

FabiaTech Corporation

IPC Solution

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Small Cube System
Fanless Series
FX5653 User's Manual

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If you have problems or difficulties in using the system or setting up the relevant devices, and software that are not explained in this manual, please contact our service engineer for service, or send email to support@fabiatech.com.

Returning Your Board for Service & Technical Support

If your board requires servicing, contact the dealer from whom you purchased the product for service information. You can help assure efficient servicing of your product by following these guidelines:

- ❑ A list of your name, address, telephone, facsimile number, or email address where you may be reached during the day
- ❑ Description of you peripheral attachments
- ❑ Description of your software (operating system, version, application software, etc.) and BIOS configuration
- ❑ Description of the symptoms (Extract wording any message)

For update BIOS, drivers, manuals, or product information, please visit us at www.fabiatech.com.

Table of Contents

FX5653 User's Manual	i
Chapter 1 Introducing the FX5653 System	1
Overview.....	1
Series Comparison Table	2
Layout.....	3
Specifications.....	4
Packing List	5
Chapter 2 Hardware Installation	7
Before Installation	7
To install hardware- remove the bottom Cover	8
LED indicators	12
I/O peripheral connectors.....	12
Connecting the DC power and power button	15
Internal Connector and Jumper setting	16
Chapter 3 BIOS Setup	19
Overview.....	19
Main Setup	21
Advanced	22
ACPI settings	23
CPU Configuration.....	24
Intel Fast Flash Standby.....	25
USB Configuration	26
IDE Configuration.....	28
Super IO Configuration	30
H/W Monitor.....	31
Chipset	32
Host Bridge	33
South Bridge.....	36
Boot	40
Security.....	42
Save & Exit	43

Chapter 4 Software Installation	45
System Driver	45
WIN 7 Driver.....	45
VGA Driver.....	46
WIN 7 Driver.....	46
Audio Driver.....	46
WIN 7 Driver.....	46
LAN Driver (RTL 8111C).....	47
WIN7 Driver.....	47
BIOS Flash Utility.....	47
iFFS Setup Procedure	48
Watchdog Timer	51
Watchdog Timer Setting	52
Watchdog Timer Enabled	53
Watchdog Timer Trigger	54
Watchdog Timer Disabled.....	54
TTL I/O (GPIO) programming	55
Chapter 5 Technical Reference	57
Trouble Shooting for Post Beep and Error Messages.....	57
Technical Reference.....	60
Physical and Environmental.....	60
Real-Time Clock and Non-Volatile RAM	60
CMOS RAM Map.....	62
I/O Port Address Map.....	63
Interrupt Request Lines (IRQ)	64
Serial Ports	65
Appendix	69
Dimension	69

Chapter 1 Introducing the FX5653 System

Overview

The FX5653 is an embedded system with Intel® Atom™ D2550 low-power CPU module inside. This user's manual provides information on the physical features, installation, and BIOS setup of the FX5653.

Built to unleash the total potential of the Intel® Atom™ D2550 -Dual Core Processor, Able to support 1.86 GHz CPU, this system supports two 10/100/1000M Base -TX LAN ports, two PCIE Mini Card connector for GPRS/GPS modules, five USB2.0 ports, Audio, and two So-DIMM socket supports up to 8GB DDR3 RAM, two SATA ports (One for CFAST, and other one for SATA SSD or Hard disk), and HD/DP/ VGA display ports.

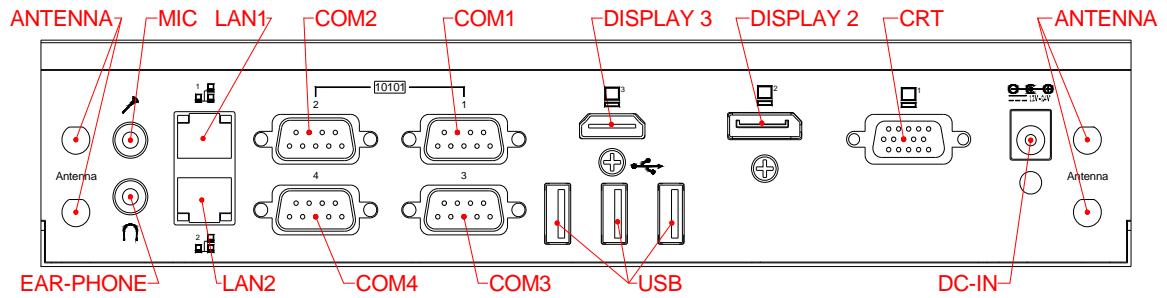
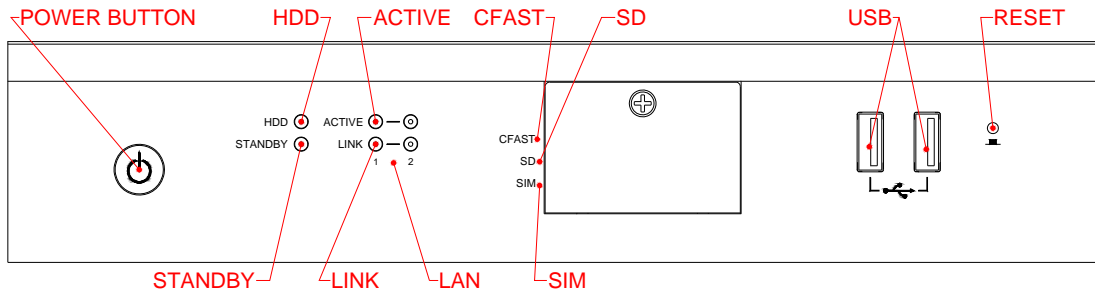
Each FX5653 has four ports for I/O communications. Four RS-232C ports are available.

The FX5653 is perfect for communication and small Embedded Control. The unit is only 180 mm (D) X 250 mm (W) X 50 mm (H).

Series Comparison Table

Model	FX5653
Processor	Intel® Atom™ D2550 1.86GHz
<i>Display (Dual-Display)</i>	<i>VGA, HD, DP</i>
<i>Memory 204-Pin So-DIMM (Max.)</i>	<i>DDR3-800/1066 4GB/8GB</i>
S-Chipset	NM10
<i>USB 2.0 Port</i>	<i>Five</i>
<i>Storage</i>	<i>One CFast, SD and One SATA HDD</i>
<i>USB 2.0 Port</i>	<i>Five</i>
<i>RJ45 LAN port (10/100/1000 Mbps)</i>	<i>Two Realtek RTL8111C</i>
<i>PCIe Mini Card</i>	<i>Two</i>
<i>Multi I/O</i>	<i>Four R232</i>
<i>Watchdog Timer</i>	<i>Yes</i>
Operating Temperature	0~+50°C (32~122°F)
Storage Temperature	-20~+60°C (4~140°F)
Dimensions (Unit: mm)	180(D) x250(W) X 50(H)

Layout



Specifications

❑ ***Processor Board –***

Intel® Atom™ D2550 Dual Core (1M L2 Cache, 1.86GHz) Low Power Processor with 4GB DDR3-RAM

❑ ***I/O Outlets –***

Two 10/100/1000 base-TX Ethernet LAN ports with RJ45

Four RS-232 serial ports with DB9

Five USB ports (2.0) and one VGA connector with DB15

One HD and one Display Port (DP)

Two audio connectors for Ear-phone and Microphone-in

Two PCIe Mini Card socket modules, especially for WLAN/GPRS module

One DC-In jack connector with power push button switch

One push button reset switch

❑ ***LED Indicator –***

One power LED with Power Button, One HDD/CF access LED, One Status LED and Four LAN LED

❑ ***Storage Bay-***

One CFast socket for CFast modules

One SD socket supports up to 32GB SDHC

One SATA hard disk space

❑ ***Power Requirement –***

DC +12V~+24V, 2.56A maximum (1.44A Typical) with DC 19V input

❑ ***Dimensions -***

180.0mm (D) x 250.0mm (W) x 50.0mm (H).

Packing List

Upon receiving the package, verify the following things. Should any of the mentioned happens, contact us for immediate service.

- Unpack and inspect the FX5653 package for possible damage that may occur during the delivery process.
- Verify the accessories in the package according to the packing list and see if there is anything missing or incorrect package is included.
- If the cable(s) you use to install the FX5653 is not supplied from us, please make sure the specification of the cable(s) is compatible with the FX5653 system.

Note: after you install the FX5653, it is recommended that you keep the diskette or CD that contains drivers and document files, and keep the document copies, or unused cables in the carton for future use.

The following lists the accessories that may be included in your FX5653 package, Some accessories are optional items that are only shipped upon order.

- One FX5653 embedded system.
- One AC to DC power adapter and 1 AC power code.
- One pack of 2.5" SATA hard disk installation kit with fixed screws.
- One compact disc includes software utility and manual.

Optional items:

- AK1006- Half size mini PCIe module adapter kits. (PN: 0606010028G)
- One FX5504K1 Panel Mount Kit (VESA 75*75/100*100).(P/N: 0606010012G)
- One FX5501K1 Wall-Mount Kit.(P/N: 0606010009G-20)
- One FX5622K1 Rack-Mount Kit.(P/N: 0606010024G)

Chapter 2 Hardware Installation

This chapter introduces the system connectors & jumper settings, and guides you to apply them for field application.

Before Installation

Before you install the system, make sure you follow the following descriptions.

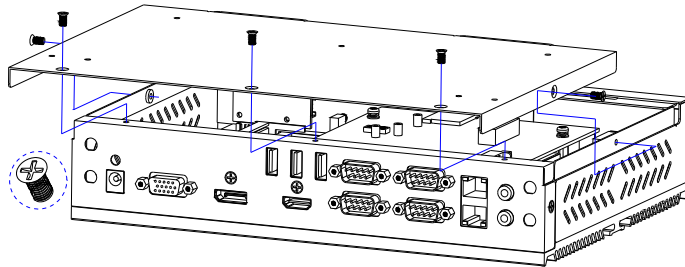
1. Before removing the cover, shut down the operation System and disconnect power switch to off and unplug AC-to DC Adapter cable.
2. Install or unplug any connector, CFAST Compact Flash and hard disk is sure that the power is disconnected or power switch to off from the system. If not, this may damage the system.
3. The ESD (Electricity Static Discharge) may be created from human body that touches the board. It may do damage to the board circuit.

□ **To install hardware- remove the bottom Cover**

If you are installing following hardware items, you can remove the bottom cover. The following figure will guide you how to install SATA 2.5" HDD, C-Fast Compact Flash modules, mini PCIe WLAN or GPRS module, DDR3 RAM module to the FX5653 and how to install the FX5653 fixers. (Please see the spots circled.)

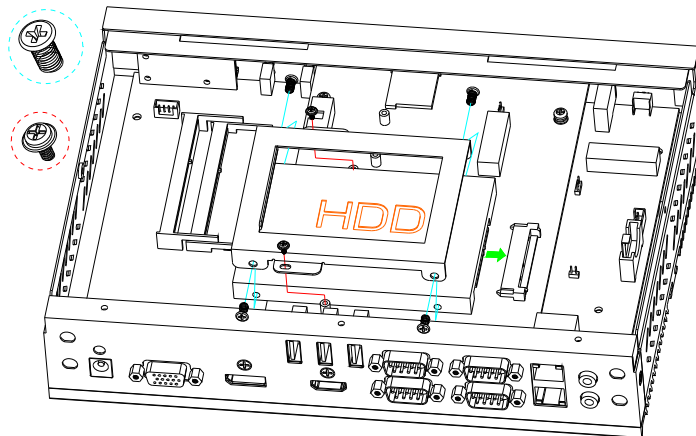
➤ **a. Unscrew bottom cover**

Use a cross-head screwdriver to remove five screws that secure the bottom cover.



➤ **b. Installing hard disk**

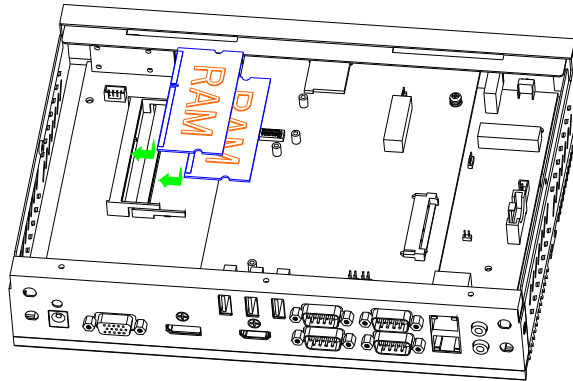
Faster Screws up the Hard disk device to HDD metal frame then plug to the SATA connector and screws up metal frame to system. See following figure.



Note: Use caution when handling the hard disk to prevent damage to SATA connector as you insert hard disk. Be careful with the orientation when installing connectors.

➤ **c. Installing memory**

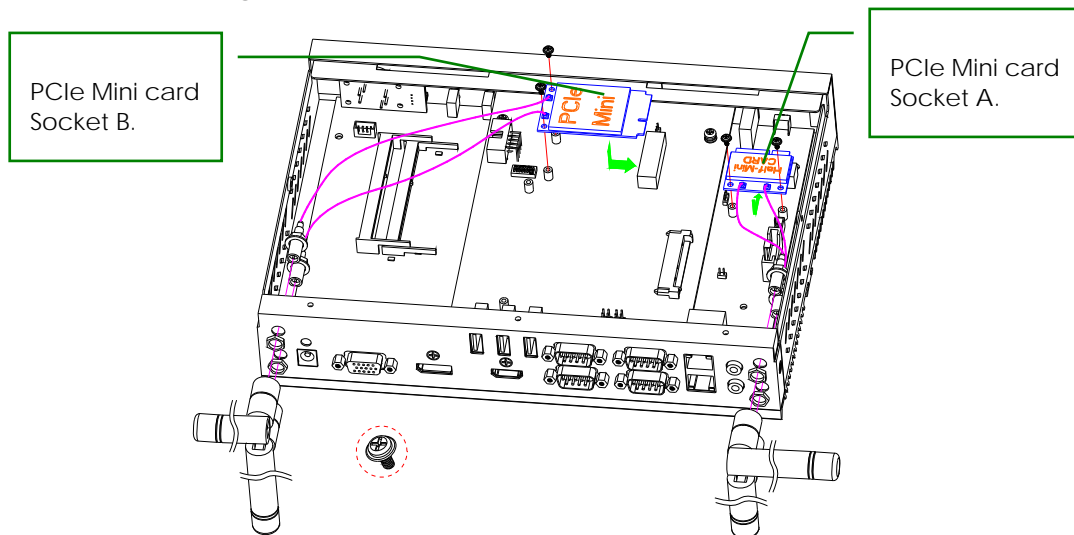
If you may extend additional memory to system, see as following figure. The 204 pin So-DIMM socket supports 1GB to 4GB of DDR3 RAM modules. (Max. 8GB)



➤ **d. Installing PCIe Mini Card Module**

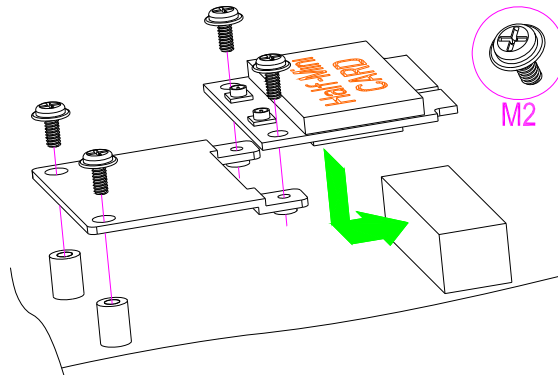
FX5637 supports 2 PCIe mini card sockets; PCIe mini card socket "A" is half size and PCIe mini card socket "B" is standard size. You may extend additional PCIe mini card module and SIM card to "socket B" on system. Connect to the antenna cable from front and rear side antenna holes to GPRS or Wireless LAN module and install the SIM card for GPRS. See following figures.

✧ **d1. Installing PCIe Mini Card and SIM card**

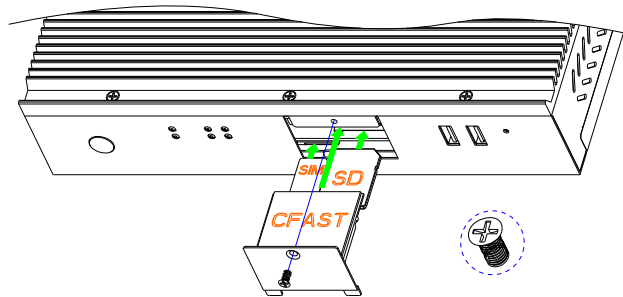


Note: 1. When installing PCIe GPRS Mini card on "socket B" of FX5637 system these is need the installing the SIM Card to system board.
 2. Open the front side cover then insert SIM card into the SIM socket. Make sure that the SIM card is properly inserted and that golden contact area on the card is facing downwards.

✧ d2. Installing AK1006 kit (Optional) - for Half Size Mini PCIe module



➤ e. Installing CFAST Compact Flash, SD and SIM Card

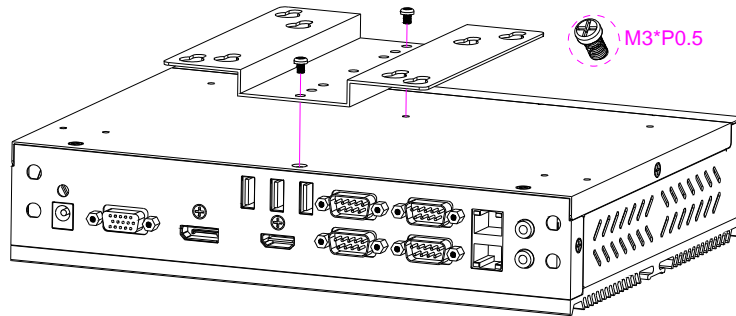


Note: The SD socket supports up to 32GB SDHC (Class 6).

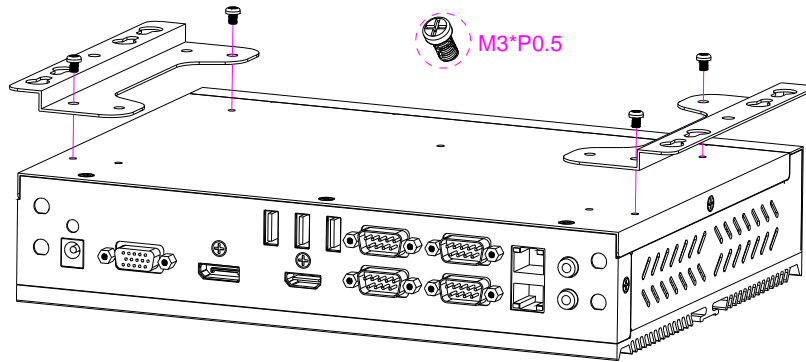
➤ **f. Installing the universal fixers on FX5653**

Please refer to the following figure for installing the FX5653 with universal fixers.

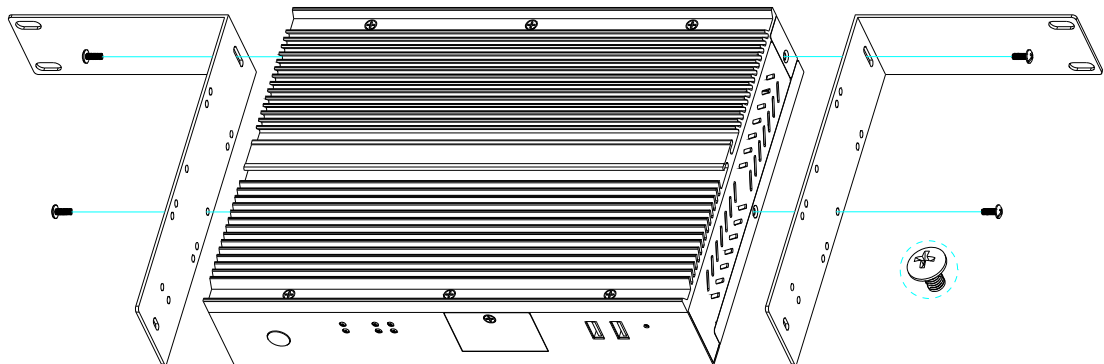
f1. FX5504K1- Panel Mount (VESA 75*75/100*100)



f2. FX5501K1- Wall Mount

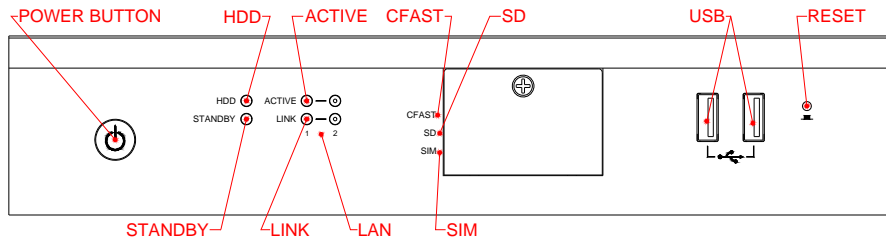


f3. FX5622K1 – Rack Mount



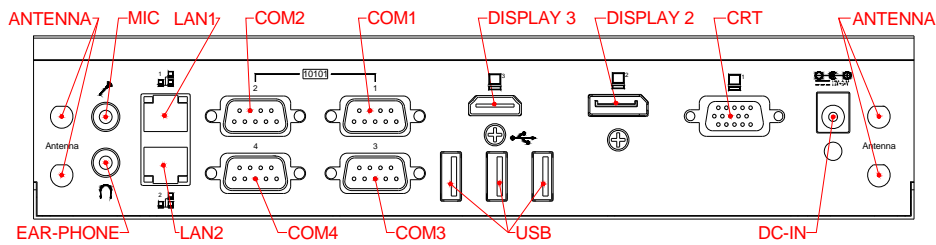
□ **LED indicators**

The Power button and HDD LED's has two distinctive statuses: Off for inactive and blinking light for activity operation. The Standby LED's indicates system state: off for normal state and blinking for suspend state. And the 4 LED's for LAN ports. The up side LED (Orange) indicates data is being accessed and the down side LED's (Green) indicates on-line status.

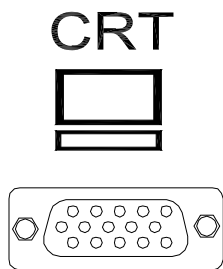


□ **I/O peripheral connectors**

View from the front and real panel, If you are connecting the monitor, LAN, audio, COM and USB to the FX5653. See following figure and a side pictures.



1. A VGA connector is provided for VGA signals.



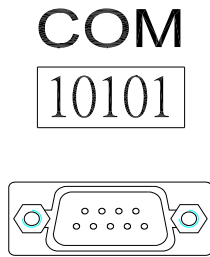
DB15	Signal
1	Red
2	Green
3	Blue
13	Hsync
14	Vsync
12	DDC Data(*)
15	DDC Clock(*)
5 & 10	Digital Ground
6,7,8	Analog Ground
Others	Not Used

2. Connecting the DISPLAY1 and DISPLAY 2



3. Connecting the COM ports

The DB9 (COM1~COM4) is standard RS232 serials port. The following tables show the signal connections of these connectors.

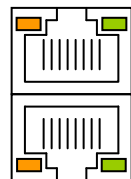


DB15	RS-232
1	-DCD
6	-DSR
2	RXD
7	-RTS
3	-TXD
8	-CTS
4	-DTR
9	-RI
5	Ground
Metal	Case Ground

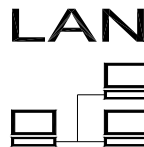
4. Connecting the LAN ports

The RJ45 connector with 2 LED's for LAN. The orange LED indicates data is being accessed and the green LED indicates on-line status.

RJ45 connector



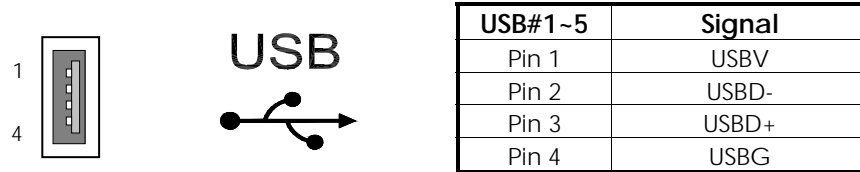
1 8
(Front View)



RJ45	LAN	RJ45	LAN
1	MDI0+	5	MDI2+
2	MDI0-	6	MDI2-
3	MDI1+	7	MDI3+
4	MDI1-	8	MDI3-

5. Connecting the USB Ports

The system supports a five port USB connector. Any USB device can be attached to USB ports as plug-and-play function is supported.



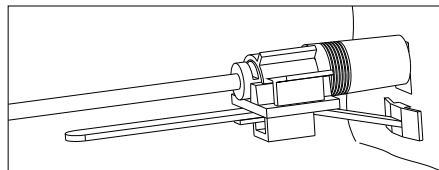
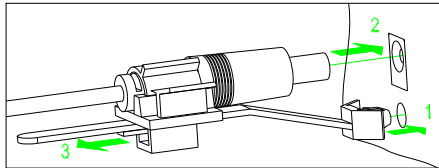
6. Connecting the Audio Microphone In/ EAR-Phone



□ **Connecting the DC power and power button**

Power is supplied through an external AC/DC power adapter DC In. Take reference to the technical specification section for information about AC/DC power input voltage. See following figure.

1. DC-Power Jack: Plug External AC/DC power adapter into DC-jack (2) plug the cable into hole (1), then pull up the end of the cable (3).



DC +12V~+24V, 60VA minimum

2. Power Button & Reset Push Button: Pushing the Power button one time will switch the system on and off. And Reset push button is the switch for system reset. Push and release the reset button will make hardware reset system and restart booting the system.



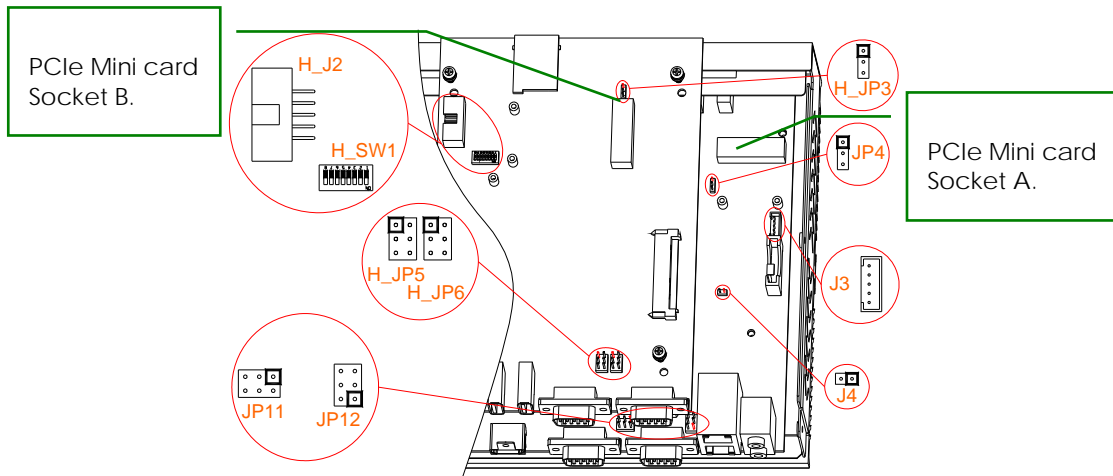
Power button: On/Off



Reset Push Button: Restart

□ **Internal Connector and Jumper setting**

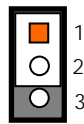
The JP11, JP12, H_JP5, H_JP6 for serial ports power voltage source +5V or +12V select. JP4 (PCIe mini card "socket A") and H_JP3 (PCIe mini card "socket B") are used to select 3VSB/3.3V voltage with PCIe Mini Card module. The H_J2 is USB header, H_SW1 is switch USB signal to H_J2 header connector or system USB ports. J4 is used to clear CMOS data, and J3 and J4 are reserved for other usage.



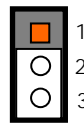
➤ **a. PCIe Mini Card Socket A/B: JP4/ H_JP3 Select 3VSB/3.3V voltage**

When installing the PCIe Mini Card module, if the card doesn't work properly (Refer PCIe module card specification with pin-24 3.3VAUX.), you can select 3VSB/3.3V voltage. (Defaulted 1, 2 closed.)

H_JP3/JP4



3.3VSB



3.3V

Factory Preset

➤ **b. Clear CMOS setting: J4**

You can use J4 to clear CMOS data. The CMOS stores information such as system date, time, and boot up device, password, IRQ... which include set up with the BIOS. To clear the CMOS, set J5 to close and then open before system powers off. The default setting is open.

J4



2 1

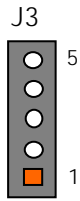
Normal Operation
Default



2 1

Clear CMOS Data

➤ c. TTL I/O header (2.0mm): J3

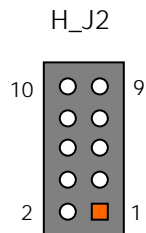
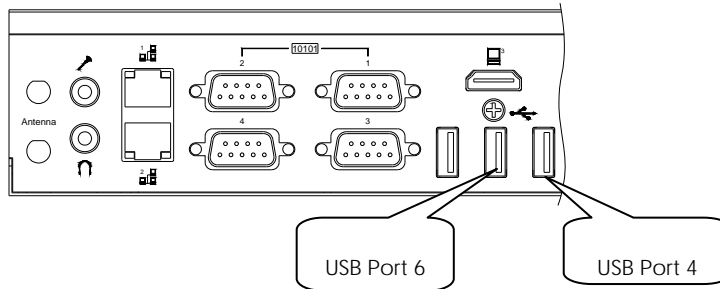


J3	TTL Lines
1	GP3
2	GP2
3	GP1
4	GP0
5	Ground

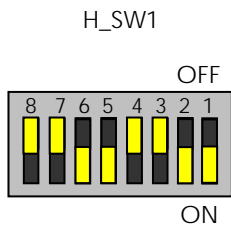
Note: Please refer to Chapter4 – J3 TTL I/O Software programming example.

➤ d. Switch USB 4/6 Port of Rear Panel to H_J2 USB Header (2.54mm): H_SW1

You can use DIP switch H_SW1 on or off select USB 4/6 ports to the H_J2 USB header. The H_SW1- 1~ 4 is for USB port 4, and H_SW1- 5~ 8 is for USB port 6, When switched to the H_J2 connector, external USB port 4/6 connector will not be able to use.



H_J2	Signal	H_J2	Signal
1	USBV4 +	2	Ground
3	USBV4 -	4	USBV6 -
5	USBV4 +	6	USBV6 +
7	USBV4 -	8	USBV6 -
9	Ground	10	USBV6 +

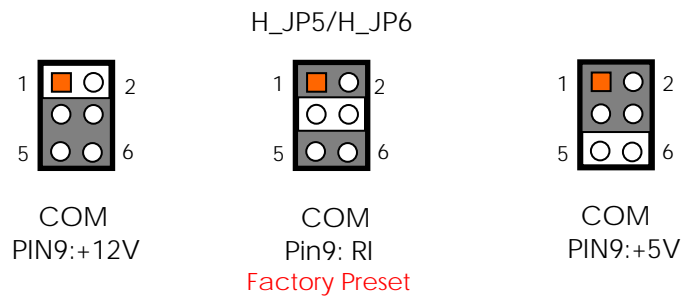
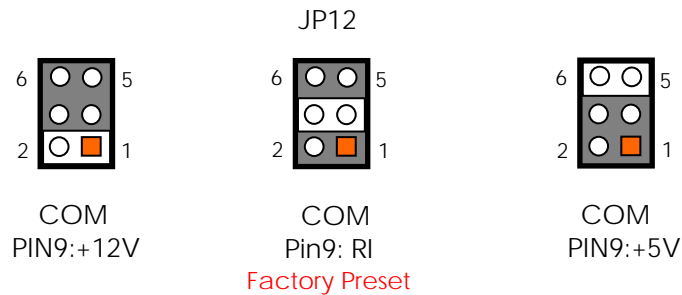
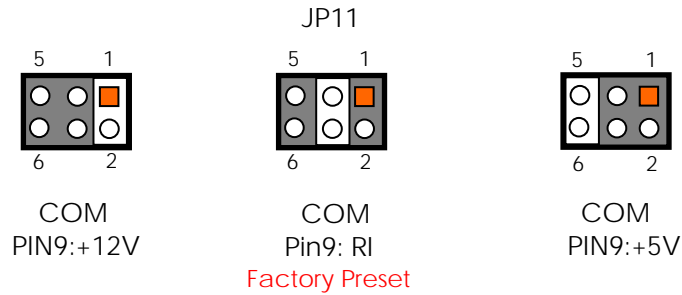


Rear Panel USB port
Factory Preset

H_SW1	USB Port 4	H_J2	H_SW1	USB Port 6	H_J2
-1	On-↓	Off-↑	-5	On-↓	Off-↑
-2	On-↓	Off-↑	-6	On-↓	Off-↑
-3	Off-↑	On-↓	-7	Off-↑	On-↓
-4	Off-↑	On-↓	-8	Off-↑	On-↓

➤ e. COM1/2/3/4 power source selection: JP11, JP12, H_JP5 and H_JP6

The COM1 to COM4 Serial ports provide power source will driver the “RI” signal with pin-9 of DB9 connect. JP11- COM1 and JP12- COM2 jumper position under the daughter board, the settings will need to remove the daughter board.



Chapter 3 BIOS Setup

This chapter describes the BIOS setup.

Overview

BIOS are a program located on a Flash memory chip on a circuit board. It is used to initialize and set up the I/O peripherals and interface cards of the system, which includes time, date, hard disk drive, and connected devices such as the video display, diskette drive, USB device, and the keyboard. This program will not be lost when you turn off the system.

The BIOS provides a menu-driven interface to the console subsystem. The console subsystem contains special software, called firmware that interacts directly with the hardware components and facilitates interaction between the system hardware and the operating system.

The BIOS default values ensure that the system will function at its normal capability. In the worst situation the user may have corrupted the original settings set by the manufacturer.

All the changes you make will be saved in the system RAM and will not be lost after power-off.

When you start the system, the BIOS will perform a self-diagnostics test called Power On Self Test (POST) for all the attached devices, accessories, and the system. Press the [Del] key to enter the BIOS Setup program, and then the main menu will show on the screen.

Note: Change the parameters when you fully understand their functions and subsequence.

➤ **BIOS Functions**

On the menu, you can perform the following functions

1. Main
2. Advanced
 - ACPI Settings
 - CPU Configuration
 - Intel Fast Flash Standby
 - USB Configuration
 - IDE Configuration
 - Super IO Configuration
 - H/W Monitor
3. Chipset
 - Host Bridge
 - South Bridge
4. Boot
 - CSM parameters
5. Security
6. Save & Exit

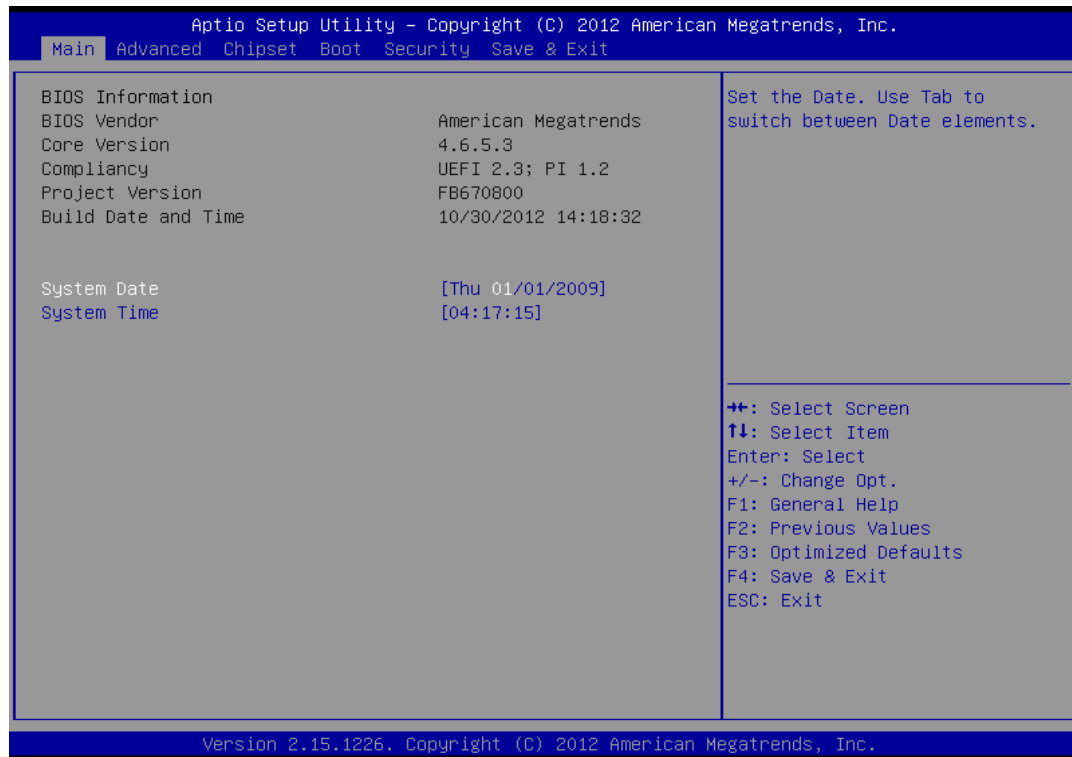
➤ **Keyboard Convention**

On the BIOS, the following keys can be used to operate and manage the menu:

Key	Function
[↑][↓]	The Up and Down keys allow you to select item.
[←][→]	The Left and Right keys allow you to select screen.
[Enter]	The Enter key allows the user to select an option to edit its value or access a sub menu.
[+]/[-]	The Plus and Minus keys allow you to change the field value of a particular setup item.
[F1]	General Help.
[F2]	Previous Values.
[F3]	Optimized Defaults.
[F4]	Save current configuration and exit.
[ESC]	To exit the current menu or message.

Main Setup

This section describes BIOS information and system clock setup. If the CPU board is already installed in a working system, you will not need to select this option anymore.



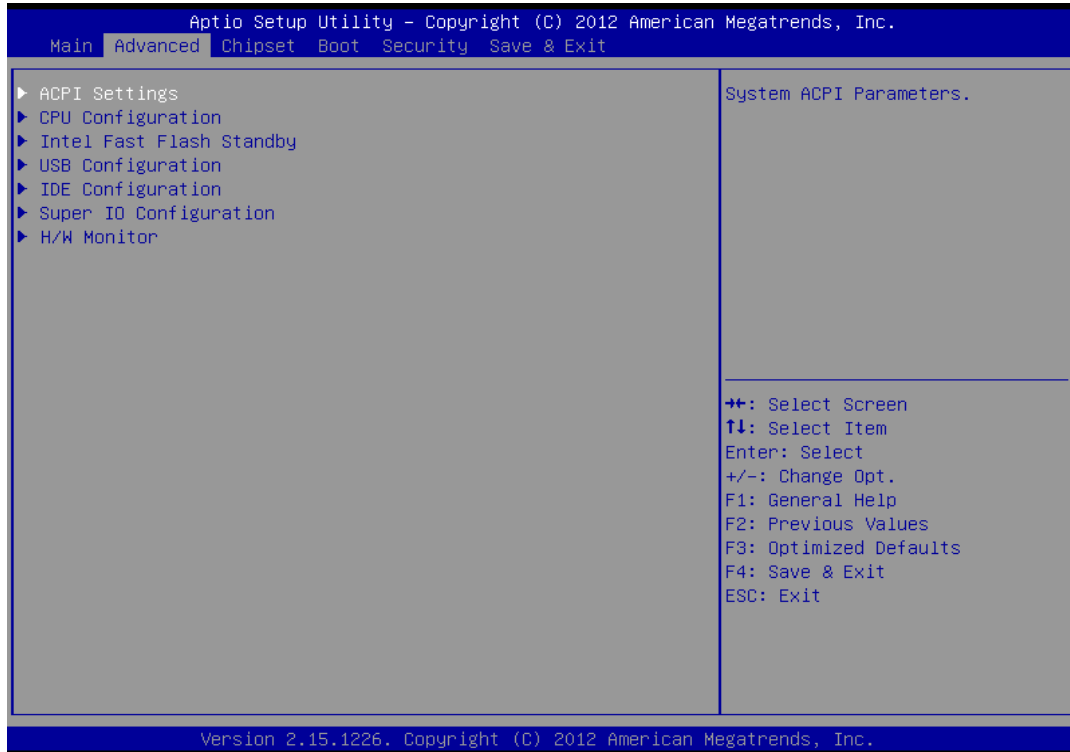
➤ System Date & System Time Setup

Highlight the <Date> field and then press the [+]/ [-] keys or enter new values to set the current date. Follow the month, day and year format.

Highlight the <Time> field and then press the [+]/ [-] keys or enter new values to set the current date. Follow the hour, minute and second format.

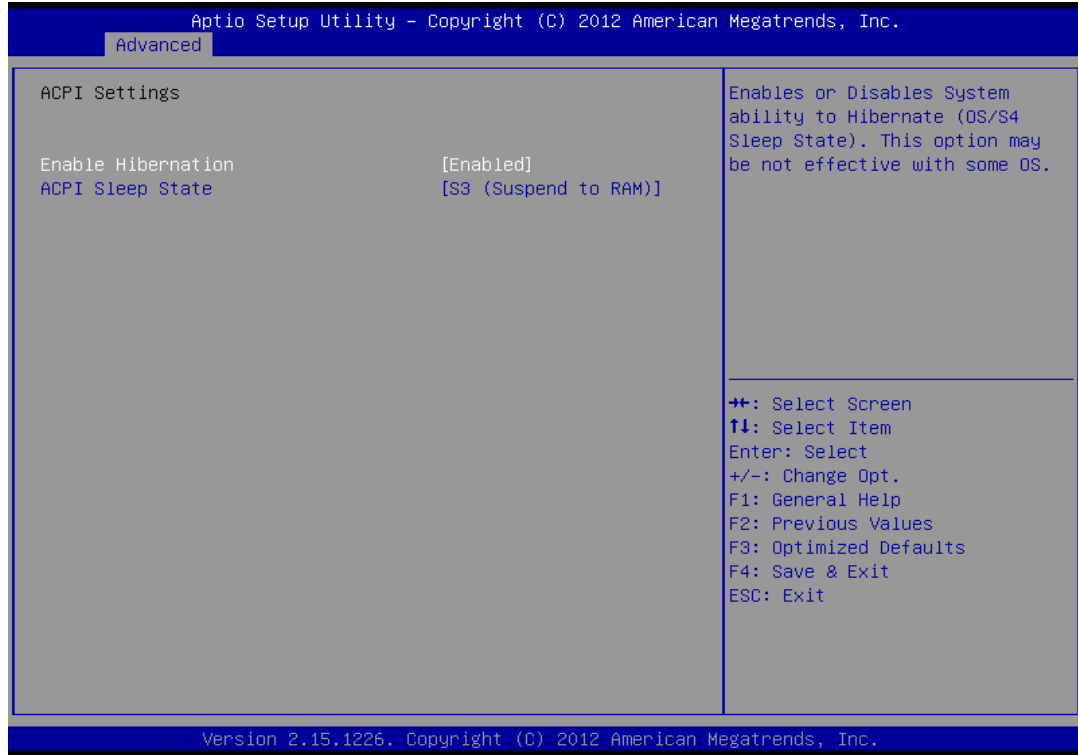
Advanced

Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Super IO Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



❑ **ACPI settings**

This filed specifies allow you set this value to utilize the ACPI (Advanced Configuration and Power Interface) specification.



➤ **Enable Hibernation**

This item allows users to enable or disable system ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

Available Options: Disabled, Enabled

Default setting: Enabled

➤ **ACPI Sleep State**

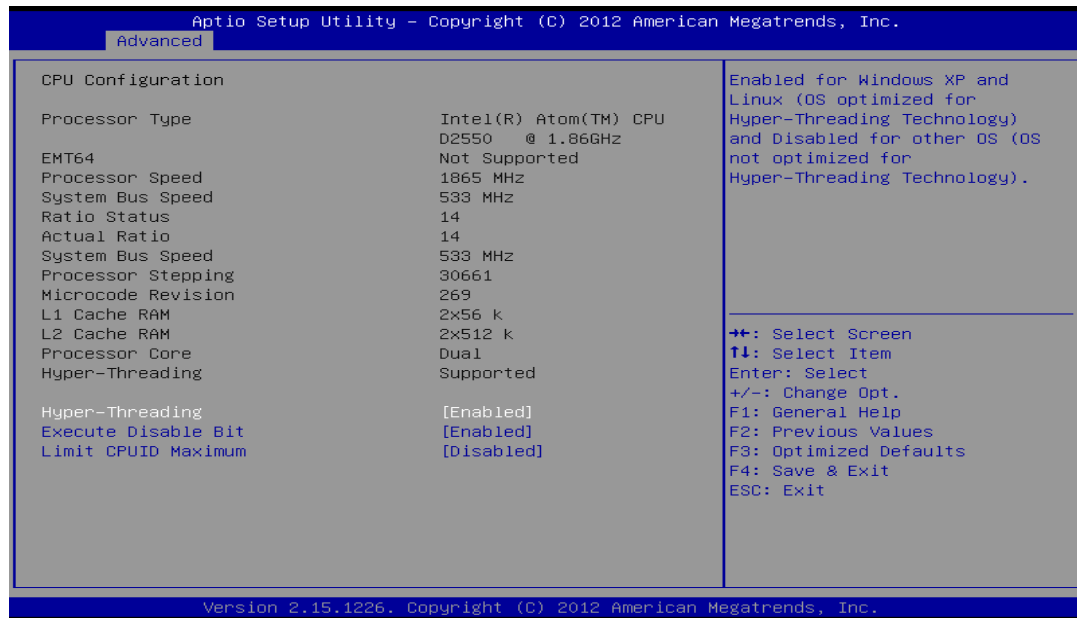
This item allows users to select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

Available Options: Suspend Disabled, S1 (CPU Stop Clock), and S3 (Suspend to RAM)

Default setting: S3 (Suspend to RAM)

❑ **CPU Configuration**

You can use this screen to select options for the CPU Configuration Parameters.



➤ **Hyper-Threading**

Enable for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disable for other OS (OS not optimized for Hyper-Threading Technology).

Available Options: Disabled, and Enabled

Default setting: Enabled

➤ **Execute Disable Bit**

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

Available Options: Disabled, and Enabled

Default setting: Enabled

➤ **Limit CPUID Maximum**

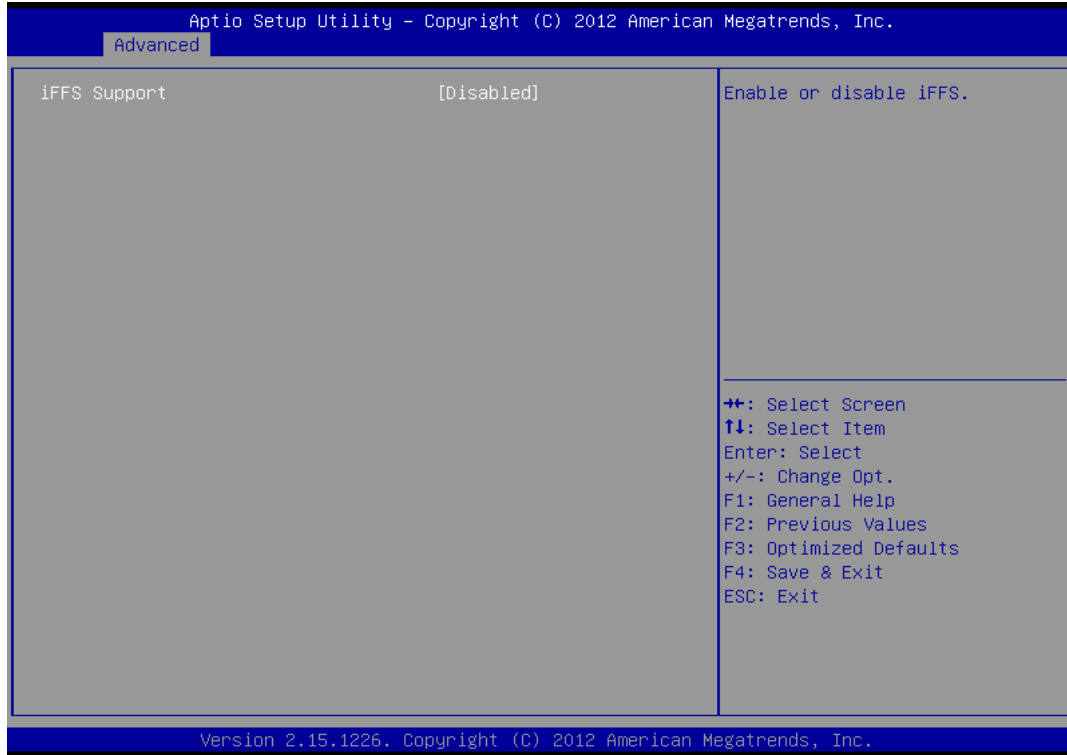
This item allows users to enable or disable limit CPUID maximum, to disable this item when Windows XP.

Available Options: Disabled, and Enabled

Default setting: Disabled

❑ **Intel Fast Flash Standby**

You can use this screen to select options for the Intel Fast Flash Standby Technology Configuration.



➤ **iFFS Support**

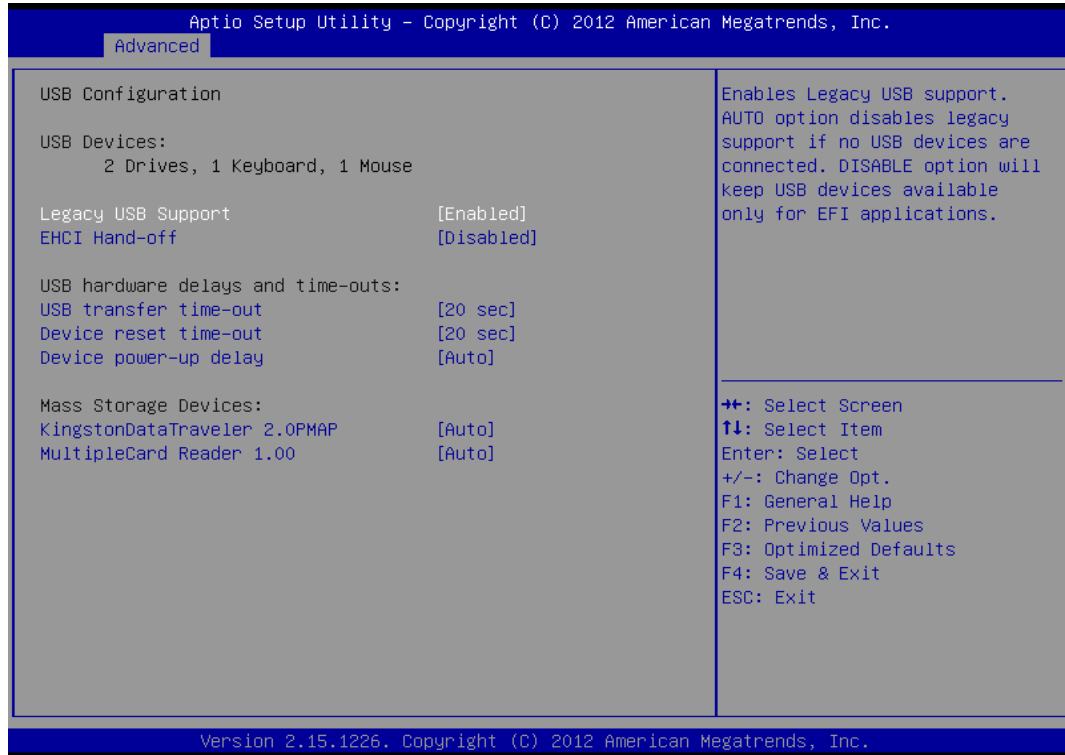
This item allows users to enable or disable iFFS(Intel Fast Flash Standby). Please refer to Chapter4 – iFFS setup procedure.

Available Options: Disabled, and Enabled

Default setting: Disabled

❑ **USB Configuration**

You can use this screen to select options for the USB Configuration.



➤ **Legacy USB Support**

Legacy USB Support refers to the USB mouse and USB keyboard support. Normally if this option is not enabled; any attached USB mouse or USB keyboard will not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB drivers loaded on the system. Set this value to Enabled or Disabled the Legacy USB Support.

Available Options: Enabled, Disabled, and Auto

Default setting: Enabled

➤ **EHCI Hand-Off**

This is a workaround for OS without EHCI Hand-Off support. The EHCI ownership change should claim by EHCI driver.

Available Options: Disabled, and Enabled

Default setting: Disabled

➤ **USB transfer time-out**

The time-out value for control, bulk, and interrupt transfers.

Available Options: 1 sec, 5 sec, 10 sec, and 20 sec

Default setting: 20 sec

➤ **Device reset time-out**

USB mass storage device start unit command time-out.

Available Options: 10 sec, 20 sec, 30 sec, and 40 sec

Default setting: 20 sec

➤ **Device power-up delay**

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

Available Options: Auto, and manual

Default setting: Auto

➤ **Mass Storage Devices:**

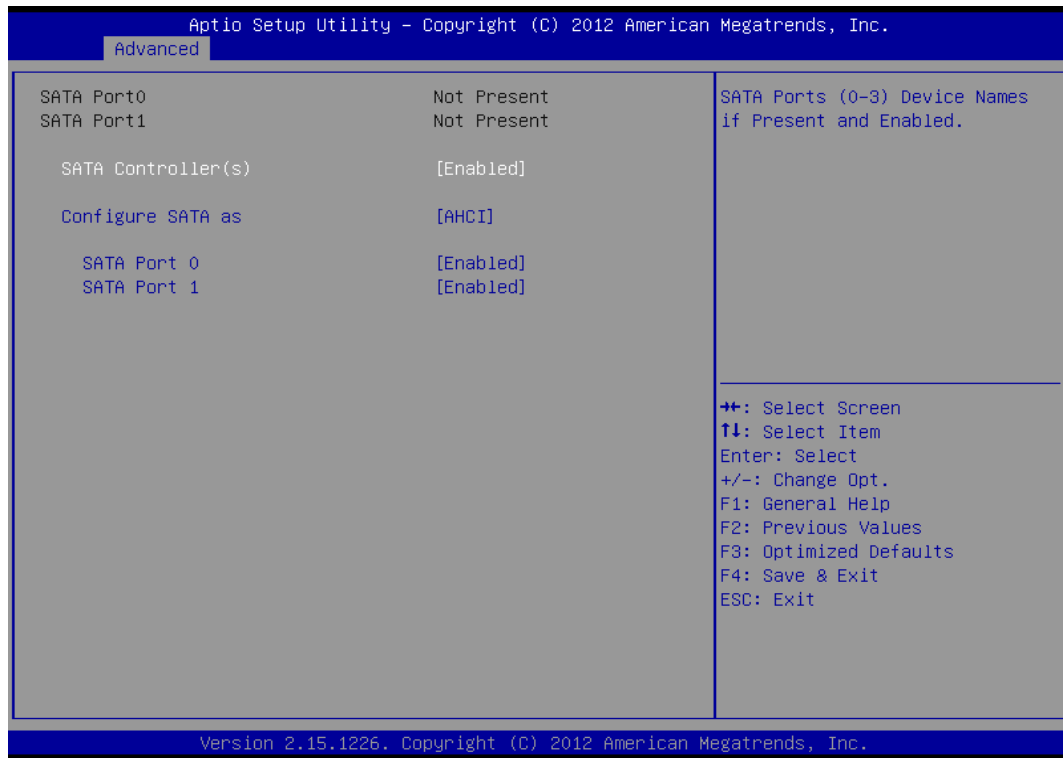
Mass storage device emulation type. If the emulation FDD, recommended formatted as FAT32 format.

Available Options: Auto, Floppy, Forced FDD, Hard Disk, and CD-ROM

Default setting: Auto

❑ **IDE Configuration**

You can use this screen to select options for the IDE devices Configuration.



➤ **SATA Controller(s)**

This item allows users to enable or disable SATA Controller.

Available Options: Disabled, and Enabled

Default setting: Enabled

➤ **Configure SATA as**

Select a configuration for SATA controller. Install Windows XP in AHCI mode need to use the F6 Method pre-installed AHCI driver, if you select IDE mode, you do not need to pre-install.

Available Options: IDE, and AHCI

Default setting: AHCI

➤ **SATA Port 0**

The system SATA HDD corresponding SATA port 0, This item allows users to enable or disable SATA port 0.

Available Options: Disabled, and Enabled

Default setting: Enabled

➤ **SATA Port 1**

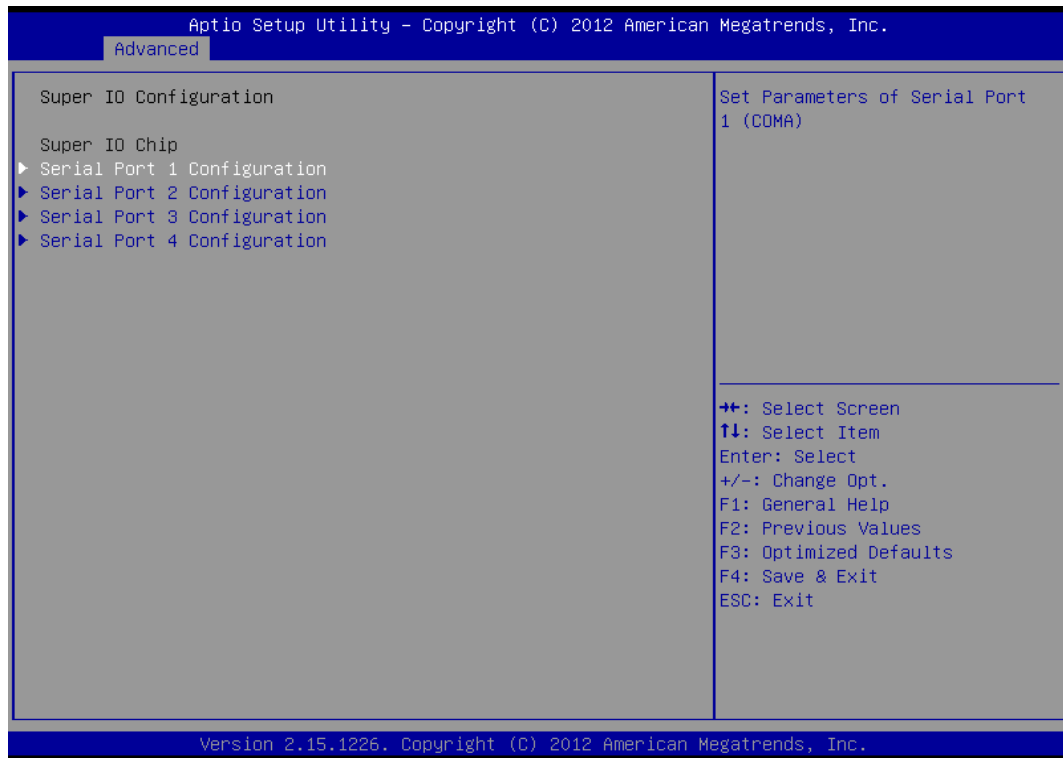
The CFast socket corresponding to the SATA port 1, This item allows users to enable or disable SATA port 1.

Available Options: Disabled, and Enabled

Default setting: Enabled

❑ Super IO Configuration

This section describes the function of Super I/O settings.



➤ Serial Port 1/2/3/4 Configuration

■ *Serial Port 1/2/3/4*

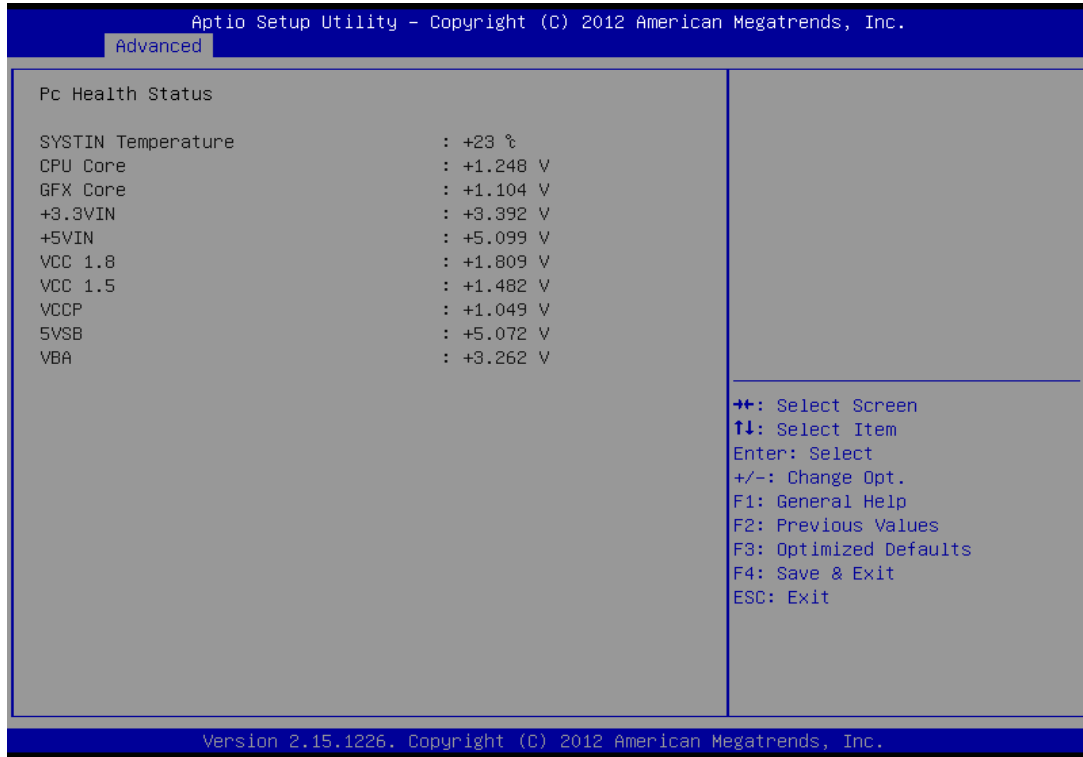
This item allows users to enable or disable Serial Port 1/2/3/4.

Available Options: Disabled, and Enabled

Default setting: Enabled

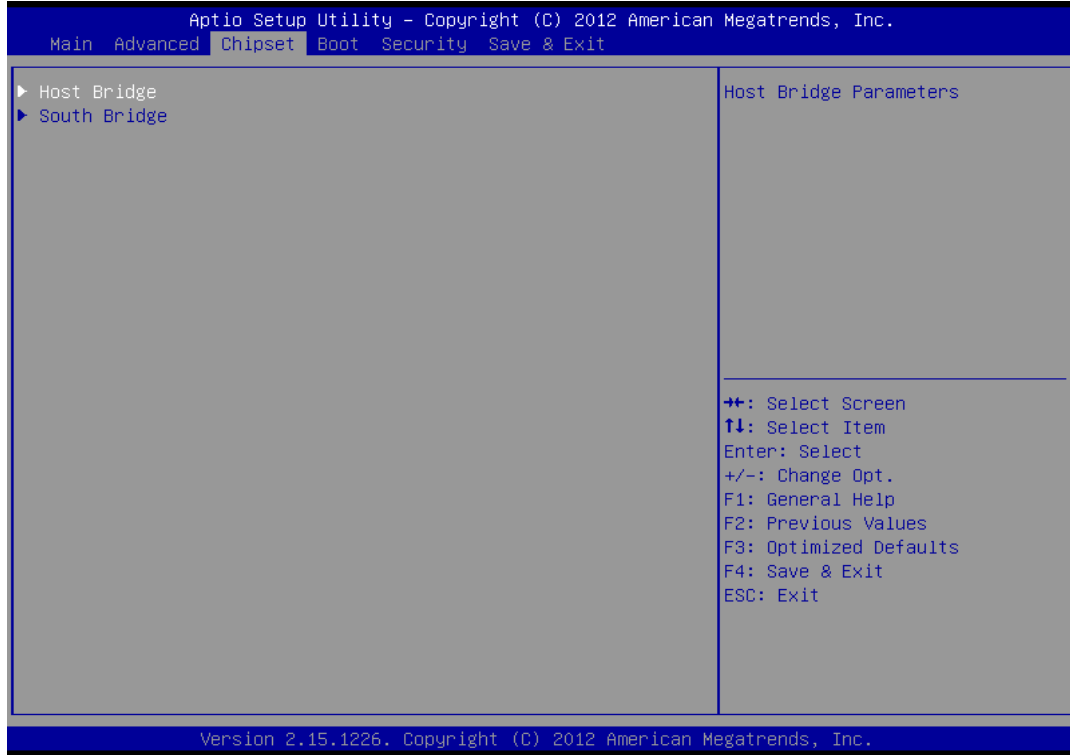
❑ **H/W Monitor**

On the Hardware Monitor screen, you can monitor the system temperature, CPU voltage, and VCC voltage...



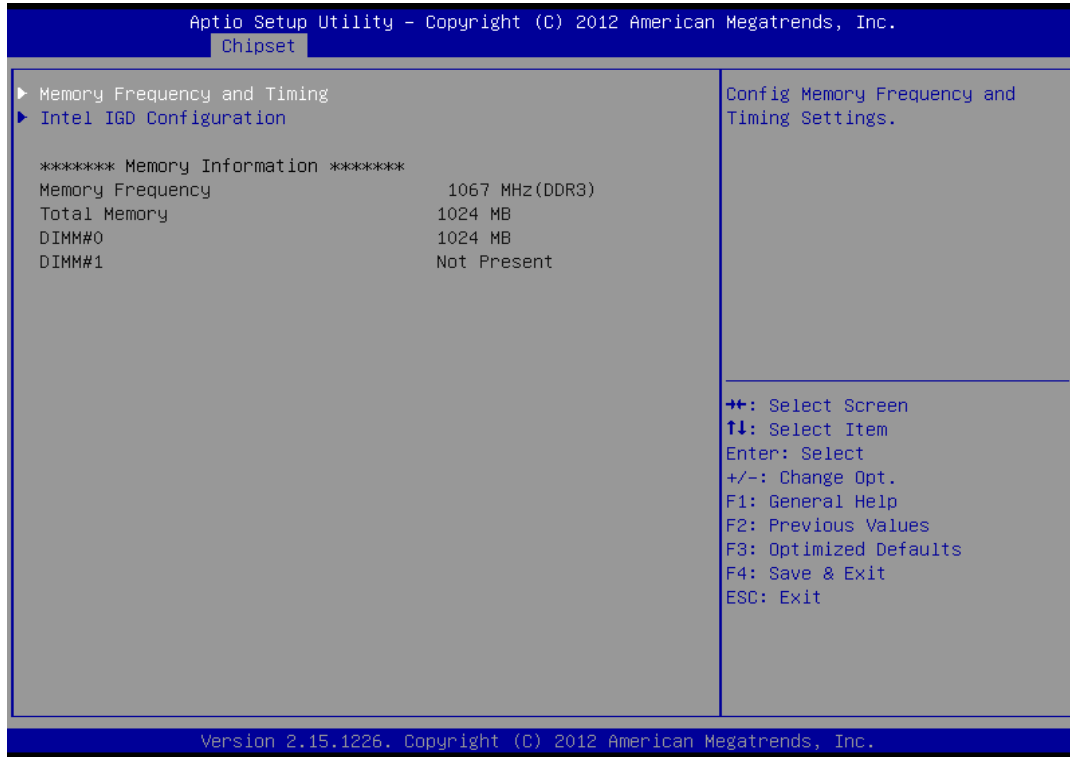
Chipset

This section describes the configuration of the board's chipset features.

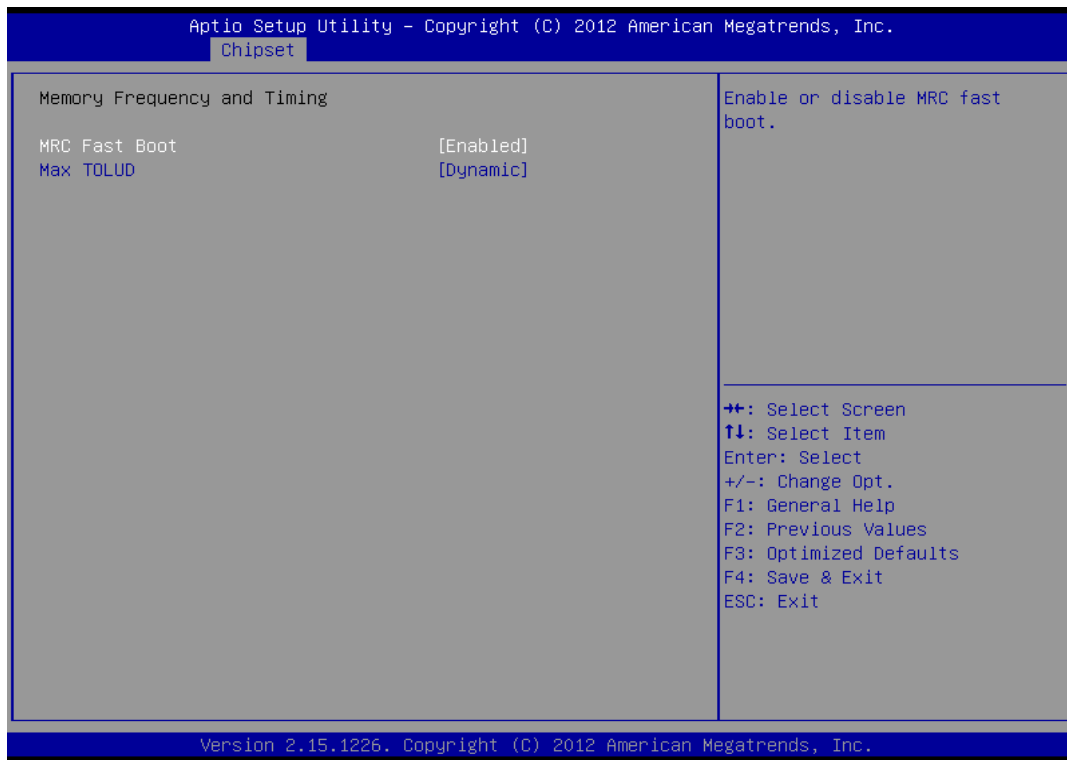


□ **Host Bridge**

Host Bridge Parameters



➤ **Memory Frequency and Timing**



■ ***MRC Fast Boot***

This item allows users to enable or disable MRC fast boot.

Available Options: Disabled, and Enabled

Default setting: Enabled

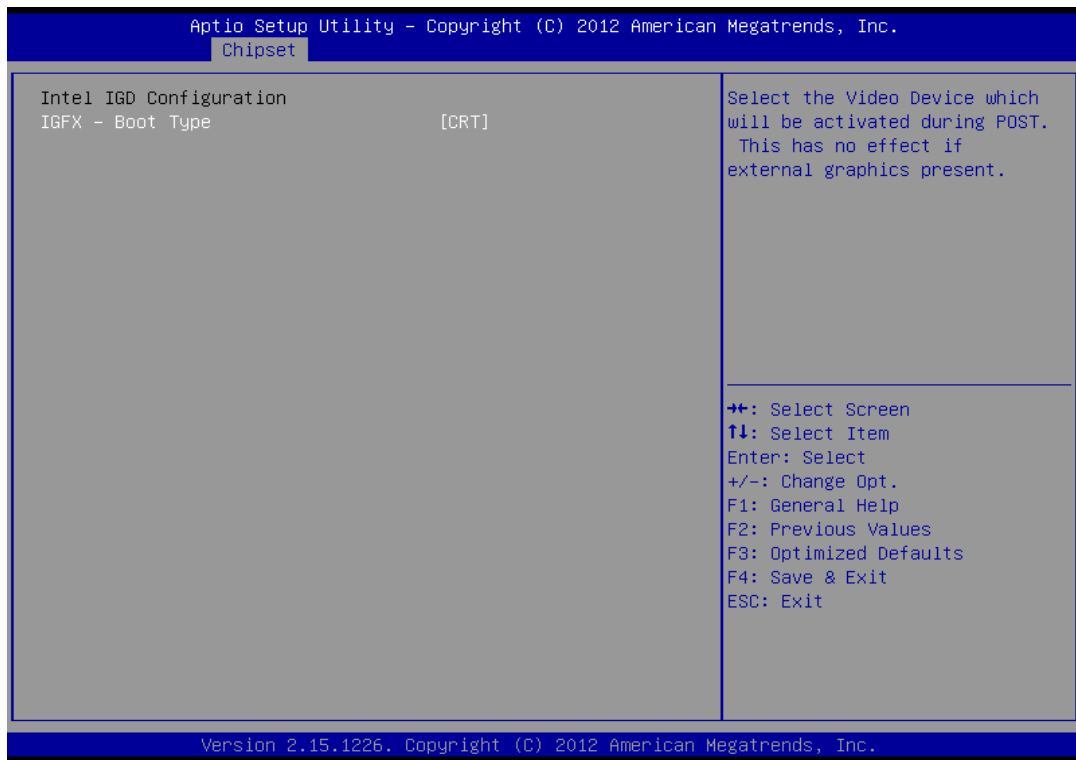
■ ***Max TOLUD***

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

Available Options: Dynamic, 1GB, 1.25GB, 1.5GB, 1.75GB, 2GB, 2.25GB, 2.5GB, 2.75GB, 3 GB, and 3.25GB

Default setting: Dynamic

➤ **Intel IGD Configuration**



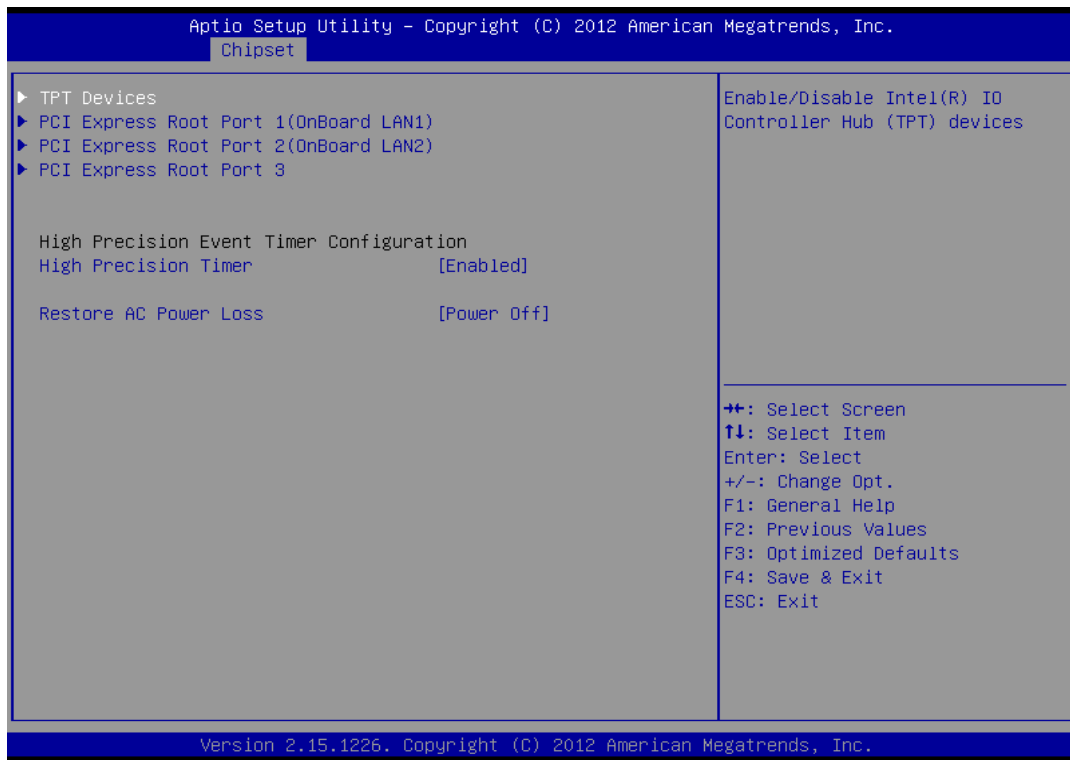
■ ***IGFX - Boot Type***

Select the Video Device which will be activated during POST.

Available Options: CRT, HD (DISPLAY3), Display Port (DISPLAY2)

Default setting: CRT

❑ **South Bridge**



➤ **High Precision Timer**

This item allows users to enable or disable the High Precision event timer.

Available Options: Disabled, and Enabled

Default setting: Enabled

➤ **Restore AC Power Loss**

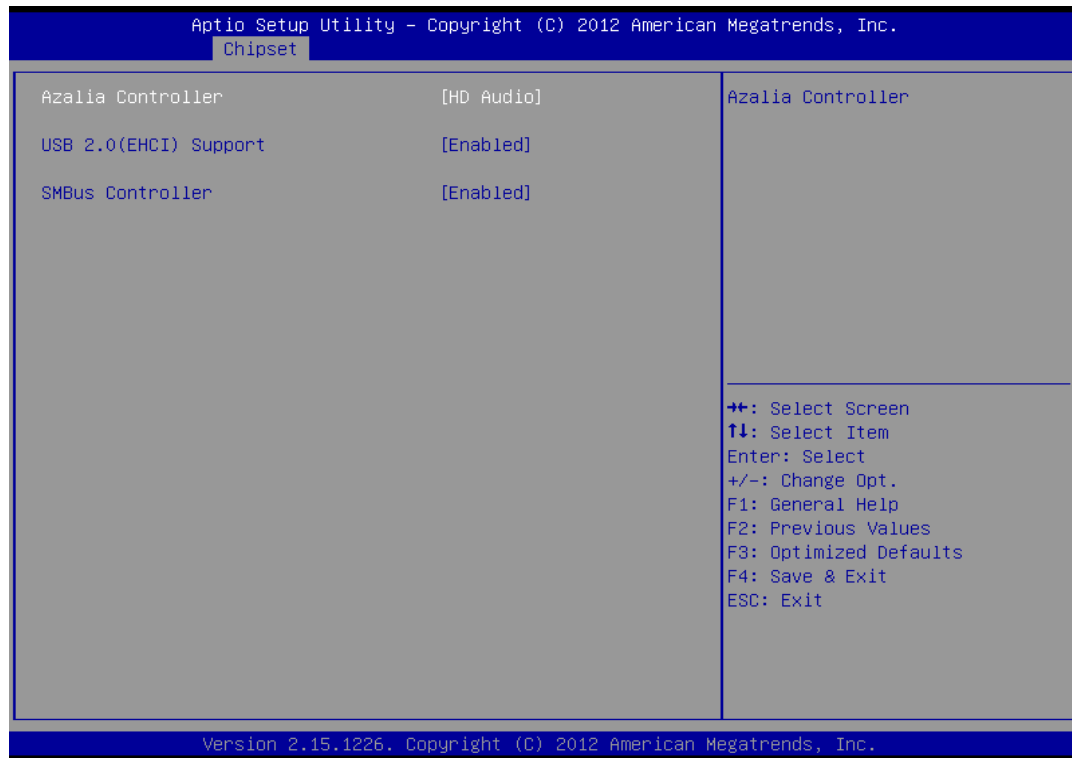
This field specifies the option controls how the PC will behave once power is restored following a power outage (or other unexpected or ungraceful shutdown). The "Last State" option returns the PC to the state in effect at the time the power outage or shutdown occurred. Assign this option the "Power On" value to reboot automatically; assign the "Power Off" value to leave the machine powered down.

Available Options: Power Off, Power On, and Last State

Default setting: Power Off

➤ **TPT Devices**

Enable/Disable Intel® IO Controller Hub(TPT) Devices.



■ ***Azalia Controller***

This item allows users to enable or disable Azalia Controller.

Available Options: Disabled, and HD Audio

Default setting: HD Audio

■ ***USB 2.0(EHCI) Support***

This item allows users to enable or disable USB 2.0 (EHCI) Support.

Available Options: Disabled, and Enabled

Default setting: Enabled

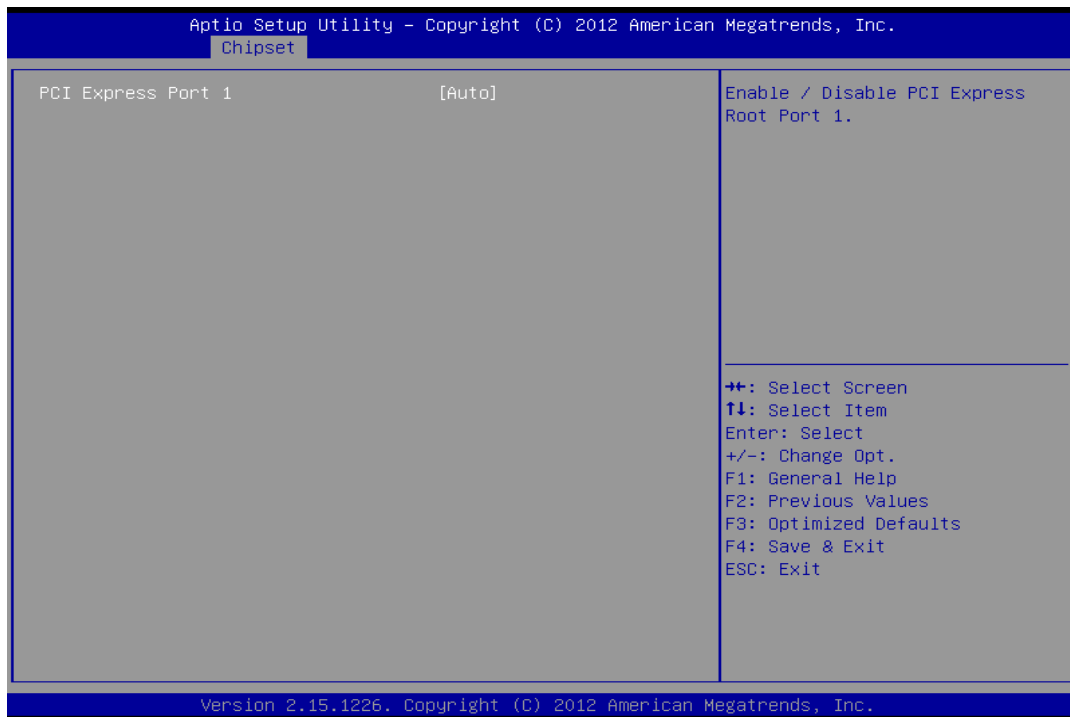
■ ***SMBus Controller***

This item allows users to enable or disable on-chip SMBus controller.

Available Options: Disabled, and Enabled

Default setting: Enabled

➤ **PCI Express Root Port 1 (On Board LAN1/2)**



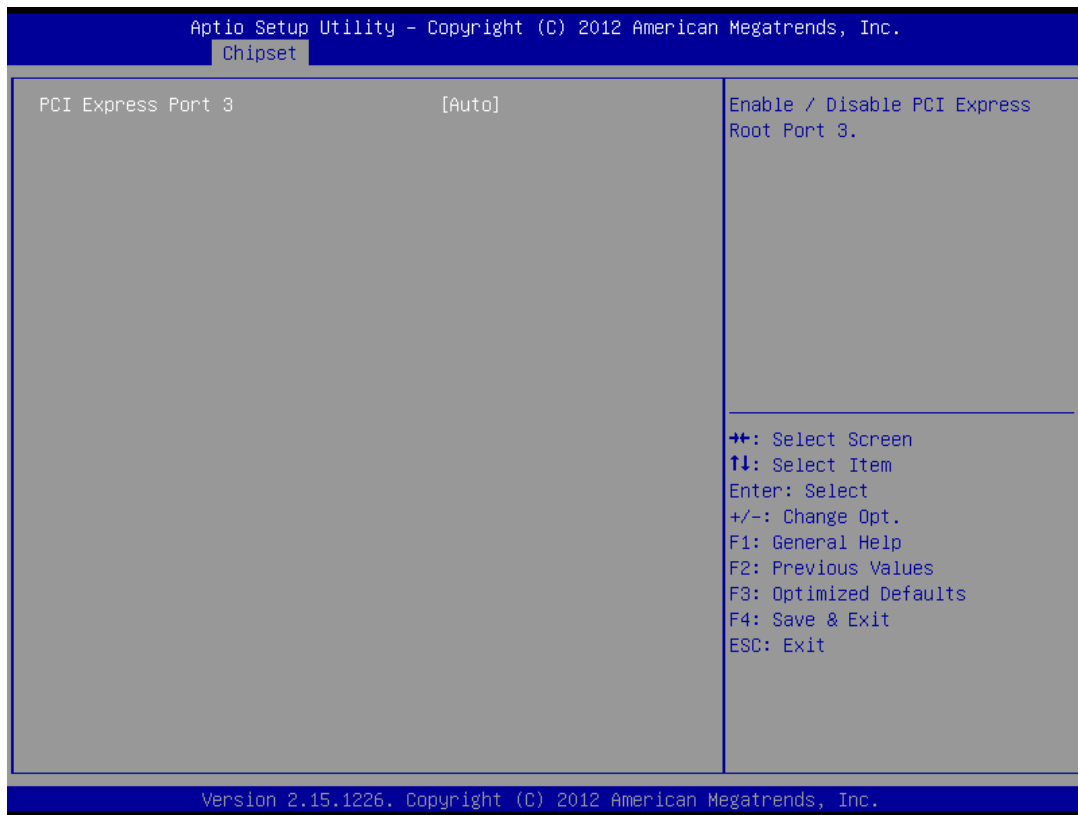
■ ***PCI Express Port 1/2***

The system on board LAN 1 corresponding port 1, the item allows users to enable or disable PCI Express Root Port1.

Available Options: Disabled, Enabled, and Auto

Default setting: Auto

➤ **PCI Express Root Port 3**



■ **PCI Express Port 3**

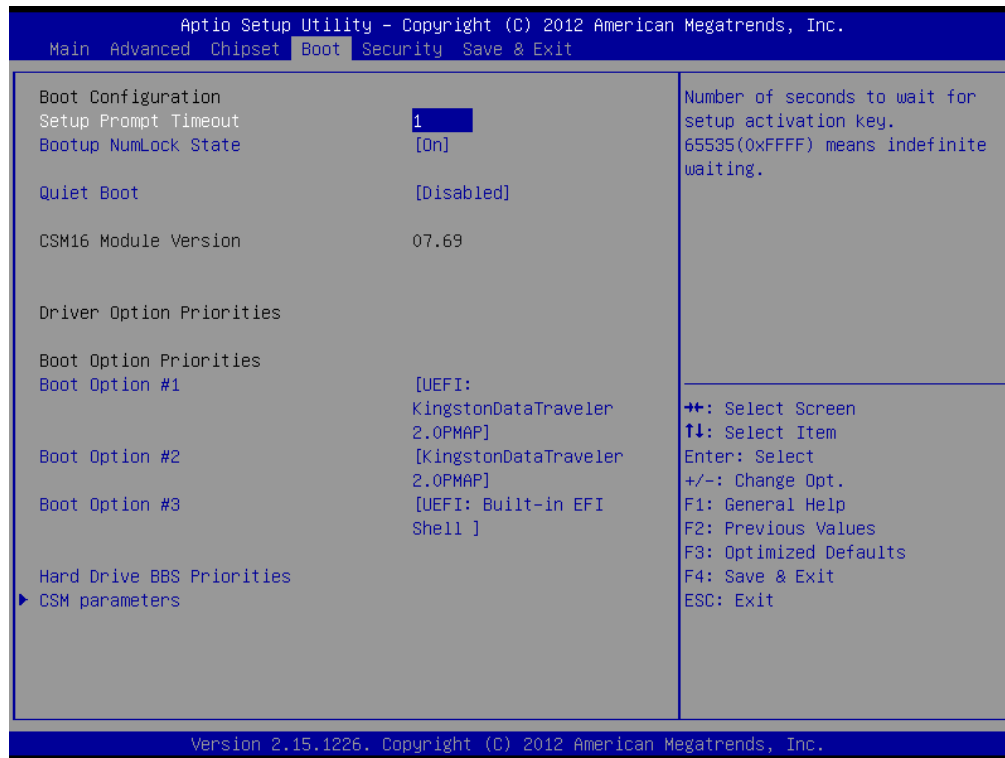
The PCIe Mini Card “socket A” (Half Size) corresponding port 3, the item allows users to enable or disable PCI Express Root Port3.

Available Options: Disabled, Enabled, and Auto

Default setting: Auto

Boot

Select the *Boot* tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the <Arrow> keys. All Boot Setup options are described in this section.



➤ Setup Prompt Timeout

This field is set number of seconds to wait for setup activation key. The set value is 0 to 65535 (0xFFFF) means indefinite waiting.

Available Options: 1~65535

Default setting: 1

➤ Bootup NumLock State

This item allows users to select the keyboard NumLock state.

Available Options: On, and Off

Default setting: On

➤ **Quiet Boot**

This item allows users to enable or disable Quiet boot option. If set enable, an OEM LOGO will replace the POST messages.

Available Options: Disabled, and Enabled

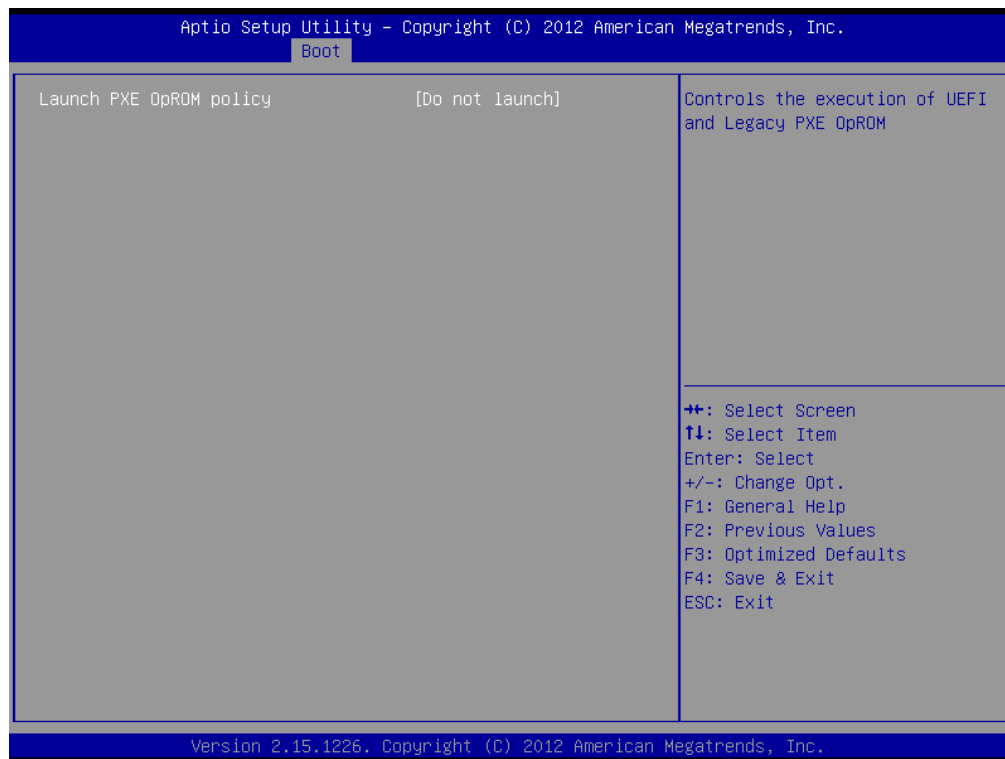
Default setting: Disabled

➤ **Boot Option Priorities**

This item allows users to set the device boot priorities in this sub-title the following.

➤ **CSM parameters**

OpROM Execution, boot options filter, etc.



■ **Launch PXE OpROM policy**

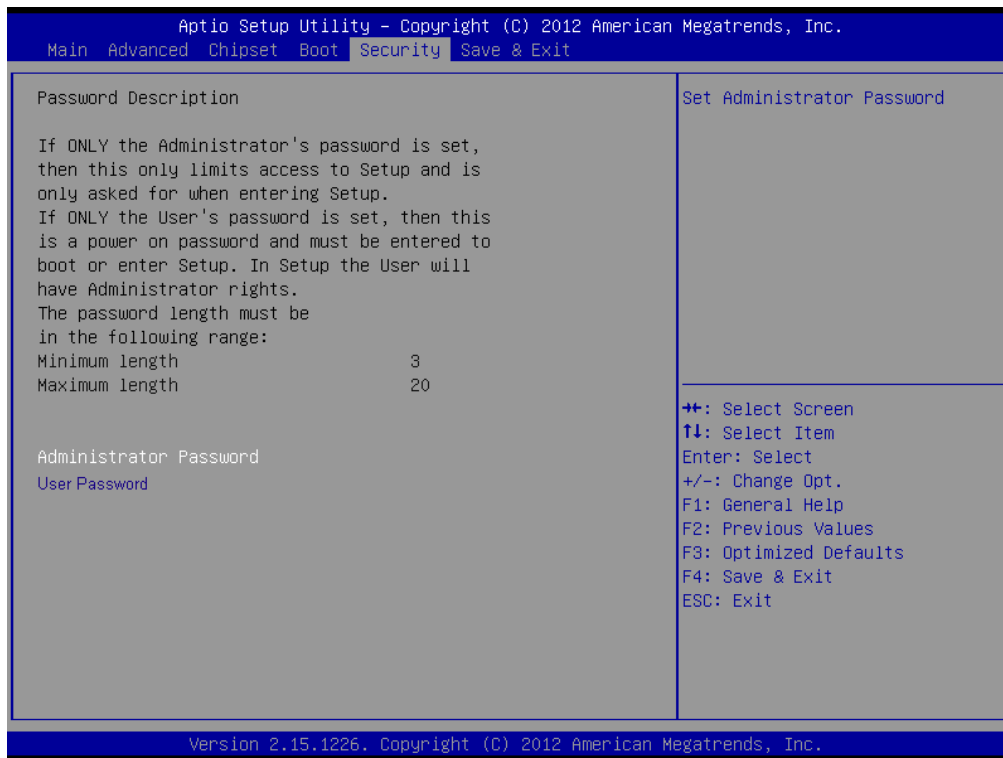
The Item controls the execution of UEFI and Legacy PXE OpROM.

Available Options: Do not launch, UEFI only, and Legacy only

Default setting: Do not launch

Security

There are two security passwords: Administrator and User. The Administrator is a privileged person that can change the User password from the BIOS. According to the default setting, both access passwords are not set up and are only valid after you set the password from the BIOS.



➤ Install Administrator/User Password

Select Administrator/user password item, press <Enter> and type new password (up to 3 character length) and confirm new password. The screen does not display the characters entered.

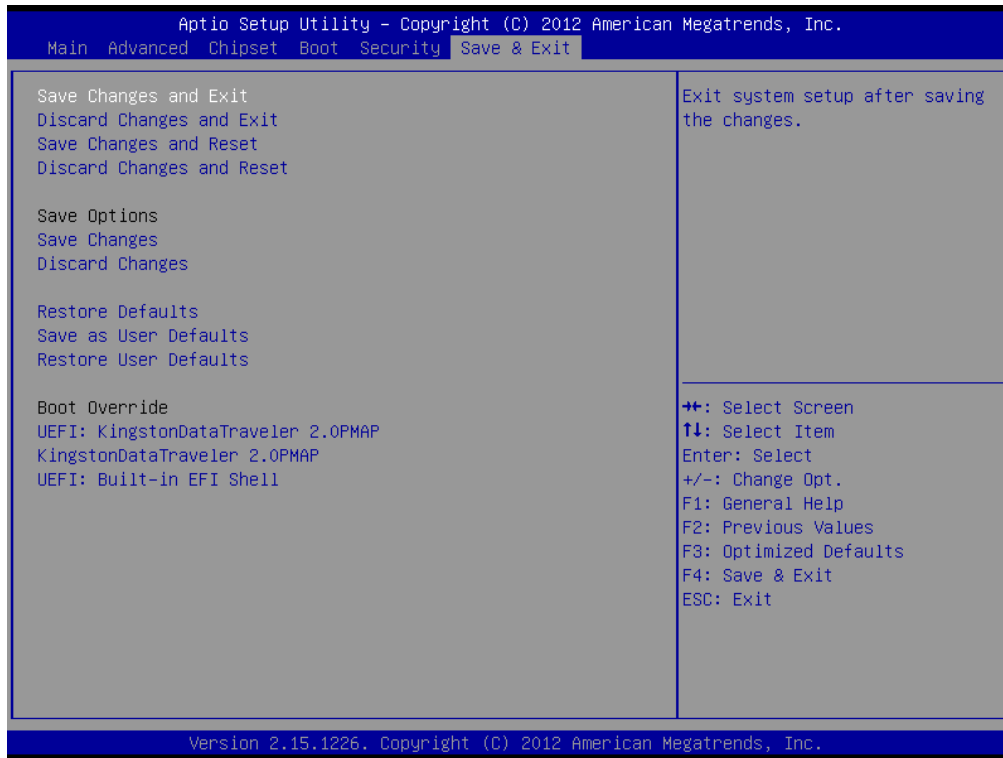
➤ Change Administrator/User Password

Select Administrator/user password item, press <Enter> and type current password, at the next dialog type new password and confirm new password.

➤ Removing the password

Select Administrator/user password item, press <Enter> and type current password, at the next dialog press <Enter> to disable password protection.

Save & Exit



➤ **Save Changes and Exit**

Exit system setup after saving the changes.

➤ **Discard Changes and Exit**

Exit system setup without saving any changes.

➤ **Save Changes and Reset**

Reset the system after saving the changes.

➤ **Discard Changes and Reset**

Reset system setup without saving any changes.

➤ **Save Changes**

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

➤ **Discard Changes**

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

➤ **Restore Defaults**

Restore/Load Default values for all the setup options.

➤ **Save as User Defaults**

Save the changes done so far as User Defaults.

➤ **Restore User Defaults**

Restore the User Defaults to all the setup option.

Chapter 4 Software Installation

The enclosed CD diskette includes FX5653 VGA, Audio, System, and LAN driver. To install and configure you FX5653 system, you need to perform the following steps.

System Driver

WIN 7 Driver

Installs Atom D2000 Chipset, Core PCI, PCIe, SATA, USB, ISAPnP and IDE/ATA Device Drive.

Step 1: To install the Atom D2000 driver, insert the CD ROM into the CD ROM device, and enter DRIVER>SysChip>NM10.

Step 2: Execute INF_allOS_9.2.2.1034_PV.exe file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done.

No, I will restart my computer later.

System must be restart then complete the installation.

VGA Driver

WIN 7 Driver

Step 1: To install the VGA driver, insert the CD ROM into the CD ROM device, and enter DRIVER>VGA> ATOM_CedarTrail>WIN7.

Step 2: Execute SETUP.EXE file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done.

No, I will restart my computer later.

System must be restart then complete the installation.

Note: In the DRIVER>VGA>ATOM_CedarTrail >WIN7 directory, a Readme.txt file is included to provide installation information.

Audio Driver

WIN 7 Driver

Step 1: To install the AUDIO driver, insert the CD ROM into the CD ROM device, and enter DRIVER>AUDIO>ALC888>WIN7.

Step 2: Execute 32bit_Win7_R270.exe file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done!

No, I will restart my computer later.

System must be restart then complete the installation.

LAN Driver (RTL 8111C)

WIN7 Driver

The Win7 has included RTL8111C driver, please follow the steps if you want to update driver.

Step 1: To install the LAN driver, insert the CD ROM into the CD ROM device, and enter DRIVER>LAN>RTL8111C\WIN7. If your system is not equipped with a CD ROM device, copy the LAN driver from the CD ROM to CF.

Step 2: Execute setup.exe file.

BIOS Flash Utility

In the <UTILITY> directory, there is the Afu301.EXE file.

Step 1: Use the Afu301.EXE program to update the BIOS setting.

Step 2: And then refer to the chapter "BIOS Setup", as the steps to modify BIOS.

Step 3: Now the CPU board's BIOS loaded with are the newest program; user can use it to modify BIOS function in the future, when the BIOS add some functions.

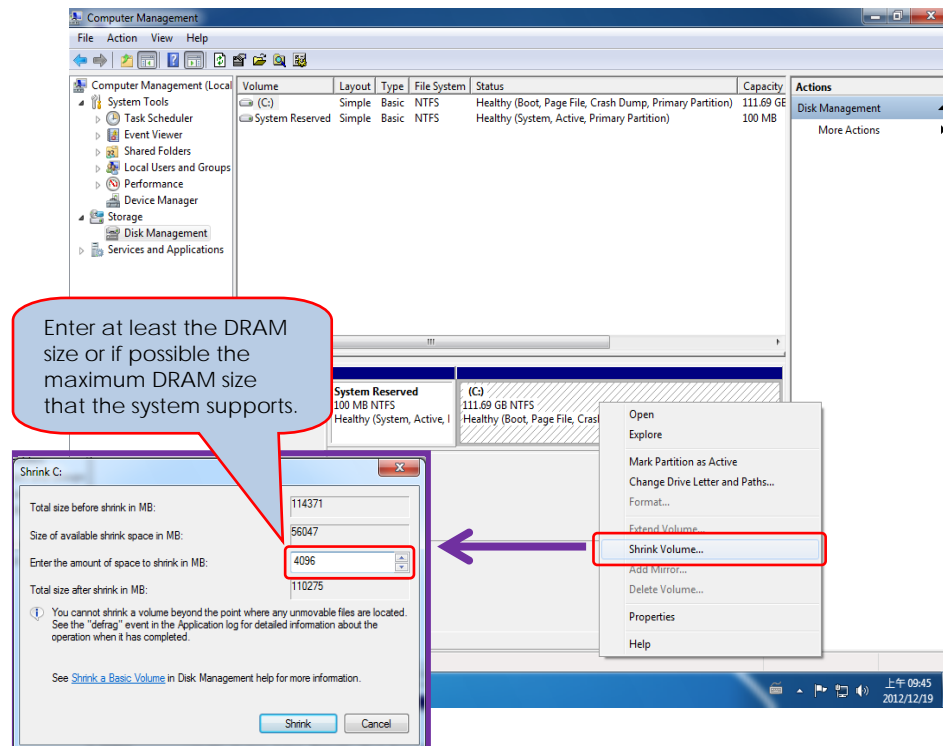
iFFS Setup Procedure

STEP1: Install WIN7 on SSD.


- While installing, partition a portion of SSD which will be used for iFFS.
- Size of this partition has to be a minimum of the DRAM size.
- It is recommended, if possible, to make this partition at least as big as the largest DRAM that can be used on this platform.

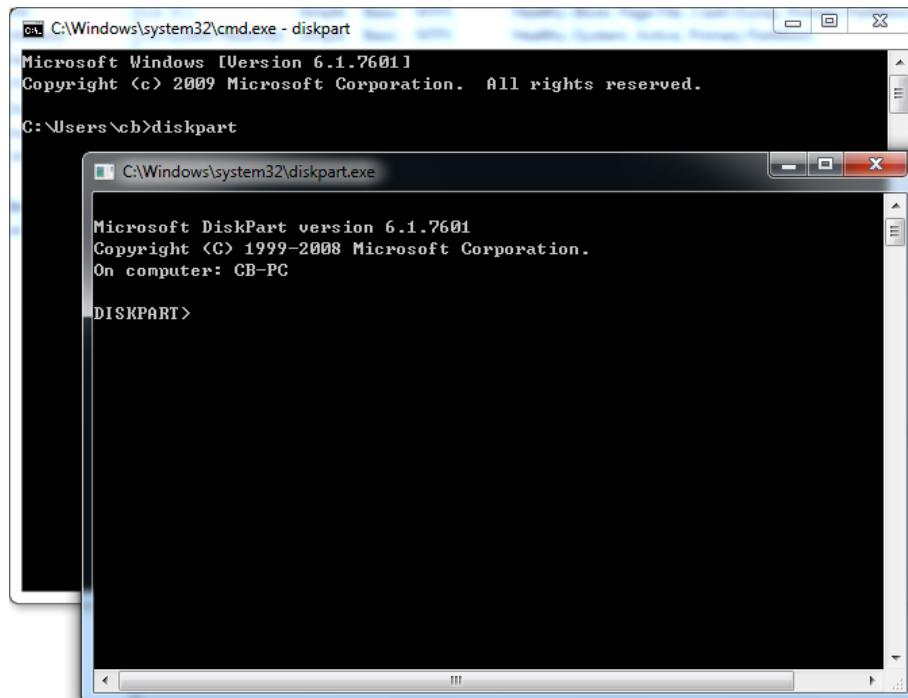
STEP2: Once OS is installed, perform the following partition steps. This is necessary for BIOS to identify the partition on SSD that it needs to use for iFFS.

- Master Boot Record format:
 - Go to Control Panel-> System and Security-> Administrative Tools-> Computer Management-> Disk Management.
 - Select the allocated partition on SSD for iFFS.
 - Right click, select "Shrink Volume".



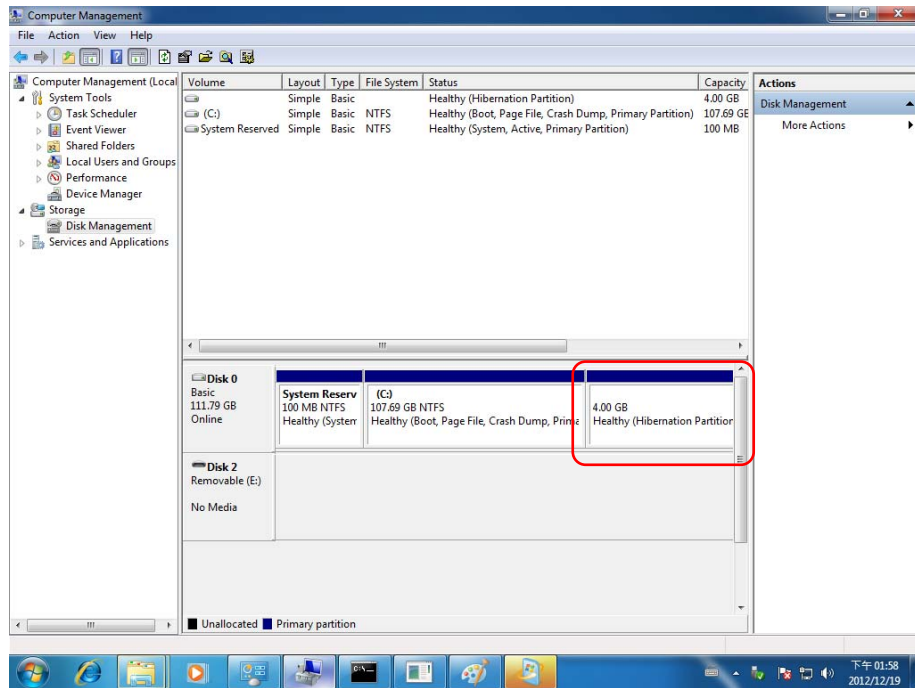
SETP3 : Reserving partition as hibernation partition:

- Launch Disk Partitioning tool – standard tool available in Windows 7.
- Go to . Type cmd.exe in the search bar.
- Type diskpart.exe and press enter.
- Click on yes when it prompts for User Account Control DiskPart. A new window for diskpart will show up as shown below.



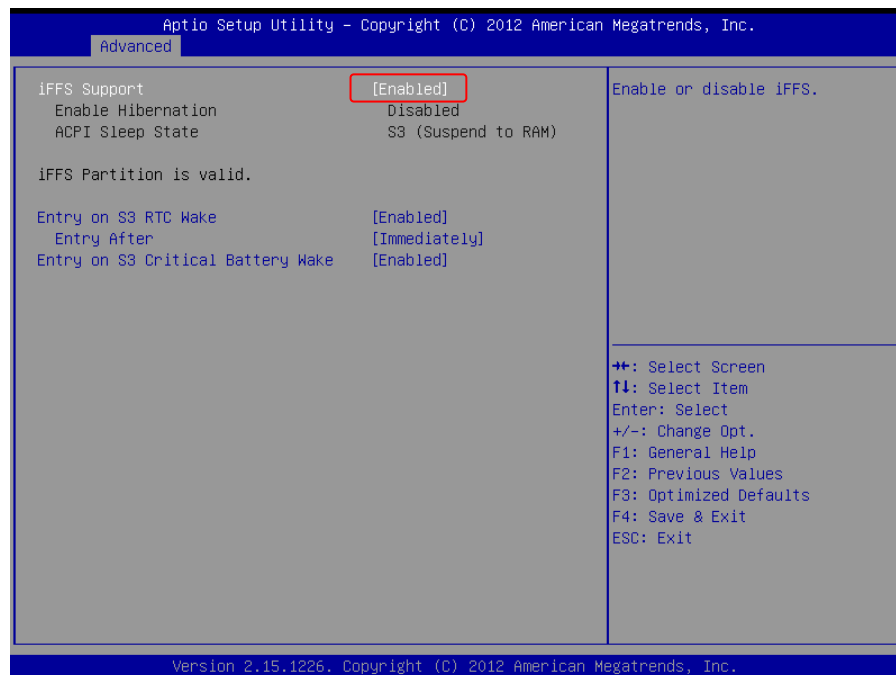
- Type the following commands in the command prompt:
 - DISKPART> list disk
 - DISKPART> select disk X
(X is disk number where you want to create the store partition. Refer to results from “list disk” for exact disk number.)
 - DISKPART> create partition primary
 - DISKPART> detail disk
 - DISKPART> select Volume X
(X is Volume of your store partition. Refer to results from “detail disk” for exact volume number.)
 - DISKPART> set id=84 override
(The id must be set to 84.)

- The hibernation partition will be identified as shown below.



SETP4 : Boot up the system and go into BIOS setup. Go to Advanced tab and select Intel Fast Flash Standby.

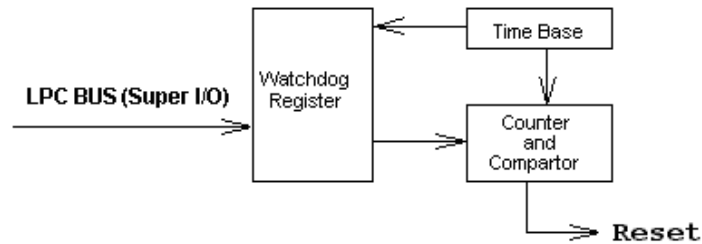
- iFFS Support Enabled
- Save and Exit



Watchdog Timer

This section describes how to use the Watchdog Timer, including disabled, enabled, and trigger functions.

The system is equipped with a programmable time-out period watchdog timer. You can use your own program to enable the watchdog timer. Once you have enabled the watchdog timer, the program should trigger the I/O every time before the timer times out. If your program fails to trigger or disable this timer before it times out, e.g. because of a system hang-up, it will generate a reset signal to reset the system. The time-out period can be programmed to be set from 1 to 65535 seconds or minutes.



Watchdog Timer Setting

The watchdog timer is a circuit that may be used from your program software to detect system crashes or hang-ups. The watchdog timer is automatically disabled after reset.

Once you have enabled the watchdog timer, your program must trigger the watchdog timer every time before it times out. After you trigger the watchdog timer, it will be set to non-zero value to watchdog counter and start to count down again. If your program fails to trigger the watchdog timer before time-out, it will generate a reset pulse to reset the system.

The factor of the watchdog timer time-out constant is approximately 1 second. The period for the watchdog timer time-out is between 1 to FFFF timer factors.

If you want to reset your system when watchdog times out, the following table listed the relation of timer factors between time-out periods.

Time Factor	Time-Out Period (Seconds)	Time-Out Period (Minutes)
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
"	"	"
"	"	"
"	"	"
FFFF	FFFF	FFFF

Watchdog Timer Enabled

To enable the watchdog timer, you have to output a byte of timer factor to the watchdog register whose address is 2eh and data port is 2fH. The following is an Assemble program, which demonstrates how to enable the watchdog timer and set the time-out period at 28 seconds.

```
-----  
; Enter the extended function mode  
-----  
Mov     dx, 2eh           ; Enter to extended function mode  
Mov     al, 87h  
Out     dx, al  
Nop  
Nop  
Mov     al, 01h  
Out     dx, al  
Nop  
Nop  
Mov     al, 55h  
Out     dx, al  
Nop  
Nop  
Mov     al, 55h  
Out     dx, al  
Mov     al, 22  
Out     dx, al  
Mov     dx, 2fh  
Mov     al, 00h  
Out     dx, al  
-----  
; Logical device 7, configuration registers Index 72h-Bit 7, 73H (LSB)/74H (MSB)  
-----  
Mov     dx, 2fh  
Mov     al, 07h           ; Select Logical Device 7 of watchdog timer  
Out     dx, al  
Mov     dx, 2eh  
Mov     al, 72h           ; Index 72h- Time-Out Value and Watchdog Register  
Out     dx, al  
Mov     dx, 2fh  
Or      al, 90h           ; Set Bit 7 is 1: Second and Bit4: Enabled Watchdog.  
; Or     al, 10h           ; Set Bit 7 is 0: Minute.  
Out     dx, al  
Mov     dx, 2eh  
Mov     al, 74h           ; Set Timer counter 0100~FF00 (MSB)  
Out     dx, al  
Mov     dx, 2fh  
Mov     al, 00h  
Out     dx, al  
Mov     dx, 2eh  
Mov     al, 73h           ; Set Timer counter 0001~00FF (LSB)  
Mov     dx, 2fh
```

```
Mov    al,28h      ; Set timeout interval as 28seconds and start counting
Out    dx,al
;-----
; Exit extended function mode
;-----
Mov    dx,2eh
Mov    al,01h
Out    dx,al
```

Watchdog Timer Trigger

After you enable the watchdog timer, your program must write the same factor as enabling to the watchdog register at least once every time-out period to its previous setting. You can change the time-out period by writing another timer factor to the watchdog register at any time, and you must trigger the watchdog before the new time-out period in next trigger.

Watchdog Timer Disabled

To disable the watchdog timer, simply write a 00H to the watchdog register.

```
;-----
; Logical device 7, configuration registers Index 72h Bit 4
;-----
Mov    dx,2fh
Mov    al,07h      ; Select Logical Device 7 of watchdog timer
Out    dx,al
Mov    dx,2eh
Mov    al,72h      ;Index 72h- Time-Out Value and Watchdog Register
Out    dx,al
Mov    dx,2fh
And    al,00h      ;Set Bit4 to '0': Disabled Watchdog.
Out    dx,al
```

TTL I/O (GPIO) programming

The following is an Assembly program, which demonstrates how to set the GPIO type and how to read and write values.

```
-----  
; Enter the extended function mode, interruptible double-write  
-----  
Mov     dx, 2eh           ; Enter to extended function mode  
Mov     al, 87h  
Out     dx, al  
Out     dx, al  
-----  
; Configures logical Device7, configuration register CRF0, CRF1, CRF2  
; CRF0 (GP0-GP7 I/O selection register.)  
;     When set to a "1", respective GPIO port is programmed as input port.  
;     When set to a "0", respective GPIO port is programmed as an output port.  
; CRF1 (GP0-GP7 data register.)  
;     if a port is programmed to be an output port, then its respective bit can be  
;     read/written.  
;     If a port is programmed to be an input port, then its respective bit can only  
;     be read.  
; CRF2 (GP0-7 inversion register.)  
;     When set to a "1", the incoming/outgoing port value is inverted.  
;     When set to a "0", the incoming/outgoing port value is same as in data  
;     register.  
-----  
Mov     dx, 2eh  
Mov     al, 07h  
Out     dx, al           ; point to Logical Device Number Reg.  
Mov     dx, 2fh  
Mov     al, 07h  
Mov     dx, al           ; Select Logical Device 7  
  
Mov     dx, 2eh  
Mov     al, f0h  
Out     dx, al           ; Select CRF0  
Mov     dx, 2fh  
Mov     al, 03h           ; Set GP0-1 is input and GP2-3 is output  
Out     dx, al           ; update CRF0 with value 0Fh  
  
Mov     dx, 2eh  
Mov     al, f1h  
Out     dx, al           ; Select CRF1  
Mov     dx, 2fh  
In      al, dx  
And     ah, 03h           ; read GP0-1 value  
Mov     ah, 0ch           ; Set GP2-3 value is "xxxx11xxb"  
Or      al, ah  
Out     dx, al           ; update CRF1 with value
```

```
;-----  
; Exit extended function mode  
;-----  
Mov    dx,2eh  
Mov    al,aah  
Out    dx,al
```

Chapter 5 Technical Reference

This section outlines the errors that may occur when you operate the system, and also gives you the suggestions on solving the problems.

Topic include:

- Trouble Shooting for Post Beep & Error Messages
- Technical Reference

Trouble Shooting for Post Beep and Error Messages

The following information informs the Post Beep & error messages. Please adjust your systems according to the messages below. Make sure all the components and connectors are in proper position and firmly attached. If the errors still exist, please contact with your distributor for maintenance.

➤ **POST BEEP**

Currently there are two kinds of beep codes in BIOS setup.

- One indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by three short beeps.
- The other indicates that an error has occurred in your DRAM. This beep code consists of a constant single long beep.

➤ **CMOS Battery Low**

When the CMOS battery is out of work or has run out, the user has to replace it with a new battery.

➤ **CMOS Checksum Bad**

This error informs that the CMOS has corrupted. When the battery runs weak, this situation might happen. Please check the battery and change a new one when necessary.

➤ **DISK BOOT FAILURE**

When you can't find the boot device, insert a system disk into Drive A and press < Enter >. Make sure both the controller and cables are all in proper positions, and also make sure the disk is formatted. Then reboot the system.

➤ **DISKETTE DRIVES OR TYPES MISMATCH ERROR**

When the diskette drive type is different from CMOS, please run setup or configure the drive again.

➤ **ERROR ENCOUNTERED INITIALIZING HARD DRIVE**

When you can't initialize the hard drive, ensure the following things:

1. The adapter is installed correctly
2. All cables are correctly and firmly attached
3. The correct hard drive type is selected in BIOS Setup

➤ **ERROR INITIALIZING HARD DISK CONTROLLER**

When this error occurs, ensure the following things:

1. The cord is exactly installed in the bus.
2. The correct hard drive type is selected in BIOS Setup
3. Whether all of the jumpers are set correctly in the hard drive

➤ **Floppy Controller Failure**

When you cannot find or initialize the floppy drive controller, please ensure the controller is in proper BIOS Setup. If there is no floppy drive installed, ensure the Diskette Drive selection in Setup is set to NONE.

➤ **KEYBOARD ERROR OR NO KEYBOARD PRESENT**

When this situation happens, please check keyboard attachment and no keys being pressed during the boot. If you are purposely configuring the system without a keyboard, set the error halt condition in BIOS Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot procedure.

➤ **MEMORY ADDRESS ERROR**

When the memory address indicates error, you can use this location along with the memory map for your system to find and replace the bad memory chips.

➤ **MEMORY SIZE HAS CHANGED**

Memory has been added or removed since last boot. In EISA mode, use Configuration Utility to re-configure the memory configuration. In ISA mode enter BIOS Setup and enter the new memory size in the memory fields.

➤ **MEMORY VERIFYING ERROR**

It indicates an error verifying a value is already written to memory. Use the location along with your system's memory map to locate the bad chip.

➤ **OFFENDING ADDRESS MISSING**

This message is used in connection with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

➤ **REBOOT ERROR**

When this error occurs that requires you to reboot. Press any key and the system will reboot.

➤ **SYSTEM HALTED**

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

Technical Reference

Physical and Environmental

Temperature: Operating 0°C ~ 50°C

Relative humidity 5 % to 95 % non-condensing

DC-AC adapter:

Manufacture: Delta Electronics Incs

Model: SADP-65KDB

Input AC Voltage Range: 100V~240V/1A, 50Hz ~60Hz

Output DC Voltage: 19V/3.42A Maximum

Surface Temperature of Chassis :

5°C to 45°C (W/HDD)/0°C to 50°C (W/CFAST card only)

Real-Time Clock and Non-Volatile RAM

The FX5653 contains a real-time clock compartment that maintains the date and time in addition to storing configuration information about the computer system. It contains 14 bytes of clock and control registers and 114 bytes of general purpose RAM. Because of the use of CMOS technology, it consumes very little power and can be maintained for long periods of time using an internal Lithium battery. The contents of each byte in the CMOS RAM are listed below:

Address	Description
00	Seconds
01	Second alarm
02	Minutes
03	Minute alarm
04	Hours
05	Hour alarm
06	Day of week
07	Date of month
08	Month
09	Year
0A	Status register A

Address	Description
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown status byte
10	Diskette drive type byte, drive A and B
11	Fixed disk type byte, drive C
12	Fixed disk type byte, drive D
13	Reserved
14	Equipment byte
15	Low base memory byte
16	High base memory byte
17	Low expansion memory byte
18	High expansion memory byte
19-2D	Reserved
2E-2F	2-byte CMOS checksum
30	Low actual expansion memory byte
31	High actual expansion memory byte
32	Date century byte
33	Information flags (set during power on)
34-7F	Reserved for system BIOS

CMOS RAM Map

Register	Description
00h -10h	Standard AT-compatible RTC and Status and Status Register data definitions
11h – 13h	Varies
14h	Equipment Bits 7-6 Number of Floppy Drives 00 1 Drive 01 2 Drives Bits 5-4 Monitor Type 00 Not CGA or MDA 01 40x25 CGA 01 2 Drives 80x25 CGA Bits 3 Display Enabled 0 Disabled 1 Enabled Bit 2 Keyboard Enabled 00 Not CGA or MDA 01 40x25 CGA 01 2 Drives 80x25 CGA Bit 1 Math Coprocessor Installed 0 Absent 1 Present Bit 0 Floppy Drive Installed 0 Disabled 1 Enabled
15h	Base Memory (in 1KB increments), Low Byte
16h	Base Memory (in 1KB increments), High Byte
17h	IBM-compatible memory (in 1KB increments), Low Byte
18h	IBM-compatible memory (in 1KB increments), High Byte (max 15 MB)
19h-2Dh	Varies
2Eh	Standard CMOS RAM checksum, high byte
2Fh	Standard CMOS RAM checksum, low byte
30h	IBM-compatible Extended Memory, Low Byte (POST) in KB
31h	IBM-compatible Extended Memory, High Byte (POST) in KB
32h	Century Byte
33h	Reserved. Do not use
34h	Reserved. Do not use
35h	Low byte of extended memory (POST) in 64 KB
36h	High byte of extended memory (POST) in 64 KB
37h-3Dh	Varies
3Eh	Extended CMOS Checksum, Low Byte (including 34h-3Dh)
3Fh	Extended CMOS Checksum, High Byte (including 34h-3Dh)

I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses, which also becomes the identity of the device. There is a total of 1K-port address space available. The following table lists the I/O port addresses used on the Industrial CPU Card.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 071h	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
2E8h - 2EFh	Serial Port #4(COM4)
2F8h - 2FFh	Serial Port #2(COM2)
3B0h - 3DFh	Graphics adapter Controller
3E8h - 3EFh	Serial Port #3(COM3)
3F8h - 3FFh	Serial Port #1(COM1)
CF0h - CFFh	System Board Resource

Interrupt Request Lines (IRQ)

There are a total of 15 IRQ lines available on the Industrial CPU Card. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial CPU Card.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Serial Port #3
IRQ6	Reserved
IRQ7	Serial Port #4
IRQ8	Real Time Clock
IRQ9	ACPI
IRQ10	Serial Port #5/#7
IRQ11	Serial Port #6/#8
IRQ12	USB/PS2 Mouse
IRQ13	FPU
IRQ14	Primary IDE
IRQ15	Reserved

Serial Ports

The ACEs (Asynchronous Communication Elements ACE1 to ACE2) are used to convert parallel data to a serial format on the transmit side and convert serial data to parallel on the receiver side. The serial format, in order of transmission and reception, is a start bit, followed by five to eight data bits, a parity bit (if programmed) and one, one and half (five-bit format only) or two stop bits. The ACEs are capable of handling divisors of 1 to 65535, and produce a 16x clock for driving the internal transmitter logic.

Provisions are also included to use this 16x clock to drive the receiver logic, also included in the ACE a completed MODEM control capability, and a processor interrupt system that may be software tailored to the computing time required to handle the communications link.

The following table is a summary of each ACE accessible register

DLAB	Port Address	Register
0	Base + 0	Receiver buffer (read)
		Transmitter holding register (write)
0	Base + 1	Interrupt enable
X	Base + 2	Interrupt identification (read only)
X	Base + 3	Line control
X	Base + 4	MODEM control
X	Base + 5	Line status
X	Base + 6	MODEM status
X	Base + 7	Scratched register
1	Base + 0	Divisor latch (least significant byte)
1	Base + 1	Divisor latch (most significant byte)

➤ **Receiver Buffer Register (RBR)**

Bit 0-7: Received data byte (Read Only)

➤ **Transmitter Holding Register (THR)**

Bit 0-7: Transmitter holding data byte (Write Only)

➤ **Interrupt Enable Register (IER)**

Bit 0: Enable Received Data Available Interrupt (ERBFI)

Bit 1: Enable Transmitter Holding Empty Interrupt (ETBEI)

Bit 2: Enable Receiver Line Status Interrupt (ELSI)

Bit 3: Enable MODEM Status Interrupt (EDSSI)

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

➤ **Interrupt Identification Register (IIR)**

Bit 0: "0" if Interrupt Pending

Bit 1: Interrupt ID Bit 0

Bit 2: Interrupt ID Bit 1

Bit 3: Must be 0

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

➤ **Line Control Register (LCR)**

Bit 0: Word Length Select Bit 0 (WLS0)

Bit 1: Word Length Select Bit 1 (WLS1)

WLS1	WLS0	Word Length
0	0	5 Bits
0	1	6 Bits
1	0	7 Bits
1	1	8 Bits

Bit 2: Number of Stop Bit (STB)

Bit 3: Parity Enable (PEN)

Bit 4: Even Parity Select (EPS)

Bit 5: Stick Parity

Bit 6: Set Break

Bit 7: Divisor Latch Access Bit (DLAB)

➤ **MODEM Control Register (MCR)**

Bit 0: Data Terminal Ready (DTR)

Bit 1: Request to Send (RTS)

Bit 2: Out 1 (OUT 1)

Bit 3: Out 2 (OUT 2)

Bit 4: Loop

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

➤ **Line Status Register (LSR)**

Bit 0: Data Ready (DR)

Bit 1: Overrun Error (OR)

Bit 2: Parity Error (PE)

Bit 3: Framing Error (FE)

Bit 4: Break Interrupt (BI)

Bit 5: Transmitter Holding Register Empty (THRE)

Bit 6: Transmitter Shift Register Empty (TSRE)

Bit 7: Must be 0

➤ **MODEM Status Register (MSR)**

Bit 0: Delta Clear to Send (DCTS)

Bit 1: Delta Data Set Ready (DDSR)

Bit 2: Training Edge Ring Indicator (TERI)

Bit 3: Delta Receive Line Signal Detect (DSLSD)

Bit 4: Clear to Send (CTS)

Bit 5: Data Set Ready (DSR)

Bit 6: Ring Indicator (RI)

Bit 7: Received Line Signal Detect (RSLD)

➤ **Divisor Latch (LS, MS)**

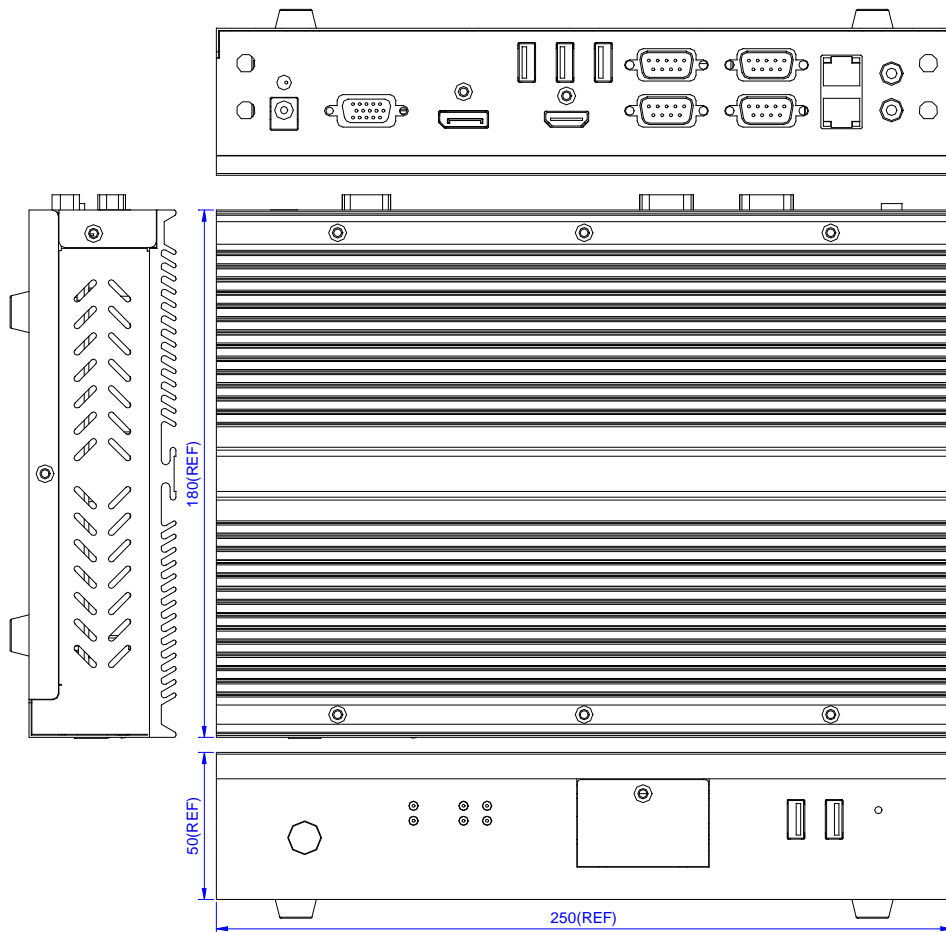
	LS	MS
Bit 0:	Bit 0	Bit 8
Bit 1:	Bit 1	Bit 9
Bit 2:	Bit 2	Bit 10
Bit 3:	Bit 3	Bit 11
Bit 4:	Bit 4	Bit 12
Bit 5:	Bit 5	Bit 13
Bit 6:	Bit 6	Bit 14
Bit 7:	Bit 7	Bit 15

Desired Baud Rate	Divisor Used to Generate 16x Clock
300	384
600	192
1200	96
1800	64
2400	48
3600	32
4800	24
9600	12
14400	8
19200	6
28800	4
38400	3
57600	2
115200	1

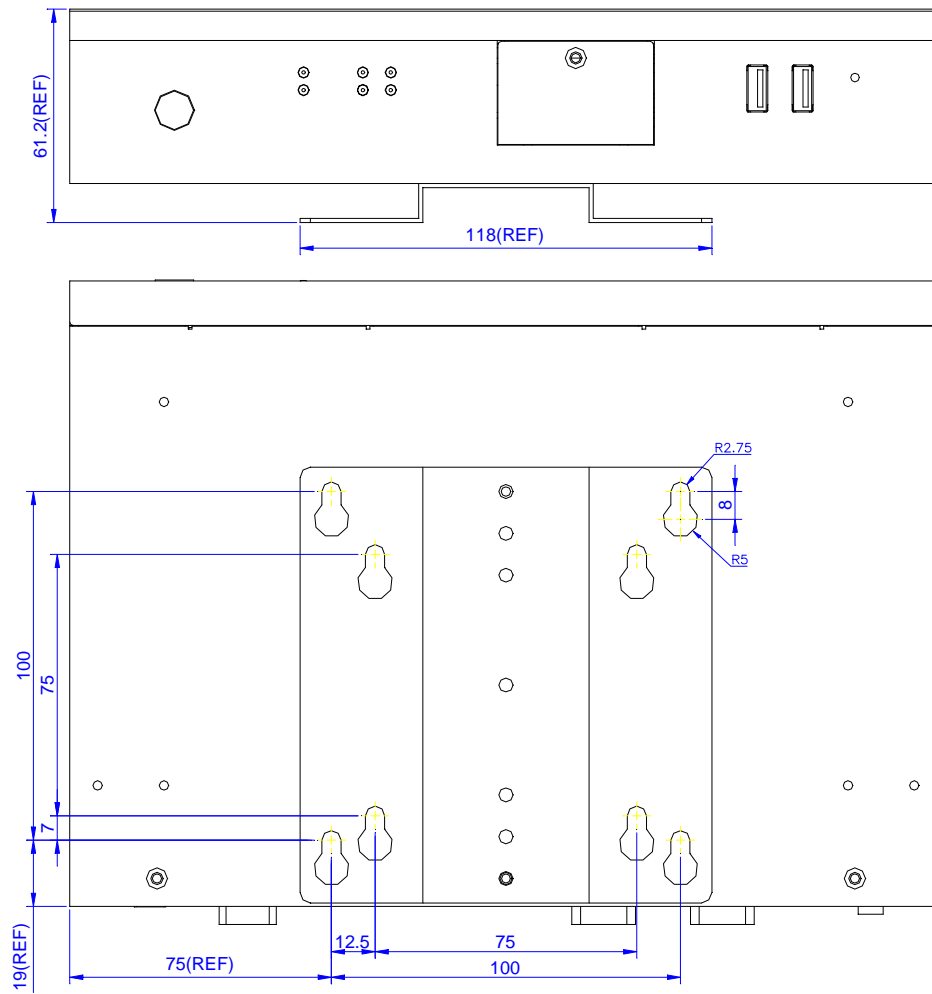
Appendix

□ Dimension

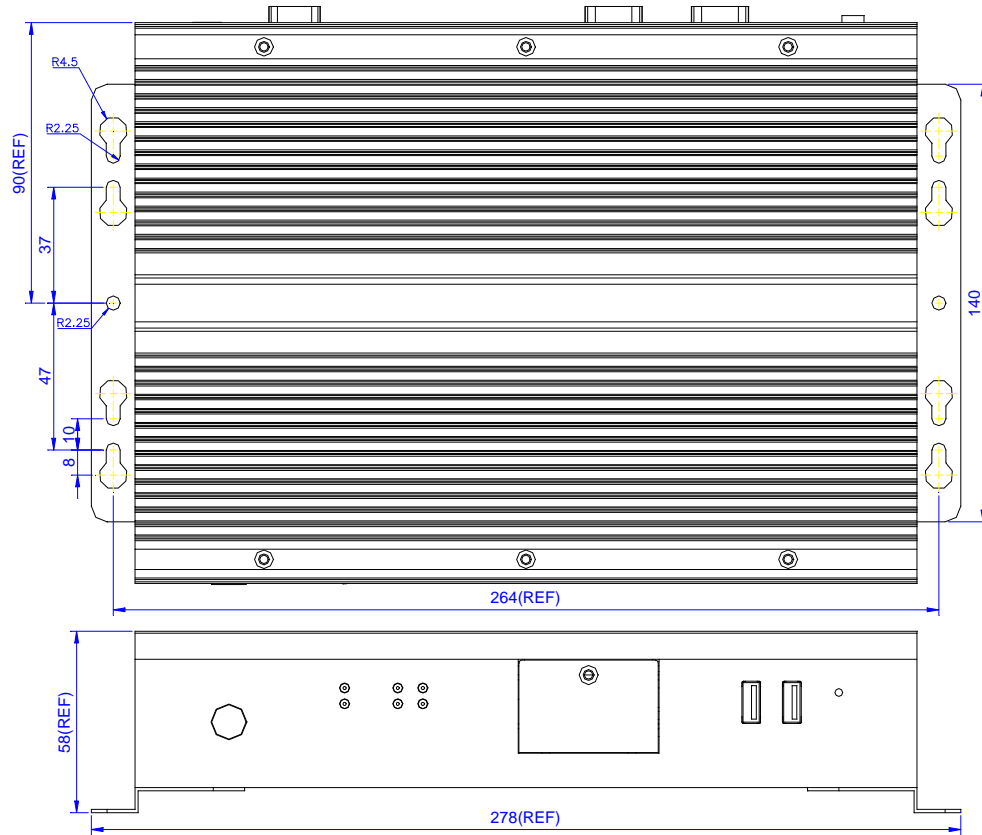
a. FX5653



b. FX5504K1



c. FX5501K1



d. FX5622K1

