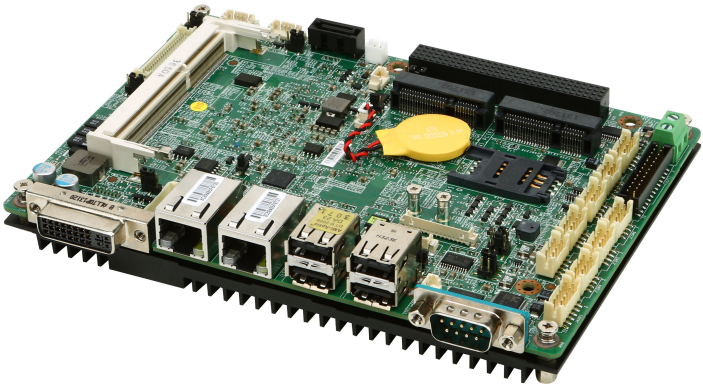
MS-98D1

(v1.x) Industrial Computer Board



Copyright Notice

Trademarks

Revision History

Revision	Date
V1.1	2014/06

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, or contact our technical staff via ***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 OPENINGS.
- Make sure the voltage of the power source and adjust properly 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°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-A 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

1 Overview

Thank you for choosing the MS-98D1, an excellent industrial computer board.

Based on the innovative Intel® NM10 chipset for optimal system efficiency, the MS-98D1 accommodates the Intel® Cedarview-M/ Cedarview-D processor and supports 1 DDR3 800/1066 SO-DIMM slot to provide the maximum of 2GB/ 4GB memory capacity.

The MS-98D1 is durable under extreme environments and suitable to be applied in every industrial field, such as digital signage, kiosk, gaming, industrial control automation and POS.

Mainboard Specifications

Processor

- Intel® Atom D2550/ 1.86GHz, N2800/1.86GHz, N2600/1.6GHz

Chipset

- Intel® NM10 chipset

Memory

- 1 DDR3 800/ 1066MHz Unbuffered, non-ECC SO-DIMM slot, supporting the maximum of 4GB (N2600 only supports DDR3 800 MHz with the maximum of 2GB)

LAN

- LAN1: Intel® I210-AT GbE LAN
- LAN1: Intel® I210-AT GbE LAN

Audio

- Realtek ALC887 audio codec
- Compliant with Azalia 1.0 specs

Storage

- 1 SATA 3Gb/s port (SATA1)
- 1 mSATA function included with Mini-PCIe slot

Graphics

- Graphics integrated in Intel processor

Rear Panel I/O

- 1 DVI-I port
- 2 Gigabit LAN jacks
- 4 USB 2.0 ports
- 1 RS-232/422/485 serial port

Onboard Pinheaders/ Connectors/ Jumpers

- 1 Dual USB 2.0 wafer connector
- 5 Serial port connectors
- 1 Parallel port connector
- 1 Front panel connector
- 1 PS/2 keyboard/ mouse combo connector
- 2 LVDS connectors
- 2 LVDS power jumpers
- 1 GPIO connector
- 1 Audio connector
- 1 Amplifier connector
- 1 System fan connector
- 1 SATA power connector
- 1 Clear CMOS jumper
- 2 Serial port power jumpers
- 1 AT/ATX select jumper
- 1 PCI-104 power jumper
- 2 Inverter connectors
- 2 Inverter power jumpers
- 1 SIM Card Holder
- 2 NVM LAN jumpers

Slot

- 2 Mini-PCIe slot (including 1 x mSATA function)
- 1 PCI-104 slot

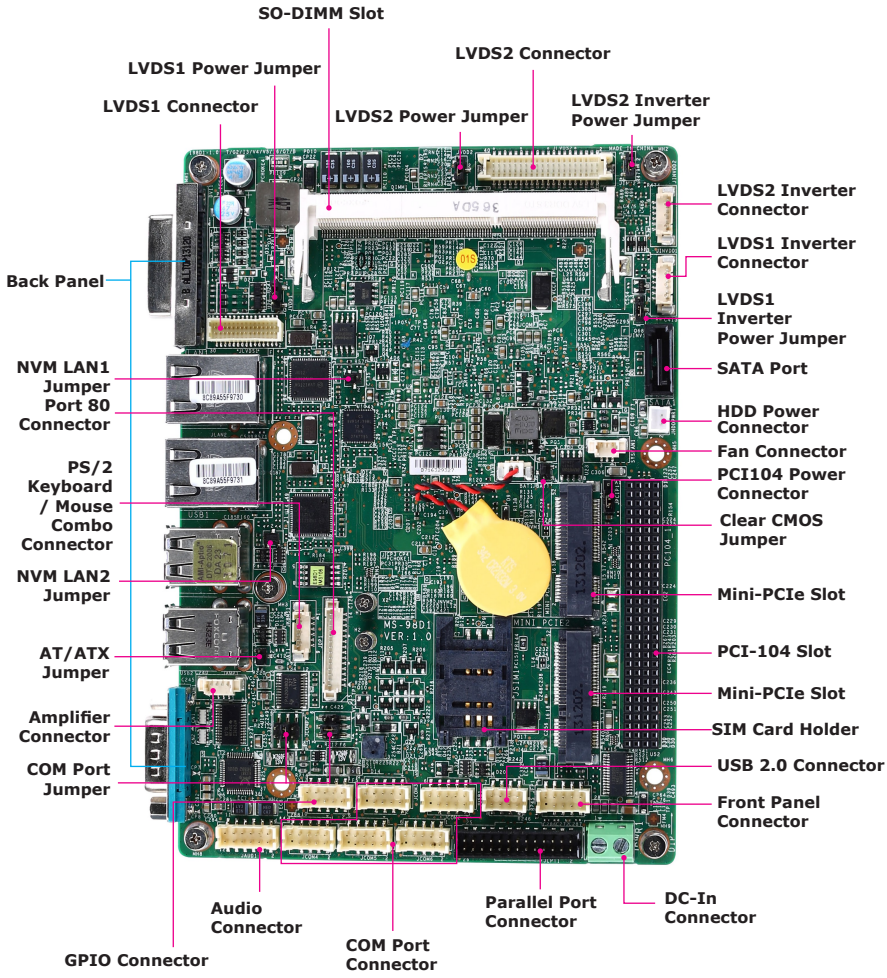
Form Factor

- 165mm x 115mm (EPIC-size)

Environmental

- Operating Temperature: 0ºC ~ 60ºC
- Storage Temperature: -20ºC ~ 80ºC
- Humidity: 10% ~ 90% RH, Non-Condensing
- Power input DC 9~36V

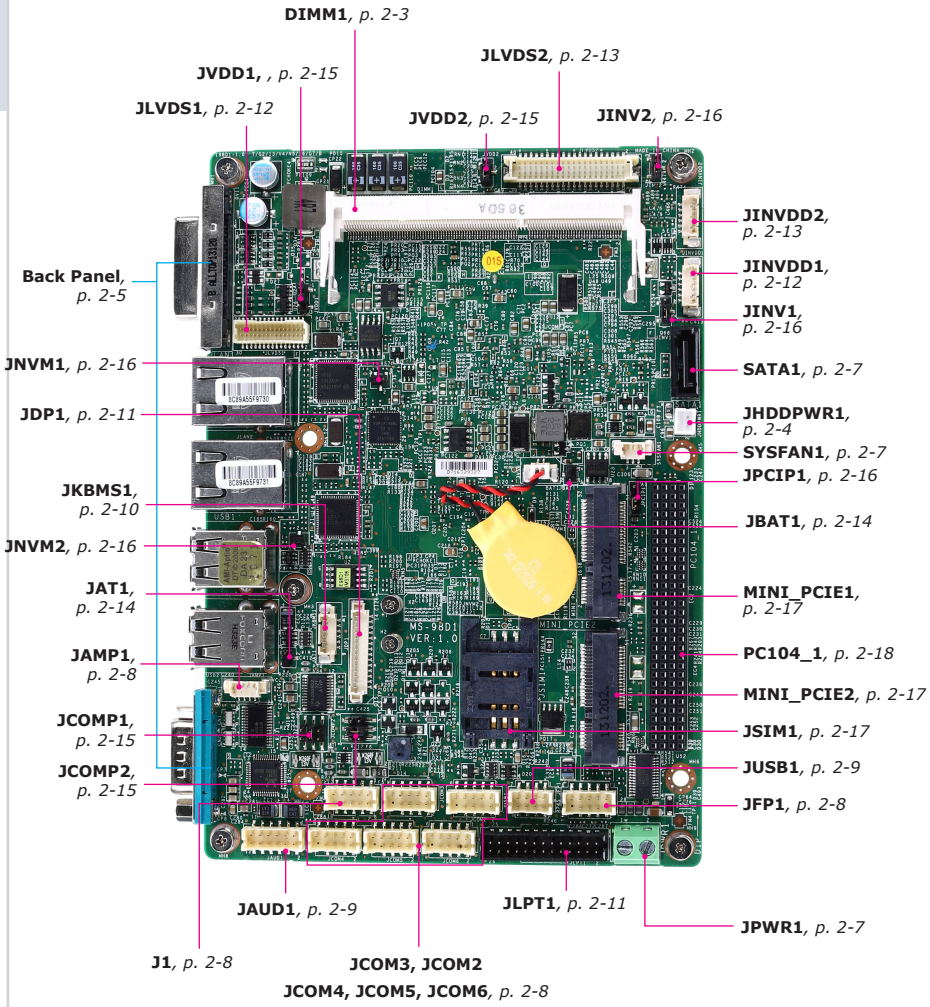
Mainboard Layout



2 Hardware Setup

This chapter provides you with the information about 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 computer components. Static electricity may damage the components.

Quick Component Guide



Memory

These DIMM slots are intended for memory modules.

Installing Memory Modules

1. Locate the SO-DIMM slot. Align the notch on the DIMM with the key on the slot and insert the DIMM into the slot.
2. Push the DIMM gently downwards until the slot levers click and lock the DIMM in place.
3. To uninstall the DIMM, flip the slot levers outwards and the DIMM will be released instantly

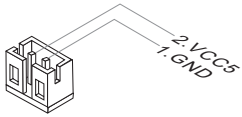
Important

You can barely see the golden finger if the DIMM is properly inserted in the DIMM slot.

Power Supply

HDD Power Connector: JHDDPWR1

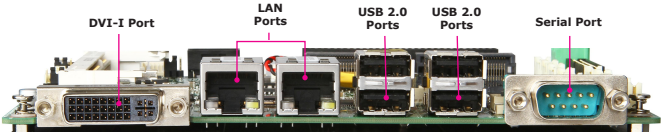
This connector is used to provide power for hard disk drives.



Important

Make sure that all power connectors are connected to the power supply to ensure stable operation of the motherboard.

Rear Panel I/O



➤ DVI-I Port

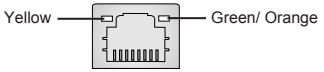
The DVI-I (Digital Visual Interface-Integrated) connector allows you to connect an LCD monitor. It provides a high-speed digital interconnection between the computer and its display device. To connect an LCD monitor, simply plug your monitor cable into the DVI connector, and make sure that the other end of the cable is properly connected to your monitor (refer to your monitor manual for more information.)The DVI-I (Digital Visual Interface-Integrated) connector allows you to connect an LCD monitor. It provides a high-speed digital interconnection between the computer and its display device. To connect an LCD monitor, simply plug your monitor cable into the DVI connector, and make sure that the other end of the cable is properly connected to your monitor (refer to your monitor manual for more information.)

➤ USB 2.0 Port

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

➤ 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.



LED	Color	LED State	Condition
Left	Yellow	Off	LAN link is not established.
		On (steady state)	LAN link is established.
		On (blinking)	The computer is communicating with another computer on the LAN.
Right	Green	Off	10 Mbit/sec data rate is selected.
		On	100 Mbit/sec data rate is selected.
	Orange	On	1000 Mbit/sec data rate is selected.

➤ RS-232/422/485 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.

RS-232

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	VCC_COM1	Voltage select setting by jumper

RS-422

PIN	SIGNAL	DESCRIPTION
1	422 TXD-	Transmit Data, Negative
2	422 RXD+	Receive Data, Positive
3	422 TXD+	Transmit Data, Positive
4	422 RXD-	Receive Data, Negative
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

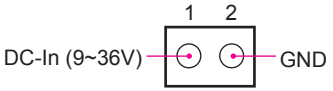
RS-485

PIN	SIGNAL	DESCRIPTION
1	485 TXD-	Transmit Data, Negative
2	NC	No Connection
3	485 TXD+	Transmit Data, Positive
4	NC	No Connection
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

Connector

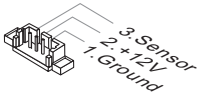
DC Power Connector: JPWR1

Thi s connector i s used to provi de power to the motherboard.



Fan Power Connector: SYSFAN1

The fan power connectors support system cooling fan with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND. If the motherboard has a System Hardware Monitor chipset onboard, you must use a specially designed fan with speed sensor to take advantage of the system fan control.

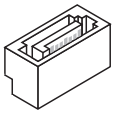


Important

- *Please refer to the recommended CPU fans at processor's official website or consult the vendors for proper CPU cooling fan.*
- *Fan cooler sets with 3- or 4-pin power connector are both available.*

Serial ATA Connector: SATA1

This connector is a high-speed Serial ATA interface port. Each connector can connect to one Serial ATA device.

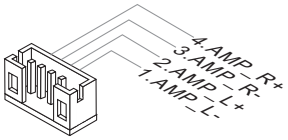


Important

Please do not fold the SATA cable into a 90-degree angle. Otherwise, data loss may occur during transmission.

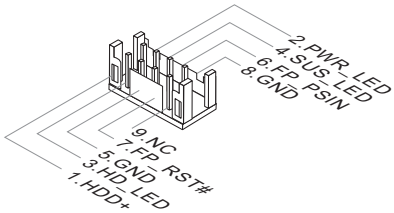
Audio Amplifier Connector: JAMP1

The JAMP1 is used to connect audio amplifiers to enhance audio performance.



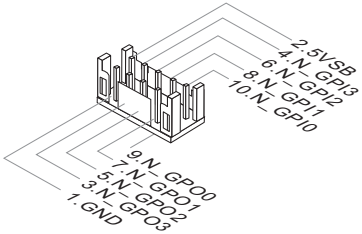
Front Panel Connector: JFP1

This front panel connector is provided for electrical connection to the front panel switches & LEDs and is compliant with Intel Front Panel I/O Connectivity Design Guide.



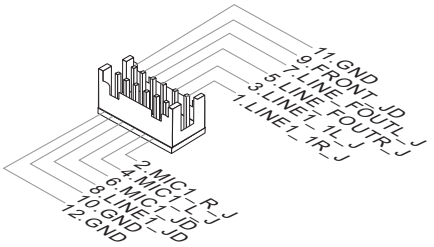
GPIO Connector: J1

This connector is provided for the General-Purpose Input/Output (GPIO) peripheral module.



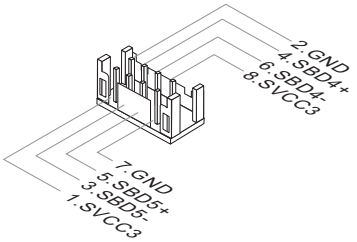
Audio Connector: JAUD1

This connector allows you to connect the additional audio panel.



Front USB 2.0 Connector: JUSB1

The USB connector is ideal for connecting high-speed USB interface peripherals such as USB HDD, digital cameras, MP3 players, printers, modems and the like.

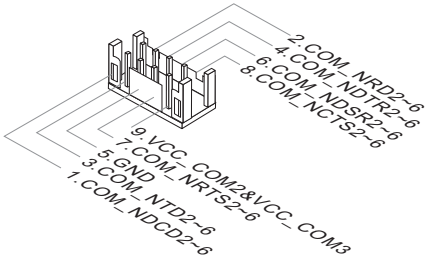


Important

Note that the pins of VCC and GND must be connected correctly to avoid possible damage.

Serial Port Connector: COM2~6

This connector is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach serial devices to it through the optional serial port bracket.

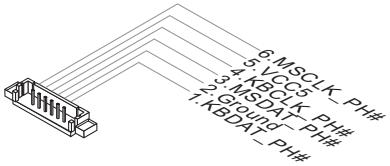


RS-232

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carrier Detect
2	RD	Receive Data
3	TD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	VCC_COM	Voltage select setting by jumper

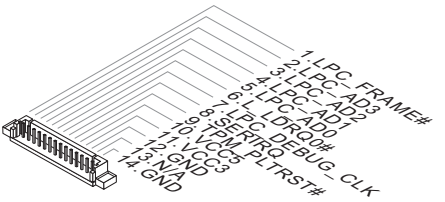
PS/2 Keyboard / Mouse Combo Connector: JKBMS1

The PS/2® mouse/ keyboard connector is for a PS/2® mouse/keyboard.



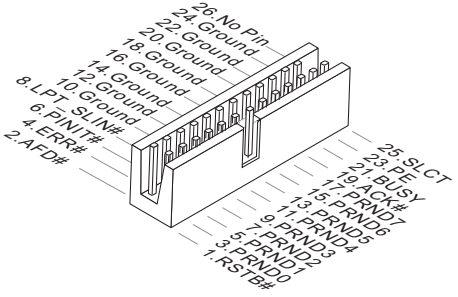
Port 80 Connector: JDP1

This pinheader is intended for Transport Control Protocol (TCP) port 80.



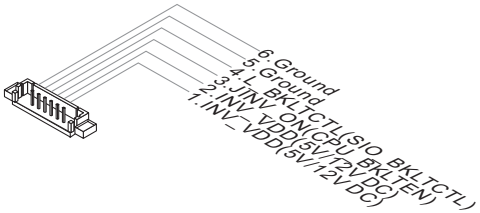
Parallel Port Connector: JLPT1

The mainboard provides a 26-pin header for connection to an optional parallel port bracket. The parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.



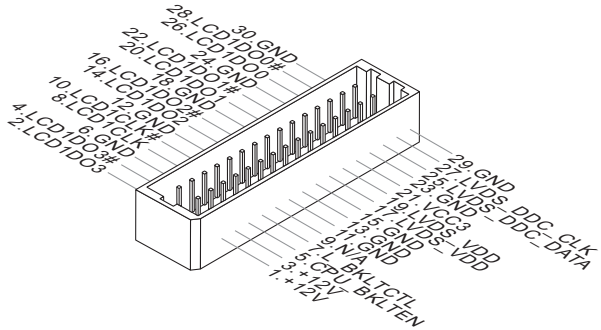
LVDS Inverter Connector: JINVDD1

The connector is provided for LCD backlight options.



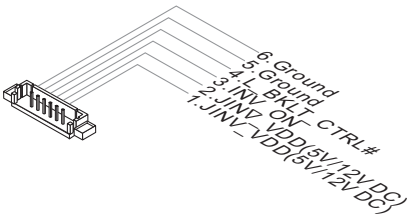
LVDS Connector: JLVDS1

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.



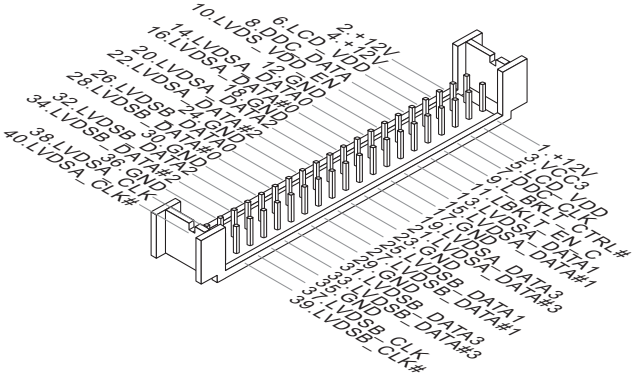
LVDS Inverter Connector: JINVDD2

The connector is provided for LCD backlight options.



LVDS Connector: JLVDS2

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.



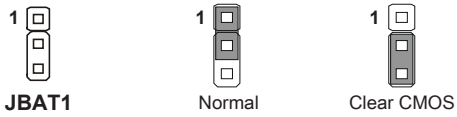
Jumper

Important

Avoid adjusting jumpers when the system is on; it will damage the motherboard.

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.

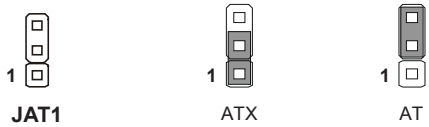


Important

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: JAT1

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



Serial Port Power Jumper: JCOMP1/ JCOMP2

These jumpers specify the operation voltage of the serial ports.

JCOMP1
(for COM1)

+5V

0V

+12V

JCOMP2
(for JCOM2~6)

+5V

0V

+12V

LVDS Power Jumper: JVDD1/ JVDD2

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

JVDD1
(for JLVDS1)

3V

5V

JVDD2
(for JLVDS2)

3V

5V

LVDS Inverter Power Jumper: JINV1/ JINV2

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

JINV1
(for JINVDD1)
JINV2
(for JINVDD2)

5V

12V

PCI-104 Power Jumper: JPCIP1

Use this jumper to specify the operation voltage of the PC/104 slot.

JPCIP1

3V

5V

NVM LAN Jumper: JNVM1/ JNVM2

Use this jumper to specify the operation for LAN.

On: Enable security and the INVM lock.

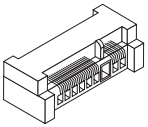
JNVM1
(for LAN1)
JNVM2
(for LAN2)

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

Slot

Mini-PCIe (Peripheral Component Interconnect Express) Slot

The Mini-PCIe slot is provided for wireless LAN card, TV tuner card, Robson NAND Flash card and mSATA devices.



- MINI_PCIE1 supports mSATA function.
- MINI_PCIE2 supports 3G module wireless LAN card, TV tuner card, Robson NAND Flash card

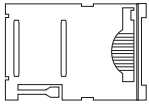
Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

SIM Card Holder

The holder is provided for SIM card.

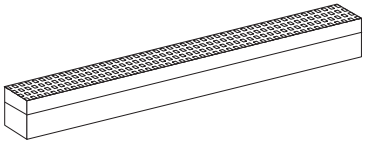
SIM card



Holder

PCI-104 Slot

The PCI-104 computer bus utilizes 104 pins. These pins include all the normal lines used in the PCI bus, with additional ground pins added to ensure bus integrity. Signal timing and voltage levels are identical to the PCI bus, with lower current requirements. The PCI-104 form factor allows modules to stack together like building blocks.



3 BIOS Setup

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

Users may need to run the Setup program when:

- An error message appears on the screen at system startup and requests users to run SETUP.
- Users want to change the default settings for customized features.

Important

Please note that BIOS update assumes technician-level experience.

Entering Setup

Power on the computer 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.

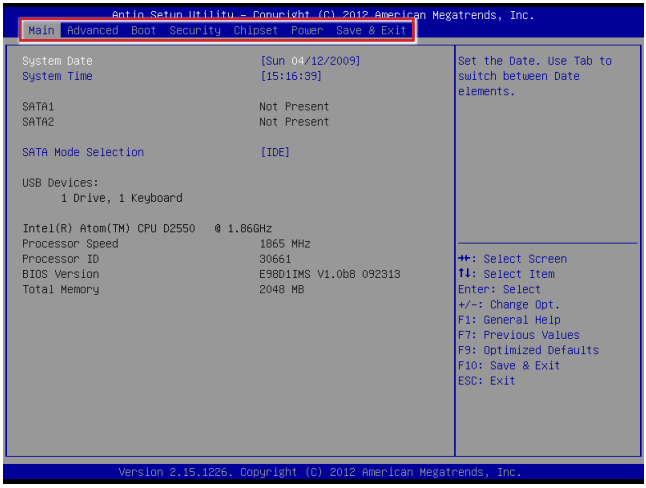
Sub-Menu

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.

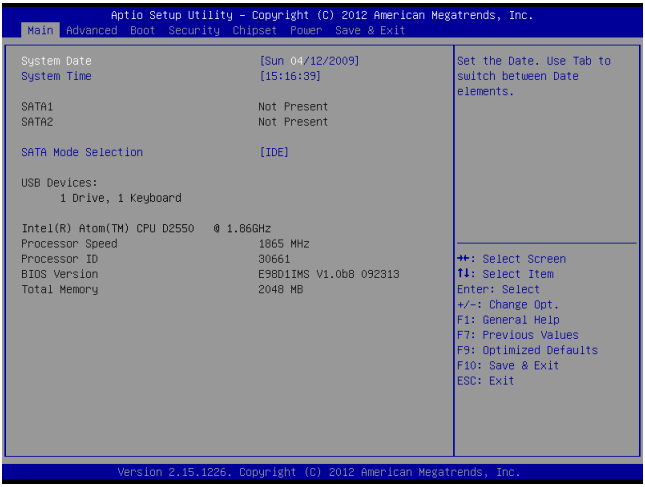
▸ **Power**

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>.

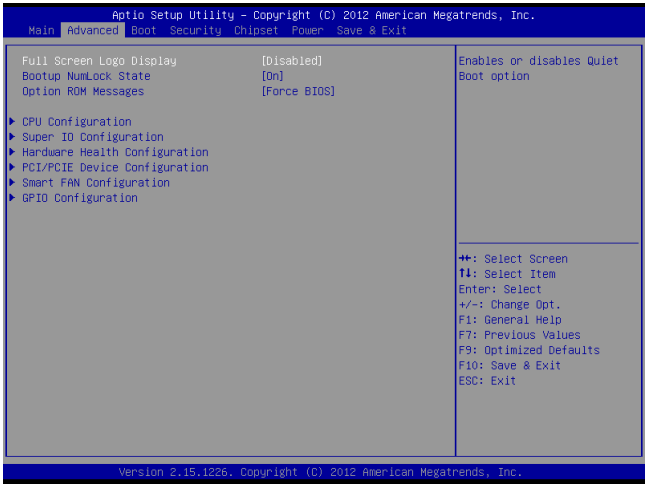
▸System Time

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.

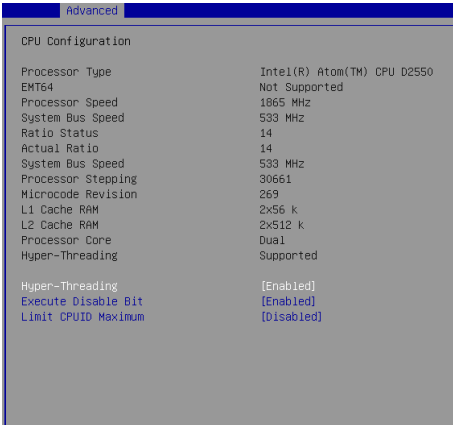
▸Bootup NumLock State

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.

▸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.

▸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.

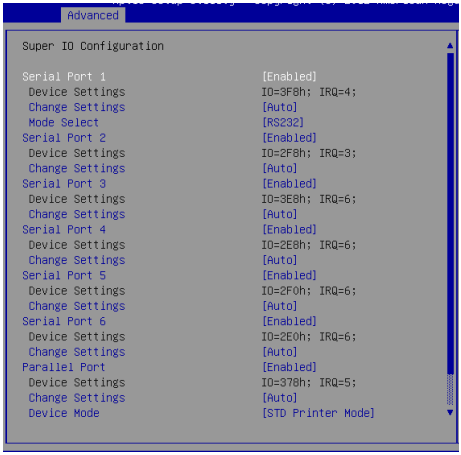
▸Execute Disable Bit

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

The Max CPUID Value Limit BIOS 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



▸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 serial port 1.

▸Parallel Port

This setting enables/disables the parallel port.

▸Change Settings

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

▸Device Mode

Select an operation mode for the parallel port.

▸FIFO Mode

This setting controls the FIFO data transfer mode.

▸Shared IRQ Mode

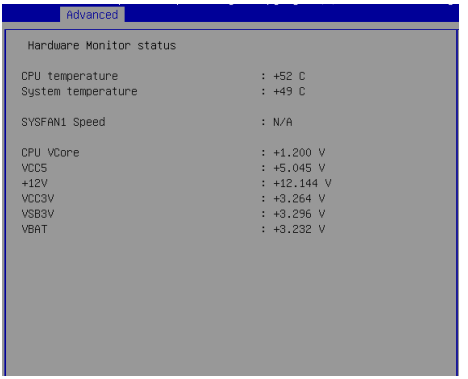
This setting provides the system with the ability to share interrupts among its serial ports.

▸ Watch Dog Timer

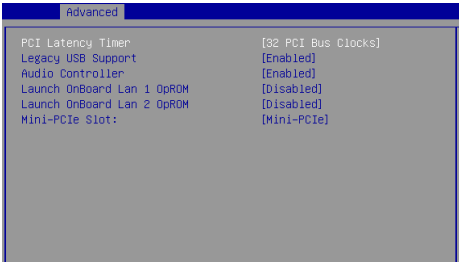
You can enable the system watch-dog timer, a hardware timer that generates a reset when the software that it monitors does not respond as expected each time the watch dog polls it.

▸Hardware Health Configuration

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



▸PCI/PCIE Device Configuration



▸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.

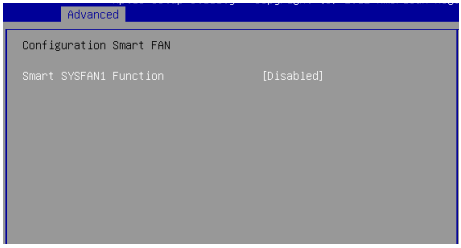
▸Launch OnBoard Lan 1/ 2 OpROM

These settings enable/disable the initialization of the onboard LAN1/ 2 Boot ROM during bootup. Selecting [Disabled] will speed up the boot process.

▸Mini-PCIe Slot:

Select the operation function for Mini-PCIE1 slot.

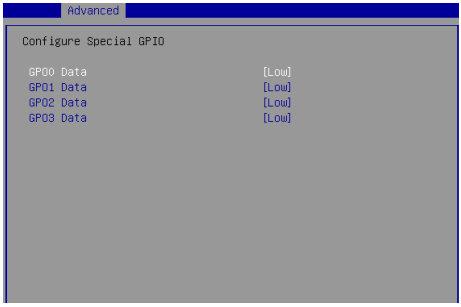
▸Smart Fan Configuration



▸Smart SYSFAN1 Function

These settings enable/disable the Smart Fan function. Smart Fan is an excellent feature which will adjust the CPU/system fan speed automatically depending on the current CPU/system temperature, avoiding the overheating to damage your system.

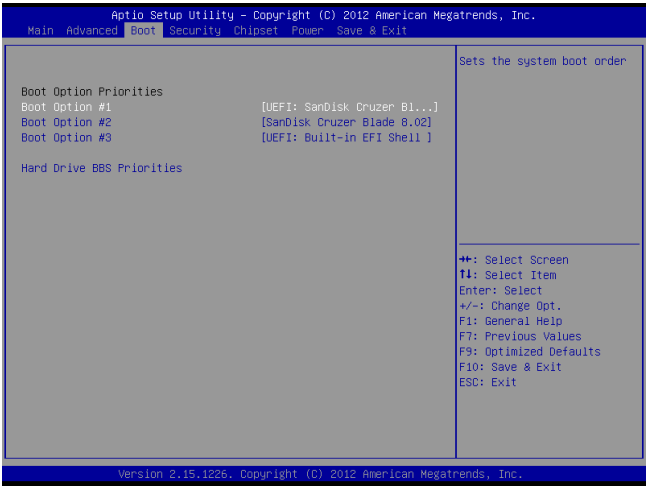
▸GPIO Configuration



▸GPO0 ~ GPO3 Data

These settings control the operation mode of the specified GPIO.

Boot



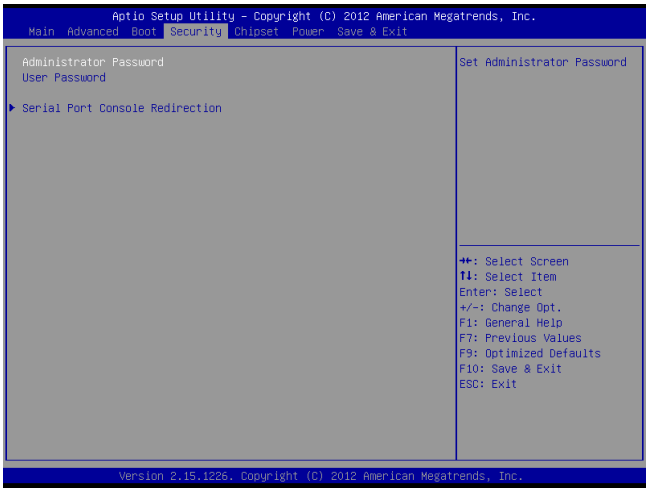
▸Boot Option Priorities

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



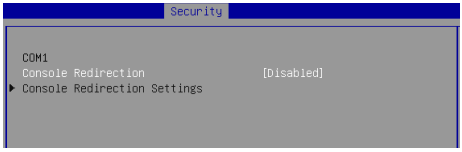
▸Administrator Password

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.

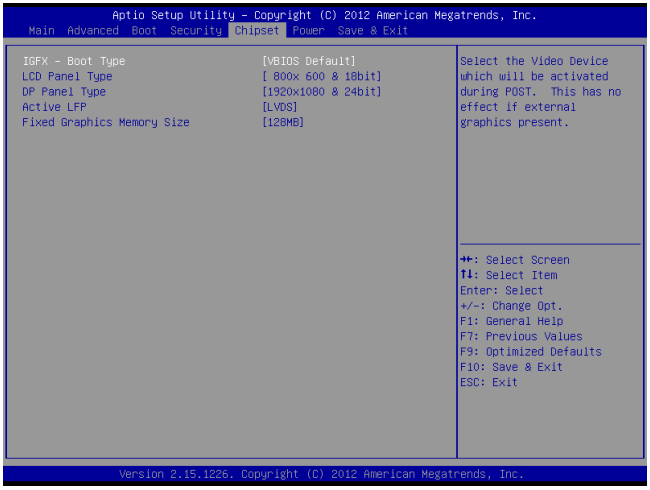
▸ **Legacy OS Redirection Resolution**

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.

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 (LVDS1)

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

▸DP Panel Type (LVDS2)

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

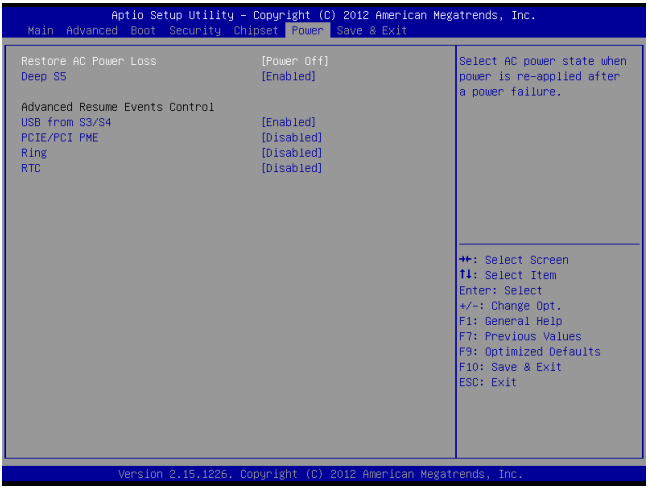
▸Active LFP

This item is used for turning on/off LVDS support. (LVDS or No LVDS)

▸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 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 ****

▸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.

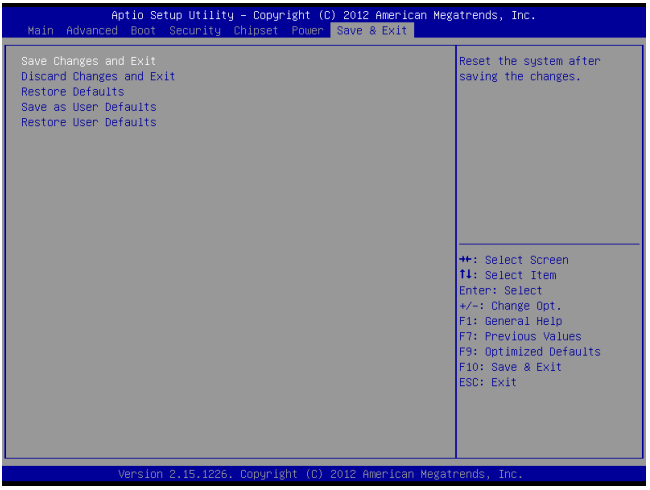
▸Ring

An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off 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 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 changes as the user's default profile.

▸**Restore User Defaults**

Restore the user's default profile.

A 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	2	3	4	5				
Sample code	#1							

- GPO 0 ~ GPO 3

	GPO 0	GPO 1	GPO 2	GPO 3				
IO Address								
SIO GPIO Register	F1h	F1h	F1h	F1h				
Bit	4	1	2	3				
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
GPO_REG                 equ     0F1h
GPO_0                   equ     00010000b
```

Sample Code:

#1 : Get GPI 0 status

```
; Get GPI 0/1/2/3 Pin Status Register
  mov     dx, 50Ch
  in      eax, dx
  ;eax bit2 = GPI 0 status
  ;eax bit3 = GPI 1 status
  ;eax bit4 = GPI 2 status
  ;eax bit5 = GPI 3 status
```

#2 : Set GPO 0 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 Register
    mov     dx, SIO_INDEX_Port
    mov     al, GPO_REG
    out     dx, al
    mov     dx, SIO_DATA_Port
    in      al, dx
    and     al, not GPO_0          ;clear al bit4 (GPO 0)
    or      al, GPO_0              ;set GPO 0
    out     dx, al

; Exit SIO
    mov    dx, SIO_INDEX_Port
    mov    al, SIO_Lock_Value
    out    dx, al
```