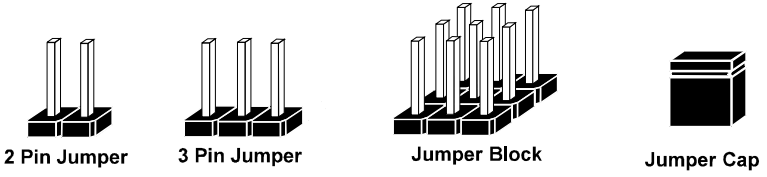

**MM-7017 Connectors, Jumpers and Components Locations**

## 2-3. HOW TO SET JUMPERS

You can configure your board by setting jumpers. Jumper is consists of two or three metal pins with a plastic base mounted on the card, and by using a small plastic "cap", Also known as the jumper cap (with a metal contact inside), you are able to connect the pins. So you can set-up your hardware configuration by "open" or "close" pins.

The jumper can be combined into sets that called jumper blocks. When the jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows how this looks like.

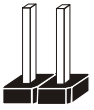
### JUMPERS AND CAPS



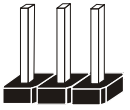

If a jumper has three pins (for examples, labelled PIN1, PIN2, and PIN3), You can connect PIN1 & PIN2 to create one setting by shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.

## JUMPER DIAGRAMS

Jumper Cap
looks like this

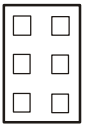


2 pin Jumper
looks like this



3 pin Jumper
looks like this

Jumper Block
looks like this



## JUMPER SETTINGS

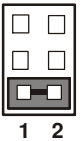

2 pin Jumper close(enabled)
Looks like this



3 pin Jumper
2-3 pin close(enabled)
Looks like this



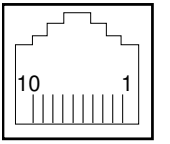
Jumper Block
1-2 pin close(enabled)
Looks like this



## 2-4. COM PORT & CONNECTOR

**COM1, COM2:** COM Ports
The pin assignments are as follows:

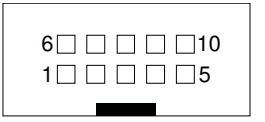
| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | DCD_C | 6 | DSR_C |
| 2 | RX_C | 7 | RTS_C |
| 3 | TX_C | 8 | CTS_C |
| 4 | DTR_C | 9 | RI_SEL |
| 5 | GND | 10 | NC |



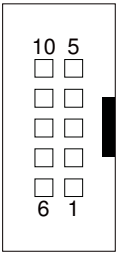

**COM1/ COM2**

**COM3, COM4:** COM Connectors
The pin assignments are as follows:

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | DCD_C | 6 | DSR_C |
| 2 | RX_C | 7 | RTS_C |
| 3 | TX_C | 8 | CTS_C |
| 4 | DTR_C | 9 | RI_SEL |
| 5 | GND | 10 | NC |



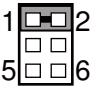
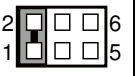
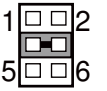
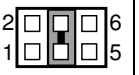
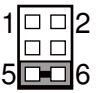
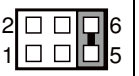

**COM3**




**COM4**

## 2-5. COM PORT RI & VOLTAGE SELECTION

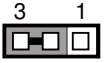
**JP8, JP11, JP16, JP17**: COM1/2/3/4 Ports RI & Voltage Selection
The selections are as follows:

| SELECTION | JUMPER SETTING | JUMPER ILLUSTRATION | | | |
|---|---|---|---|---|---|
| | | COM1 | COM2 | COM3 | COM4 |
| RI | 1-2 |   **JP8** |   **JP11** |   **JP16** |   **JP17** |
| 12V | 3-4 | N/A | N/A |   **JP16** |   **JP17** |
| 5V | 5-6 | N/A | N/A |   **JP16** |   **JP17** |

**Note:** Manufacturing Default is RI.

## 2-6. RS-485 DIR CONTROL SELECTION

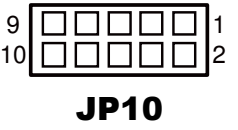
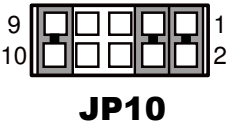
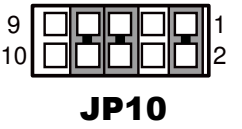
**JP9**: RS-485 DIR Control Selection
The selections are as follows:

| SELECTION | JUMPER SETTINGS | JUMPER ILLUSTRATION |
|---|---|---|
| Auto | 1-2 |  **JP9** |
| COM Port | 2-3 |  **JP9** |

**Note:** Manufacturing Default is Auto.

## 2-7. COM2 RS-232/422/485 SELECTION

**JP10**: COM2 RS-232/422/485 Selection
The selections are as follows:

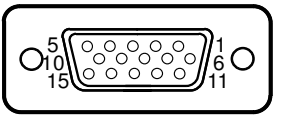
| SELECTION | JUMPER SETTINGS | JUMPER ILLUSTRATION |
|---|---|---|
| RS-232 | All open |  **JP10** |
| RS-422 | 1-2, 3-4, 9-10 |  **JP10** |
| RS-485 | 1-2, 5-6, 7-8 |  **JP10** |

**Note:** Manufacturing Default is RS-232.

## 2-8. VGA PORT

**VGA1:** VGA Port
The pin assignments are as follows:

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | CRT_RED | 9 | VCC5 |
| 2 | CRT_GREEN | 10 | GND |
| 3 | CRT_BLUE | 11 | NC |
| 4 | NC | 12 | CRT_DDC_DATA_O |
| 5 | GND | 13 | CRT_HSYNC_O |
| 6 | CRT_ALWAYS_ON | 14 | CRT_VSYNC_O |
| 7 | GND | 15 | CRT_DDC_CLK_O |
| 8 | GND | | |

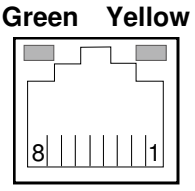



**VGA1**

## 2-9. LAN PORT

**LAN1, LAN2:** LAN Ports
The pin assignments are as follows:

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | MDI0_DP | 5 | MDI2_DP |
| 2 | MDI0_DN | 6 | MDI2_DN |
| 3 | MDI1_DP | 7 | MDI3_DP |
| 4 | MDI1_DN | 8 | MDI3_DN |




**LAN1/ LAN2**

**LAN LED Indicator:**
Left Side LED

| | |
|---|---|
| Green Color On | 10/100 LAN Speed Indicator |
| Orange Color On | Giga LAN Speed Indicator |
| Off | No LAN switch/hub connected. |

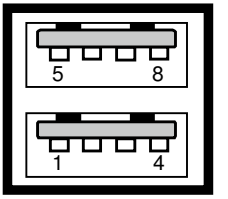
Right Side LED

| | |
|---|---|
| Yellow Color Blinking | LAN Message Active |
| Off | No LAN Message Active |

## 2-10. USB PORT & CONNECTOR

**USB0_1:** USB Ports
The pin assignments are as follows:

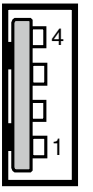
| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | VCC5 | 5 | VCC5 |
| 2 | DN | 6 | DN |
| 3 | DP | 7 | DP |
| 4 | GND | 8 | GND |




**USB0_1**

**USB2:** USB Port
The pin assignments are as follows:

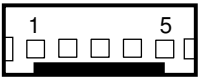
| PIN | ASSIGNMENT |
|---|---|
| 1 | VCC5 |
| 2 | DN |
| 3 | DP |
| 4 | GND |




**USB2**

**USB3, USB6:** USB Connector
The pin assignments are as follows:

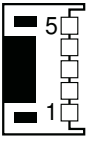
| PIN | ASSIGNMENT |
|---|---|
| 1 | VCC5 |
| 2 | DN_C |
| 3 | DP_C |
| 4 | GND |
| 5 | GND |




**USB3/**
**USB6**

**USB4:** USB Connector **(for CPT)**
The pin assignments are as follows:

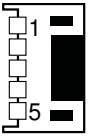
| PIN | ASSIGNMENT |
|---|---|
| 1 | VCC5 |
| 2 | DN_C |
| 3 | DP_C |
| 4 | GND |
| 5 | GND |




**USB4**

**USB7:** USB Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT |
|---|---|
| 1 | VCC5 |
| 2 | DN_C |
| 3 | DP_C |
| 4 | GND |
| 5 | GND |

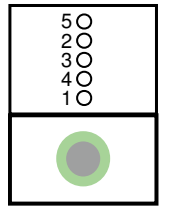



**USB7**

## 2-11. AUDIO CONNECTOR

**LINE-OUT1:** Line-Out Jack (green)
The pin assignments are as follows:

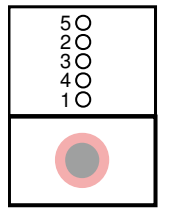
| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | GND | 4 | SPKL_M |
| 2 | SPKR_M | 5 | VCC_AMP |
| 3 | NC | | |




**LINE-OUT1**

**MIC-IN1:** Microphone Input Jack (pink)

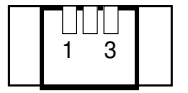
| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | GND | 4 | MIC1-R |
| 2 | MIC1-L | 5 | NC |
| 3 | NC | | |




**MIC_IN1**

**MIC-IN2:** Microphone Input Connector

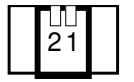
| PIN | ASSIGNMENT |
|---|---|
| 1 | MIC1-R |
| 2 | GND |
| 3 | MIC1-L |




**MIC-IN2**

**SPK_L_OUT1:** Speaker Connector

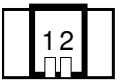
| PIN | ASSIGNMENT |
|---|---|
| 1 | SPKL_P |
| 2 | SPKL_M |




**SPK_L_OUT1**

**SPK_R_OUT2:** Speaker Connector

| PIN | ASSIGNMENT |
|---|---|
| 1 | SPKR_P |
| 2 | SPKR_M |

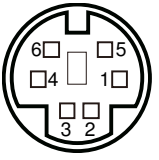



SPK_R_OUT1

## 2-12. KEYBOARD & MOUSE CONNECTOR

**DIN1:** Keyboard/Mouse Connector
The pin assignments are as follows:

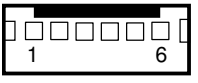
| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | KDAT_KB | 4 | KBMS_VCC_C |
| 2 | MS_DATA_C | 5 | KCLK_KB |
| 3 | GND | 6 | MS_CLK_C |




DIN1

**PS2:** Keyboard Setting Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | KCLK_KB | 4 | KDAT_KB |
| 2 | KB_CLK_C | 5 | KBMS_VCC_C |
| 3 | KB_DATA_C | 6 | GND |

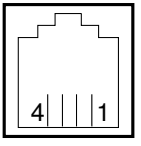



PS2

## 2-13. VOIP CONNECTOR

**VOIP1:** VoIP Connector
The pin assignments are as follows:

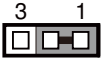
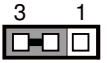
| PIN | ASSIGNMENT |
|---|---|
| 1 | VBIAS |
| 2 | LINE_OUT |
| 3 | GND |
| 4 | MIC_L |




VOIP1

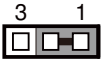
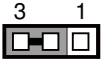
## 2-14. VOIP SELECTION

**JP14**: VoIP (CM108AH) ADC Input Source Selection
The selections are as follows:

| SELECTION | JUMPER SETTINGS | JUMPER ILLUSTRATION |
|---|---|---|
| External ADC (via I2S) | 1-2 |  **JP14** |
| Internal ADC | 2-3 |  **JP14** |

**Note:** Manufacturing Default is Normal.

**JP15**: VoIP (CM108AH) Mixer Selection
The selections are as follows:

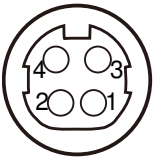
| SELECTION | JUMPER SETTINGS | JUMPER ILLUSTRATION |
|---|---|---|
| Mixer/AA-Path Enabled | 1-2 |  **JP15** |
| Mixer/AA-Path Disabled | 2-3 |  **JP15** |

**Note:** Manufacturing Default is Normal.

## 2-15. POWER INPUT CONNECTOR

**PWR_IN1:** Power Input Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT |
|---|---|
| 1 | GND |
| 2 | GND |
| 3 | VCC24_SB_VIN |
| 4 | VCC24_SB_VIN |



**PWR_IN1**

## 2-16. POWER MODE SELECTION

**JP12**: AT Power Mode Selection
The selections are as follows:

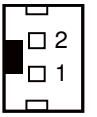
| SELECTION | JUMPER SETTINGS | JUMPER ILLUSTRATION |
|---|---|---|
| Normal | Open |  **JP12** |
| AT Power Mode | 1-2 |  **JP12** |

**Note:** Manufacturing Default is Normal.

## 2-17. POWER BUTTON CONNECTOR

**PWR_BTN1:** Power Button Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT |
|---|---|
| 1 | PWRBTNJ |
| 2 | GND |

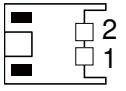



**PWR_BTN1**

## 2-18. POWER RESET CONNECTOR

**RST_BTN1:** Power Reset Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT |
|---|---|
| 1 | RST_IN |
| 2 | GND |

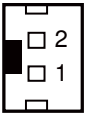



**RST_BTN1**

## 2-19. POWER LED CONNECTOR

**PWR_LED1:** Power Button Connector
The pin assignments are as follows:

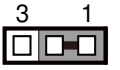
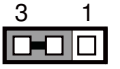
| PIN | ASSIGNMENT |
|---|---|
| 1 | PWRBTNJ |
| 2 | GND |




**PWR_LED1**

## 2-20. CLEAR CMOS DATA SELECTION

**JP6 :** Clear CMOS Data Selection
The jumper setting is as follows:

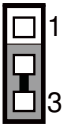
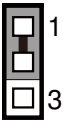
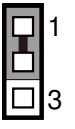
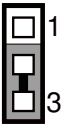
| SELECTION | JUMPER SETTINGS | JUMPER ILLUSTRATION |
|---|---|---|
| Clear CMOS* | 1-2 |  JP6 |
| Normal | 2-3 |  JP6 |

**Note:** Manufacturing Default is Normal.

*To clear CMOS data, user must power-off the computer and set the jumper to "Clear CMOS" as illustrated above. After five to six seconds, set the jumper back to "Normal" and power-on the computer.

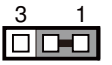
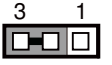
## 2-21. LCD RESOLUTION SETTING

**JP1, JP2, JP3, JP4**: LCD Resolution Setting
The selections are as follows:

| SELECTION | JUMPER SETTING | JUMPER ILLUSTRATION | | | |
|---|---|---|---|---|---|
| 1280 x 1024, 2ch/24bit | JP1: 2-3<br>JP2: 1-2<br>JP3: 1-2<br>JP4: 2-3 |  JP1 |  JP2 |  JP3 |  JP4 |

## 2-22. BRIGHTNESS CONTROL SELECTION

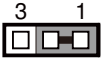
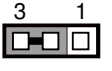
**JP_BRCTR1**: Brightness Control Selection
The selections are as follows:

| SELECTION | JUMPER SETTINGS | JUMPER ILLUSTRATION |
|---|---|---|
| LED | 1-2 |  **JP_BRCTR1** |
| CCFL | 2-3 |  **JP_BRCTR1** |

**Note:** Manufacturing Default is LED.

## 2-23. BACKLIGHT VOLTAGE SELECTION

**JP_BLEN1**: Backlight Voltage Selection
The selections are as follows:

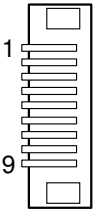
| SELECTION | JUMPER SETTINGS | JUMPER ILLUSTRATION |
|---|---|---|
| 3.3V | 1-2 |  **JP_BLEN1** |
| 5V | 2-3 |  **JP_BLEN1** |

**Note:** Manufacturing Default is 5V.

## 2-24. LCD POWER CONNECTOR

**OSD_CTRL1:** LCD Power Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | BLPU | 6 | BKLT_PWRBTNJ |
| 2 | BLPD | 7 | OSD_HOME |
| 3 | GND | 8 | VCC5 |
| 4 | VOLPU | 9 | VCC3_3 |
| 5 | VOLPD | | |

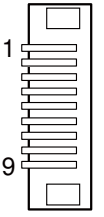



**OSD_CTRL1**

## 2-25. LED BACKLIGHT CONTROL CONNECTOR

**INV1:** LED Backlight Control Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | VCC12 | 6 | GND |
| 2 | VCC12 | 7 | GND |
| 3 | VCC12 | 8 | BLEN |
| 4 | NC | 9 | BRCTR |
| 5 | GND | | |

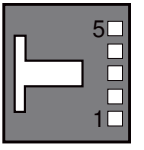



**INV1**

## 2-26. TOUCH PANEL CONNECTOR

**JTP1:** Touch Panel Connector **(for resistive touchscreen)**
The pin assignments are as follows:

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | LR | 4 | UR |
| 2 | LL | 5 | UL |
| 3 | PROBE | | |




**JTP1**

## 2-27. SATA CONNECTOR

**SATA1, SATA2:** SATA Connectors
The pin assignments are as follows:

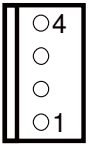
| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | GND | 5 | RX_DN |
| 2 | TX_DP | 6 | RX_DP |
| 3 | TX_DN | 7 | GND |
| 4 | GND | | |


**SATA1/**
**SATA2**

## 2-28. HDD POWER CONNECTOR

**HDD_POWER1, HDD_POWER2:** HDD Power Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT |
|---|---|
| 1 | VCC5 |
| 2 | GND |
| 3 | GND |
| 4 | VCC12 |

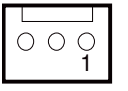



**HDD_POWER1/**
**HDD_POWER2**

## 2-29. FAN CONNECTOR

**CPU_FAN1:** CPU Fan Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT |
|---|---|
| 1 | GND |
| 2 | OUT |
| 3 | VCC12 |




**CPUFAN1**

## 2-30. CPLD CONNECTOR

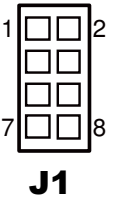
**JTAG1:** CPLD Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | VCC3_3 | 5 | NC |
| 2 | TDO | 6 | TMS |
| 3 | TDI | 7 | GND |
| 4 | NC | 8 | CTCK |


## 2-31. SPI CONNECTOR

**J1:** SPI Connector
The pin assignments are as follows:

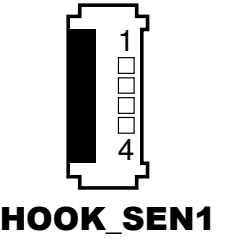
| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | VCC3_3 | 5 | MISO_R |
| 2 | GND | 6 | MOSI_R |
| 3 | CSJ_R | 7 | NC |
| 4 | CLK_R | 8 | NC |




## 2-32. HOOK CONNECTOR

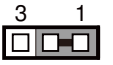
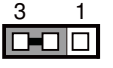
**HOOK_SEN1:** Hook Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT |
|---|---|
| 1 | VCC3_3 |
| 2 | GND |
| 3 | CTR |
| 4 | VCC3_3 |



## 2-33. HOOK CONTROL SELECTION

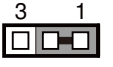
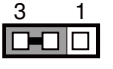
**JP7 :** Hook Control Selection
The jumper setting is as follows:

| SELECTION | JUMPER SETTINGS | JUMPER ILLUSTRATION |
|---|---|---|
| Software Control | 1-2 |  **JP7** |
| Hardware Control | 2-3 |  **JP7** |

**Note:** Manufacturing Default is Software Control.

## 2-34. HOOK FUNCTION SELECTION

**JP19 :** Hook Function Selection
The jumper setting is as follows:

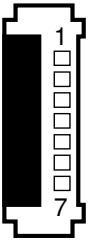
| SELECTION | JUMPER SETTINGS | JUMPER ILLUSTRATION |
|---|---|---|
| Enable | 1-2 |  **JP19** |
| Disable | 2-3 |  **JP19** |

**Note:** Manufacturing Default is Enable.

## 2-35. LED CONNECTOR

**EM_LED1:** LED Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | VCC5_SB | 5 | VCC5_SB |
| 2 | EMLED1 | 6 | EMLED3 |
| 3 | VCC5_SB | 7 | NC |
| 4 | EMLED2 | | |

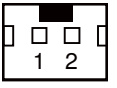



**EM_LED1**

## 2-36. WIRELESS LED CONNECTOR

**WLAN_LED1:** Wireless LED Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT |
|---|---|
| 1 | VCC3_3_SB |
| 2 | LED_WLANJ |

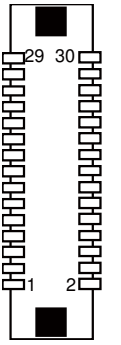



**WLAN_LED1**

## 2-37. LVDS CONNECTOR

**LVDS1:** LVDS Connector
The pin assignments are as follows:

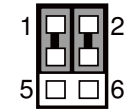
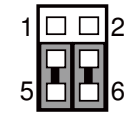
| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | LVDS_VCC | 16 | LVDS_CLKA_DP |
| 2 | GND | 17 | LVDS_CLKA_DN |
| 3 | LVDS_CLKB_DN | 18 | GND |
| 4 | LVDS_CLKB_DP | 19 | LVDS_A2_DP |
| 5 | GND | 20 | LVDS_A2_DN |
| 6 | LVDS_B2_DN | 21 | GND |
| 7 | LVDS_B2_DP | 22 | LVDS_A1_DP |
| 8 | GND | 23 | LVDS_A1_DN |
| 9 | LVDS_B1_DN | 24 | GND |
| 10 | LVDS_B1_DP | 25 | LVDS_A0_DP |
| 11 | LVDS_B3_DP | 26 | LVDS_A0_DN |
| 12 | LVDS_B3_DN | 27 | LVDS_A3_DP |
| 13 | LVDS_B0_DP | 28 | LVDS_A3_DN |
| 14 | LVDS_B0_DN | 29 | LVDS_VCC |
| 15 | GND | 30 | LVDS_VCC |



**LVDS1**

## 2-38. LVDS VOLTAGE SELECTION

**JP_VDD1**: LVDS Power Selection
The selections are as follows:

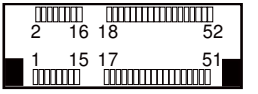
| SELECTION | JUMPER SETTINGS | JUMPER ILLUSTRATION |
|---|---|---|
| 3.3V | 1-3, 2-4 |  **JP_VDD1** |
| 5V | 3-5, 4-6 |  **JP_VDD1** |

**Note:** Manufacturing Default is 5V.

## 2-39. MINI-PCIE CONNECTOR

**M_PCIE1:** Mini-PCIe Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | WAKEJ | 27 | GND |
| 2 | VCC3_3_SB | 28 | VCC1_5 |
| 3 | NC | 29 | GND |
| 4 | GND | 30 | SMB_CLK |
| 5 | NC | 31 | PCIE_TXN4 |
| 6 | VCC1_5 | 32 | SMB_DATA |
| 7 | M_PCIE_CLKREQJ | 33 | PCIE_TXP4 |
| 8 | SIM_PWR | 34 | GND |
| 9 | GND | 35 | GND |
| 10 | SIM_DATA | 36 | USB5_DN |
| 11 | MINI_PCIE_CLK_DN | 37 | GND |
| 12 | SIM_CLK | 38 | USB5_DP |
| 13 | MINI_PCIE_CLK_DP | 39 | VCC3_3_SB |
| 14 | SIM_RESET | 40 | GND |
| 15 | GND | 41 | VCC3_3_SB |
| 16 | SIM_VPP | 42 | NC |
| 17 | SIM_SW2 | 43 | GND |
| 18 | GND | 44 | LED_WLANJ |
| 19 | SIM_SW1 | 45 | NC |
| 20 | NC | 46 | NC |
| 21 | GND | 47 | NC |
| 22 | PLTRSTJ_BUF | 48 | VCC1_5 |
| 23 | PCIE_RX4_DN | 49 | NC |
| 24 | VCC3_3_SB | 50 | GND |
| 25 | PCIE_RX4_DP | 51 | NC |
| 26 | GND | 52 | VCC3_3_SB |




**M_PCIE1**

# *SOFTWARE UTILITIES*

*CHAPTER*

***3***

This chapter comprises the detailed information of VGA driver, LAN driver, and Sound driver.

Section includes:

- Introduction
- Intel® Chipset Software Installation Utility
- VGA Driver Utility
- LAN Driver Utility
- Sound Driver Utility
- Touchscreen Driver Utility

## 3-1. INTRODUCTION

Enclosed with our MM-7017 package, you will find a CD ROM disk containing all types of drivers we have. As a MM-7017 user, you will only need some of files contained in the CD ROM disk, please take note of the following chart:

| **FILE NAME (Assume that CD ROM drive is D:)** | **PURPOSE** |
|---|---|
| D:\Driver\Plaform\[OS]\MainChip | Intel® Chipset Device Software installs Window *.INF files to the system. |
| D:\Driver\Plaform\[OS]\VGA | Intel® HD Graphics installer for Embedded Media and Graphics Driver installation |
| D:\Driver\Plaform\[OS]\LAN | Realtek RTL8111E for LAN driver installation |
| D:\Driver\Plaform\[OS]\SOUND | Realtek ALC888S High Definition Audio for sound driver installation |
| D:\Driver\Device\Touch Screen | eGalaxTouch Controller utility |
| D:\Driver\Flash BIOS | AMI BIOS update utility |

**Note:** Be sure to install the utilities right after the OS is fully installed.

# 3-2. INTEL® CHIPSET SOFTWARE INSTALLATION UTILITY

## 3-2-1. Introduction

The Intel® Chipset Device Software installs Windows *.INF files to the target system. These files outline to the operating system how to configure the Intel® chipset components in order to ensure that the following features function properly:

- PCIe Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

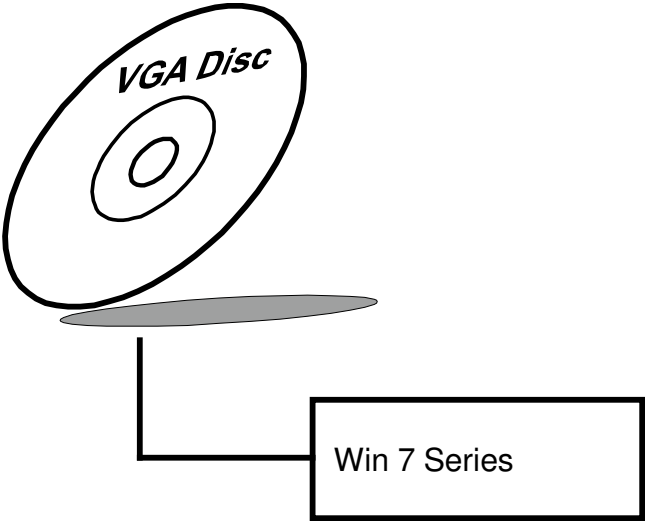
## 3-2-2. Installation of Utility for Windows 7

The Utility Pack is made only for Windows 7. It should be installed right after the OS installation; kindly follow the following steps:

1. Place insert the Utility Disk into Floppy Disk Drive A/B or CD ROM drive.
2. Under Windows system, go to the directory where Utility Disc is located.
   e.g.: D:\Driver\Platform\(OS)\Utility\infinst_autol.exe
3. Click infinst_autol.exe file for utility installation.
4. Follow the instructions on the screen to complete the installation.
5. Once installation is completed, shut down the system and restart in order for the changes to take effect.

## 3-3. VGA DRIVER UTILITY

The VGA interface is embedded with our MM-7017 system to support CRT display. The following illustration briefly shows you the content of VGA driver.



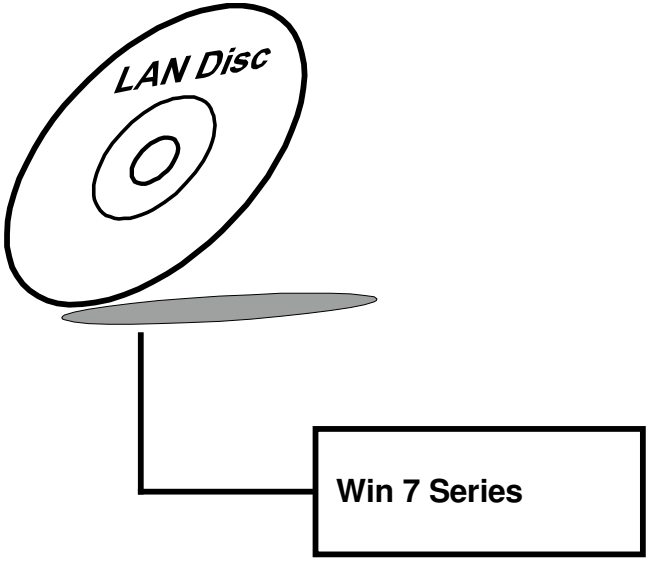

### 3-3-1. Installation of VGA Driver for Windows 7

1. Start the computer.
2. Insert the Utility Disk into the CD ROM drive or drive A/B.
3. Open the VGA folder for your system to choose an appropriate folder, and double-click "*.exe" file to install.
   e.g. D:\Driver\Platform\(OS)\Graphics\Your system\ ***.exe
   (If D is not your CD-ROM drive, substitute D with the correct drive letter.)
4. Follow the Wizard's on-screen instructions to complete the installation.

# 3-4. LAN DRIVER UTILITY

## 3-4-1. Introduction

The MM-7017 is enhanced with LAN function that can support various network adapters. The content of the LAN driver is found as follows:

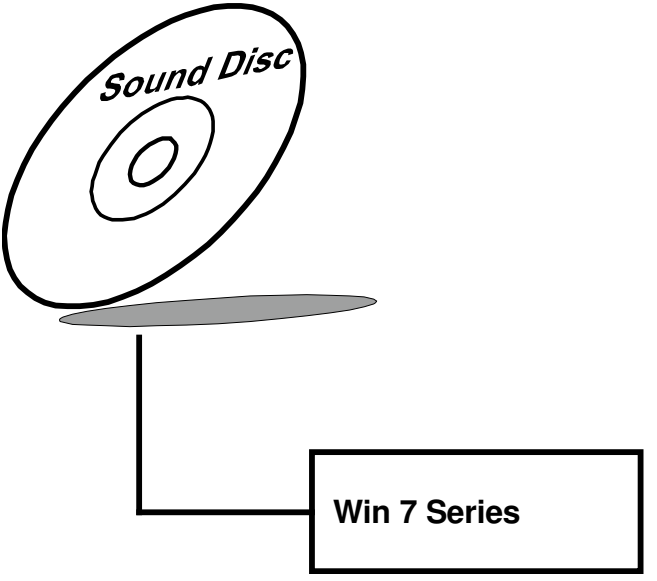



**For more details on Installation procedure, please refer to Readme.txt file found on LAN DRIVER UTILITY.**

## 3-5. SOUND DRIVER UTILITY

### 3-5-1. Introduction

The Audio chip enhanced in this system is fully compatible with Windows 7. Below, you will find the content of the Sound driver:

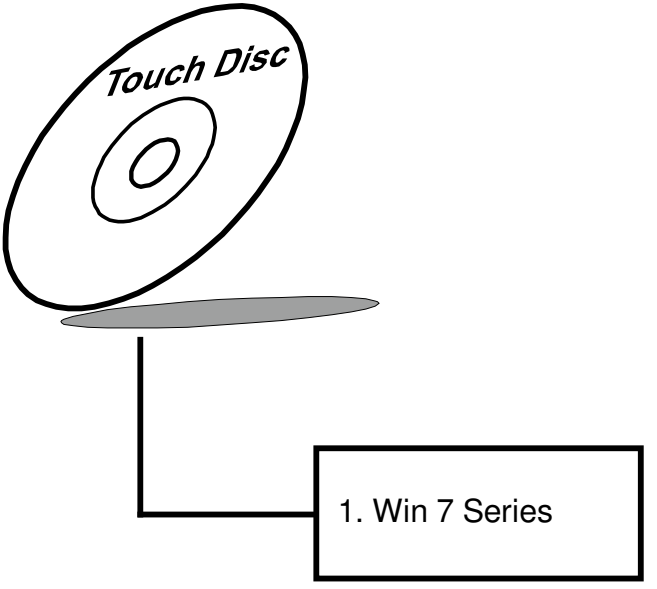



### 3-5-2. Installation Procedure for Windows 7

1. Open the “Sound” folder. For your system to choose an appropriate folder, and Run the setup.exe program to start the installation.
   e.g.: D:\Driver\Platform\(OS)\ SOUND\Your system\setup.exe
   (If D is not your CD-ROM drive, substitute D with the correct drive letter.)
2. Click on [Next] to continue the procedure. If the Windows popup "Windows can't verify the publisher of this driver software" message, press "Install this driver software anyway" to continue the installation.
3. Finally, select to restart the system and press [Finish] to complete the installation.

## 3-6. TOUCHSCREEN DRIVER UTILITY

The touch screen driver utility can only be installed on Windows 7, and it should be installed right after the OS installation.




### 3-6-1. Installation of Touchscreen Driver

To install the touchscreen driver, follow the steps below:

1. Open the "Device/Touchscreen" folder where the touchscreen driver is located.
2. Click **Setup.exe** file for driver installation.
3. Follow the on-screen instructions to complete the installation.
4. Once installation is completed, shut down the system and restart for the changes to take effect.

CHAPTER

4

# BIOS SETUP

This chapter shows how to set up the AMI BIOS.

Section includes:

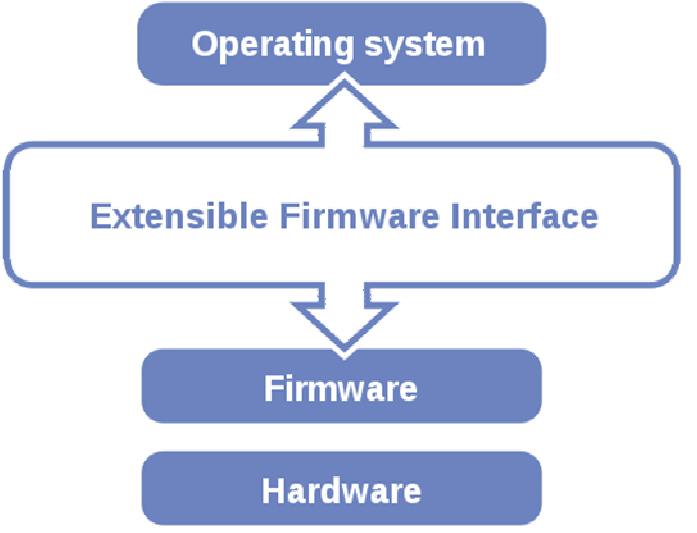
- Introduction
- Entering Setup
- Main
- Advanced
- Chipset
- Boot
- Security
- Save & Exit

## 4-1. INTRODUCTION

The system MM-7017 uses an AMI (American Megatrends Incorporated) Aptio BIOS (Basic Input Output System) that is stored in the Serial Peripheral Interface Flash Memory (4MB SPI Flash) and can be updated. The SPI Flash contains the BIOS setup menu, Power-on Self-test (POST), the PCI auto-configuration utility, LAN EEPROM information, and Plug and Play support.

Aptio is AMI's BIOS firmware based on the UEFI (Unified Extensible Firmware Interface) specifications and the Intel Platform Innovation Framework for EFI. The UEFI specification defines an interface between an operating system and platform firmware. The interface consists of data tables that contain platform-related information, boot service calls, and runtime service calls that are available to the operating system and its loader. These provide standard environment for booting an operating system and running pre-boot applications.

Following illustration shows Extensible Firmware Interface's position in the software stack.



EFI BIOS provides an user interface allow users the ability to modify hardware configuration, e.g. change system date and time, enable or disable a system component, decide bootable device priorities, setup personal password, etc., which is convenient for modifications and customization of the computer system and allows technicians another method for finding solutions if hardware has any problems.

The BIOS setup menu can be used to view and change the BIOS settings for the computer. The BIOS setup menu is accessible by pressing the <Del> or <F2> key on keyboard during the POST stage, right before the operating system is loading. All the settings are described in chapter to be followed.

## 4-2. ENTERING SETUP

When the system is powered on, the BIOS will enter the Power-on Self-test (POST) routines and the following message will appear on the lower screen:


**POST screen**

As long as this message is present on the screen before the operating system boot begins, you may press the <F2> or <Del> key (the one that shares the decimal point at the bottom of the number keypad) to access the setup menu.

In a moment, the main menu of the Aptio Setup Utility will appear on the screen:


**BIOS setup program initial screen**

The BIOS setup menu interface and help messages are shown in US English. You may move the cursor by up/down keys to highlight the individual menu items. As you highlight each item, a brief description of the highlighted selection will appear at the bottom of the screen.

### 4-2-1. BIOS Setup Menu Keys

The following table provides list of keys available for BIOS setup menu.

| BIOS Setup menu key | Description |
|---|---|
| <← > and <→> | Selects a different menu screen (moves the selection left or right). |
| < ↑ > and < ↓ > | Selects an item (moves the selection up or down). |
| <Enter> | Executes command or selects the sub-menu. |
| <F2> | Load the previous configuration values. |
| <F3> | Load the default configuration values. |
| <F4> | Save the current values and exits the BIOS setup menu. |
| <Esc> | Leaves the sub-menu.<br>Triggers confirmation to exit BIOS setup menu. |

### 4-2-2. BIOS Messages

This section describes error messages generated by the board's BIOS. These messages would be displayed on the monitor when certain recoverable error/event occurs during POST stage. The table bellow gives an explanation of the BIOS messages.

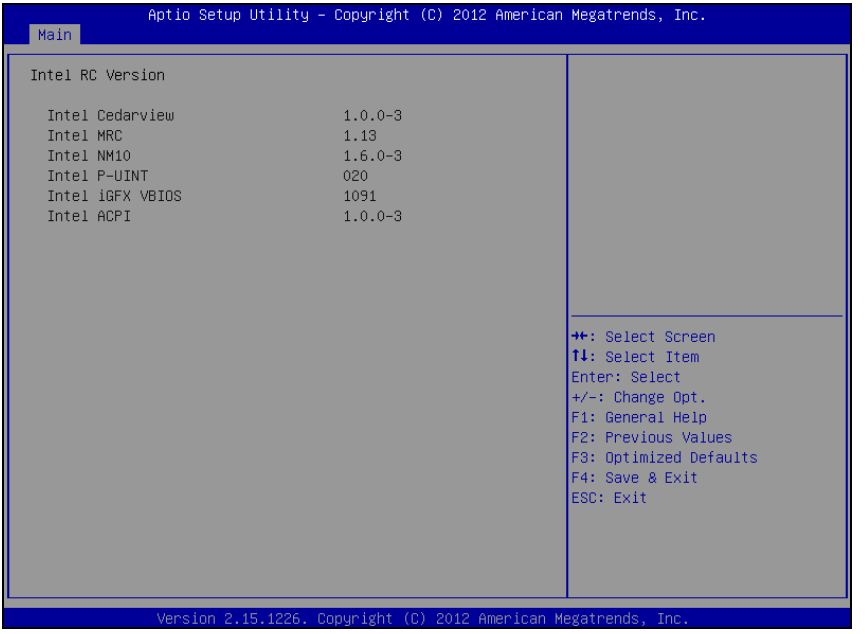
| BIOS Setup menu key | Explanation |
|---|---|
| A first boot or NVRAM reset condition has been detected. | BIOS has been updated or the battery was replaced. |
| The CMOS defaults were loaded. | Default values have been loaded after the BIOS was updated or the battery was replaced. |
| The CMOS battery is bad or was recently replaced. | The battery may be losing power, replace the battery soon. Also, this message is displayed once the new battery was placed. |

## 4-3. MAIN


**Main screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| BIOS Vendor | No changeable options | Displays the BIOS vendor. |
| Core Version | No changeable options | Displays the current BIOS core version. |
| Compliancy | No changeable options | Displays the current UEFI version. |
| Project Version | No changeable options | Displays the version of the BIOS and its architecture compatibility currently installed on the platform. |
| Build Date and Time | No changeable options | Displays the date of current BIOS version. |
| Intel RC Version | Sub-menu | Enters sub-menu with information regarding used components versions. |
| System Date | Month, day, year | Specifies the current date. |
| System Time | Hour, minute, second | Specifies the current time. |
| Access Level | No changeable options | Displays security levels currently in use. |

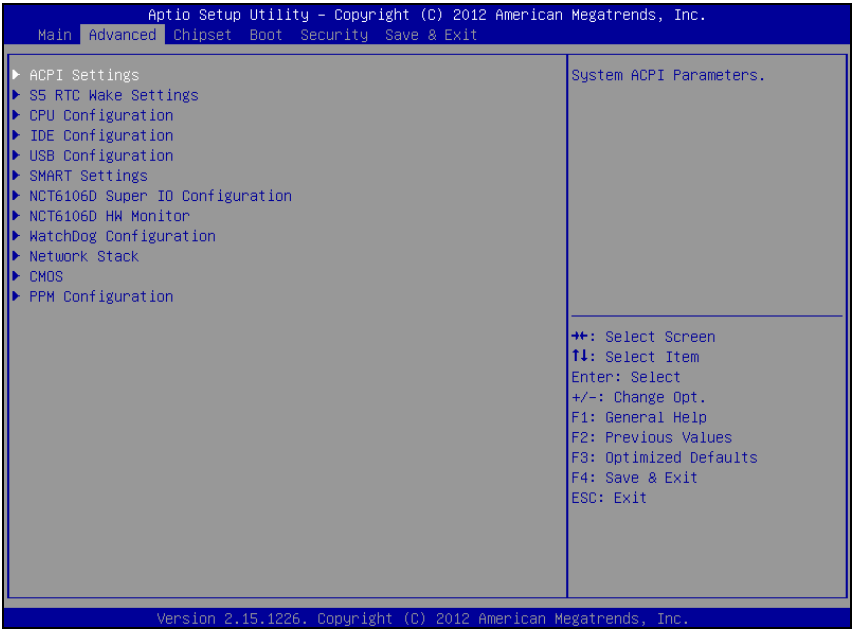
### 4-3-1. Main – Intel RC Version




**Intel RC Version screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Intel Cedarview | No changeable options | Displays code version for Intel D/N2x00 processor. |
| Intel MRC | No changeable options | Displays code version for Intel Memory Reference Code (MRC), e.g. “1.12”. |
| Intel NM10 | No changeable options | Displays code version for Intel NM10 chipset. |
| Intel P-UNIT | No changeable options | Displays code version for power unit. |
| Intel iGFX VBIOS | No changeable options | Displays current version of Intel Video BIOS (VBIOS), e.g. “1089”. |
| Intel ACPI | No changeable options | Displays code version for Advanced Configuration and Power Interface (ACPI). |

## 4-4. ADVANCED

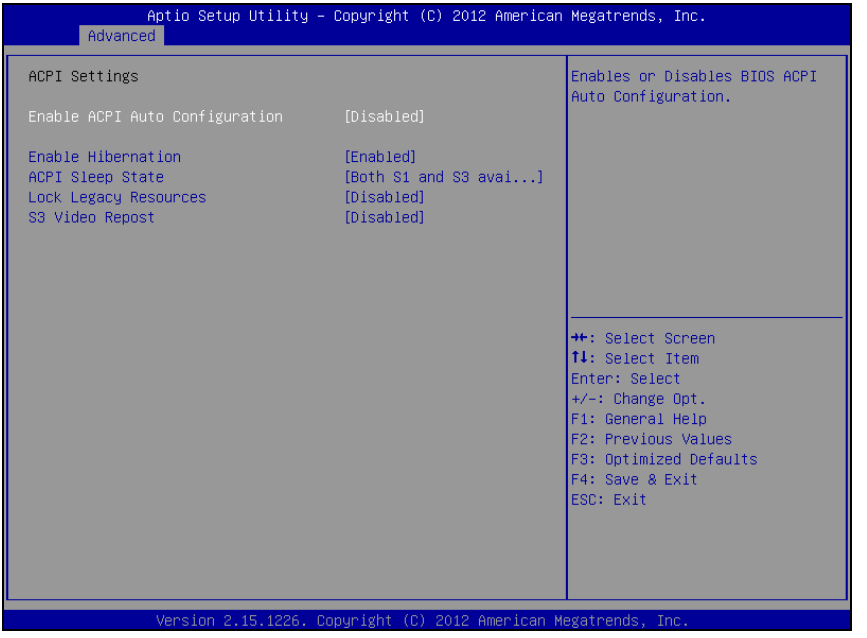



**Advanced screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| ACPI Settings | Sub-menu | Enters menu to set ACPI option. |
| S5 RTC Wake Settings | Sub-menu | Accesses settings for scheduled S5 power on feature. |
| CPU Configuration | Sub-menu | All processor basic options menu. |
| IDE Configuration | Sub-menu | SATA device configuration section. |
| USB Configuration | Sub-menu | Enters menu to configure USB options. |
| SMART Settings | Sub-menu | Section to SATA HDD/SSD S.M.A.R.T. capability. |
| NCT6106D Super IO Configuration | Sub-menu | Serial and parallel ports configuration section. |

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| NCT6106D HW Monitor | Sub-menu | Options for NCT6106D hardware monitor chip. |
| WatchDog Configuration | Sub-menu | Section to configure Watchdog timer. |
| Network Stack | Sub-menu | Enters menu to enable network during DXE stage and UEFI shell environment. |
| CMOS | Sub-menu | Options for CMOS battery. |
| PPM Configuration | Sub-menu | Processor advanced power options menu. |

## 4-4-1. Advanced – ACPI Settings




**ACPI Setting screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Enable ACPI Auto Configuration | -Disabled<br>-Enabled | Allows deciding whether ACPI settings are configured by operating system or manually (option disabled). |
| Enable Hibernation | -Disabled<br>-Enabled | Enables ability to enter S4 state (to be able to hibernate in Windows operating system). |
| ACPI Sleep State | -Suspend Disabled<br>-S1 only<br>-S3 only<br>-Both S1 and S3 | Specifies the ACPI sleep state.<br>▪ **Disabled** option disables ACPI sleep feature.<br>▪ **S3** allows the platform to enter Sleep mode (also known as Standby or Suspend to RAM). S1 is less common state in which the CPU is stopped. |

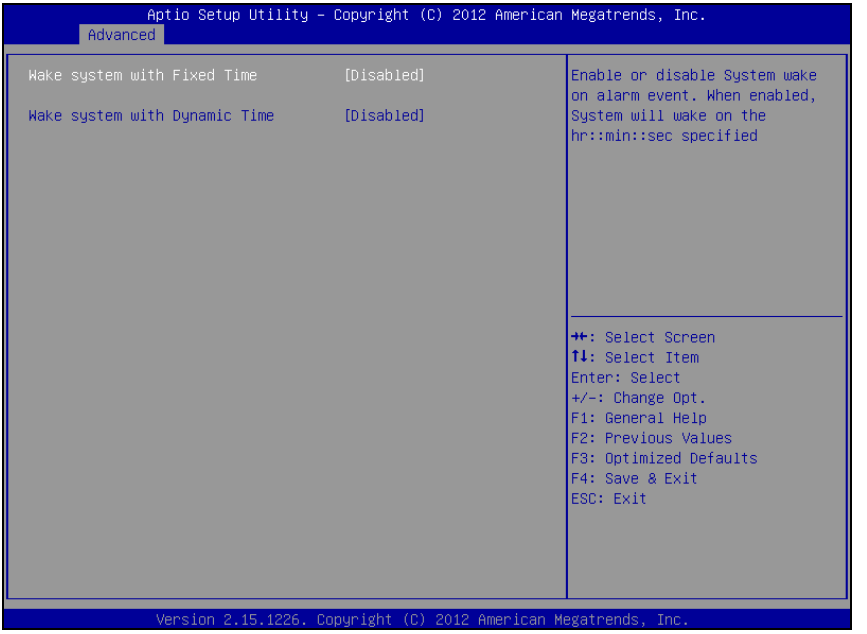
| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Lock Legacy Resources | -Disabled<br>-Enabled | Prevents the operating system from changing resources to serial or parallel controller. |
| S3 Video Repost | -Disabled<br>-Enabled | If enabled re-initialises the VBIOS after waking up from an S3 sleep. |

**Note**: It is necessary to modify system registry in order enable wake up from S3 system power state via USB devices in Windows XP.

Simply add DWORD entry named "USBBIOSx" with value 0 to location: HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\usb\

Fore more details refer to Microsoft Support article KB 841858 at http://support.microsoft.com/kb/841858.

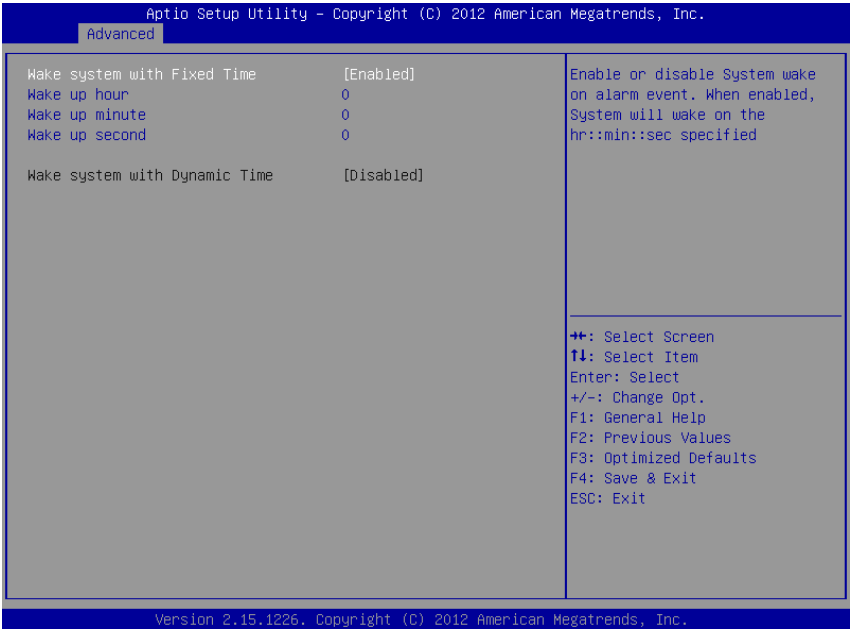
## 4-4-2. Advanced – S5 RTC Wake Settings [Disabled]




**S5 RTC wake settings screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Wake system with Fixed Time | -Disabled<br>-Enabled | Allows enabling scheduled S5 to S0 transition set to specific period of time (option enabled). Please note that only one of these two options can be enabled at the same moment. |
| Wake system with Dynamic Time | -Disabled<br>-Enabled | Allows enabling scheduled S5 to S0 transition set to variable period of time (option enabled). |

## 4-4-3. Advanced – S5 RTC Wake Settings [Enabled]

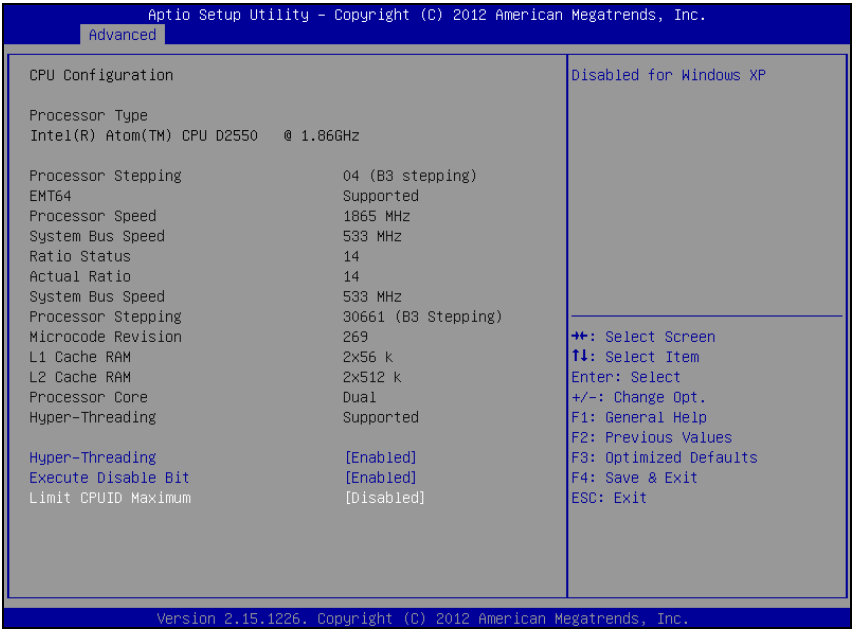



**S5 RTC wake settings screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Wake system with Fixed Time | -Disabled<br>-Enabled | Allows enabling scheduled S5 to S0 transition set to specific period of time (option enabled).<br>Please note that only one of these two options can be enabled at the same moment. |
| Wake up hour | Multiple options ranging from 0 to 23 | Sets an hour for schedule power on event. |
| Wake up minute | Multiple options ranging from 0 to 59 | Sets a minute for schedule power on event. |
| Wake up second | Multiple options ranging from 0 to 59 | Sets a second for schedule power on event. |

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Wake system with Dynamic Time | -Disabled<br>-Enabled | Allows enabling scheduled S5 to S0 transition set to variable period of time (option enabled). |
| Wake up minute increase | Multiple options ranging from 1 to 5 | Sets a period of time (in minutes) after which the board wakes up from S5 state. |

## 4-4-4. Advanced - CPU Configuration

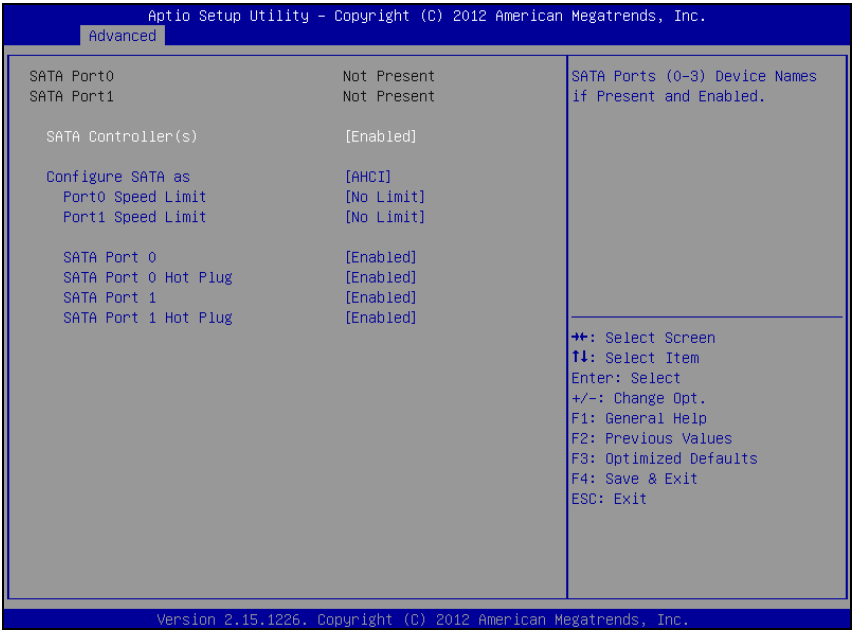



**CPU Configuration screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Processor Type | No changeable options | Displays the current processor model number and frequency. |
| Processor Stepping | No changeable options | Displays the D/N2x000 processor stepping. |
| EMT64 | No changeable options | Reports if processor supports Intel x86-64 (amd64) implementation. |
| Processor Speed | No changeable options | Displays the current processor frequency. |
| System Bus Speed | No changeable options | Displays the bus frequency. |
| Ratio Status | No changeable options | Displays the processor model bus/core ratio. |
| Actual Ration | No changeable options | Displays the processor current bus/core ratio. |

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Processor Stepping | No changeable options | Displays processor's ID stepping. |
| Microcode Revision | No changeable options | Displays processor's microcode update revision. |
| L1 Cache RAM | No changeable options | Displays amount of Level 1 cache. |
| L2 Cache RAM | No changeable options | Displays amount of Level 2 cache. |
| Processor Cores | No changeable options | Displays information about number of physical cores in processor. |
| Hyper-Threading | No changeable options | Reports if Intel Hyper-Threading Technology is supported by processor. |
| Hyper-threading | -Disabled<br>-Enabled | When disabled, only one thread per active core will operate. |
| Execute Disable Bit | -Disabled<br>-Enabled | Enables the NX bit (No eXecute) security feature. |
| Limit CPUID Maximum | -Disabled<br>-Enabled | Enables for legacy operating systems to boot processors with extended CPUID (CPU Identification) functions. |

## 4-4-5. Advanced – IDE Configuration [Enabled]




**IDE Configuration screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| SATA Port0 | No changeable options | Displays device ID plugged in SATA port (if any). |
| SATA Controller(s) | -Disabled<br>-Enabled | Enables SATA controller. |
| Configure SATA as | -IDE<br>-AHCI | Configures SATA devices as IDE or AHCI. It is not advised to change this option once the operating system is installed. |
| Port0 Speed Limit | -No Limit<br>-Gen1<br>-Gen2 | Configures SATA (only when set as AHCI) interface as following:<br>▪ **No Limit** selects no speed limitation.<br>▪ **Gen1** mode sets the device to 1.5 Gbit/s speed.<br>▪ **Gen2** mode sets the device to 3 Gbit/s speed (in case it is compatible). |

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Port1 Speed Limit | -No Limit<br>-Gen1<br>-Gen2 | Configures SATA (only when set as AHCI) interface as following:<br>▪ **No Limit** selects no speed limitation.<br>▪ **Gen1** mode sets the device to 1.5 Gbit/s speed.<br>▪ **Gen2** mode sets the device to 3 Gbit/s speed (in case it is compatible). |
| SATA Port 0 | -Disabled<br>-Enabled | Allows controlling specific SATA port. |
| SATA Port 0 Hot Plug | -Disabled<br>-Enabled | Enables Hot Plug feature on SATA port 0 (if supported by the device). |
| SATA Port 1 | -Disabled<br>-Enabled | Allows controlling specific SATA port. |
| SATA Port 1 Hot Plug | -Disabled<br>-Enabled | Enables Hot Plug feature on SATA port 1 (if supported by the device). |

## 4-4-6. Advanced – IDE Configuration [Disabled]


**IDE Configuration screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| SATA Port0 | No changeable options | Displays device ID plugged in SATA port (if any). |
| SATA Controller(s) | -Disabled<br>-Enabled | Disables SATA controller. |

## 4-4-7. Advanced – USB Configuration


**USB Configuration screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| USB Devices | No changeable options | Reports number and type of connected USB devices (if any). |
| Legacy USB Support | -Enabled<br>-Disabled<br>-Auto | Enables support for USB in legacy operating systems (e.g. MS-DOS, Windows NT). |
| EHCI Hand-off | -Disabled<br>-Enabled | When enabled it allows BIOS support control of the EHCI controller and the OS hand-off synchronization capability. |
| USB transfer time-out | -1 sec<br>-5 sec<br>-10 sec<br>-20 sec | Specifies time-out value for Control, Bulk and Interrupt transfers. |

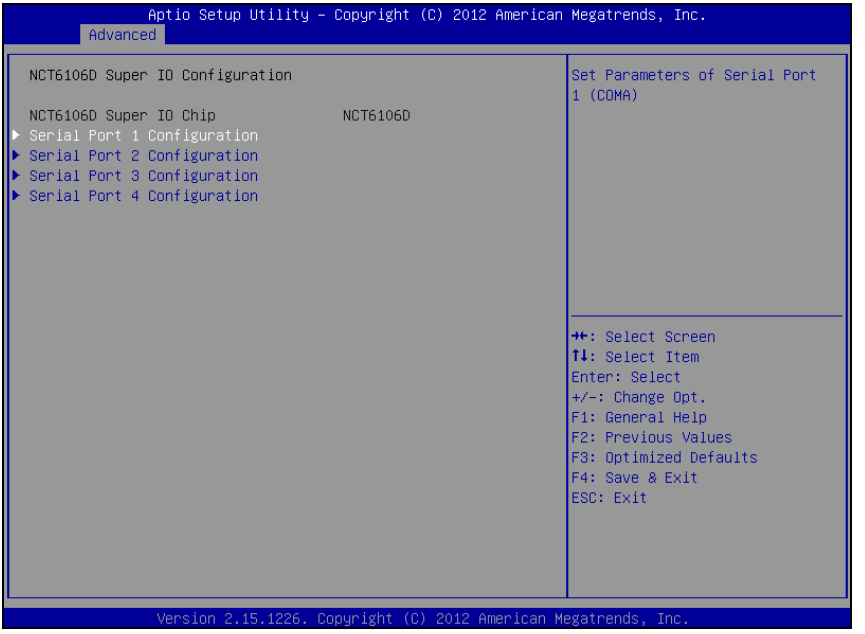
| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Device reset time-out | -10 sec<br>-20 sec<br>-30 sec<br>-40 sec | Specifies the value for device reset timeout. |
| Device power-up delay | -Auto<br>-Manual | Specifies maximum time it would take for USB device to report itself to the controller. If set to auto, it would use default values (100 ms for root port) and value read from hub descriptor in case of hub port. |
| Mass Storage Devices: [drive(s)] | -Auto<br>-Floppy<br>-Forced FDD<br>-Hard Disk<br>-CD-ROM | Appears only when USB flash drive is plugged in. Allows selecting which emulation to use on available drive(s).<br>**Note:** The sector size of your USB drive should be emulated device native sector size. |

## 4-4-8. Advanced – SMART Settings


**SMART Settings screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| SMART Self Test | -Disabled<br>-Enabled | Enables S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) feature to be found on most modern HDD/SSD. |

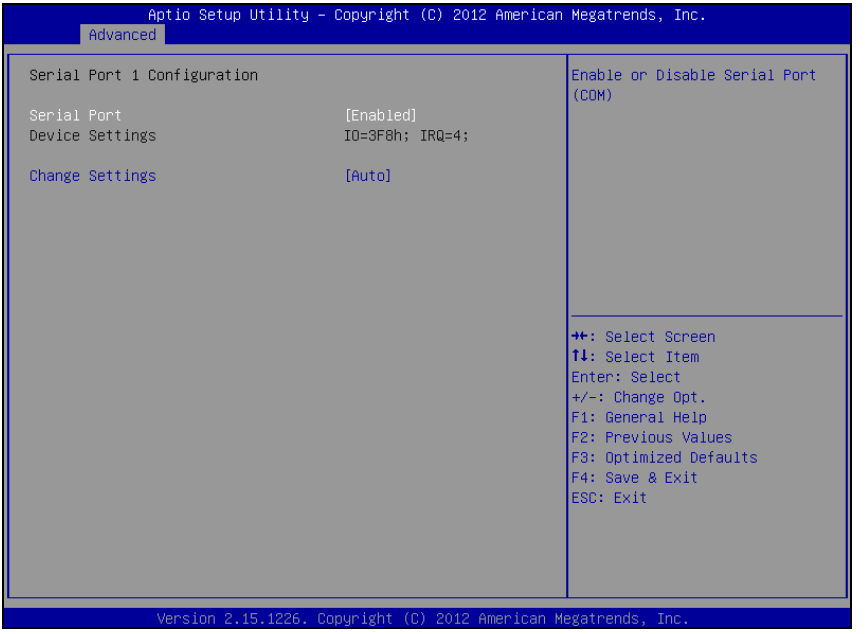
## 4-4-9. Advanced – NCT6106D Super IO Configuration




**NCT6106D Super IO Configuration screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| NCT6106D Super IO Chip | No changeable options | Shows Super IO manufacturer and model. |
| Serial Port 1 Configuration | Sub-menu | Enters menu to configure serial port 1. |
| Serial Port 2 Configuration | Sub-menu | Enters menu to configure serial port 2. |
| Serial Port 3 Configuration | Sub-menu | Enters menu to configure serial port 3. |
| Serial Port 4 Configuration | Sub-menu | Enters menu to configure serial port 4. |

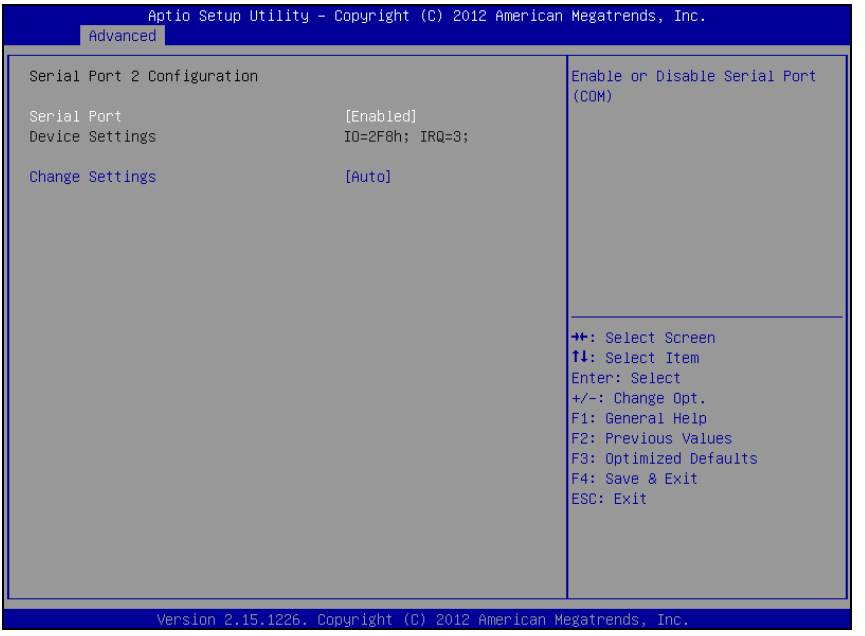
### 4-4-9-1. NCT6106D Super IO Configuration – Serial Port 1 Configuration




**Serial Port 1 Configuration screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Serial Port | -Disabled<br>-Enabled | Configures the serial port 1. |
| Device Settings | No changeable options | Shows current settings applied to the serial port. |
| Change Settings | -Auto<br>-IO=3F8h; IRQ=4;<br>-IO=3F8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=2F8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=3E8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=2E8h; IRQ=3,4,5,6,7,10,11,12; | Specifies the base I/O address and interrupt request for the serial port 1 if enabled. |

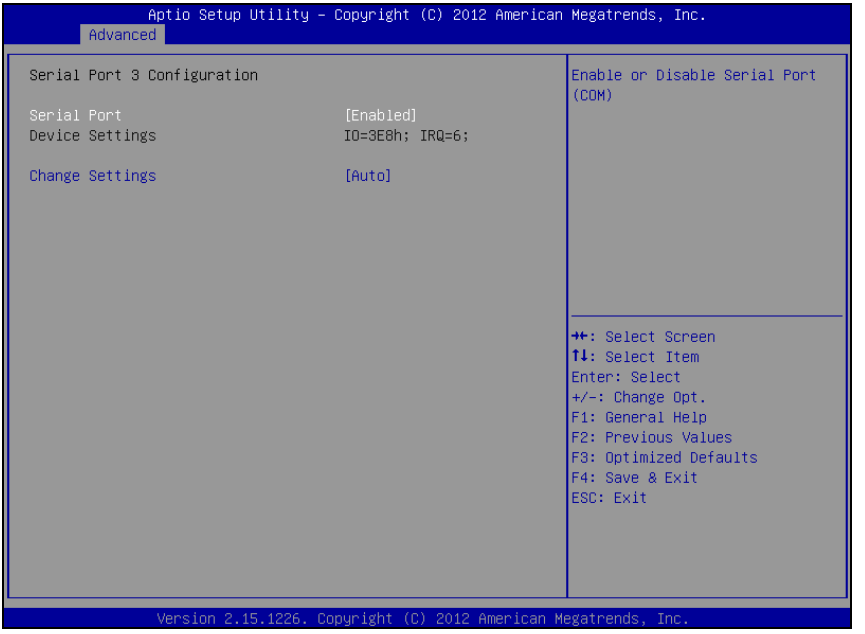
### 4-4-9-2. NCT6106D Super IO Configuration – Serial Port 2 Configuration




**Serial Port 2 Configuration screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Serial Port | -Disabled<br>-Enabled | Configures the serial port 2. |
| Device Settings | No changeable options | Shows current settings applied to the serial port. |
| Change Settings | -Auto<br>-IO=3F8h; IRQ=4;<br>-IO=3F8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=2F8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=3E8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=2E8h; IRQ=3,4,5,6,7,10,11,12; | Specifies the base I/O address and interrupt request for the serial port 2 if enabled. |

### 4-4-9-3. NCT6106D Super IO Configuration – Serial Port 3 Configuration




**Serial Port 3 Configuration screen**

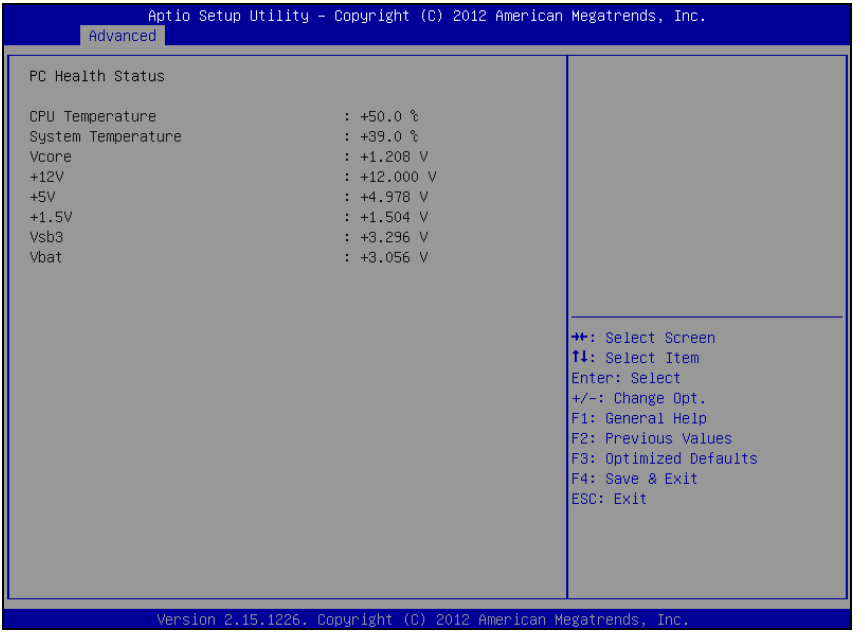
| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Serial Port | -Disabled<br>-Enabled | Configures the serial port 3. |
| Device Settings | No changeable options | Shows current settings applied to the serial port. |
| Change Settings | -Auto<br>-IO=3F8h; IRQ=4;<br>-IO=3F8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=2F8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=3E8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=2E8h; IRQ=3,4,5,6,7,10,11,12; | Specifies the base I/O address and interrupt request for the serial port 3 if enabled. |

### 4-4-9-4. NCT6106D Super IO Configuration – Serial Port 4 Configuration


**Serial Port 4 Configuration screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Serial Port | -Disabled<br>-Enabled | Configures the serial port 4. |
| Device Settings | No changeable options | Shows current settings applied to the serial port. |
| Change Settings | -Auto<br>-IO=3F8h; IRQ=4;<br>-IO=3F8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=2F8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=3E8h; IRQ=3,4,5,6,7,10,11,12;<br>-IO=2E8h; IRQ=3,4,5,6,7,10,11,12; | Specifies the base I/O address and interrupt request for the serial port 4 if enabled. |

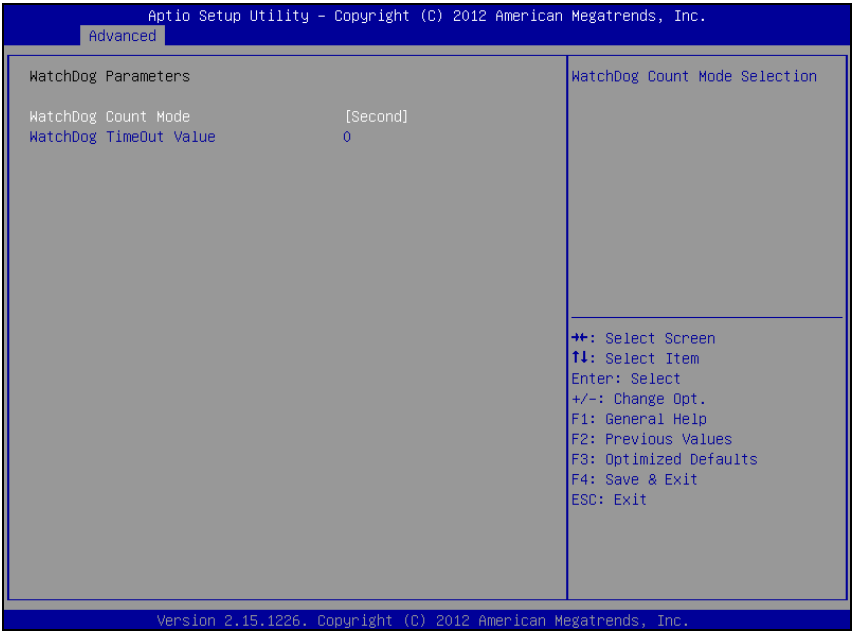
## 4-4-10. Advanced – NCT6106D HW Monitor




**NCT6106D HW Monitor screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| CPU Temperature | No changeable options | Shows processor temperature in degree Celsius. |
| System Temperature | No changeable options | Monitors system temperature in degree Celsius. |
| Vcore | No changeable options | Shows actual voltage of processor core in volt. |
| +12V | No changeable options | Monitors 12V section (in volt). |
| +5V | No changeable options | Monitors 5V section (in volt). |
| +1.5V | No changeable options | Monitors 1.5V section (in volt). |
| Vsb3 | No changeable options | Monitors 3.3V standby section (in volt). |
| Vbat | No changeable options | Monitors battery voltage (in volt). |

## 4-4-11. Advanced – Watchdog Configuration




**Watchdog Configuration screen**

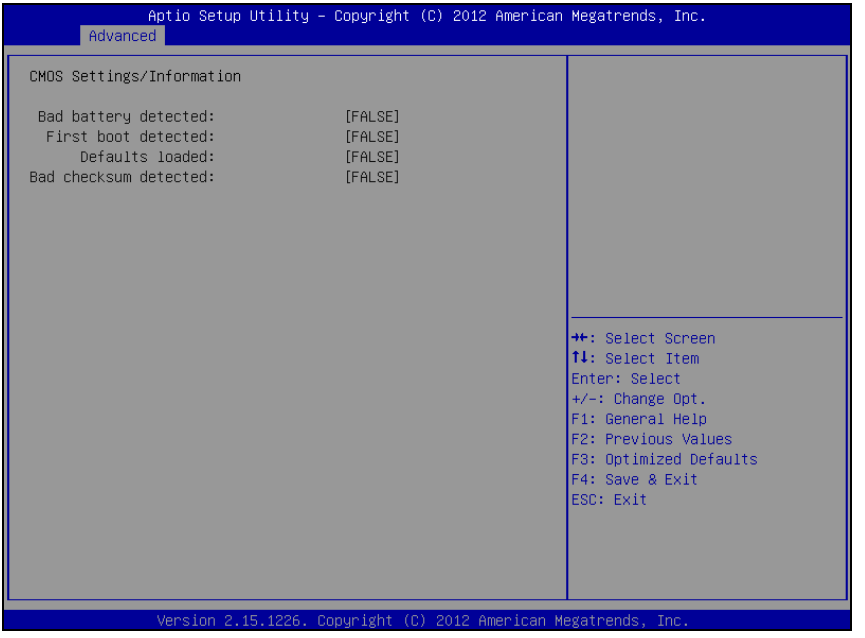
| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Watchdog Timer | -Second<br>-Minute | Selects time unit for watchdog timer feature. |
| WatchDog TimeOut Value | Multiple options ranging from 0 to 255 | Sets the desired value (in seconds) for watchdog timeout. Setting value '0' means the watchdog is disabled. |

## 4-4-12. Advanced – Network Stack


**Network Stack screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Network stack | -Disabled<br>-Enabled | Allows for enabling network capability in DXE stage and UEFI shell. |

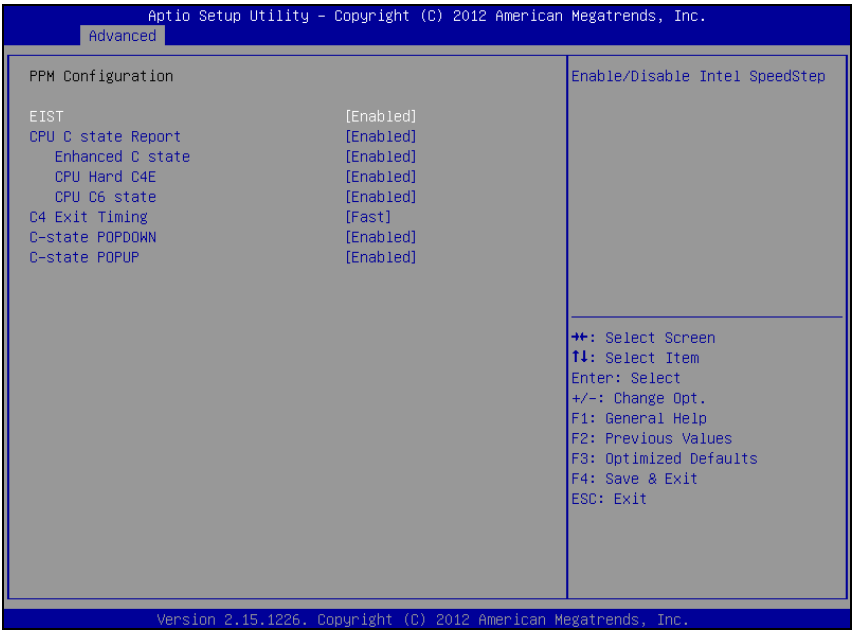
## 4-4-13. Advanced – CMOS




**CMOS screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Bad battery detected | No changeable options | Informs about low voltage on CMOS backup battery. Please replace the battery. |
| First boot detected | No changeable options | Shows that this is first boot after updating BIOS. |
| Defaults loaded | No changeable options | Confirms that loaded default values has been selected and loaded. |
| Bad checksum detected | No changeable options | Informs about CMOS memory bad checksum. |

## 4-4-14. Advanced – PPM Configuration

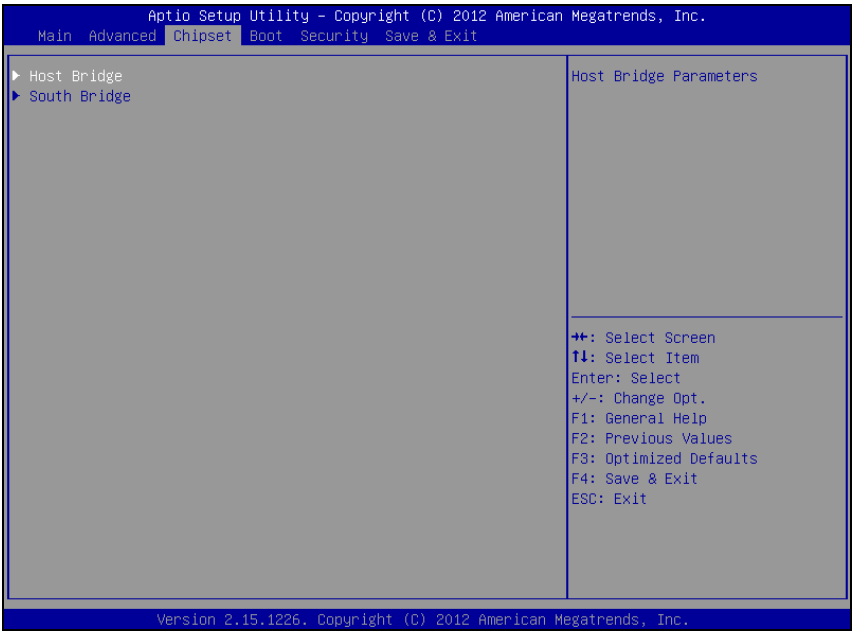



**PPM Configuration screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| EIST | -Disabled<br>-Enabled | Enables Intel SpeedStep feature for dynamic scaling processor frequency. |
| CPU C state Report | -Disabled<br>-Enabled | Enables C states mode as a measure to save power. In those states, the clock signal and power is cut from idle units. |
| Enhanced C state | -Disabled<br>-Enabled | Enables enhanced C states, which allows cutting clock signal and reducing CPU voltage both at the same time. |
| CPU Hard C4E | -Disabled<br>-Enabled | Enables enhanced deeper sleep in which reduces CPU voltage even more and turns off the cache. |

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| CPU C6 State | -Disabled<br>-Enabled | Enabled deep power down C state. |
| C4 Exit Timing | -Default<br>-Fast<br>-Slow | Controls a programmable time for the CPU voltage to stabilize when exiting from C4 state. In case of perceptible audio noise caused by periodically exiting the C4 state option slow might eliminate the noise. |
| C-state POPDOWN | -Disabled<br>-Enabled | When disabled, the CPU will no try to promote its sleep state from C2 down to C3/C4.; these last two items are part of PPM (Processor Power Management). |
| C-state POPUP | -Disabled<br>-Enabled | Enables popup mode in which CPU goes from C3 or C4 state into C2 (when disabled it changes straight to C0). |

## 4-5. Chipset




**Chipset screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Host Bridge | Sub-menu | Enters menu to configure integrated graphics & memory related items. |
| South Bridge | Sub-menu | Enters menu to configure audio, USB and power lost items. |

### 4-5-1. Chipset – Host Bridge


**Host Bridge screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Memory Frequency and Timing | Sub-menu | Enters menu to deal with memory setting. |
| Intel IGD Configuration | Sub-menu | Controls settings for integrated graphics device. |
| Memory Frequency | No changeable options | Displays current frequency for DDR3 memory, please note mobile processor model N2600 is limited to 800 MHz. |
| Total Memory | No changeable options | Displays current amount of total memory, e.g. “2048 MB”. |
| DIMM#0 | No changeable options | Displays current amount of memory in memory slot 0 (if installed), e.g. “1024 MB”. |

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| DIMM#1 | No changeable options | Displays current amount of memory in memory slot 1 (if installed), e.g. “1024 MB”. |

### 4-5-1-1. Host Bridge – Memory Frequency and Timing


**Memory frequency and timing screen**

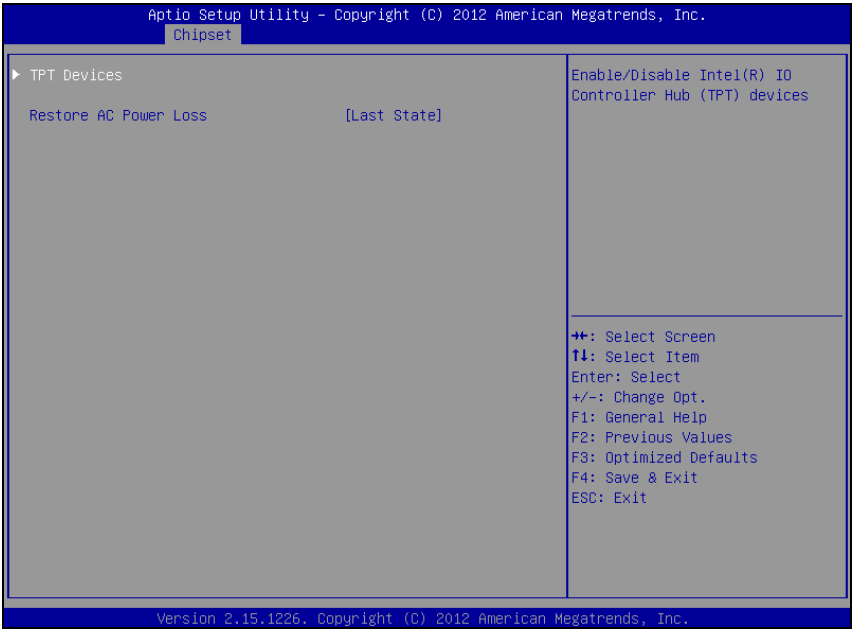
| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| MRC Fast Boot | -Disabled<br>-Enabled | Selects MRC (Memory Reference Code) boot setting. Disabled MRC fast boot may resolve memory issues if encountered. |

### 4-5-1-2. Host Bridge – Intel IGD Configuration


**Intel IGD Configuration screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| IGFX - Boot Type | -CRT<br>-LVDS<br>-CRT + LVDS | Selects which screen is going to be active on power on.<br>▪ In **CRT + LVDS** mode, if VGA monitor is connected, clone mode (both VGA display and LVDS panel show same content) is enabled.<br>▪ **CRT** option selects output to VGA monitor only. |

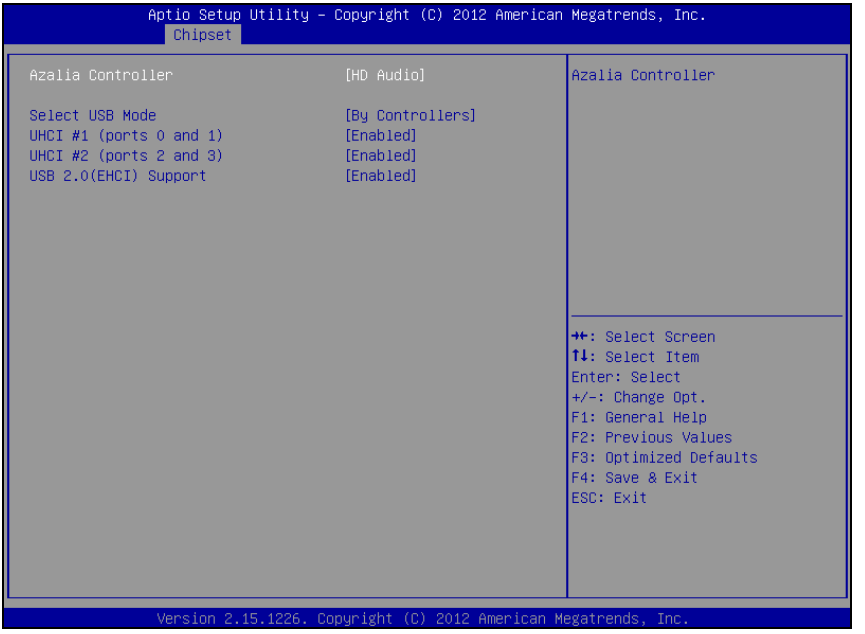
## 4-5-2. Chipset – South Bridge




**South Bridge screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| TPT Devices | Sub-menu | Enters menu to configure audio and USB devices. |
| Restore AC Power Loss | -Power Off<br>-Power On<br>-Last State | Section to configure the board behavior if sudden loss of power should occur. |

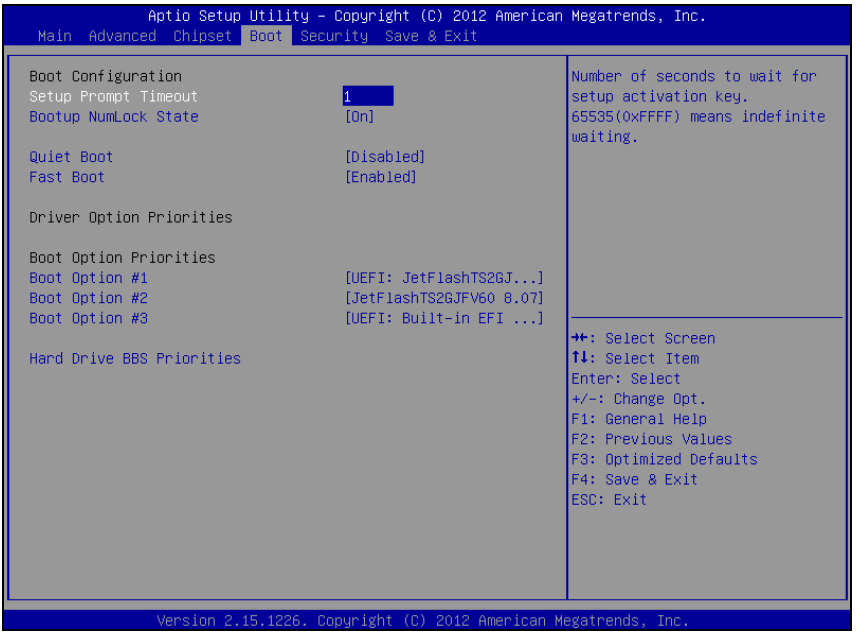
### 4-5-2-1. South Bridge – TPT Devices




**TPT Devices screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Audio Controller | -Disabled<br>-HD Audio | Enables Intel HD audio controller. |
| Select USB Mode | -By Controllers<br>-By Ports | Allows controlling USB ports from two different perspectives. |
| UHCI #1 (ports 0 and 1) | -Disabled<br>-Enabled | Controls UHCI root port 1 (ports 0 and 1). |
| UHCI #2 (ports 2 and 3) | -Disabled<br>-Enabled | Controls UHCI root port 2 (ports 2 and 3). |
| USB 2.0 (EHCI) Support | -Disabled<br>-Enabled | Enables High Speed USB 2.0 on all ports. |

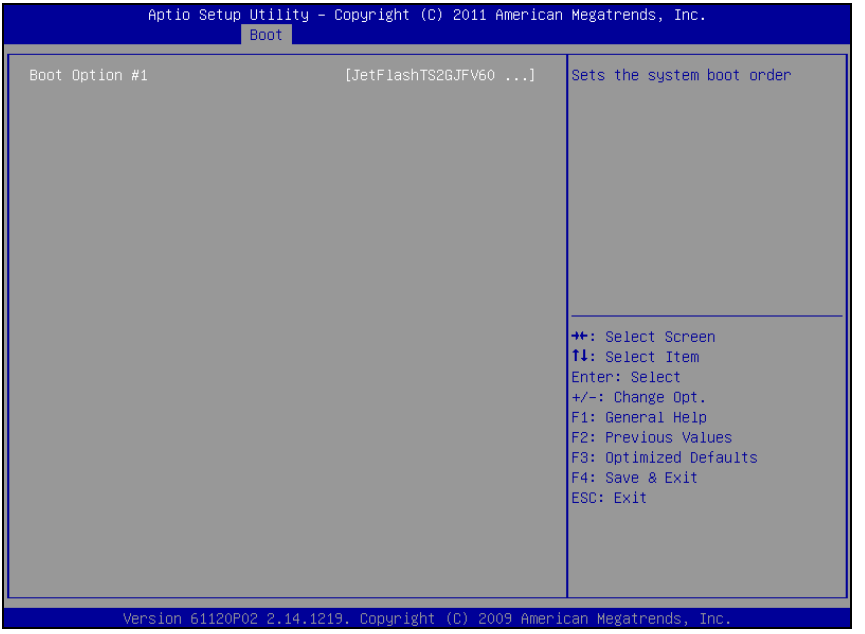
## 4-6. Boot




**Boot screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Setup Prompt Timeout | Multiple options ranging from 1 to 65535 | Specifies number of seconds to wait for setup activation key (value 65535 results in indefinite waiting). |
| Bootup NumLock Status | -On<br>-Off | Specifies the power-on state of the numlock feature on the numeric keypad of keyboard. |
| Quiet Boot | -Disabled<br>-Enabled | When quiet boot is enabled, it displays AMI or OEM logo (if implemented) instead of POST messages during the boot. |
| Boot Option #1 | -[USB/DVD/ hard drive(s)]<br>-Built-in EFI shell<br>-Disabled | Allows setting up boot option(s) from menu listed. |

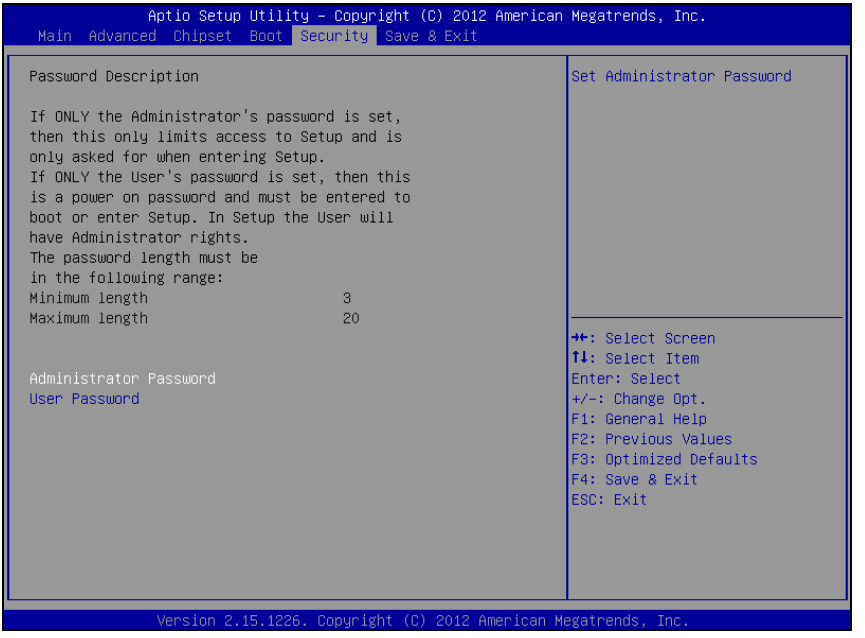
### 4-6-1. Boot – Hard Drive BBS Priorities




**Hard drive BBS priorities screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Boot Option #1 | -[drive(s)]<br>-Disabled | Allows setting the boot order of available drive(s). |

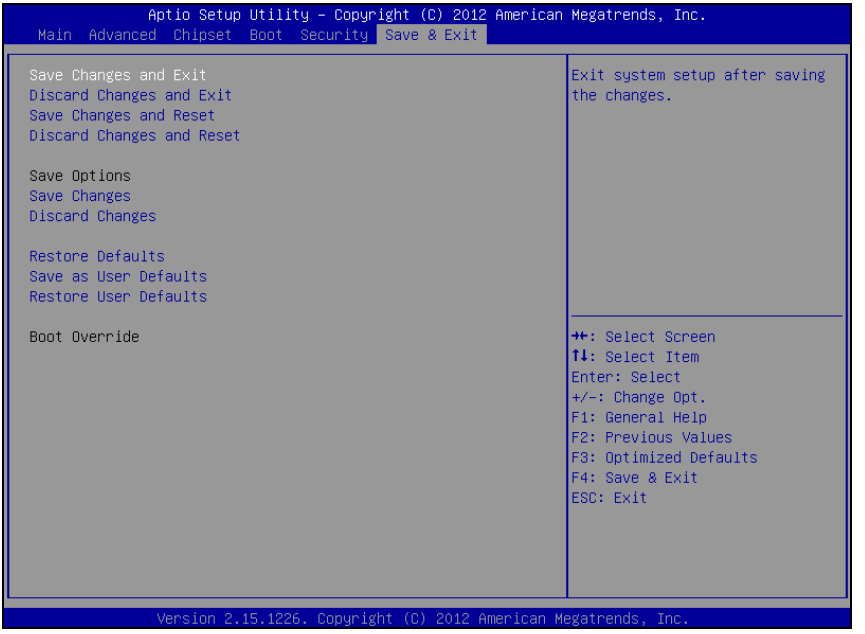
## 4-7. Security




**Security screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Administrator Password | Password can be up to 20 alphanumeric characters | Specifies the administrator password. |
| User Password | Password can be up to 20 alphanumeric characters | Specifies the user password. |
| HDD Security Configuration | Sub-menu | Enters sub-menu with option to enabled password protected HDD/SSD (if supported by SATA device). |

## 4-8. Save & Exit




**Save & Exit screen**

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Save Changes and Exit | No changeable options | Exits and saves the changes in CMOS memory. |
| Discard Changes and Exit | No changeable options | Exits without saving any changes made in BIOS settings. |
| Save Changes and Reset | No changeable options | Saves the changes in CMOS memory and resets. |
| Discard Changes and Reset | No changeable options | Resets without saving any changes made in BIOS settings. |
| Save Changes | No changeable options | Saves the changes done in BIOS settings so far. |
| Discard Changes | No changeable options | Discards the changes done in BIOS settings so far. |

| BIOS Setting | Options | Description/Purpose |
|---|---|---|
| Restore Defaults | No changeable options | Loads the optimized defaults for BIOS settings. |
| Save as User Defaults | No changeable options | Saves the current values as user defaults. |
| Restore User Defaults | No changeable options | Loads the user defaults for BIOS settings. |
| Boot Override | -[drive(s)] | Forces to boot from selected [drive(s)] or UEFI shell |

*APPENDIX*

*A*

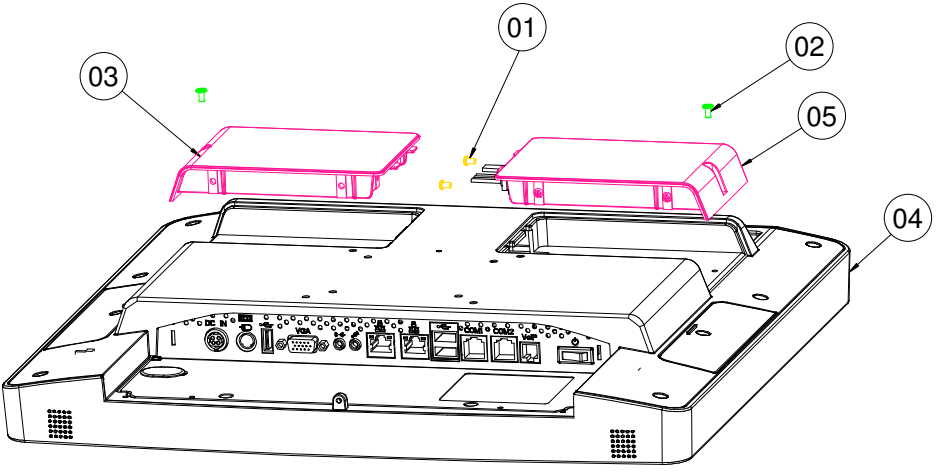
# *SYSTEM DIAGRAMS*

This appendix contains the exploded diagram of the system.

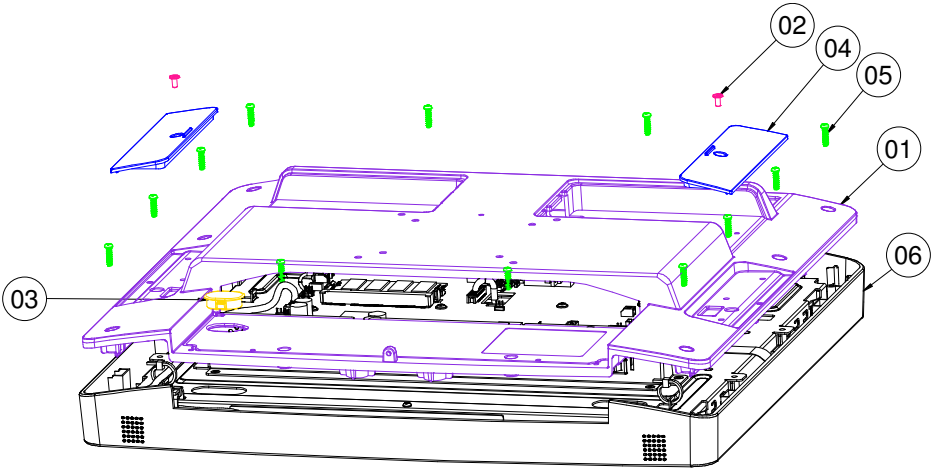
Section includes:

- Exploded Diagram for Basic Construction
- Exploded Diagram for Front Cover
- Exploded Diagram for LCD Panel
- Exploded Diagram for Mainboard
- Exploded Diagram for HDD

# EXPLODED DIAGRAM FOR BASIC CONSTRUCTION

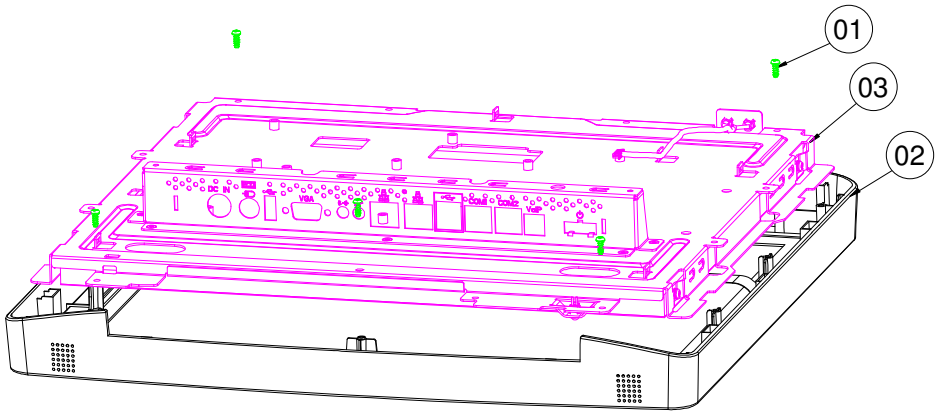



| NO. | COMPONENT NAME | PART NO. | Q'TY |
|---|---|---|---|
| 1 | SCREW | 22-232-30060211 | 2 |
| 2 | SCREW | 22-272-30006311 | 2 |
| 3 | HDD COVER | 20-004-01062258 | 1 |
| 4 | FRONT AND BACK ASSY | -- | 1 |
| 5 | HDD ASSY | -- | 1 |

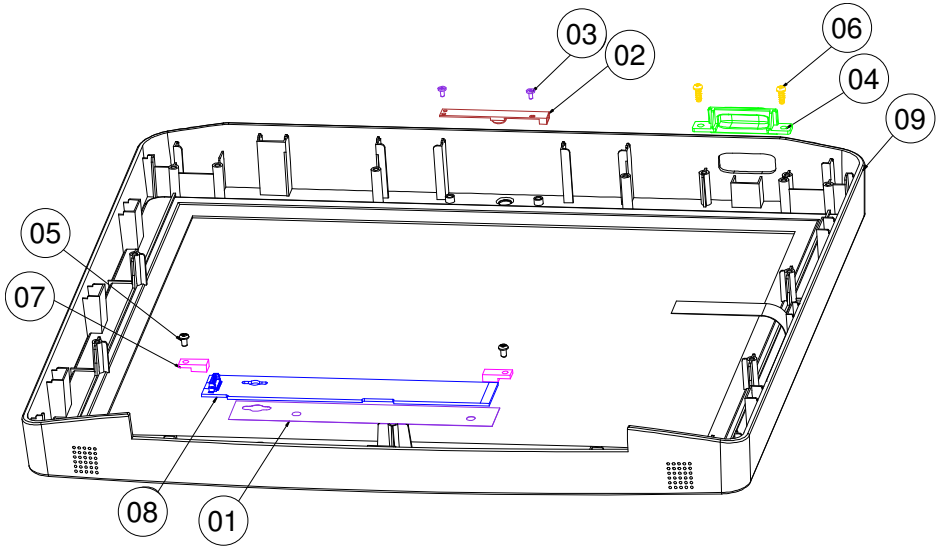



| NO. | COMPONENT NAME | PART NO. | Q'TY |
|---|---|---|---|
| 1 | BACK COVER | 20-004-01061258 | 1 |
| 2 | SCREW | 22-272-30006311 | 2 |
| 3 | HOLE PLUG | 90-067-04100000 | 1 |
| 4 | OPTION COVER | 30-002-12110258 | 2 |
| 5 | SCREW | 22-125-30012061 | 12 |
| 6 | FRONT COVER MB ASSY | -- | 1 |

## EXPLODED DIAGRAM FOR FRONT COVER

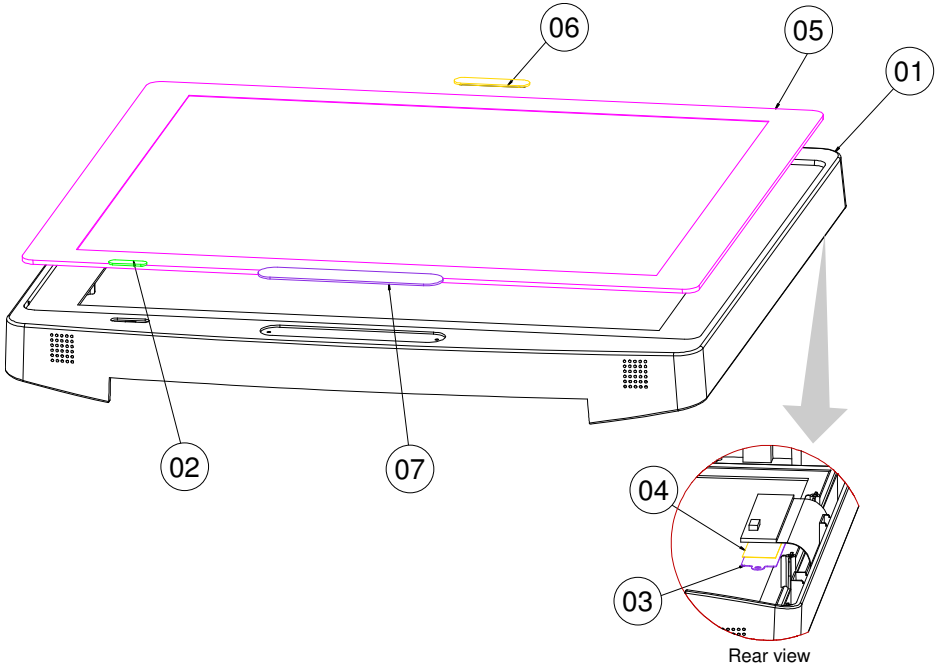



| NO. | COMPONENT NAME | PART NO. | Q'TY |
|---|---|---|---|
| 1 | SCREW | 22-122-30080011 | 5 |
| 2 | FRONT COVER ASSY-1 | -- | 1 |
| 3 | LCD ASSY | -- | 1 |



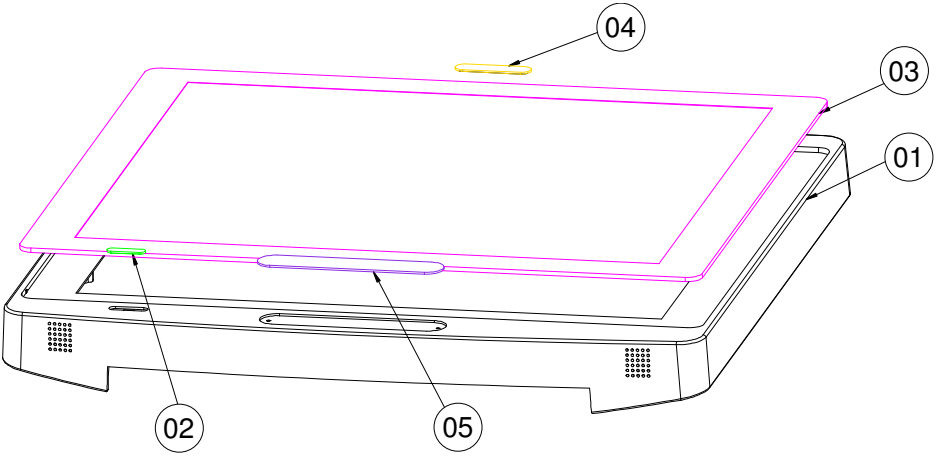

| NO. | COMPONENT NAME | PART NO. | Q'TY |
|---|---|---|---|
| 1 | DOUBLE COATED TAPE | 94-026-04501258 | 1 |
| 2 | CAMERA | 52-151-08502028 | 1 |
| 3 | SCREW | 22-272-20004011 | 2 |
| 4 | EM LED COVER | 30-002-02330258 | 1 |
| 5 | SCREW | 22-232-30060211 | 2 |
| 6 | SCREW | 22-122-30080011 | 2 |
| 7 | PARTS HOUSING | 90-004-04100000 | 2 |
| 8 | FUNCTION KEY PCBA | MR-701X | 1 |
| 9 | FRONT COVER ASSY R | -- | 1 |

## Capacitive Touchscreen



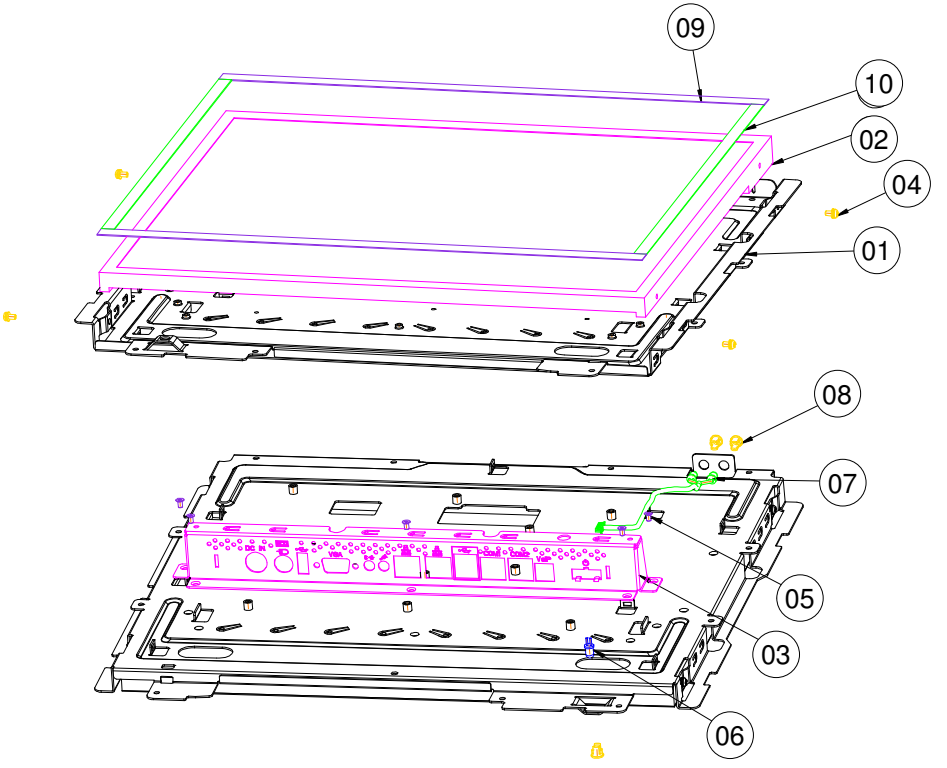

| NO. | COMPONENT NAME | PART NO. | Q'TY |
|---|---|---|---|
| 1 | FRONT COVER | 30-002-12210258 | 1 |
| 2 | POWER LED LENS | 30-021-02430258 | 1 |
| 3 | TOUCH BOARD BRACKET | 80-006-03001258 | 1 |
| 4 | DOUBLE COATED TAPE | 94-026-04502258 | 1 |
| 5 | TOUCH PANEL | 52-380-04172317 | 1 |
| 6 | WEB CAM LENS | 30-021-02130258 | 1 |
| 7 | FUNCTION KEY LENS | 30-021-02230258 | 1 |

**Resistive Touchscreen**




| NO. | COMPONENT NAME | PART NO. | Q'TY |
|---|---|---|---|
| 1 | FRONT COVER | 30-002-12210258 | 1 |
| 2 | POWER LED LENS | 30-021-02430258 | 1 |
| 3 | TOUCH PANEL | 52-380-04151017 | 1 |
| 4 | WEB CAM LENS | 30-021-02130258 | 1 |
| 5 | FUNCTION KEY LENS | 30-021-02230258 | 1 |

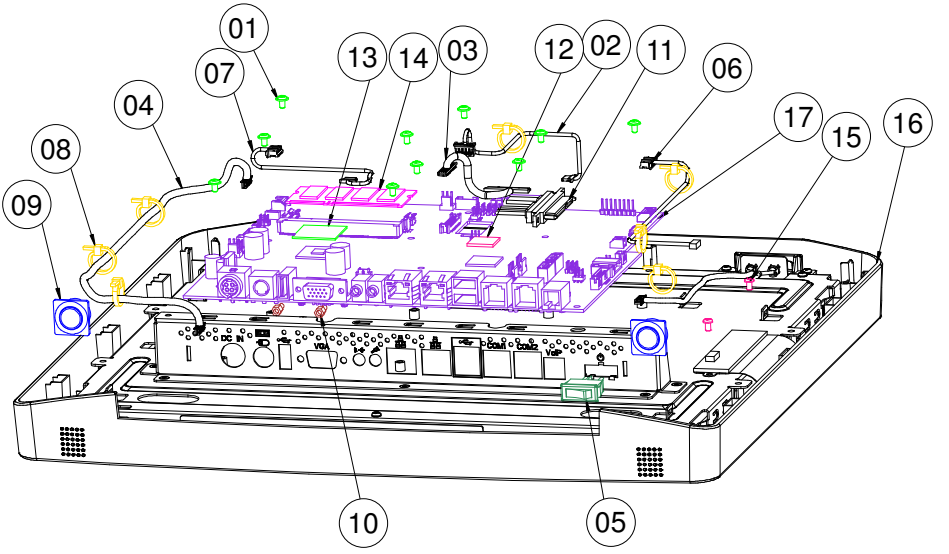
## EXPLODED DIAGRAM FOR LCD PANEL



| NO. | COMPONENT NAME | PART NO. | Q'TY |
|---|---|---|---|
| 1 | LCD HOLDER | 20-029-03001258 | 1 |
| 2 | 17" LCD | 52-351-04017002 | 1 |
| 3 | IO PLATE | 80-005-03001258 | 1 |
| 4 | SCREW | 22-232-30060211 | 4 |
| 5 | SCREW | 22-215-30005011 | 5 |
| 6 | LDE CABLE | 27-018-25804071 | 1 |
| 7 | ALARM LED CABLE | 27-018-25803071 | 1 |
| 8 | LED HOUSING | 30-014-04100009 | 3 |
| 9 | PORON-A | 90-013-24200255 | 2 |
| 10 | PORON-B | 90-013-24100255 | 2 |

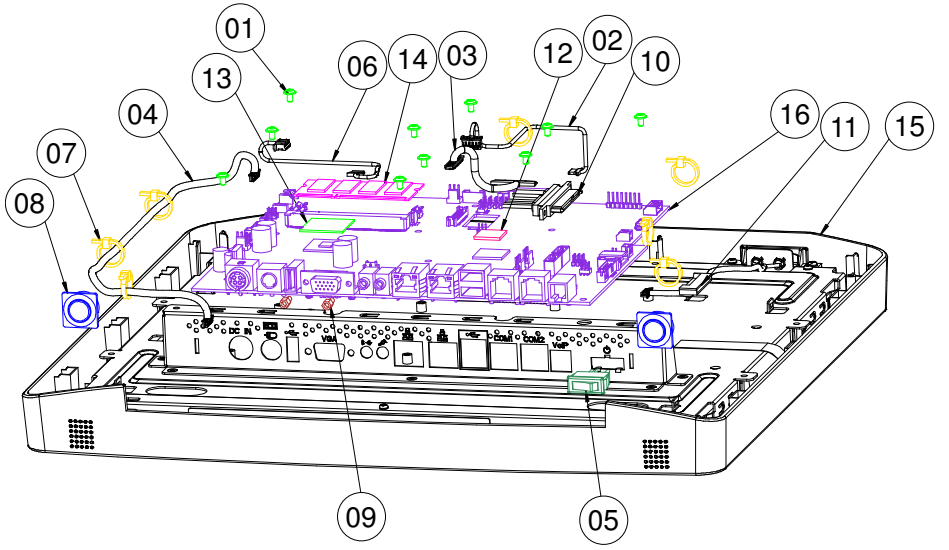
# EXPLODED DIAGRAM FOR MAINBOARD

**For Capacitive Touch**



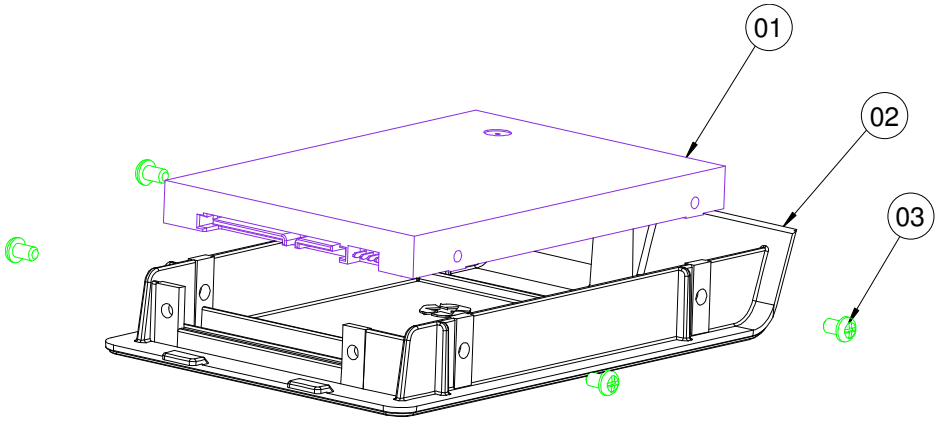
| NO. | COMPONENT NAME | PART NO. | Q'TY |
|---|---|---|---|
| 1 | SCREW | 22-242-30005311 | 11 |
| 2 | PANEL LED CABLE | 27-055-25803111 | 1 |
| 3 | LVDS CABLE | 27-020-25802111 | 1 |
| 4 | OSD CABLE | 27-058-25806111 | 1 |
| 5 | POWER SWITCH | 27-019-25803071 | 1 |
| 6 | TOUCH CABLE | 27-006-25804111 | 1 |
| 7 | CAMARA CABLE | 27-006-25703111 | 1 |
| 8 | CABLE TIE | 30-015-04200000 | 7 |
| 9 | SPEAKER | 27-021-25807071 | 2 |
| 10 | UNC No.4-40 | 22-692-40048051 | 2 |
| 11 | SATA CABLE | 27-008-25804081 | 1 |
| 12 | THERMAL PAD-A | 81-006-81515002 | 1 |
| 13 | THERMAL PAD-B | 81-006-82626001 | 1 |
| 14 | MEMORY | SEE ORDER | 1 |
| 15 | SCREW | 22-232-30060211 | 2 |
| 16 | FRONT COVER ASSY-2 | -- | 1 |
| 17 | MAIN BOARD | MB-701X | 1 |

**For Resistive Touch**



| NO. | COMPONENT NAME | PART NO. | Q'TY |
|---|---|---|---|
| 1 | SCREW | 22-242-30005311 | 11 |
| 2 | PANEL LED CABLE | 27-055-25803111 | 1 |
| 3 | LVDS CABLE | 27-020-25802111 | 1 |
| 4 | OSD CABLE | 27-058-25806111 | 1 |
| 5 | POWER SWITCH | 27-019-25803071 | 1 |
| 6 | CAMARA CABLE | 27-006-25703111 | 1 |
| 7 | CABLE TIE | 30-015-04200000 | 7 |
| 8 | SPEAKER | 27-021-25807071 | 2 |
| 9 | UNC No.4-40 | 22-692-40048051 | 2 |
| 10 | SATA CABLE | 27-008-25804081 | 1 |
| 11 | FLAT CABLE CLAMP | 30-042-04100258 | 1 |
| 12 | THERMAL PAD-A | 81-006-81515002 | 1 |
| 13 | THERMAL PAD-B | 81-006-82626001 | 1 |
| 14 | MEMORY | SEE ORDER | 1 |
| 15 | FRONT COVER ASSY-2 | -- | 1 |
| 16 | MAIN BOARD | MB-701X | 1 |

## EXPLODED DIAGRAM FOR HDD




| NO. | COMPONENT NAME | PART NO. | Q'TY |
|---|---|---|---|
| 1 | HDD | SEE ORDER | 1 |
| 2 | HDD COVER | 20-004-01062258 | 1 |
| 3 | SCREW | 22-232-30060211 | 4 |

# *TECHNICAL SUMMARY*

*APPENDIX*

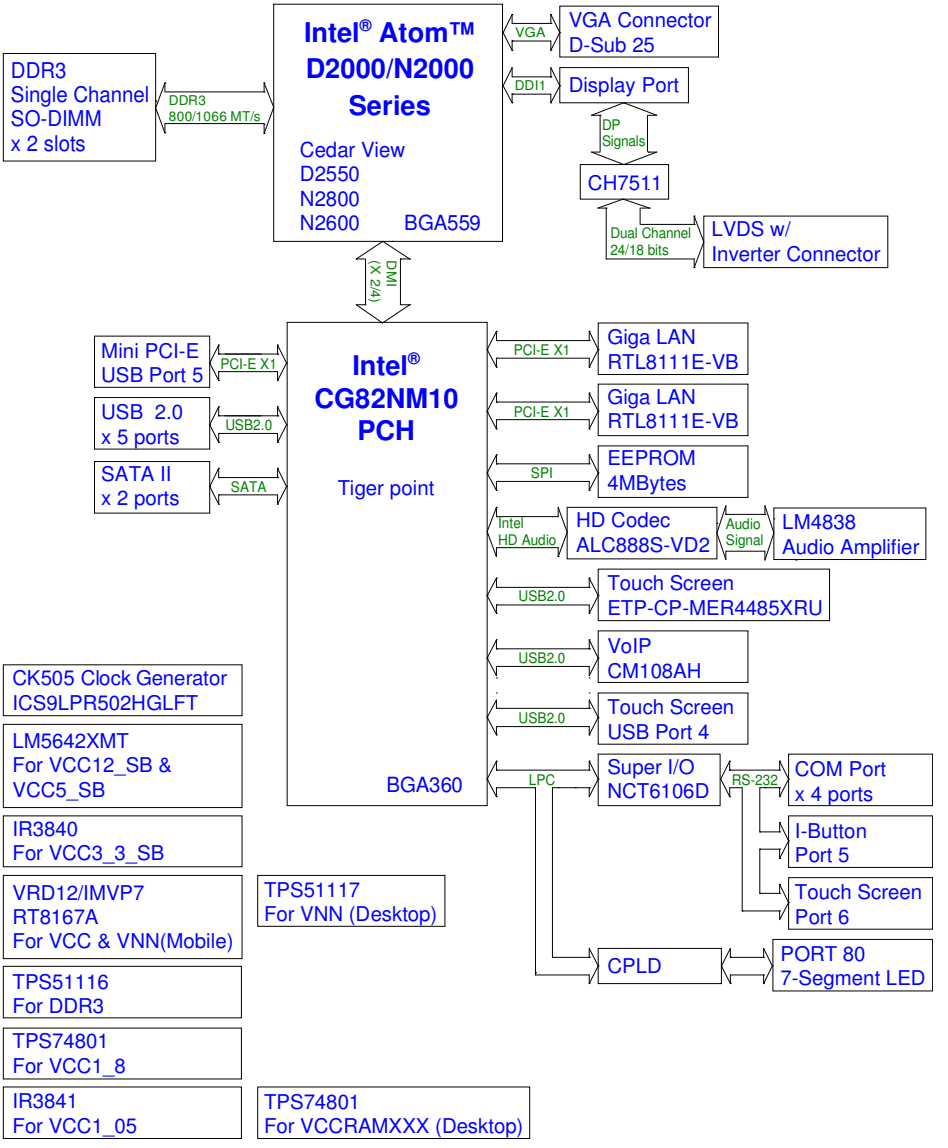
***B***

This section introduces you the maps concisely.

Section includes:

- Block Diagram
- Interrupt Map
- DMA Channels Map
- I/O Map
- Watchdog Timer Configuration
- Flash BIOS Update

## BLOCK DIAGRAM



## INTERRUPT MAP

| IRQ | ASSIGNMENT |
|---|---|
| 4 | Communications Port (COM1) |
| 3 | Communications Port (COM2) |
| 6 | Communications Port (COM3) |
| 19 | Standard AHCI 1.0 Serial ATA Controller |
| 19 | Intel® N10/ICH7 Family USB Universal Host Controller - 27C9 |
| 18 | Intel® N10/ICH7 Family PCI Express Root Port - 27D4 |
| 18 | Intel® N10/ICH7 Family USB Universal Host Controller - 27CA |
| 7 | Communications Port (COM4) |
| 10 | Communications Port (COM5) |
| - | Realtek PCIe GBE Family Controller #3 |
| 23 | Intel® N10/ICH7 Family USB Universal Host Controller - 27C8 |
| 23 | Intel® N10/ICH7 Family USB2 Enhanced Host Controller - 27CC |
| 12 | Microsoft PS/2 Mouse |
| 0 | System timer |
| 22 | High Definition Audio Controller |
| 8 | System CMOS/real time clock |
| 81 - 190 | Microsoft ACPI-Compliant System |
| 16 | Intel® N10/ICH7 Family USB Universal Host Controller - 27CB |
| 16 | Intel® N10/ICH7 Family PCI Express Root Port - 27D0 |
| 1 | Standard PS/2 Keyboard |
| 11 | Intel® N10/ICH7 Family SMBus Controller - 27DA |
| - | Intel® Graphics Media Accelerator 3600 Series |
| 13 | Numeric data processor |

**Note:** The resource information is gathered on Windows 7 (the IRQ could be assigned differently depending on your OS).

## DMA CHANNELS MAP

| TIMER CHANNEL | ASSIGNMENT |
|---|---|
| Channel 4 | Direct memory access controller |

## I/O MAP

| I/O MAP | ASSIGNMENT |
|---|---|
| 0x00000378-0x0000037F | Printer Port (LPT1) |
| 0x000003F8-0x000003FF | Communications Port (COM1) |
| 0x000002F8-0x000002FF | Communications Port (COM2) |
| 0x000003E8-0x000003EF | Communications Port (COM3) |
| 0x0000F0F0-0x0000F0F7 | Standard AHCI 1.0 Serial ATA Controller |
| 0x0000F0E0-0x0000F0E3 | Standard AHCI 1.0 Serial ATA Controller |
| 0x0000F0D0-0x0000F0D7 | Standard AHCI 1.0 Serial ATA Controller |
| 0x0000F0C0-0x0000F0C3 | Standard AHCI 1.0 Serial ATA Controller |
| 0x0000F020-0x0000F02F | Standard AHCI 1.0 Serial ATA Controller |
| 0x0000E000-0x0000EFFF | Intel® N10/ICH7 Family PCI Express Root Port - 27D4 |
| 0x0000E000-0x0000EFFF | Realtek PCIe GBE Family Controller #3 |
| 0x000002E8-0x000002EF | Communications Port (COM4) |
| 0x00000020-0x00000021 | Programmable interrupt controller |
| 0x00000024-0x00000025 | Programmable interrupt controller |
| 0x00000028-0x00000029 | Programmable interrupt controller |
| 0x0000002C-0x0000002D | Programmable interrupt controller |
| 0x00000030-0x00000031 | Programmable interrupt controller |
| 0x00000034-0x00000035 | Programmable interrupt controller |
| 0x00000038-0x00000039 | Programmable interrupt controller |
| 0x0000003C-0x0000003D | Programmable interrupt controller |
| 0x000000A0-0x000000A1 | Programmable interrupt controller |
| 0x000000A4-0x000000A5 | Programmable interrupt controller |
| 0x000000A8-0x000000A9 | Programmable interrupt controller |
| 0x000000AC-0x000000AD | Programmable interrupt controller |
| 0x000000B0-0x000000B1 | Programmable interrupt controller |
| 0x000000B4-0x000000B5 | Programmable interrupt controller |
| 0x000000B8-0x000000B9 | Programmable interrupt controller |
| 0x000000BC-0x000000BD | Programmable interrupt controller |
| 0x000004D0-0x000004D1 | Programmable interrupt controller |

| I/O MAP | ASSIGNMENT |
|---|---|
| 0x000004D0-0x000004D1 | Motherboard resources |
| 0x000002E0-0x000002E7 | Communications Port (COM5) |
| 0x0000F0A0-0x0000F0BF | Intel® N10/ICH7 Family USB Universal Host Controller - 27C8 |
| 0x00000000-0x00000CF7 | PCI bus |
| 0x00000000-0x00000CF7 | Direct memory access controller |
| 0x00000D00-0x0000FFFF | PCI bus |
| 0x00000040-0x00000043 | System timer |
| 0x00000050-0x00000053 | System timer |
| 0x0000F080-0x0000F09F | Intel® N10/ICH7 Family USB Universal Host Controller - 27C9 |
| 0x00000070-0x00000077 | System CMOS/real time clock |
| 0x00000070-0x00000077 | Motherboard resources |
| 0x0000F060-0x0000F07F | Intel® N10/ICH7 Family USB Universal Host Controller - 27CA |
| 0x0000F040-0x0000F05F | Intel® N10/ICH7 Family USB Universal Host Controller - 27CB |
| 0x00000081-0x00000091 | Direct memory access controller |
| 0x00000093-0x0000009F | Direct memory access controller |
| 0x000000C0-0x000000DF | Direct memory access controller |
| 0x00000010-0x0000001F | Motherboard resources |
| 0x00000022-0x0000003F | Motherboard resources |
| 0x00000044-0x0000005F | Motherboard resources |
| 0x00000062-0x00000063 | Motherboard resources |
| 0x00000065-0x0000006F | Motherboard resources |
| 0x00000065-0x0000006F | Motherboard resources |
| 0x00000072-0x0000007F | Motherboard resources |
| 0x00000080-0x00000080 | Motherboard resources |
| 0x00000080-0x00000080 | Motherboard resources |
| 0x00000084-0x00000086 | Motherboard resources |
| 0x00000088-0x00000088 | Motherboard resources |
| 0x0000008C-0x0000008E | Motherboard resources |

| I/O MAP | ASSIGNMENT |
|---|---|
| 0x00000090-0x0000009F | Motherboard resources |
| 0x000000A2-0x000000BF | Motherboard resources |
| 0x000000E0-0x000000EF | Motherboard resources |
| 0x00000290-0x0000029F | Motherboard resources |
| 0x000002A0-0x000002AF | Motherboard resources |
| 0x0000002E-0x0000002F | Motherboard resources |
| 0x0000004E-0x0000004F | Motherboard resources |
| 0x00000061-0x00000061 | Motherboard resources |
| 0x00000063-0x00000063 | Motherboard resources |
| 0x00000067-0x00000067 | Motherboard resources |
| 0x00000092-0x00000092 | Motherboard resources |
| 0x000000B2-0x000000B3 | Motherboard resources |
| 0x00000680-0x0000069F | Motherboard resources |
| 0x00001000-0x0000100F | Motherboard resources |
| 0x0000FFFF-0x0000FFFF | Motherboard resources |
| 0x0000FFFF-0x0000FFFF | Motherboard resources |
| 0x00000400-0x0000047F | Motherboard resources |
| 0x00000400-0x0000047F | Motherboard resources |
| 0x00000500-0x0000057F | Motherboard resources |
| 0x00000500-0x0000057F | Motherboard resources |
| 0x00000600-0x0000061F | Motherboard resources |
| 0x00000060-0x00000060 | Standard PS/2 Keyboard |
| 0x00000064-0x00000064 | Standard PS/2 Keyboard |
| 0x000006A0-0x000006AF | Motherboard resources |
| 0x000006B0-0x000006EF | Motherboard resources |
| 0x0000F000-0x0000F01F | Intel® N10/ICH7 Family SMBus Controller - 27DA |
| 0x0000F100-0x0000F107 | Intel® Graphics Media Accelerator 3600 Series |
| 0x000003B0-0x000003BB | Intel® Graphics Media Accelerator 3600 Series |
| 0x000003C0-0x000003DF | Intel® Graphics Media Accelerator 3600 Series |
| 0x000000F0-0x000000F0 | Numeric data processor |

# WATCHDOG TIMER CONFIGURATION

The I/O port address of the watchdog timer is 2Eh (in hex) and 2Fh. Address 2Eh is the address port while 2Fh is the data port. User must first assign the address of register by writing address value into address port 2Eh, then write/read data to/from the assigned register through data port 2Fh.

## Configuration Sequence

To program NCT6106D configuration registers, the following configuration sequence must be followed:

(1) Enter the extended function mode

(2) Configure the configuration registers

(3) Exit the extended function mode

**(1) Enter the extended function mode**

To place the chip into the Extended Function Mode, two successive writes of 0x87 must be applied to Extended Function Enable Registers (EFERs, i.e. 2Eh or 4Eh).

**(2) Configure the configuration registers**

The chip selects the Logical Device and activates the desired Logical Devices through Extended Function Index Register (EFIR) and Extended Function Data Register (EFDR). The EFIR is located at the same address as the EFER, and the EFDR is located at address (EFIR+1). First, write the Logical Device Number (i.e. 0x07) to the EFIR and then write the number of the desired Logical Device to the EFDR. If accessing the Chip (Global) Control Registers, this step is not required. Secondly, write the address of the desired configuration register within the Logical Device to the EFIR and then write (or read) the desired configuration register through the EFDR.

**(3) Exit the extended function mode**

To exit the Extended Function Mode, writing 0xAA to the EFER is required. Once the chip exits the Extended Function Mode, it is in the normal running mode and is ready to enter the configuration mode.

## Code example for watchdog timer

Enable and start watchdog timer while set 30 seconds as the timeout interval.

**In assembly** — **Step 1 - Enter to extended function mode** — **In C language**

```
Mov     dx,     2eh                 IoWrite8(NCT6106D_CFG_INDEX,0x87);
Mov     al,     87h                 IoWrite8(NCT6106D_CFG_INDEX,0x87);
Out     dx,     al
Out     dx,     al
```

**In assembly** — **Step 2 - Select Logical Device 8 of watchdog timer** — **In C language**

```
Mov     al,     07h                 IoWrite8(NCT6106D_CFG_INDEX,0x07);
Out     dx,     al                   IoWrite8(NCT6106D_CFG_DATA,0x08);
Inc     dx
Mov     al,     08h
Out     dx,     al
```

**In assembly** — **Step 3 - Set second as counting unit** — **In C language**

```
Dec     dx                          IoWrite8(NCT6106D_CFG_INDEX,0xF0);
Mov     al,     0f0h        TempData = (IoRead8(NCT6106D_CFG_DATA) &
                                                              0xF7)\
Out     dx,     al                  | (SetupData.WdtCountMode << 3);
Inc     dx                  IoWrite8(NCT6106D_CFG_DATA,TempData);
In      al,     dx
And     al,     not 08h
Out     dx,     al
```

**In assembly**

**Step 4 - Set timeout interval as 30seconds and start counting**

**In C language**

```
Dec     dx
Mov     al,     0f1h
Out     dx,     al
Inc     dx
Mov     al,     30
Out     dx,     al
```

```
IoWrite8(NCT6106D_CFG_INDEX,0xF1);
IoWrite8(NCT6106D_CFG_DATA,SetupData.WdtTimeOut);
```

**In assembly**

**Step 5 - Exit the extended function mode**

**In C language**

```
Dec     dx
Mov     al,     0aah
Out     dx,     al
```

```
IoWrite8(NCT6106D_CFG_INDEX,0xAA)
```

# FLASH BIOS UPDATE

### Important Notes:

- Downgrading the BIOS to an earlier version is not recommended and may not be supported. An earlier BIOS version may not contain the support for the latest processors, bug fixes, critical security updates, or support the latest board revisions currently being manufactured.
- Before initiating a BIOS update, be sure to read and precisely follow the instructions included in this document. You may wish to print the instructions for easy reference.
- If a BIOS update process is interrupted, your computer may not function properly. We recommend the process be done in an environment with a steady power supply (preferably with UPS).
- If desired, before updating the BIOS manually record all BIOS settings that have been changed (from default) so they can be restored after completing the BIOS update.
- All images and instructions in this example are specific to the MM-7017 product and are for illustration purposes only.

### Using a Bootable USB Flash Device

With the afudos (AMI Firmware Update for MS-DOS) 3.04.03 BIOS update utility, you can update the BIOS from bootable USB flash drive or other bootable USB media.

Using the afudos BIOS update is two-stage process:

I. Create the bootable media containing the BIOS update and update utility
II. AFUDOS Command for system BIOS update
III. BIOS update procedure

## I. Create the bootable media containing the BIOS update and update utility

1. Download and save the BIOS update ROM file to the bootable USB device with MS-DOS environment.
2. To the same location copy MS-DOS utility afudos 3.04.03.
   All required files for the BIOS update is shown as in the figure below.

```
C:\AFUDOS>dir


 Volume in drive C is EFI_DUET
 Volume Serial Number is 32E4-9D1F
 Directory of C:\AFUDOS

               <DIR>              02-23-12   9.51a
               <DIR>              02-23-12   9.51a
AFUDOS    EXE       167,152        11-12-12   3.12p
70170P01  BIN     4,194,304        02-13-13   2.14p
          2 file(d)         4,361,456 bytes
          2 dir(s)        864,940,088 bytes free



C:\AFUDOS>
```

## II. AFUDOS Command for System BIOS Update

AFUDOS.exe is the AMI firmware update utility; the command line is shown as below:

**AFUDOS <ROM File Name> [option1] [option2]…**

You can type AFUDOS /? to see all the definition of each control options. The recommended options for BIOS ROM update consist of following parameters:

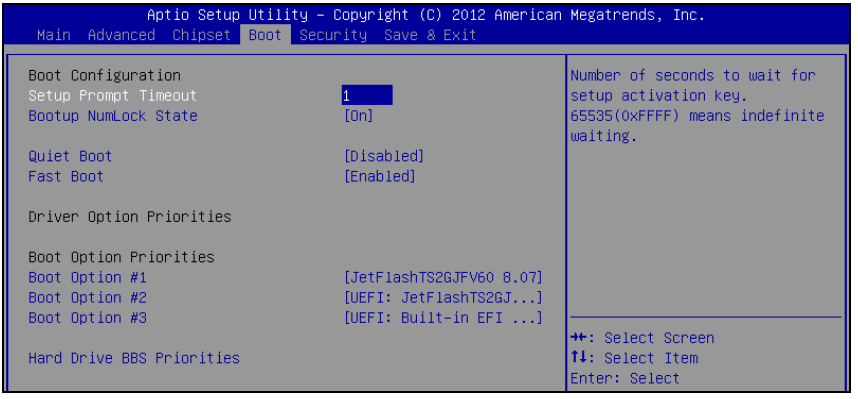
**/P**: program main BIOS image
**/B**: program Boot Block
**/N**: program NVRAM
**/X**: don't check ROM ID

## III. BIOS update procedure

1. Configure the BIOS on target computer to boot to the USB flash device.

   a. Connect the USB device.
   b. Turn on the computer and press <F2> or <Del> key during boot to enter BIOS Setup.
   c. Go to the Boot section.
   d. In Boot Option Priorities section, set the USB flash device to be the first boot device.
   e. By pressing <F4> key save configuration and exit the BIOS setup.

2. Boot the target computer with the USB flash device connected.
   BIOS option to boot from the USB device is illustrated as in the figure below.




3. At the prompt, type: afudos 70170P0x.rom /b /p /n /x where 70170P0x.rom is the filename of intended ROM file (in this example 70170P01.rom), to launch BIOS update process.

4. During the update you will see the BIOS update process status.
   **Beware! Do not power down or reset your computer** before the update is complete! The whole update process may take up to 3 minutes.

   The update in progress is shown as in the following figure.

```
C:\afudos 70170P01.rom /b /p /n /x

+-----------------------------------------------------+
|              AMI Firmware Update Utility     v3.04.03            |
|  Copyright (C) 2012 American Megatrends Inc. All Rights Reserved.  |
+-----------------------------------------------------+

Reading file ............ done
- FFS checksums ...... ok
Erasing Boot Block ...... done
Updating Boot Block ..... done
Verifying Boot Block .... done
Erasing Main Block ...... done
Updating Main Block ..... 0x0006E (8%)
```

5. Successful BIOS flash is confirmed by messages: ... done for all the items. The already finished BIOS update process is displayed as in the figure below.

```
C:\afudos 70170P01.rom /b /p /n /x

+-----------------------------------------------------+
|              AMI Firmware Update Utility     v3.04.03            |
|  Copyright (C) 2012 American Megatrends Inc. All Rights Reserved.  |
+-----------------------------------------------------+

Reading file ............ done
- FFS checksums ...... ok
Erasing Boot Block ...... done
Updating Boot Block ..... done
Verifying Boot Block .... done
Erasing Main Block ...... done
Updating Main Block ..... done
Verifying Main Block .... done
Erasing NVRAM Block ..... done
Updating NVRAM Block .... done
Verifying NVERAM Block .. done


C:\AFUDOS>
```

6. Update is complete after restart.
7. To verify, check during following boot that the BIOS version displayed at initialization screen has changed.