# MS-9A69B1

Industrial Data Machine

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## Trademarks

All trademarks are the properties of their respective owners.

## Revision

| Revision | Date |
|----------|---------|
| V1.2 | 2020/12 |

## 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 visit the MSI website for technical guide, BIOS updates, driver updates and other information, or contact our technical staff via https://www.msi.com/support/

# 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 OPENINGS.

- 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 UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60℃ (140℉), IT MAY DAMAGE THE EQUIPMENT.

警告使用者:

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，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:

https://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:

https://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 gener-ates, 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.

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.
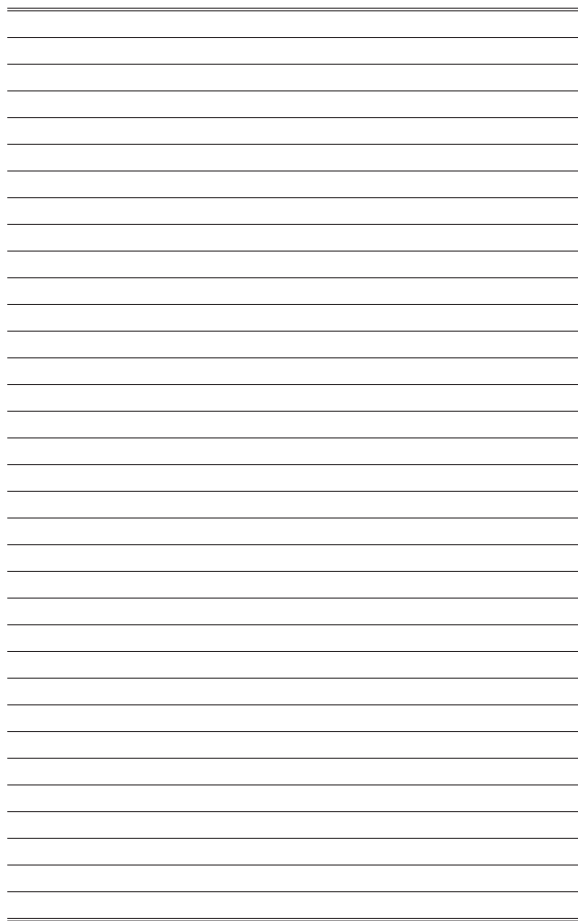
# WEEE Statement

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*

# Chapter 1
# Overview

Thank you for choosing the 9A69, an excellent industrial data machine from MSI.

The MS-9A69 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-9A69 Industrial Data Machine
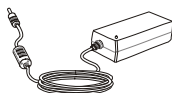
Power Adapter

Power Cord

Mounting Brackets

SATA Power & Signal Cable
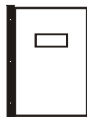
User's Manual (Optional)

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



## ➤ Front View
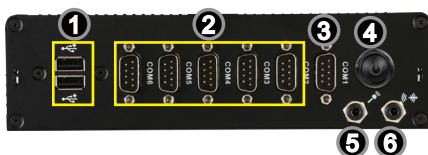


| | | |
|---|---|---|
| **1** | **USB 2.0 Port** | |
| | The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices. | |
| **2** | **RS232 Serial Port: COM2 ~ COM6** | |
| | The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector. | |

**③ RS232/422/485 Serial Port: COM1**

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.

| Mode | Pin | Signal |
|---|---|---|
| RS422 | 1 | TX-B |
| | 2 | RX-A |
| | 3 | TX-A |
| | 4 | RX-B |
| RS485 | 1 | DATA-B |
| | 3 | DATA-A |

**④ Power Button**

Press the power button to turn the system on or off.

**⑤ Microphone**

This connector is provided for for microphones.

**⑥ Line-Out Jack**

This connector is provided for headphones or speakers.

## ➤ Rear View



**① WLAN Antenna Connector (Optional)**

This connector allows you to connect an external antenna for wireless LAN.

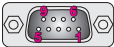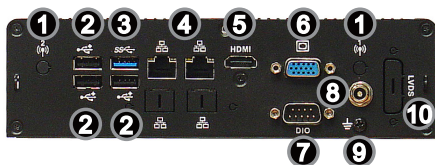| | |
|---|---|
| **2** | **USB 2.0 Port**<br>The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices. |
| **3** | **USB 3.0 Port**<br>The USB 3.0 port is backward-compatible with USB 2.0 devices and supports data transfer rate up to 5 Gbit/s (SuperSpeed). |
| **4** | **Gigabit LAN Jack**<br>The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it. |
| **5** | **HDMI Port** HƏMI<br>HIGH-DEFINITION MULTIMEDIA INTERFACE<br>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. |
| **6** | **VGA Port**<br>The DB15-pin female connector is provided for monitor. |
| **7** | **DIO Port**<br>This port is provided for the General-Purpose Input/Output (GPIO) peripheral module. |

| PIN | SIGNAL |
|-----|--------|
| 1 | GPO0 |
| 2 | GPO1 |
| 3 | GPO2 |
| 4 | GPO3 |
| 5 | GPI0 |
| 6 | GPI1 |
| 7 | GPI2 |
| 8 | GPI3 |
| 9 | VCC5 |
| Shell | GND |
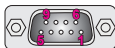
**8** **Power Jack**

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.

**9** **Grounding Point**

The connector is provided for connecting a grounding wire.

**10** **LVDS (Optional)**

The LVDS (Low Voltage Differential Signal) connector provides a digital interface typically used with flat panels. After connecting an LVDS interface flat panel to the JLVDS1, be sure to check the panel datasheet and set the LVDS jumper to proper power voltage.

# System Specifications

| | |
|---|---|
| **CPU** | ■ Intel Bay Trail-D J1900, QC 2.0GHz |
| **Memory** | ■ 1 DDR3L 1333MHz Non-ECC SO-DIMM slot<br>■ Supports the maximum of 8GB |
| **LAN** | ■ 2 Gigabit Fast Ethernet by Intel I210-ATcontroller |
| **Storage** | ■ 1 SATA 3Gb/s port<br>■ 2 Mini PCIe slots |
| **Audio** | ■ HDA Codec by ALC887-VD2-CG / ALC888S<br>■ Compliant with Azalia 1.0 specs |
| **Graphics** | ■ Integrated in CPU<br>  • LVDS 18/24-bit Dual Channel, resolution up to 1920 x 1200<br>  • VGA port, resolution up to 2560 x 1600<br>  • HDMI port, resolution up to 1920 x 1080 |
| **Front Panel Input/Output** | ■ 2 USB 2.0 ports<br>■ 1 Line-Out audio jack<br>■ 1 Microphone jack<br>■ 6 Serial ports<br>■ 1 Power button |
| **Rear Panel Input/Output** | ■ 1 D-sub VGA port<br>■ 1 DIO<br>■ 1 HDMI port<br>■ 2 Gigabit LAN jacks<br>■ 3 USB 2.0 ports<br>■ 1 USB 3.0 port<br>■ 1 DC power jack<br>■ 2 Wireless LAN antenna connectors (Optional)<br>■ 1 LVDS (Optional) |
| **Power Supply** | ■ 65 watt switching power adapter<br>■ Input: 100~240Vac, 1.5A, 50~60Hz<br>■ Output: 19Vdc, 3.42A<br>■ No power consumption for COM1~6<br><br>*Important*<br><br>- *Before powering on the system, recheck the adapter to ensure safety* |

| Dimension & Weight | ■ 200mm x 150mm x 55mm<br>■ 1.38Kg |
|---|---|
| Regulatory Compliance | ■ Safety: BSMI<br>■ EMI: FCC Class A, CE, RCM, BSMI, VCCI<br>■ RoHS Compliant |
| Environm-ental | ■ Operating Temperature:<br>  • -10 ~ 45°C (HDD)<br>  • -10 ~ 55°C (SSD or mSATA)<br>■ Storage Temperature: -20°C to 80°C<br>■ Humidity: 10% ~ 90% RH, non-condensing |

# Motherboard Jumper

## Important

*Avoid adjusting jumpers when the system is on; it will damage the motherboard.*
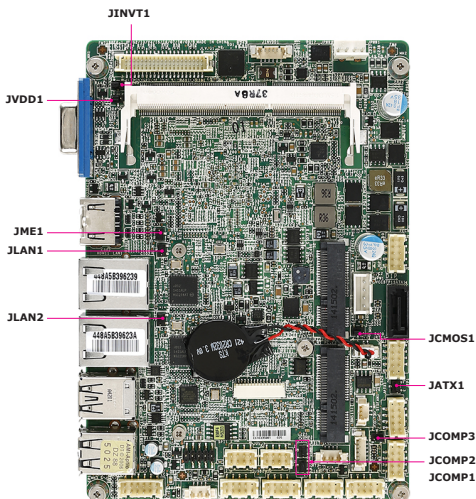
## Clear CMOS Jumper: JCMOS1

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.

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.*

## AT/ATX Select Jumper: JATX1

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

ATX          AT

## Serial Port Power Jumper: JCOMP1~3
This jumper specifies the operation voltage of the COM serial port.

**JCOMP1~2**

1 +5V    1 +12V

**JCOMP3**

1 +5V    1 +12V

## LAN Configure Jumper: JLAN1~2
Use this jumper to specify the operation for LAN.

1 **On**: Enable security and the INVM lock.

1 **Off**: Disable security and the INVM lock. (non-secure mode)

**JLAN1**
*(for LAN1)*
**JLAN2**
*(for LAN2)*

## LVDS Power Jumper: JVDD1

Use this jumper to specify the operation voltage of the LVDS interface flat panel.

1 [□■□□]    1 [□□■□]
3V          5V

## LVDS Inverter Power Jumper: JINV1

Use this jumper to specify the operation voltage of the interver interface flat panel.

1 [□■□□]    1 [□□■□]
5V          12V

## TXE F/W Jumper: JME1

This jumper is used to enable/disable the Intel TXE F/W.

Normal      ME disable

# 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 $40^{\circ}C$ 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. |

# **Removing the 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.
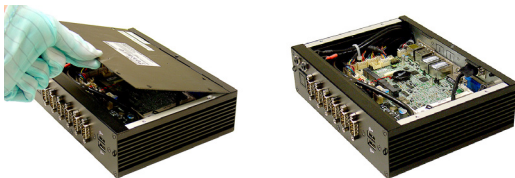
# **Installing Memory**

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.*

# Installing the WLAN Card (Optional)

1. Locate the Mini PCIe slot. Remove the Mini PCIe card screw prein-stalled 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.

# Installing the mSATA Card

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

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

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

# Installing the LVDS Cable (Optional)

1. Remove the screw and LVDS brackets with a pliers.
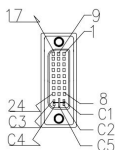


| Pin | Signal | Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|-----|--------|
| 1 | L_BKLT_CTRL# | 13 | LCD_VDD | C1 | +12V |
| 2 | LVDS_BLON | 14 | LCD_VDD | C2 | LVDS_DETECT#_C |
| 3 | LVDSA_DATA0 | 15 | LVDSB_DATA0 | C3 | +12V |
| 4 | LVDSA_DATA#0 | 16 | LVDSB_DATA#0 | C4 | GND |
| 5 | LVDSA_DATA1 | 17 | LVDSB_DATA1 | C5 | GND |
| 6 | LVDSA_DATA#1 | 18 | LVDSB_DATA#1 | | |
| 7 | LVDSA_DATA2 | 19 | LVDSB_DATA2 | | |
| 8 | LVDSA_DATA#2 | 20 | LVDSB_DATA#2 | | |
| 9 | LVDSA_DATA3 | 21 | LVDSB_DATA3 | | |
| 10 | LVDSA_DATA#3 | 22 | LVDSB_DATA#3 | | |
| 11 | LVDSA_CLK | 23 | LVDSB_CLK | | |
| 12 | LVDSA_CLK# | 24 | LVDSB_CLK# | | |

2. Connect the LVDS cable to LVDS connector on the motherboard.



3. Fix the other connector with two hexagonal screws.

# Installing the 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.

# **Wall Mount**

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.

# DIN Rail Mount 1

1. Check the accessory box for the DIN rails.
2. Put the DIN rails on the wall mount brackets with the hooks aligned.



3. Insert screws through the wall mount brackets into the DIN rails and tighten until each DIN rail is secure.

# DIN Rail Mount 2 (Optional)

1.  Check the VESA mount plate for the DIN rail screw holes.



2.  Put the DIN rails on the VESA mount plate with screw holes aligned.
3.  Insert screws through the VESA mount plate into the DIN rails and tighten until each DIN rail is secure.
4.  Mount the VESA mount plate onto the system and tighten the thumbscrew of the VESA mount plate.

# VESA Mount (Optional)

1. Locate the VESA mount screw holes on the intended device.
2. Fasten the VESA mount plate to the device with the supplied screws.
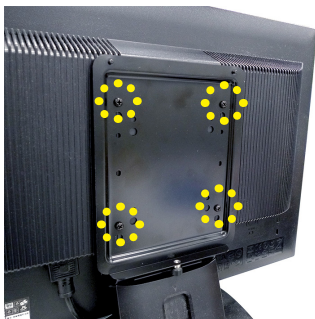


3. Mount the system onto the VESA mount plate.
4. Tighten the thumbscrew at the bottom of the VESA mount plate to secure the system.
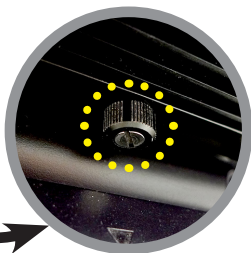
# Chapter 3
# BIOS Setup

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
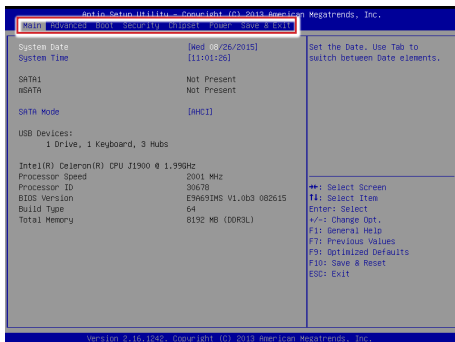


▶ **Main**

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
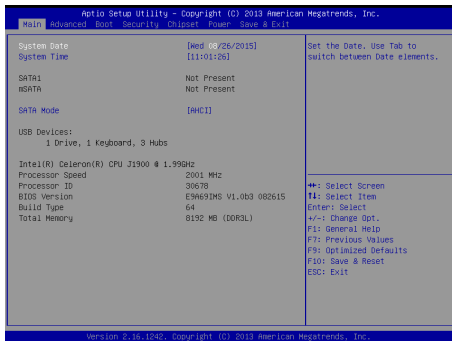


▶ **System Date**

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**

This setting specifies the SATA controller mode.

# Advanced
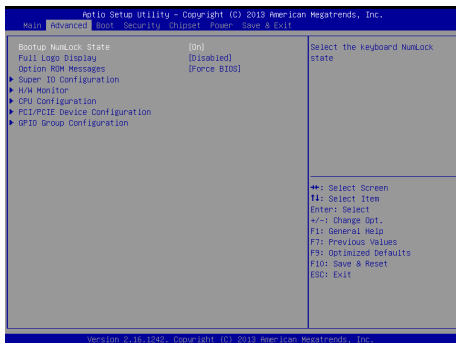


▶ **Bootup NumLock State**

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.

▶ **Full 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.

▶ **Option ROM Messages**

This item is used to determine the display mode when an optional ROM is initialized during POST. When set to [Force BIOS], the display mode used by AMI BIOS is used. Select [Keep Current] if you want to use the display mode of optional ROM.

▶ **Super IO Configuration**



```
        Advanced

 Super IO Configuration

 Serial Port 1                        [Enabled]
  Device Settings                     IO=3F8h; IRQ=4;
  Change Settings                     [Auto]
  Mode Select                         [RS232]
 Serial Port 2                        [Enabled]
  Device Settings                     IO=2F8h; IRQ=3;
  Change Settings                     [Auto]
 Serial Port 3                        [Enabled]
  Device Settings                     IO=3E8h; IRQ=7;
  Change Settings                     [Auto]
 Serial Port 4                        [Enabled]
  Device Settings                     IO=2E8h; IRQ=7;
  Change Settings                     [Auto]
 Serial Port 5                        [Enabled]
  Device Settings                     IO=2F0h; IRQ=7;
  Change Settings                     [Auto]
 Serial Port 6                        [Enabled]
  Device Settings                     IO=2E0h; IRQ=7;
  Change Settings                     [Auto]

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

▶ **Serial Port 1/ 2/ 3/ 4/ 5/ 6**

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 specified serial port.

▶ **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.

▶ **FIFO Mode**

This setting controls the FIFO data transfer mode.

▶ **Shared IRQ Mode**

This setting provides the system with the ability to share interrupts among its serial ports.

> **H/W Monitor**

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



> **Thermal Shutdown**

This setting enables/disables the thermal shutdown function for system thermal protection.

▶ **CPU Configuration**

```
      Advanced

CPU Configuration

Intel(R) Celeron(R) CPU J1900 @ 1.99GHz
Processor ID                          30678
Microcode Patch                       815
Max CPU Speed                         1990 MHz
Processor Cores                       4
Intel HT Technology                   Not Supported
Intel VT-x Technology                 Supported
64-bit                                Supported
L2 Cache                              1024 kB x 2
L3 Cache                              Not Present

Active Processor Cores                [All]
Execute Disable Bit                   [Enabled]
Intel Virtualization Technology       [Enabled]
EIST                                  [Enabled]
```
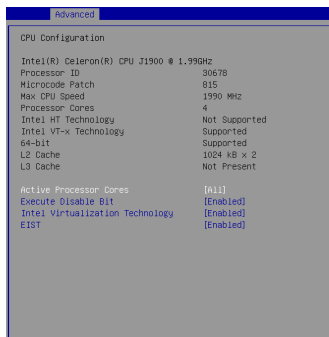
▶ **Active Processor Cores**

This item allows you to select the number of active processor cores.

▶ **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.

▶ **Intel Virtualization Technology**

Virtualization enhanced by Intel Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple "Virtual" systems.

▶ **EIST**

EIST (Enhanced Intel SpeedStep Technology) allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production.

When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

▶ **PCI/PCIE Device Configuration**

```
        Advanced

PCI Latency Timer              [32 PCI Bus Clocks]
OS Selection                   [Windows 7]
XHCI Mode                      [Disabled]
USB 2.0(EHCI) Support          [Enabled]
Legacy USB Support             [Enabled]
Audio Controller               [Enabled]
Launch OnBoard Lan OpRom       [Disabled]
Launch OnBoard Lan OpRom       [Disabled]
```
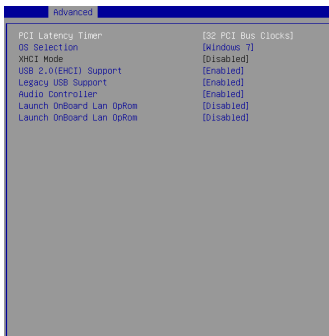
▶ **PCI Latency Timer**

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

▶ **OS Selection**

Allows you to select the OS version.

[Windows 8]        For Windows 8.X
[Windows 7]        For Windows 7

▶ **XHCI Mode**

This setting disables/enables the USB XHCI controller. The eXtensible Host Controller Interface (XHCI) is a computer interface specification that defines a register-level description of a Host Controller for Universal Serial bus (USB), which is capable of interfacing to USB 1.0, 2.0, and 3.0 compatible devices. The specification is also referred to as the USB 3.0 Host Controller specification.

▶ **USB 2.0 (EHCI) Support**

This setting disables/enables the USB EHCI controller. The Enhanced Host Controller Interface (EHCI) specification describes the register-level interface for a Host Controller for the Universal Serial Bus (USB) Revision 2.0.

▶ **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.
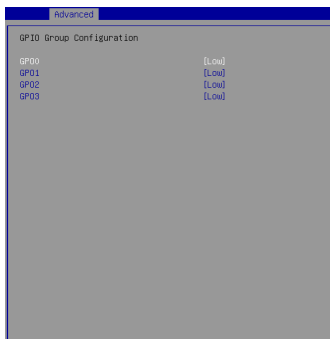
▶ **Audio Controller**

This setting enables/disables the onboard audio controller.

▶ **Launch OnBoard LAN OpROM**

These settings enable/disable the initialization of the onboard/onchip LAN Boot ROM during bootup. Selecting [Disabled] will speed up the boot process.

▶ **GPIO Group Configuration**



▶ **GPO0 ~ GPO3**

These settings control the operation mode of the specified GPIO.

# Boot
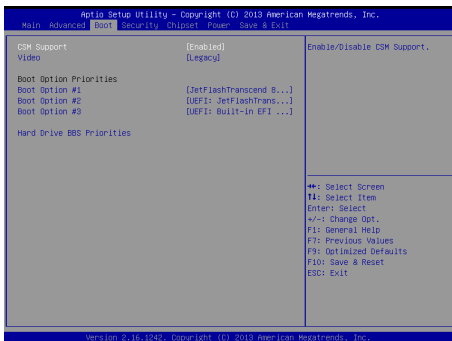


▶ **CSM Support**

This setting enables/disables the support for Compatibility Support Module, a part of the Intel Platform Innovation Framework for EFI providing the capability to support legacy BIOS interfaces.

## Important

*If the Operating System is going to boot in UEFI mode, disable **CSM Support** to speed up the boot process.*

▶ **Video**

Allows you to select the OS mode.

[EFI Mode OS]          For UEFI mode.

[Legacy Mode OS]       For Legacy mode.

▶ **Boot Option Priorities**

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>, <PageDown> key to move it up/down in the priority list.

# Security
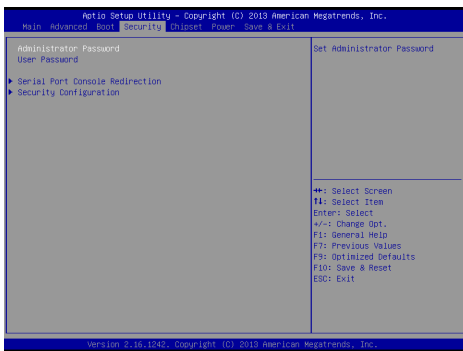


▸ **Administrator Password**

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**
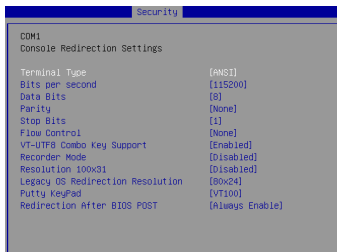
▸ **Terminal Type**

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 the VT-UTF8 combination key support for ANSI/VT100 terminals.

▸ **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**

PuTTY is a terminal emulator for Windows. This setting controls the numeric keypad for use in PuTTY.

▸ **Redirection After BIOS POST**

This setting determines whether or not to keep terminals?console redirection running after the BIOS POST has booted.

▶ **Security Configuration**
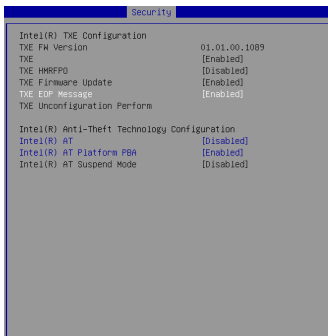


▶ **Intel(R) TXE Configuration**

Intel Trusted Execution Technology provides highly scalable platform security in physical and virtual infrastructures.

▶ **Intel(R) Anti-Theft Technology Configuration**

Intel Anti-Theft Technology is hardware-based technology that can lock a lost or stolen system so that personal confidential information is protected and inaccessible by unauthorized users.

# Chipset

```
              Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
       Main  Advanced  Boot  Security  Chipset  Power  Save & Exit

 DVMT Pre-Allocated                    [64M]              Select DVMT 5.0 Pre-Allocated
 DVMT Total Gfx Mem                    [256MB]            (Fixed) Graphics Memory size
 LCD Panel Type                        [ 800x  600 & 18bit]  used by the Internal Graphics
 LCD Backlight Level                   [Level 6]          Device.




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



              Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

▸ **DVMT Pre-Allocated**

This setting defines the DVMT pre-allocated memory. Pre-allocated memory is the small amount of system memory made available at boot time by the system BIOS for video. Pre-allocated memory is also known as locked memory. This is because it is "locked" for video use only and as such, is invisible and unable to be used by the operating system.

▸ **DVMT Total Gfx Mem**

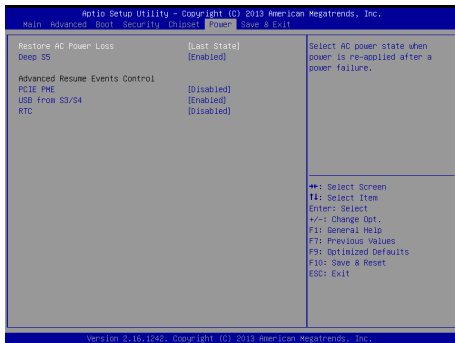This setting specifies the memory size for DVMT.

▸ **LCD Panel Type**

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

▸ **LCD Backlight Level**

This setting allows you to set the LCD backlight level.

# 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 computer in the power off state. |
| [Power On] | Leaves the computer 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 computer can "wake" on input from the keyboard, clock, modem, LAN, or USB device.

**\*\* Advanced Resume Events Control \*\***

‣ **PCIE PME**

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

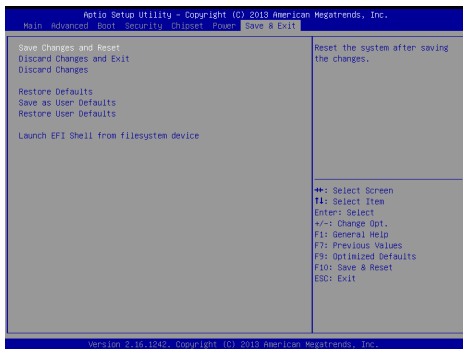‣ **USB from S3/S4**

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

‣ **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 Reset**

Save changes to CMOS and reset the system.

▶ **Discard Changes and Exit**

Abandon all changes and exit the Setup Utility.

▶ **Discard Changes**

Abandon all changes.

▶ **Restore Defaults**

Use this menu to load the default values set by the motherboard manufacturer specifically for optimal performance of the motherboard.

▶ **Save as User Defaults**

Save changes as the user's default profile.

▶ **Restore User Defaults**

Restore the user's default profile.

▶ **Launch EFI Shell from filesystem device**

This setting helps to launch the EFI Shell application from one of the available file system devices.

# 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
```
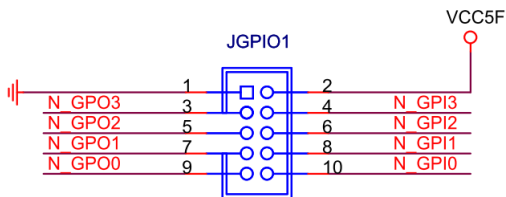
# GPIO Sample Code



● GPI 0 ~ GPI 3

|  | GPI 0 | GPI 1 | GPI 2 | GPI 3 |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
| IO Address |  |  |  |  |  |  |  |  |
| SIO GPIO Register | 82h | 82h | 82h | 82h |  |  |  |  |
| Bit | 0 | 1 | 2 | 3 |  |  |  |  |
| Sample code | #1 |  |  |  |  |  |  |  |

● GPO 0 ~ GPO 3

|  | GPO 0 | GPO 1 | GPO 2 | GPO 3 |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
| IO Address |  |  |  |  |  |  |  |  |
| SIO GPIO Register | 81h | 81h | 81h | 81h |  |  |  |  |
| Bit | 4 | 5 | 6 | 7 |  |  |  |  |
| Sample code | #2 |  |  |  |  |  |  |  |

```
SIO_INDEX_Port      equ     04Eh
SIO_DATA_Port       equ     04Fh
SIO_UnLock_Value    equ     087h
SIO_Lock_Value      equ     0AAh
SIO_LDN_GPIO        equ     06h
GPI_REG             equ     082h
GPO_REG             equ     081h
GPI_ADD             equ     000h
GPO_ADD             equ     000h
GPO_0               equ     00010000b
```

## Sample Code:

#1 : Get GPI 0 status

```
; 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
    ; Switch GPIO Configuration for SIO LDN 0x06
        mov     dx, SIO_INDEX_Port
        mov     al, 07h
        out     dx, al
        mov     dx, SIO_DATA_Port
        mov     al, SIO_LDN_GPIO
        out     dx, al
    ; Get GPI 0 Pin Status Register
        mov     dx, SIO_INDEX_Port
        mov     al, GPI_REG
        out     dx, al
        mov     dx, SIO_DATA_Port
        in      al, dx
        ;al bit0 = GPI 0 status
    ; Exit SIO
        mov     dx, SIO_INDEX_Port
        mov     al, SIO_Lock_Value
        out     dx, al


#2 : Set GPO 0 status to high
    ; 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
    ; Switch GPIO Configuration for SIO LDN 0x06
        mov     dx, SIO_INDEX_Port
        mov     al, 07h
        out     dx, al
        mov     dx, SIO_DATA_Port
        mov     al, SIO_LDN_GPIO
        out     dx, al
    ; Set GPO 0 Pin to High
        mov     dx, SIO_INDEX_Port
        mov     al, GPO_REG
        out     dx, al
        mov     dx, SIO_DATA_Port
        in      al, dx
        or      al, GPO_0
        out     dx, al
        ;al bit4 = GPO 0 status
    ; Exit SIO
        mov     dx, SIO_INDEX_Port
        mov     al, SIO_Lock_Value
        out     dx, al
```