MS-9A29

Industrial Data Machine

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Trademarks

All trademarks are the properties of their respective owners.

Revision

Revision	Date
V1.2	2015/08

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- Visit the MSI website for technical guide, BIOS updates, driver updates, and other information:
  http://www.msi.com/service/download/

- Contact our technical staff at: *http://support.msi.com/*

Safety Instructions

- Always read the safety instructions carefully.

- Keep this User's Manual for future reference.

- Keep this equipment away from humidity.

- Lay this equipment on a reliable flat surface before setting it up.

- The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPEN-INGS.

- Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.

- Place the power cord such a way that people can not step on it. Do not place anything over the power cord.

- Always Unplug the Power Cord before inserting any add-on card or module.

- All cautions and warnings on the equipment should be noted.

- Never pour any liquid into the opening that could damage or cause electrical shock.

- If any of the following situations arises, get the equipment checked by service personnel:

  ○ The power cord or plug is damaged.

  ○ Liquid has penetrated into the equipment.

  ○ The equipment has been exposed to moisture.

  ○ The equipment does not work well or you can not get it work according to User's Manual.

  ○ The equipment has dropped and damaged.

  ○ The equipment has obvious sign of breakage.

- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UN-CONDITIONED, STORAGE TEMPERATURE ABOVE 60°C (140°F), IT MAY DAMAGE THE EQUIPMENT.

警告使用者：
這是甲類資訊產品，在居住的環境中使用時，可能會造成無線電干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Chemical Substances Information

In compliance with chemical substances regulations, such as the EU REACH Regulation (Regulation EC No. 1907/2006 of the European Parliament and the Council), MSI provides the information of chemical substances in products at:

http://www.msi.com/html/popup/csr/evmtprtt_pcm.html

Battery Information

European Union:

Batteries, battery packs, and accumulators should not be disposed of as unsorted household waste. Please use the public collection system to return, recycle, or treat them in compliance with the local regulations.

Taiwan:

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

廢電池請回收

California, USA:

The button cell battery may contain perchlorate material and requires special handling when recycled or disposed of in California.

For further information please visit:

http://www.dtsc.ca.gov/hazardouswaste/perchlorate/

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

CE Conformity

Hereby, Micro-Star International CO., LTD declares that this device is in compliance with the essential safety requirements and other relevant provisions set out in the European Directive.

FCC Radio Frequency Interference Statement

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.

NOTICE 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTICE 2

Shielded interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1.   this device may not cause harmful interference, and
2.   this device must accept any interference received, including interference that may cause undesired operation.

WEEE Statement

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life. MSI will comply with the product take back requirements at the end of life of MSI-branded products that are sold into the EU. You can return these products to local collection points.

CONTENTS

NOTE

Chapter 1
Overview

Thank you for choosing the 9A29, an excellent industrial data machine from MSI.

The MS-9A29 eliminates the noise and the risk of fan's failure by wide heatsink as fanless solution. Furthermore, it supports VESA wall-mount interface for various scenarios like digital signage, kiosk, industrial control, and POS with affordable expenditure, which not only meets the demand of Industrial applications but also fulfills the needs of companies, governments, and institutes for general applications.

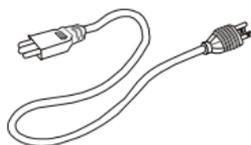# **Packing Contents**

MS-9A29 Industrial Data Machine

Power Adapter

Power Cord

Mounting Brackets

SATA Power & Signal Cable

User's Manual (Optional)

Driver/Utility Disc
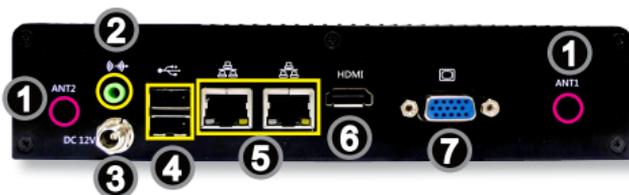
- Please contact us immediately if any of the item is damaged or missing.
- The picture is for your reference only and your packing contents may slightly vary depending on the model you purchased.

System Overview

➤ **Top View**

➤ **Rear View**

①	**WLAN Antenna Connector (Optional)**
	This connector allows you to connect an external antenna for wireless LAN.

2 **Line-Out Jack**

This connector is provided for headphones or speakers.

3 **Power Jack**

The power adapter converts AC power to DC power for this jack.Power supplied through this jack supplies power to the system.To prevent damage to the system, always use the supplied power adapter.

4 **USB 2.0 Port**

The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

5 **Gigabit LAN Jack**

The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.

6 **HDMI Port** HDMI

The High-Definition Multimedia Interface (HDMI) is an all-digital audio/video interface capable of transmitting uncompressed streams. HDMI supports all TV format, including standard, enhanced, or high-definition video, plus multi-channel digital audio on a single cable.

7 **VGA Port**

The DB15-pin female connector is provided for monitor.

➢ **Front View**

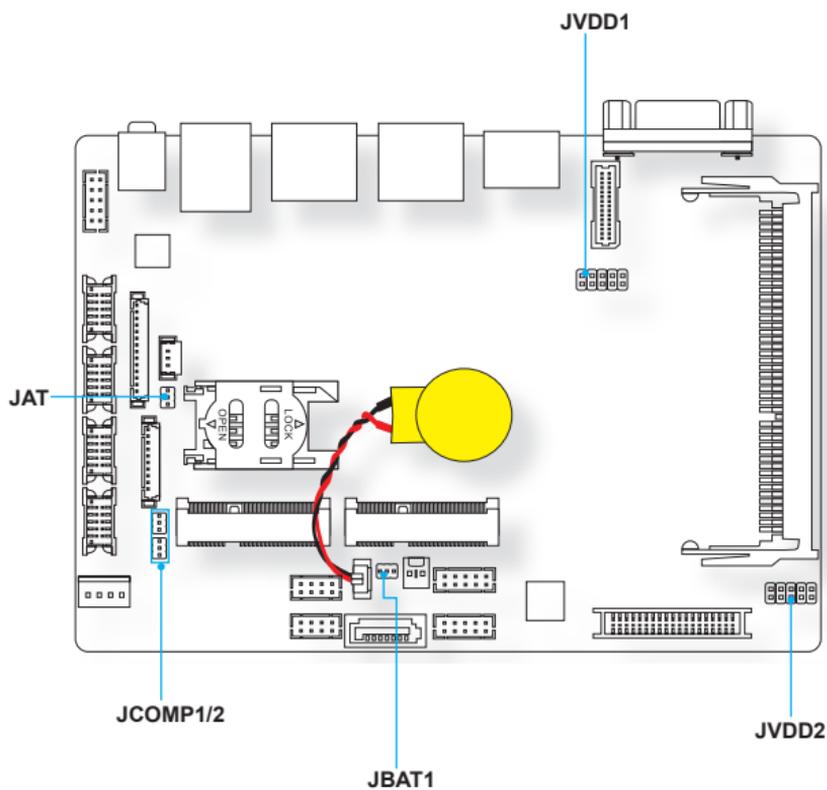|		
1	**Serial Port**	The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.
2	**Power Button**	Press the power button to turn the system on or off.
3	**USB 2.0 Port**	The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

System Specifications

CPU	■ Intel Cedarview-D D2550
Chipset	■ Intel NM10 chipset
Memory	■ 1 DDR3 800 / 1066MHz Non-ECC SO-DIMM slot ■ Supports the maximum of 4GB
LAN	■ 2 Gigabit Fast Ethernet by Intel 82583V controller
Storage	■ 1 SATA 3Gb/s port ■ 1 mSATA slot
Audio	■ HDA Codec by Realtek ALC887 ■ Compliant with Azalia 1.0 specs

Graphics	■ Intel 3600 series integrated Graphics Engine
	  - LVDS1 24-bit single channel, resolution up to 1440 x 900 pixels
	  - LVDS2 24-bit dual channel, resolution up to 1920 x 1080 pixels
	  - VGA port, resolution up to 1920 x 1200 pixels

Rear Panel Input/Output	■ 1 D-sub VGA port ■ 1 HDMI port ■ 2 Gigabit LAN jacks ■ 2 USB 2.0 ports ■ 1 Line-Out audio jack ■ 1 DC power jack ■ 2 Wireless LAN antenna connectors (Optional)
Front Panel Input/Output	■ 4 USB 2.0 ports ■ 4 Serial ports ■ 1 Power button

Power Supply	■ SKU1 - 36 watt switching power adapter - Input: 100~240Vac, 1.5A, 50~60Hz - Output: 12Vdc, 3A - No power consumption for COM1~4 ■ SKU2 - 60 watt switching power adapter - Input: 100~240Vac, 1.5A, 50~60Hz - Output: 12Vdc, 5A - COM1: 12V/1A or 5V/1A maximum - COM2~4: 12V/0.5A or 5V/0.5A maximum *Important* *- Before powering on the system, recheck the adapter to ensure safety (36 watt for SKU1 and 60 watt for SKU2).* *- For SKU2, make sure the operation voltages of the serial ports are properly adjusted. Please refer to page 1-10 for details.*
Dimension & Weight	■ 196mm x 136mm x 43mm ■ 1.20 kg
Regulatory Compliance	■ FCC Class A, CE, C-Tick, BSMI, RoHS, VCCI
Environm-ental	■ Operating Temperature: 0°C to 40°C ■ Storage Temperature: 0°C to 50°C ■ Humidity: 10% ~ 90% RH, non-condensing

Motherboard Jumper

JVDD1

JAT

JCOMP1/2

JBAT1

JVDD2

Backlight Pinheader & LVDS Power Jumper: JVDD1, JVDD2

The backlight connector is provided for LCD backlight options while the LVDS power jumper allows users to select the operation voltage of the LVDS flat panel.

JVDD1

LVDS Power Jumper

Backlight Connector

PIN	SIGNAL
1	VCC5
3	L_BKLTCTL
5	INV_ON
7	GND
9	+12V

JVDD2

Backlight Connector

LVDS Power Jumper

VCC5   VCC3   VCC3   +12V
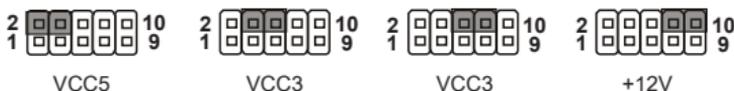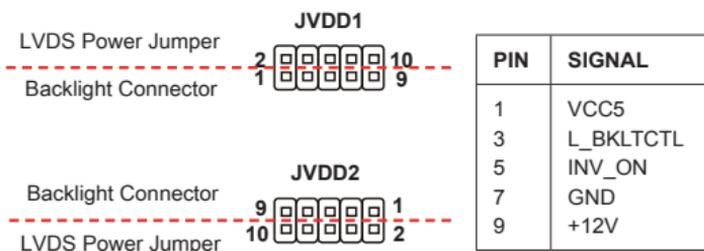
Clear CMOS Jumper: JBAT1

There is a CMOS RAM onboard that has a power supply from an external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, set the jumper to clear data.

JBAT1   Normal   Clear CMOS

Important

You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the motherboard.

Serial Port Power Jumper: JCOMP1, JCOMP2

These jumpers specify the operation voltage of the onboard serial ports.

JCOMP1/2
(for COM1/2)

+5V

+12V
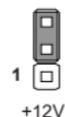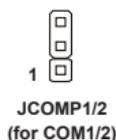
AT/ATX Select Jumper: JAT1

This jumper allows users to select between AT and ATX power.

JAT1

ATX
(Default)

AT

Chapter 2
System Setup

This chapter provides you with the information on hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

Use a grounded wrist strap before handling data machine components. Static electricity may damage the components.

Important

• *Always unplug the power cord before installing any components.*

• *When the operating temperature reaches 40°C or higher, please replace your HDD with SSD (Solid-State Drive) or other types of heat-resistant HDD to protect your HDD from being damaged by high temperature.*

Installation Tools

	A Phillips (crosshead) screwdriver and a flathead screwdriver, can be used to do most of the installation. Choose one with a magnetic head would be better.
	Pliers, can be used as an auxiliary tool to connect some connectors or cables.
	Forceps, can be used to pick up tiny screws or set up the jumpers.
	Rubber gloves, can prevent yourself from being incised and suffering the static charge.

System Cover

1. Place the system horizontally on a flat and steady surface. Locate and remove the screws that secure the system cover.

2. Slide the cover carefully sidewards and remove it from the system.

Memory

1. Locate the memory slot.

2. Align the notch on the memory with the key on the slot and insert the memory into the slot at a 45-degree angle.

3. Push the memory gently downwards until the slot clips click and lock the memory in place.

Important

- *You can barely see the golden finger if the DIMM is properly inserted in the DIMM slot.*
- *To uninstall the DIMM, flip the slot clips outwards and the DIMM will be released instantly.*

Wireless LAN Card (Optional)

1. Locate the Mini PCIe slot. Remove the Mini PCIe card screw preinstalled on the motherboard.

2. Insert the wireless LAN card into the slot at a 45-degree angle.

3. Push the card gently downwards and fasten it with a screw.

mSATA Card (Optional)

1. To install an mSATA card, the motherboard has to be disassembled from the system to uncover the mSATA slot on the other side of the motherboard. First, locate and disconnect the cables as indicated below.

2. Unscrew and remove the system rear panel.

3. Remove the screws that secure the motherboard to the system.

4. Remove the motherboard from the system.

5. Gently flip over the motherboard and locate the mSATA slot.

6. Remove the mSATA card screw preinstalled on the motherboard.
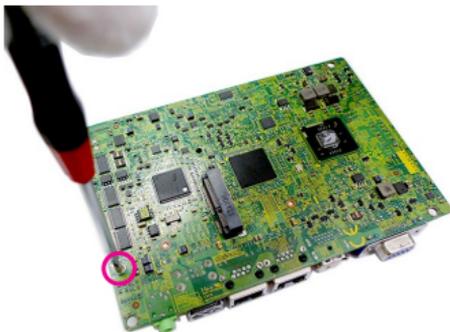
7. Insert the mSATA card into the slot at a 45-degree angle.

8. Push the card gently downwards and fasten it with a screw.

9. Follow steps 1 through 4 in reverse order to reinstall the motherboard.

Hard Disk Drive

1. Flip over the system cover and locate the HDD bracket. Remove the sticker film to uncover the thermal paste.
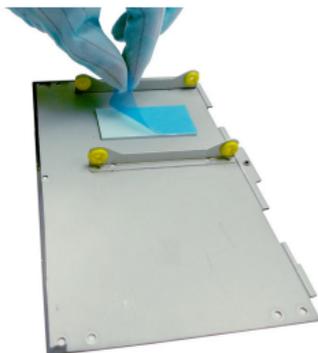
2. Insert the HDD into the HDD bracket with screw holes aligned.

3. Tighten the screws to fix the HDD to the bracket.

Important

Please make sure the HDD is properly and completely fixed to the bracket.

4. Connect the SATA signal & power cable to the HDD.

5. Connect the SATA signal & power cable to the motherboard to complete the installation.

Mounting Brackets

1. Flip over the system and locate the bracket screw holes.
2. Place the brackets along the sides with screw holes aligned.
3. Fasten the screws to fix the brackets.

NOTE
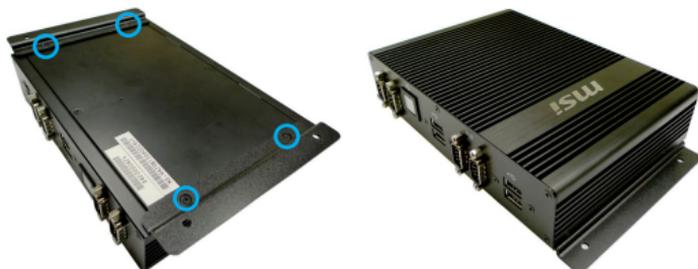
Chapter 3
BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

Important

- *Please note that BIOS update assumes technician-level experience.*

- *As the system BIOS is under continuous update for better system performance, the illustrations in this chapter should be held for reference only.*

Entering Setup

Power on the data machine and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> or <F2> key to enter Setup.

Press <DEL> or <F2> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

Control Keys

← →	Select Screen
↑ ↓	Select Item
Enter	Select
+ -	Change Option
F1	General Help
F7	Previous Values
F9	Optimized Defaults
F10	Save & Exit
Esc	Exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

The Menu Bar
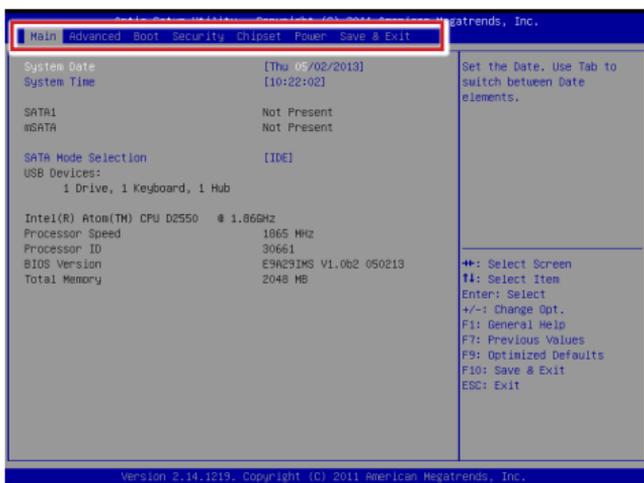
▸ **Main**

Use this menu for basic system configurations, such as time, date, etc.

▸ **Advanced**

Use this menu to set up the items of special enhanced features.

▸ **Boot**

Use this menu to specify the priority of boot devices.

▸ **Security**

Use this menu to set supervisor and user passwords.

▸ **Chipset**

This menu controls the advanced features of the onboard chipsets.

▸ **Power**

Use this menu to specify your settings for power management.

▸ **Save & Exit**

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.

Main
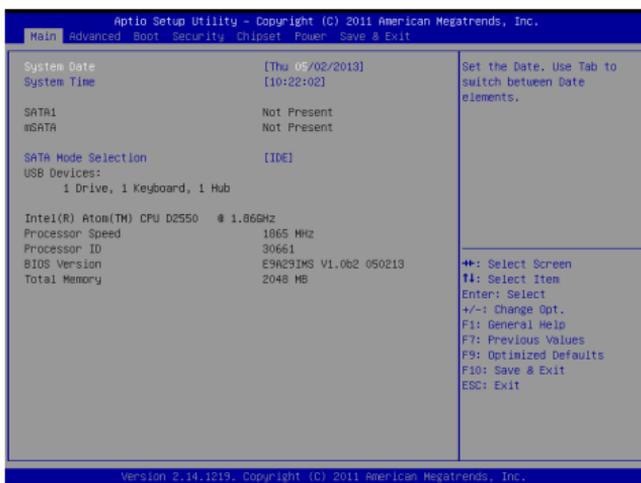
▶ **System Date**

This setting allows you to set the system date. The date format is <Day>, <Month> <Date> <Year>.

▶ **System Time**

This setting allows you to set the system time. The time format is <Hour> <Minute> <Second>.

▶ **SATA Mode Selection**

This setting specifies the SATA controller mode.

Advanced
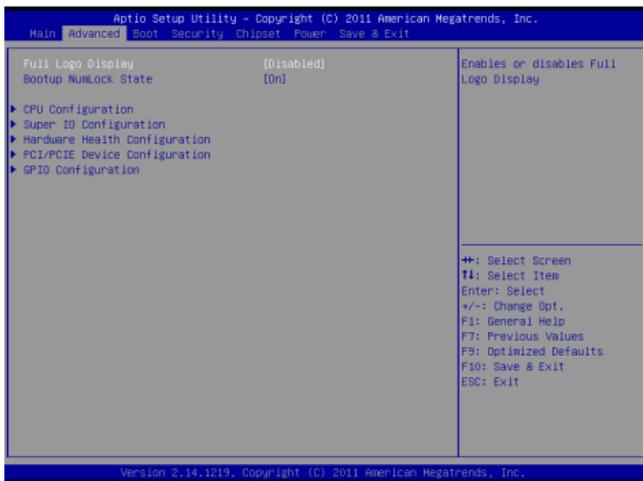
▸ **Full Screen Logo Display**

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo.

When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.

When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disable this BIOS feature for a faster boot-up time.

▸ **Bootup NumLock State**

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

▸ **CPU Configuration**

▸ **Hyper-Threading**

The processor uses Hyper-Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. Please disable this item if your operating system doesn't support HT Function, or unreliability and instability may occur.

▸ **Execute Disable Bit**

Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation.

▸ **Limit CPUID Maximum**

This feature allows you to circumvent problems with older operating systems that do not support the Intel Pentium 4 processor with Hyper-Threading Technology. When enabled, the processor will limit the maximum CPUID input value to 03h when queried, even if the processor supports a higher CPUID input value. When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

▶ **Super IO Configuration**

```
         Advanced

Super IO Configuration

Serial Port 1 Configuration        [Enabled]
 Device Settings                   IO=3F8h; IRQ=4;
 Change Settings                   [Auto]
 Mode Select                       [RS232]
Serial Port 2 Configuration        [Enabled]
 Device Settings                   IO=2F8h; IRQ=3;
 Change Settings                   [Auto]
Serial Port 3 Configuration        [Enabled]
 Device Settings                   IO=3E8h; IRQ=6;
 Change Settings                   [Auto]
Serial Port 4 Configuration        [Enabled]
 Device Settings                   IO=2E8h; IRQ=6;
 Change Settings                   [Auto]

FIFO Mode                          [128-byte]
Watch Dog Timer                    [Disabled]
```

▶ **Serial Port 1/ 2/ 3/ 4 Configuration**

This setting enables/disables the specified serial port.

▶ **Change Settings**

This setting is used to change the address & IRQ settings of the specified serial port.

▶ **Mode Select**

Select an operation mode for the serial port 1.

▶ **FIFO Mode**

This setting controls the FIFO data transfer mode.

▶ **Watch Dog Timer**

You can enable the system watch-dog timer, a hardware timer that generates a reset when the software that it monitors does not respond as expected each time the watch dog polls it.

▶ **Hardware Health Configuration**

These items display the current status of all monitored hardware devices/components such as voltages, temperatures and all fans' speeds.

```
 Advanced

  Hardware Monitor status
 Thermal Shutdown             [Enabled]

 System temperature          : +38 C
 CPU temperature             : +40 C

 System Fan Speed            : N/A

 CPU VCore                   : +1.208 V
 VCC5                        : +5.087 V
 +12V                        : +12.144 V
 VCC3                        : +3.328 V
 VSB3V                       : +3.344 V
 VBAT                        : +3.264 V
```

▶ **PCI/PCIE Device Configuration**

```
 Advanced

 PCI Latency Timer            [32 PCI Bus Clocks]
 Legacy USB Support           [Enabled]
 Audio Controller             [Enabled]
 Launch PXE OpROM             [Disabled]
```

▶ **PCI Latency Timer**

This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can con-

duct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values.

▸ **Legacy USB Support**

Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.
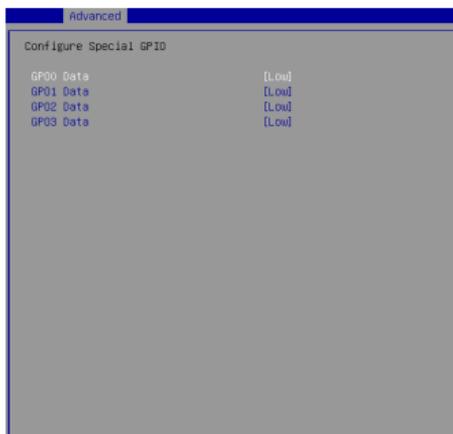
▸ **Audio Controller**

This setting enables/disables the onboard audio controller.

▸ **Launch PXE OpROM**

This setting enables/disables the initialization of the onboard LAN Boot ROM during bootup. Selecting [Disabled] will speed up the boot process.
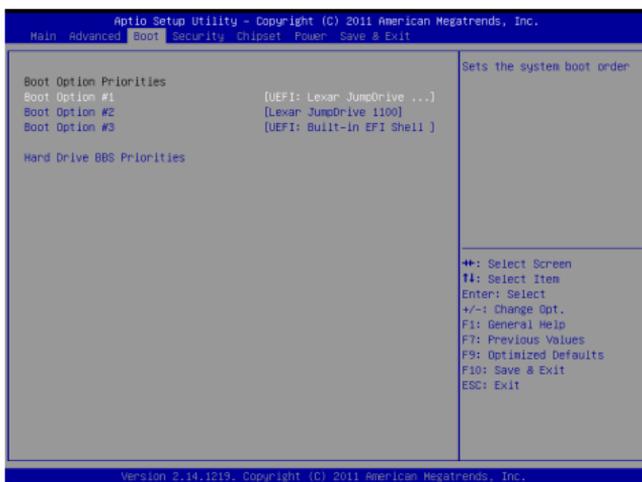
▸ **GPIO Configuration**

▸ **GPO0~3 Data**

This setting controls the operation mode of the specified GPIO.

Boot

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Main  Advanced  Boot  Security  Chipset  Power  Save & Exit

                                                                    Sets the system boot order
   Boot Option Priorities
   Boot Option #1              [UEFI: Lexar JumpDrive ...]
   Boot Option #2              [Lexar JumpDrive 1100]
   Boot Option #3              [UEFI: Built-in EFI Shell ]

   Hard Drive BBS Priorities




                                                                    →←: Select Screen
                                                                    ↑↓: Select Item
                                                                    Enter: Select
                                                                    +/-: Change Opt.
                                                                    F1: General Help
                                                                    F7: Previous Values
                                                                    F9: Optimized Defaults
                                                                    F10: Save & Exit
                                                                    ESC: Exit



          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

▸ **Boot Option #1 / #2 / #3**

This setting allows users to set the sequence of boot devices where BIOS attempts to load the disk operating system.

▸ **Hard Drive BBS Priorities**

This setting allows users to set the priority of the specified devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑ ↓) to select the desired device, then press <+>, <-> or <PageUp>, <Page-Down> key to move it up/down in the priority list.
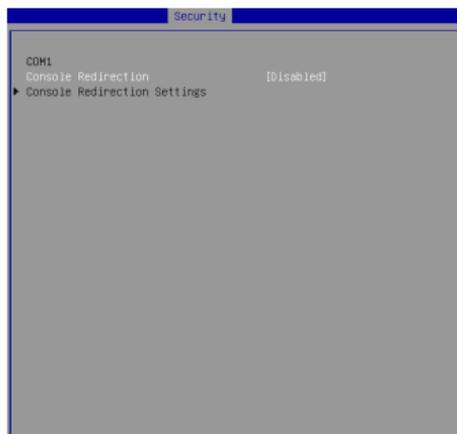
Security
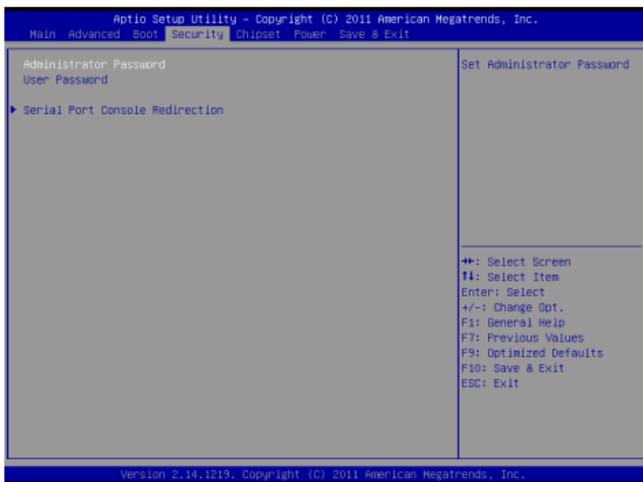
▶ **Administrator Password**

Administrator Password controls access to the BIOS Setup utility.

▶ **User Password**

User Password controls access to the system at boot and to the BIOS Setup utility.

► **Serial Port Console Redirection**

► **Console Redirection**

Console Redirection operates in host systems that do not have a monitor and keyboard attached. This setting enables/disables the operation of console redirection. When set to [Enabled], BIOS redirects and sends all contents that should be displayed on the screen to the serial COM port for display on the terminal screen. Besides, all data received from the serial port is interpreted as keystrokes from a local keyboard.

► **Console Redirection Settings**

Press <Enter> to enter the sub-menu.

► **Terminal Type**

To operate the system's console redirection, you need a terminal supporting ANSI terminal protocol and a RS-232 null modem cable connected between the host system and terminal(s). This setting specifies the type of terminal device for console redirection.

► **Bits per second, Data Bits, Parity, Stop Bits**

This setting specifies the transfer rate (bits per second, data bits, parity, stop bits) of Console Redirection.

► **Flow Control**

Flow control is the process of managing the rate of data transmission between two nodes. It's the process of adjusting the flow of data from one device to another to ensure that the receiving device can handle all of the incoming data. This is particularly important

where the sending device is capable of sending data much faster than the receiving device can receive it.

▶ **VT-UTF8 Combo Key Support**

This setting enables/disables VT-UTF8 Combo Key Support.

▶ **Recorder Mode, Resolution 100x31**

These settings enable/disable the recorder mode and the resolution 100x31.

▶ **Legacy OS Redirection Resolution**

This setting specifies the redirection resolution of legacy OS.
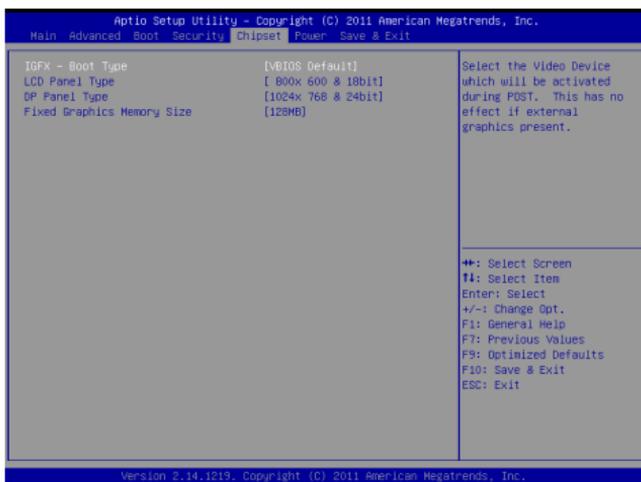
▶ **Putty KeyPad**

This setting specifies the type of Putty KeyPad.

▶ **Redirection After BIOS POST**

This setting specifies the Redirection configuration after BIOS POST.

[Disable]	Turn off the redirection after POST
[Boot Loader]	Set the Redirection to be active during POST and Boot Loader
[Always Enable]	Set the Redirection to be always active

Chipset

▸ **IGFX - Boot Type**

Use the field to select the type of device you want to use as the boot display of the system.

▸ **LCD Panel Type**

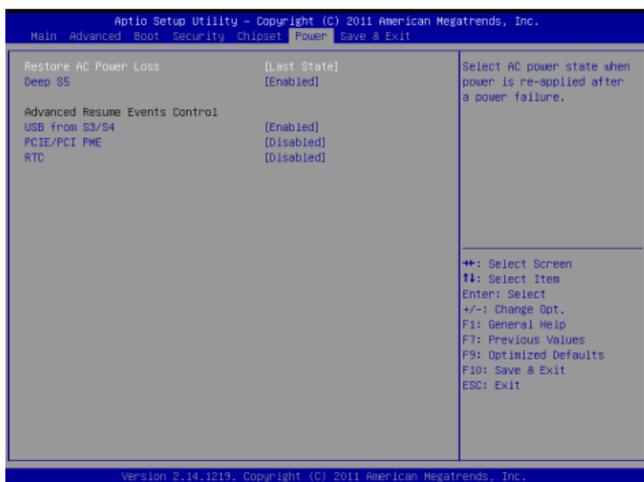This setting allows you to set the resolution of the LCD panel.

▸ **DP Panel Type**

This setting allows you to set the resolution of the DP panel.

▸ **Fixed Graphics Memory Size**

This setting specifies the size of system memory allocated for video memory.

Power

▶ **Restore AC Power Loss**

This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

[Power Off]	Leaves the data machine in the power off state.
[Power On]	Leaves the data machine in the power on state.
[Last State]	Restores the system to the previous status before power failure or interrupt occurred.

▶ **Deep S5**

The setting enables/disables the Deep S5 power saving mode. S5 is almost the same as G3 Mechanical Off, except that the PSU still supplies power, at a minimum, to the power button to allow return to S0. A full reboot is required. No previous content is retained. Other components may remain powered so the data machine can "wake" on input from the keyboard, clock, modem, LAN, or USB device.

** Advanced Resume Events Control **

▸ **USB from S3/S4**

The item allows the activity of the USB device to wake up the system from S3/S4 sleep state.

▸ **PCIE/PCI PME**

This field specifies whether the system will be awakened from power saving modes when activity or input signal of onboard PCIE/PCI PME is detected.

▸ **RTC**

When [Enabled], your can set the date and time at which the RTC (real-time clock) alarm awakens the system from suspend mode.

Save & Exit
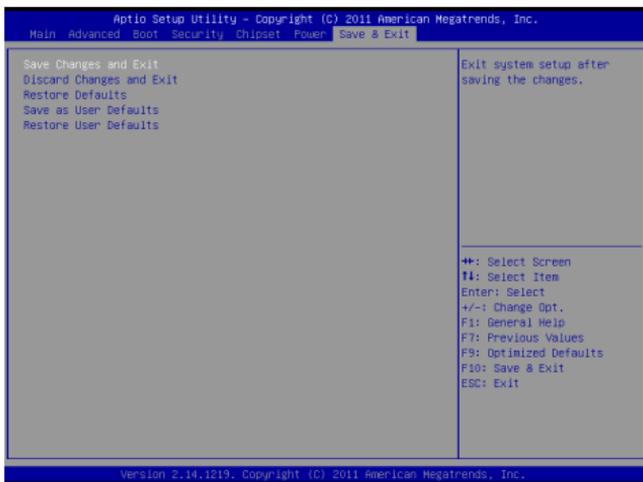
▶ **Save Changes and Exit**
Save changes to CMOS and exit the Setup Utility.

▶ **Discard Changes and Exit**
Abandon all changes and exit the Setup Utility.

▶ **Restore Defaults**
Restore the factory defaults.

▶ **Save as User Defaults**
Save all changes as the user defaults.

▶ **Restore User Defaults**
Restore the preset user defaults.

Appendix
WDT & GPIO

This appendix provides the sample codes of WDT (Watch Dog Timer) and GPIO (General Purpose Input/Output).

WDT Sample Code

```
SIO_INDEX_Port      equ 04Eh
SIO_DATA_Port       equ 04Fh
SIO_UnLock_Value    equ 087h
SIO_Lock_Value      equ 0AAh
WatchDog_LDN        equ 007h
WDT_UNIT            equ 60h     ;60h=second, 68h=minute, 40h=Disabled Watchdog timer
WDT_Timer           equ 30      ;ex. 30 seconds

Sample code:
;Enable config mode
    mov     dx, SIO_INDEX_Port
    mov     al, SIO_UnLock_Value
    out     dx, al
    jmp     short $+2           ;Io_delay
    jmp     short $+2           ;Io_delay
    out     dx, al
;Change to WDT
    mov     dx, SIO_INDEX_Port
    mov     al, 07h
    out     dx, al
    mov     dx, SIO_DATA_Port
    mov     al, WatchDog_LDN
    out     dx, al
;Acive WDT
    mov     dx, SIO_INDEX_Port
    mov     al, 30h
    out     dx, al
    mov     dx, SIO_DATA_Port
    in      al, dx
    or      al, 01h
    out     dx, al
;set timer
    mov     dx, SIO_INDEX_Port
    mov     al, 0F6h
    out     dx, al
    mov     dx, SIO_DATA_Port
    mov     al, WDT_Timer
    out     dx, al
;set UINT
    mov     dx, SIO_INDEX_Port
    mov     al, 0F5h
    out     dx, al
    mov     dx, SIO_DATA_Port
    mov     al, WDT_UNIT
    out     dx, al
;enable reset
    mov     dx, SIO_INDEX_Port
    mov     al, 0FAh
    out     dx, al
    mov     dx, SIO_DATA_Port
    in      al, dx
    or      al, 01h
    out     dx, al
;close config mode
    mov     dx, SIO_INDEX_Port
    mov     al, SIO_Lock_Value
    out     dx, al
```

GPIO Sample Code

● GPI 0 ~ GPI 3

	GPI 0	GPI 1	GPI 2	GPI 3				
IO Address	50Ch	50Ch	50Ch	50Ch				
SIO GPIO Register								
Bit	24	26	27	28				
Sample code	#1	#1	#1	#1				

● GPO 0 ~ GPO 3

	GPO 0	GPO 1	GPO 2	GPO 3				
IO Address	538h	538h	538h	538h				
SIO GPIO Register								
Bit	1	2	6	7				
Sample code	#2	#2	#2	#2				

```
GPO_0            equ    00000010b
GPO_1            equ    00000100b
GPO_2            equ    01000000b
GPO_3            equ    10000000b
```

Sample Code:

#1 : Get GPI 0 status
```
; Get GPI 0/1/2/3 Pin Status Register
   mov    dx, 50Ch
   in     eax, dx
   ;eax bit24 = GPI 0 status
   ;eax bit26 = GPI 1 status
   ;eax bit27 = GPI 2 status
   ;eax bit28 = GPI 3 status
```

#2 : Set GPO 0/1/2/3 status to high
```
; Set GPO 0/1/2/3 status to high(1).
   mov    dx, 538h
   in     eax, dx
   or     eax, GPO_0 + GPO_1 + GPO_2 + GPO_3
   out    dx,eax
```

NOTE