NEXCOM International Co., Ltd.

IoT Automation Solutions Business Group
Fan-less Computer
NISE 505
User Manual

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PREFACE

Copyright

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Acknowledgements

NISE 505 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class A digital device, pursuant to Part 15 of 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 instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2013 will be RoHS compliant. They will use the usual NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.

- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.

- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.

- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."

- Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

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System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.

- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.

- Replace with 3rd party products if needed.

- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.

- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver

- A flat-tipped screwdriver

- A grounding strap

- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.

- Do not place the unit on an unstable surface, cart, or stand.

- Follow all warnings and cautions in this manual.

- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.

- Avoid using the system near water, in direct sunlight, or near a heating device.

- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.

- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

- This product is intended to be supplied by an approved power adapter, rated 12Vdc, 5A or 24Vdc, 2.5A minimum and Tma 55 degree Celsius. If further assistance is needed, please contact NEXCOM for further information.

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

CAUTION! ATTENTION
IL Y A RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE PAR UNE BATTERIE DE TYPE INCORRECT.
METTRE AU REBUT LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS.

Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.

7. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

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

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. This equipment is not suitable for use in locations where children are likely to be present.

14. Ensure to connect the power cord to a socket-outlet with earthing connection.

15. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

16. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.

17. Do not place heavy objects on the equipment.

18. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

19. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   – Product name and serial number
   – Detailed information of the peripheral devices
   – Detailed information of the installed software (operating system, version, application software, etc.)
   – A complete description of the problem
   – The exact wordings of the error messages

Warning!
1. Handling the unit: carry the unit with both hands and handle it with care.

2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

Conventions Used in this Manual

Warning:
Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.

Caution:
Information to avoid damaging components or losing data.

Note:
Provides additional information to complete a task easily.

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Package Contents

Before continuing, verify that the package that you received is complete.
Your NISE 505 package should have all the items listed in the following table.

Item	Part Number	Description	Qty
1	19J00050502X0	NISE 505 ASSY	1
2	6012200052X00	PE Zipper Bag	1
3	60177A0726X00	NISE 505 Quick Reference Guide VER:A	1
4	602DCD1616X00	NISE 505 DVD Driver VER:1.0	1
5	6012200053X00	PE Zipper Bag	1
6	5060900226X00	Mini PCIe Bracket	1
7	50311F0295X00	Flat Head Screw Long Fei:F2x4 Nylok NIGP	2
8	50311F0330X00	Round Head Screw Long Fei:P2x3 ISO+Nylon	4

Ordering Information

The following information below provides ordering information for NISE 505.

NISE 505 (P/N: 10J00050502X0)
- Intel® Celeron® processor J1900 quad core fanless system

- **60W 12V/5A AC/DC power adapter w/o power cord
(P/N: 7400060042X00)**

CHAPTER 1: PRODUCT INTRODUCTION

Overview

Key Features

- Onboard Intel® Celeron® processor J1900 quad core, 2.42GHz

- 1 x HDMI display

- 3 x Intel® I210-IT GbE LAN ports; support WoL, teaming and PXE

- 2 x USB 2.0

- 1 x mini-PCIe socket for optional Wi-Fi/BT modules

- 1 x mini-PCIe socket for optional mSATA storage

- 1 x RJ45 COM serial port for RS232 signal

- Support -5~55 degree C operating temperature

- Support 12V DC input

Hardware Specifications

CPU Support

- Onboard Intel® Celeron® processor J1900 quad core, 2.42GHz

Main Memory

- DDR3L SO-DIMM slot *1
  - Support 1600 RAM
  - Un-buffered and non-ECC
  - Support up to a maximum of 4GB (optional)

Display Option

- 1 x HDMI display

I/O Interface - Front

- ATX power on/off switch
- 1 x Storage/2 x GPO programmable LEDs
- 3 x Intel® I210-IT GbE LAN ports; support WoL, teaming and PXE
- 1 x HDMI display output
- 2 x USB 2.0 (500mA per each)
- 2 x Antenna holes for optional Wi-Fi antenna
- 1 x RJ45 COM serial port for RS232 signal

I/O Interface - Rear

- Support 12V DC input

I/O Interface - Internal

- 4 x GPI and 4 x GPO (programmable to GPI or GPO)

Storage Device

- Optional mSATA module

Expansion Slot

- 1 x Mini-PCIe socket for optional Wi-Fi/BT modules

Power Requirements

- Power input: 12V DC +/-20%
- 1 x Optional 12V, 60W power adapter

Support OS

- Windows 7 64-bit
- Windows 10 64-bit

Dimensions

- 162mm (W) x 26mm (H) x 150mm (D) without wall-mount bracket

Construction

- Metal chassis with fanless design

Environment

- Operating temperature:
  Ambient with air flow: -5°C to 55°C
  (according to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)
- Storage temperature: -20°C to 75°C
- Relative humidity: 10% to 95% (non-condensing)
- Shock protection:
  - mSATA: 50G, half sine, 11ms, IEC60068-2-27

- Vibration protection w/mSATA condition:
  - Random: 2Grms @ 5~500 Hz, IEC60068-2-64
  - Sinusoidal: 2Grms @ 5~500 Hz, IEC60068-2-6

Certifications

- CE
- FCC Class A

Knowing Your NISE 505
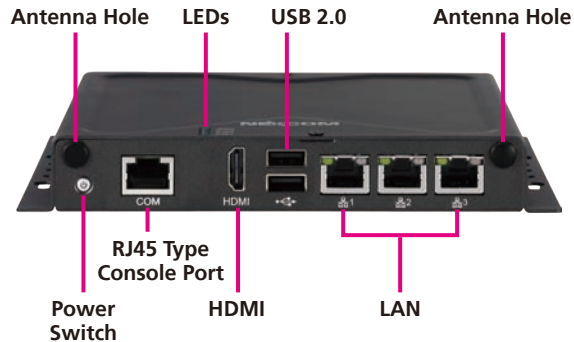
Front Panel

Antenna Hole
Used to install external antennas.

Power Switch
Press to power-on or power-off the system.

RJ45 Type Console Serial Port
Used to connect console devices with RJ45 type connection.

LED Indicators
Indicates the hard drive and GPIO (programmable) activity of the system.

HDMI
Used to connect an HDMI interface display.

USB 2.0
USB 2.0 ports to connect the system with USB 2.0/1.1 devices.

LAN
Used to connect the system to a local area network.

DC Input
Used to plug a DC power cord.

Rear Panel

Mechanical Dimensions

186.00

174.00

4.00

Ø 8.00

Ø 3.70

25.00

70.00

150.00

162.00

26.00
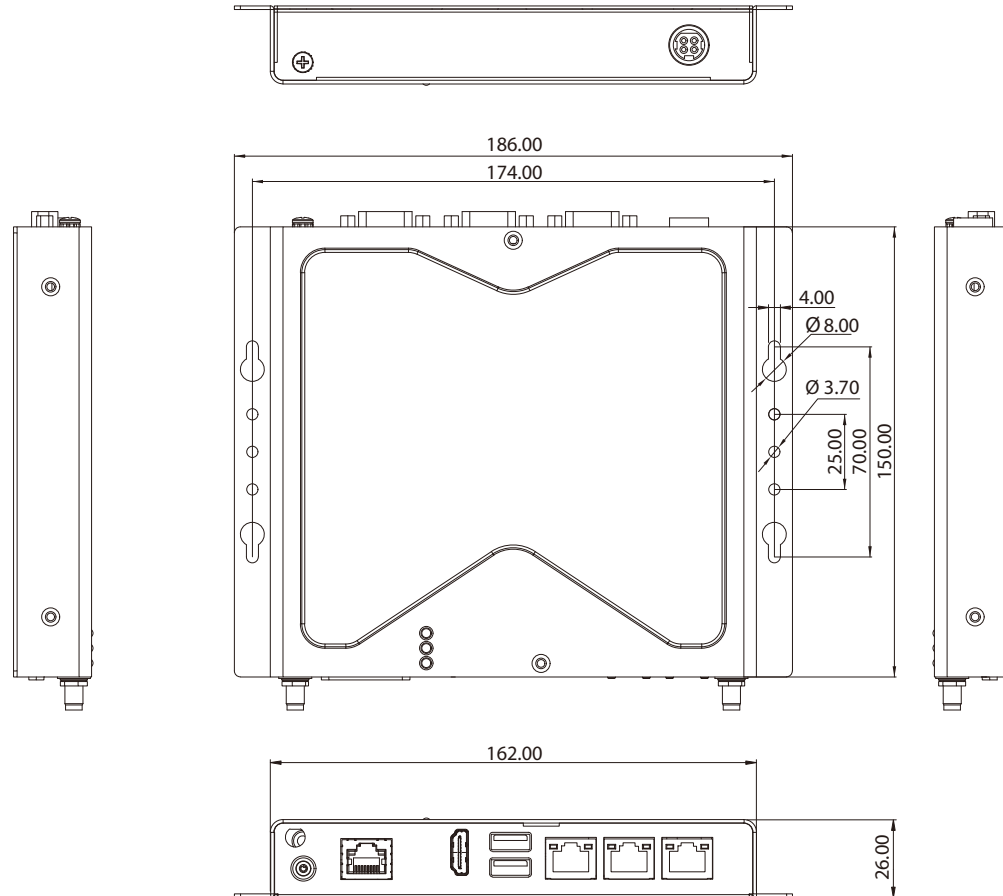
Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the NISE 505 motherboard.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers screwdrivers
  - A grounding strap
  - An anti-static pad

- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:
- Always disconnect the unit from the power outlet whenever you are working inside the case.

- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.

- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.

- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.

- Use correct screws and do not over tighten screws.

Jumper Settings

A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is open.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)
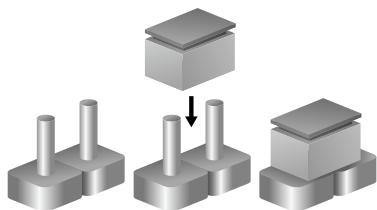
Three-Pin Jumpers: Pins 1 and 2 are Short
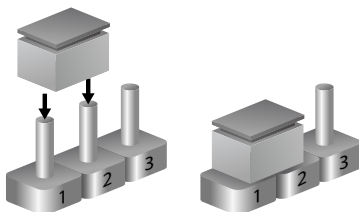
Locations of the Jumpers and Connectors for NISB 505

NISB 505

The figure below is the top view of the NISB 505 main board which is the main board used in NISE 505. It shows the locations of the jumpers and connectors.
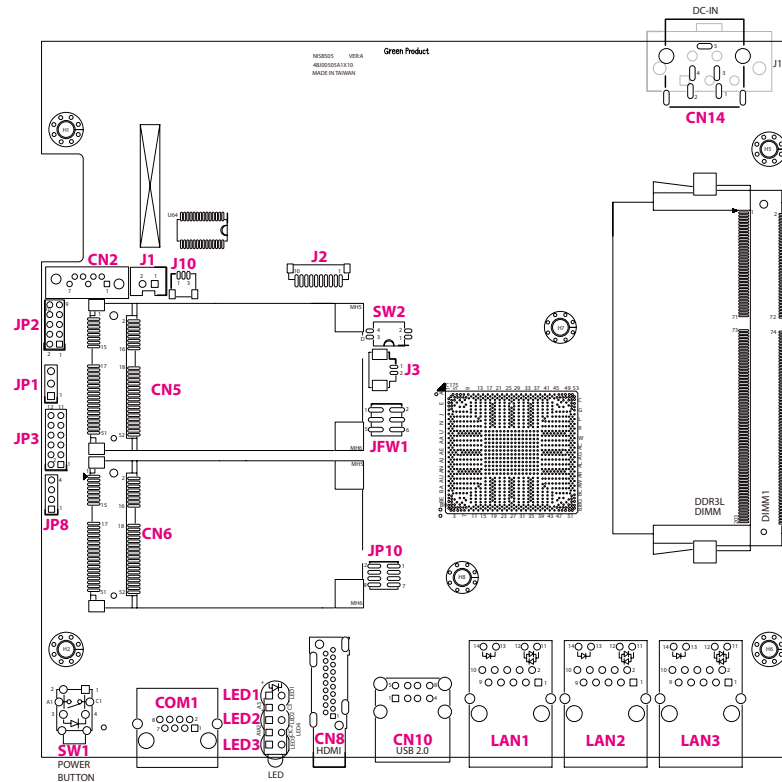
Jumpers and Switches

AT/ATX Power Select

Connector type: 1x3 3-pin header, 2.54mm pitch
Connector location: JP1

1 ▢ ○ ○ 3

Pin	Settings
1-2 On	ATX Mode
2-3 On	AT Mode

Pin	Definition
1	3VSB
2	AT_ATX_SELECT
3	GND

CMOS/ME Clear Select

Connector type: 2-pin DIP switch
Connector location: SW2

Pin	Definition
1	SRTC_RST#
2	RTC_TEST#
3	GND
4	GND

Connector Pin Definitions

External I/O Interfaces - Front Panel

Power Button

Connector location: SW1

RJ45 Console Port

Connector location: COM1

Pin	Definition	Pin	Definition
1	GND	2	EC_PWRBT#
3	EC_PWRBT#	4	GND
A1	PWR_SW_P	C1	PWR_SW_N
MH1	GND	MH2	GND
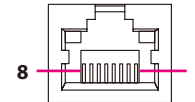
Pin	Definition	Pin	Definition
1	COM1_RTS#	2	COM1_DTR#
3	COM1_TXD	4	GND
5	GND	6	COM1_RXD
7	COM1_DSR#	8	COM1_CTS#
MH1	COM1_MH1	MH2	COM1_MH2
NH1	NA	NH2	NA

LED Indicators

Connector location: LED1, LED2 and LED3

LED1 🟢 **Sata**

LED2 🟢 **PG0**

LED3 🟢 **PG1**

	Pin	Definition	Pin	Definition
LED1	A	VCC3	C	SATA_LED#
LED2	A	VCC3	C	GPIO_PG0
LED3	A	VCC3	C	GPIO_PG1

HDMI

Connector type: HDMI port
Connector location: CN8
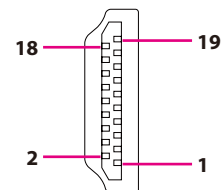
Pin	Definition	Pin	Definition
1	HDMI_DATA2_P_C	2	GND
3	HDMI_DATA2_N_C	4	HDMI_DATA1_P_C
5	GND	6	HDMI_DATA1_N_C
7	HDMI_DATA0_P_C	8	GND
9	HDMI_DATA0_N_C	10	HDMI_CLK_P_C
11	GND	12	HDMI_CLK_N_C
13	HDMI_CEC	14	NC
15	HDMI_CTRL_CLK_C	16	HDMI_CTRL_DAT_C
17	GND	18	HDMI_PWR
19	HDMI_HPD_R		
MH1	CHASSIS_GND	MH2	GND
MH3	CHASSIS_GND	MH4	GND

USB 2.0 Ports

Connector type: Dual USB 2.0 ports
Connector location: CN10
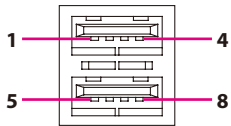
Pin	Definition	Pin	Definition
1	4USBV1	2	DN1_C
3	DP1_C	4	GND
5	4USBV1	6	DN2_C
7	DP2_C	8	GND
MH1	CHASSIS_GND	MH2	CHASSIS_GND
MH3	CHASSIS_GND	MH4	CHASSIS_GND

LAN 1 Port

Connector type: RJ45 with LEDs
Connector location: LAN1
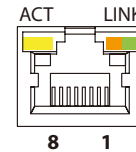
Act	Status
Flashing Yellow	Data activity
Off	No activity

Link	Status
Steady Green	1G network link
Steady Orange	100Mbps network link
Off	10Mbps or no link

Pin	Definition	Pin	Definition
1	LAN1_MDI0P	2	LAN1_MDI0N
3	LAN1_MDI1P	4	LAN1_MDI1N
5	LAN1TCT	6	GND
7	LAN1_MDI2P	8	LAN1_MDI2N
9	LAN1_MDI3P	10	LAN1_MDI3N
11	LAN1_LINK1G#	12	LAN1_LINK
13	LAN1_LED_ACT#	14	LAN1_ACTPW

LAN 2 Port

Connector type: RJ45 with LEDs
Connector location: LAN2
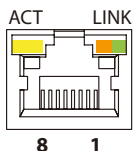
Act	Status
Flashing Yellow	Data activity
Off	No activity

Link	Status
Steady Green	1G network link
Steady Orange	100Mbps network link
Off	10Mbps or no link

Pin	Definition	Pin	Definition
1	LAN2_MDI0P	2	LAN2_MDI0N
3	LAN2_MDI1P	4	LAN2_MDI1N
5	LAN2TCT	6	GND
7	LAN2_MDI2P	8	LAN2_MDI2N
9	LAN2_MDI3P	10	LAN2_MDI3N
11	LAN2_LINK1G#	12	LAN2_LINK
13	LAN2_LED_ACT#	14	LAN2_ACTPW

LAN 3 Port

Connector type: RJ45 with LEDs
Connector location: LAN3
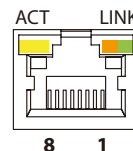
Act	Status
Flashing Yellow	Data activity
Off	No activity

Link	Status
Steady Green	1G network link
Steady Orange	100Mbps network link
Off	10Mbps or no link

Pin	Definition	Pin	Definition
1	LAN3_MDI0P	2	LAN3_MDI0N
3	LAN3_MDI1P	4	LAN3_MDI1N
5	LAN3TCT	6	GND
7	LAN3_MDI2P	8	LAN3_MDI2N
9	LAN3_MDI3P	10	LAN3_MDI3N
11	LAN3_LINK1G#	12	LAN3_LINK
13	LAN3_LED_ACT#	14	LAN3_ACTPW

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External I/O Interfaces - Rear Panel
DC Power Input
Connector location: CN14
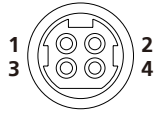
Pin	Definition
1	VIN_VSS
2	VIN_1
3	VIN_VSS
4	VIN_1

Internal Connectors

BIOS Pin Header

Connector type: 2x3 6-pin header, 2.0mm pitch
Connector location: JFW1

SATA Connector

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)
Connector location: CN2
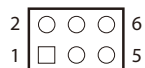
Pin	Definition	Pin	Definition
1	VCC	2	GND
3	CS#0	4	CLK
5	SO	6	SI
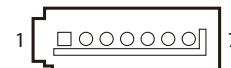
Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP0_C
3	SATA_TXN0_C	4	GND
5	SATA_RXN0_C	6	SATA_RXP0_C
7	GND		

SATA Power Connector

Connector type: 1x2 2-pin header, 2.0mm pitch
Connector location: J1

Pin	Definition
1	GND
2	VCC5

GPIO Pin Header

Connector type: 2x5 10-pin header, 2.0mm pitch
Connector location: JP2
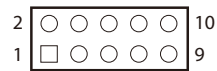
Pin	Definition	Pin	Definition
1	VCC5	2	GND
3	ICH_GPO0_OUT	4	ICH_GPI0_IN
5	ICH_GPO1_OUT	6	ICH_GPI1_IN
7	ICH_GPO2_OUT	8	ICH_GPI2_IN
9	ICH_GPO3_OUT	10	ICH_GPI3_IN

80 Port Connector

Connector type: 1x10 10-pin header, 1.0mm pitch
Connector location: J2

PWR_LED/HDD_LED/SMB_BUS/S3/SW_ON/Reset Header

Connector type: 2x6 12-pin header, 2.0mm pitch
Connector location: JP3

Pin	Definition	Pin	Definition
1	GND	2	EC_PLTRST#
3	DEBUG_LPC33MHZ	4	LPC_FRAME#
5	LPC_AD3	6	LPC_AD2
7	LPC_AD1	8	LPC_AD0
9	VCC3/LPC_SERIRQ	10	VCC3
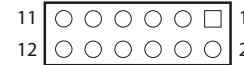
Pin	Definition	Pin	Definition
1	PWR_LED_N	2	VCC5
3	SATA_LED#	4	VCC5
5	3VSB	6	GND
7	SLP_S3#	8	PS_ON#
9	EC_PWRBT#	10	GND
11	PM_RESET#_J	12	GND

RTC Connector

Connector type: 1x2 2-pin header, 1.25mm pitch
Connector location: J3

Pin	Definition
1	GND
2	VBAT_L

EC Programmable Connector

Connector type: 1x3 3-pin header, 1.25mm pitch
Connector location: J10

Pin	Definition
1	EC_SMBCLK
2	EC_SMBDATA
3	GND

SMBus Pin Header

Connector type: 1x4 4-pin header, 2.0mm pitch
Connector location: JP8

1 [□ ○ ○ ○] 4

Pin	Definition	Pin	Definition
1	VCC3	2	SMB_CLK
3	SMB_DATA	4	GND

SPI and I2C Pin Header

Connector type: 2x4 8-pin header, 1.27mm pitch
Connector location: JP10

2 [○ ○ ○ ○] 8
1 [□ ○ ○ ○] 7
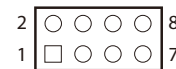
Pin	Definition	Pin	Definition
1	3VSB	2	GND
3	3V3_SPI_CS	4	3V3_SPI_MISO
5	3V3_SPI_MOSI	6	3V3_SPI_CLK
7	3P3_I2C_CLK	8	3P3_I2C_DATA

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Mini-PCIe Connector (mSATA/USB)

Connector location: CN5
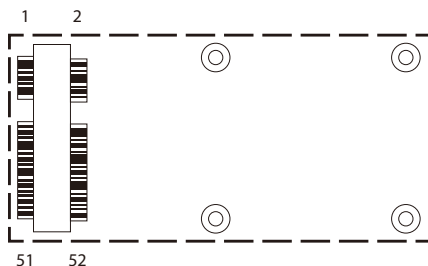
Pin	Definition	Pin	Definition
1	N/A	2	3VSB_MINI1
3	N/A	4	GND
5	N/A	6	V1P5S_1
7	N/A	8	N/A
9	GND	10	N/A
11	N/A	12	N/A
13	N/A	14	N/A
15	GND	16	N/A
17	N/A	18	GND
19	N/A	20	MINICARD2DIS#
21	GND	22	N/A
23	SATA_RXP1_C	24	3VSB_MINI1
25	SATA_RXN1_C	26	GND

Pin	Definition	Pin	Definition
27	GND	28	V1P5S_1
29	GND	30	EC_SMBCLK
31	SATA_TXN1_C	32	EC_SMBDATA
33	SATA_TXP1_C	34	GND
35	GND	36	MINI1USBN
37	GND	38	MINI1USBP
39	3VSB_MINI1	40	GND
41	3VSB_MINI1	42	N/A
43	GND	44	N/A
45	N/A	46	N/A
47	N/A	48	V1P5S_1
49	N/A	50	GND
51	3VSB_MINI1	52	3VSB_MINI1

Mini-PCIe Connector (Wi-Fi/USB)

Connector location: CN6
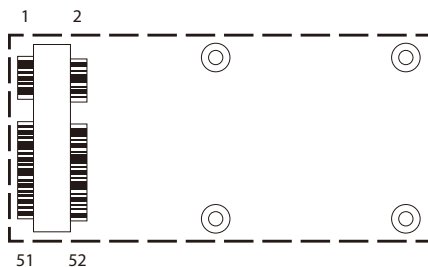
Pin	Definition	Pin	Definition
1	PCIEWAKE#	2	3VSB_MINI2
3	N/A	4	GND
5	N/A	6	V1P5S_2
7	MINICARD2CLKREQ#	8	N/A
9	GND	10	N/A
11	PCIE_CLKN0	12	N/A
13	PCIE_CLKP0	14	N/A
15	GND	16	N/A
17	N/A	18	GND
19	N/A	20	MINICARD2DIS#
21	GND	22	EC_PLTRST#
23	RXN0_R	24	3VSB_MINI2
25	RXP0_R	26	GND

Pin	Definition	Pin	Definition
27	GND	28	V1P5S_2
29	GND	30	EC_SMBCLK
31	TXN0_R	32	EC_SMBDATA
33	TXP0_R	34	GND
35	GND	36	MINI2USBN
37	GND	38	MINI2USBP
39	3VSB_MINI2	40	GND
41	3VSB_MINI2	42	N/A
43	GND	44	N/A
45	N/A	46	N/A
47	N/A	48	V1P5S_2
49	N/A	50	GND
51	N/A	52	3VSB_MINI2

CHAPTER 3: SYSTEM SETUP

Removing the Chassis Cover

CAUTION! Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

1. Remove the six mounting screws around the chassis cover. There are two screws each on the top and on the sides.

2. With the screws removed, lift up the cover and remove it from the chassis.

Screws on the sides

Installing a SO-DIMM Memory Module

1. Locate the SO-DIMM socket.
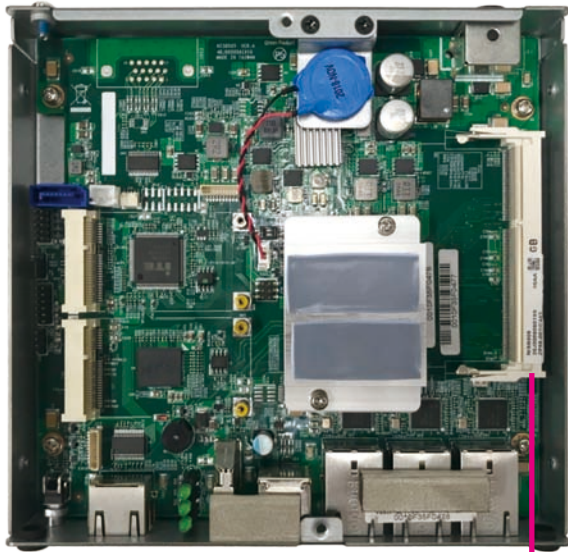
SO-DIMM Socket

2. Insert the module into the socket at an approximately 30 degrees angle. Push the module down until the clips on both sides of the socket lock into position. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.

Memory Module

Installing an mSATA Mini-PCIe Module (Storage)

1. Locate the mini-PCI Express slot (CN5) on the board.
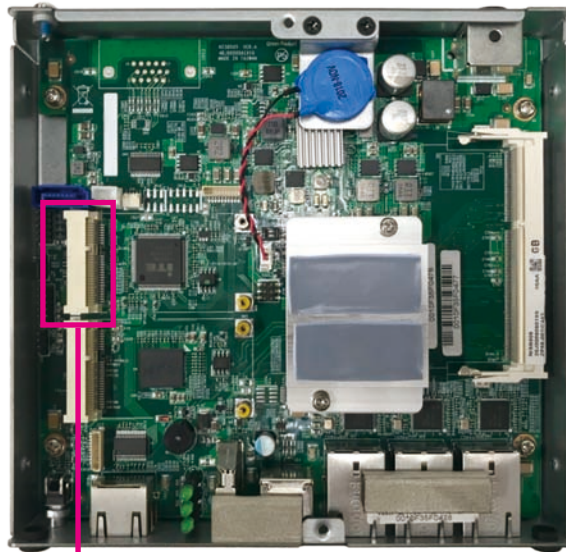
Mini-PCIe Slot

2. Insert the storage module into the mini-PCI Express slot at a 45 degree angle until the gold-plated connector on the edge of the module completely disappears inside the slot.

3. Push the module down and then secure it with mounting screws.
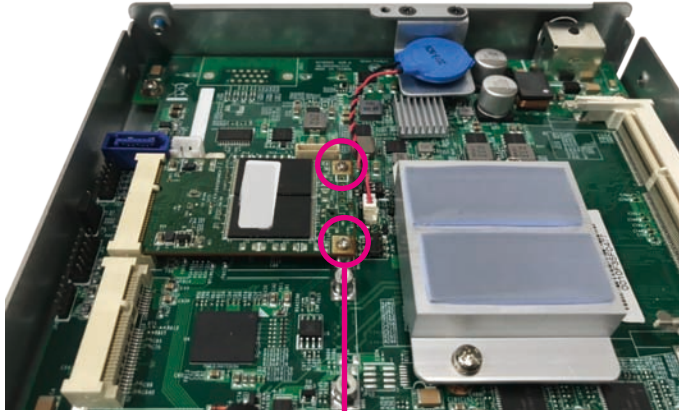
Mounting Screw

Installing a Wi-Fi/BT Mini-PCIe Module (Half-size)

1. Locate the mini-PCI Express slot (CN6) on the board.
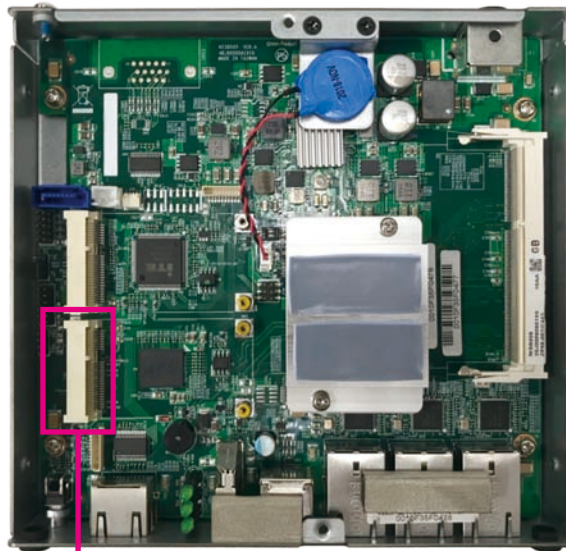
Mini-PCIe Slot

2. Align the wireless LAN module to the module bracket and secure both together with screws.

WLAN Module **Module Bracket**

3. Insert the wireless LAN module into the mini-PCI Express slot at a 45 degree angle until the gold-plated connector on the edge of the module completely disappears inside the slot.

4. Push the module down and then secure it with mounting screws.
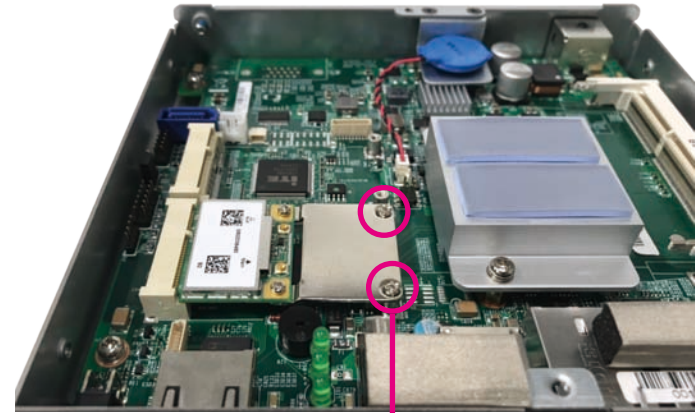
Mounting Screw

Installing an Antenna

Note: Please remove the gaskets (ring 1 and ring 2) on the SMA antenna jack first.

Ring 2
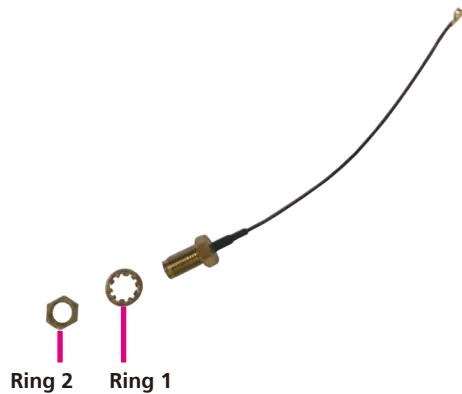
Ring 1

Ring 2   **Ring 1**

1. Remove the antenna hole cover located on the front panel.

2. Insert the SMA antenna jack end of the cable through the antenna hole, and insert the 2 rings (ring 1 and ring 2) back to the antenna jack.

3. Attach the RF cable onto the module.

RF Cable

4. Connect the external antenna to the antenna jack.

Wall Mount Installation

📝 Note: The top cover of the system also serves as the wall mount bracket. Before wall mounting the system, please ensure the top cover is secured with 6 screws. (Screw specifications: M3x4mm)

1. Align the M4 mounting holes on the chassis cover to the desired installation location.

Mounting Holes

2. Mount the system by fastening 4 screws through the mounting holes.

DIN Rail Clip Installation

1. Align the DIN rail clips to the mounting holes on the chassis cover.

2. Secure the DIN rail clips with screws.

Mounting holes

Aluminum DIN Rail Clip Installation

1. Align the aluminum DIN rail clip to the mounting holes on the chassis cover.

Mounting holes

2. Secure the aluminum DIN rail clip with screws.

CHAPTER 4: BIOS SETUP

This chapter describes how to use the BIOS setup program for NISE 505. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM website at www.nexcom.com.tw.

About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:
- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

- This program should be executed under the following conditions:
- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.

- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <Del> allows you to enter Setup.

Press the Del key to enter Setup:

Legends

Key	Function
← →	Moves the highlight left or right to select a menu.
↑ ↓	Moves the highlight up or down between sub-menus or fields.
Esc	Exits the BIOS Setup Utility.
+	Scrolls forward through the values or options of the highlighted field.
–	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
F1	Displays General Help.
F2	Load previous values.
F3	Load optimized default values.
F4	Saves and exits the Setup program.
Enter	Press <Enter> to enter the highlighted sub-menu

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press Enter .

BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from several setup functions and one exit. Use arrow keys to select among the items and press Enter, to accept or enter the submenu.

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.

System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Monday to Sunday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

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

   BIOS Information                                    Set the Date. Use Tab to switch
   BIOS Vendor              American Megatrends        between Date elements.
   Core Version             5.009
   Compliancy               UEFI 2.3; PI 1.2
   Project Version          ZP56A003 x64
   Build Date and Time      07/26/2019 10:00:44
   EC Version               C 00 1

   CPU Configuration
   Microcode Patch          90a

   Memory Information
   Total Memory             2048 MB                    →←: Select Screen
                                                       ↑↓: Select Item
   GOP Information                                     Enter: Select
   Intel(R) GOP Driver      [N/A]                      +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
   System Date              [Sun 01/01/2012]           F3: Optimized Defaults
   System Time              [00:00:54]                 F4: Save & Exit
                                                       ESC: Exit



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

Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

⚠️ Setting incorrect field values may cause the system to malfunction.

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

 ► ACPI Settings                                    System ACPI Parameters.
 ► IT8528 Super IO Configuration
 ► IT8528 H/W Monitor
 ► CPU Configuration
 ► PPM Configuration
 ► IDE Configuration
 ► LPSS & SCC Configuration
 ► CSM Configuration
 ► Trusted Computing
 ► USB Configuration

                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit

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```

ACPI Settings

This section is used to configure ACPI settings.

```
           Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
           Advanced

   ACPI Settings                                    Enables or Disables System
                                                    ability to Hibernate (OS/S4
   Enable Hibernation          [Enabled]            Sleep State). This option may
   ACPI Sleep State            [S3 (Suspend to RAM)] be not effective with some OS.


                              ┌─────────────────────────┐
                              │ Enable Hibernation       │
                              │ Disabled                 │
                              │ Enabled                  │
                              └─────────────────────────┘

                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit

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```

Enable Hibernation

Enables or disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

ACPI Sleep State

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Advanced	

```
ACPI Settings                                          Select the highest ACPI sleep
                                                        state the system will enter
Enable Hibernation          [Enabled]                  when the SUSPEND button is
ACPI Sleep State            [S3 (Suspend to RAM)]       pressed.




                       ┌─────────────────────────┐
                       │     ACPI Sleep State     │
                       │     Suspend Disabled     │
                       │   S3 (Suspend to RAM)    │
                       └─────────────────────────┘
                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit
```

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Select the highest ACPI sleep state the system will enter when the suspend button is pressed. The options are Suspend Disabled and S3 (Suspend to RAM).

IT8528 Super IO Configuration

This section is used to configure the serial ports of the IT8528 Super IO.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.	
Advanced	

```
IT8528 Super IO Configuration                          Set Parameters of Serial Port
                                                        1 (COMB)
Super IO Chip                    IT8528
▶ Serial Port 1 Configuration




                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit
```

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Super IO Chip

Displays the Super I/O chip used on the board.

Serial Port 1 Configuration

This section is used to configure serial port 1.

```
Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
 Advanced

 Serial Port 1 Configuration                          Enable or Disable Serial Port
                                                       (COM)
 Serial Port                        [Enabled]
 Device Settings                    IO=3F8h; IRQ=4;



                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit


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

Serial Port
Enables or disables the serial port.

IT8528 H/W Monitor

This section is used to monitor hardware status such as temperature, fan speed and voltages.

```
Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
 Advanced

 PC Health Status

 CPU temperature(DTS)               :  +30 C
 System temperature1                :  +30 C
 VCore                              :  +0.86 V
 VCC3                               :  +3.25 V
 VCC5                               :  +4.92 V



                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit


             Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```
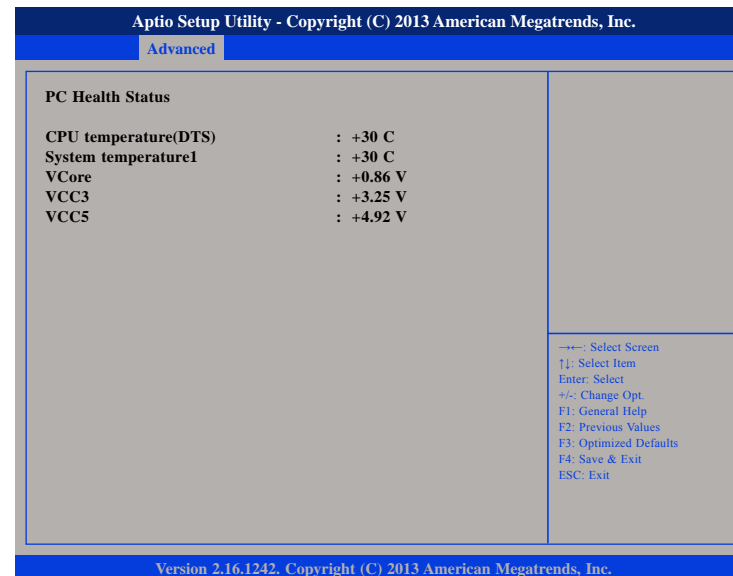
CPU temperature(DTS)
Detects and displays the current CPU temperature.

System temperature1
Detects and displays the current system temperature.

VCore to VCC5
Detects and displays the output voltages.

CPU Configuration

This section is used to configure the CPU.

```
Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
   Advanced

  CPU Configuration                                      Socket specific CPU Information

▶ Socket 0 CPU Information

  CPU Speed                        2001 MHz
  64-bit                           Supported

  Active Processor Cores           [All]
  Limit CPUID Maximum              [Disabled]
  Execute Disable Bit              [Enabled]
  Intel Virtualization Technology  [Enabled]

                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

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```

Active Processors Cores

Select the number of cores to enable in each processor package.

Limit CPUID Maximum

The CPUID instruction of some newer CPUs will return a value greater than 3. The default is Disabled because this problem does not exist in the Windows series operating systems. If you are using an operating system other than Windows, this problem may occur. To avoid this problem, enable this field to limit the return value to 3 or lesser than 3.

Execute Disable Bit

When this field is set to Disabled, it will force the XD feature flag to always return to 0. XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3).

Intel® Virtualization Technology

Enables or disables Intel Virtualization technology.

Socket 0 CPU Information

Display information on the CPU installed on socket 0.

```
Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
   Advanced

  Socket 0 CPU Information

  Intel(R) Celeron(R) CPU J1900 @ 1.99GHz
  CPU Signature                    30679
  Microcode Patch                  90a
  Max CPU Speed                    1990 MHz
  Min CPU Speed                    1334 MHz
  Processor Cores                  4
  Intel HT Technology              Not Supported
  Intel VT-x Technology            Supported

  L1 Data Cache                    24 kB x 4
  L1 Code Cache                    32 kB x 4      →←: Select Screen
  L2 Cache                         1024 kB x 2    ↑↓: Select Item
  L3 Cache                         Not Present    Enter: Select
                                                  +/-: Change Opt.
                                                  F1: General Help
                                                  F2: Previous Values
                                                  F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit

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```

PPM Configuration

This section is used to configure the Processor Power Management (PPM) configuration.

```
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   Advanced

   PPM Configuration                                           Enable/Disable Intel SpeedStep

   EIST                              [Disabled]




                                                              →←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit

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```

EIST
Enables or disables Intel® SpeedStep.

IDE Configuration

This section is used to configure the SATA drives.

```
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   Advanced

   IDE Configuration                                          Enable / Disable Serial ATA

   Serial-ATA (SATA)                 [Enabled]
   SATA Mode                         [AHCI Mode]

   Serial-ATA Port 0                 [Enabled]
   SATA Port0 HotPlug                [Disabled]

   Serial-ATA Port 1                 [Enabled]
   SATA Port1 HotPlug                [Disabled]

   SATA Port0
   Not Present
                                                              →←: Select Screen
   SATA Port1                                                 ↑↓: Select Item
   64GB SATA Flas (64.0GB)                                    Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit

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```

Serial-ATA (SATA)
Enables or disables the SATA controller.

SATA Mode
Configures the SATA as IDE or AHCI mode.

IDE   This option configures the Serial ATA drives as Parallel ATA physical storage device.

AHCI   This option configures the Serial ATA drives to use AHCI (Advanced Host Controller Interface). AHCI allows the storage driver to enable the advanced Serial ATA features which will increase storage performance.

Serial-ATA Port 0 and Serial-ATA Port 1

Enables or disables SATA port 0 and port 1.

SATA Port0 HotPlug and SATA Port1 HotPlug

Enables or disables hot pluggable support on SATA port 0 and port 1.

LPSS & SCC Configuration

This section is used to configure LPSS and SCC settings.

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Advanced		
LPSS & SCC Devices Mode	[PCI mode]	LPSS & SCC Devices Mode Settings
SCC Configuration		
SCC eMMC Support	[eMMC AUTO MODE]	
SCC eMMC 4.5 DDR50 Support	[Enabled]	
SCC eMMC 4.5 HS200 Support	[Disabled]	
		→←: Select Screen
		↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
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LPSS & SCC Devices Mode

Selects the LPSS and SCC device mode as ACPI mode or PCI mode.

SCC eMMC Support

Enables or disables SCC eMMC support.

SCC eMMC 4.5 DDR50 Support

Enables or disables SCC eMMC 4.5 DDR50 support.

SCC eMMC 4.5 HS200 Support

Enables or disables SCC eMMC 4.5 HS200 support.

CSM Configuration

This section is used to configure the compatibility support module features.

```
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      Advanced

   Compatibility Support Module Configuration              Enable/Disable CSM Support.

   CSM Support                      [Enabled]

   CSM16 Module Version             07.71

   Option ROM execution order

   Network                          [Disabled]
   Storage                          [Legacy only]
   Video                            [Legacy only]
   Other PCI devices                [Legacy only]

                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit

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```

CSM Support
Enables or disables CSM support.

Network
Controls the execution of UEFI and legacy PXE OpROM.

Storage
Controls the execution of UEFI and legacy storage OpROM.

Video
Controls the execution of UEFI and legacy video OpROM.

Other PCI devices
Determines OpROM execution policy for devices other than network, storage or video.

Trusted Computing

This section is used to configure Trusted Platform Module (TPM) settings.

```
        Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
   Advanced

                                                          Enables or Disables BIOS
                                                          support for security device.
   Security Device Support        [Enable]                O.S. will not show Security
                                                          Device. TCG EFI protocol and
   TPM20 Device Found                                     INT1A interface will not be
   HashPolicy                     [Sha-1]                 available.




                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit


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```

Security Device Support
Enables or disables BIOS support for security device. O.S will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

USB Configuration

This section is used to configure the USB.

```
        Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
   Advanced

   USB Configuration                                      Enables Legacy USB support.
                                                          AUTO option disables legacy
   USB Module Version             8.10.27                 support if no USB devices are
                                                          connected. DISABLE option will
   USB Devices:                                           keep USB devices available
        1 Keyboard, 1 Mouse, 1 Hub                        only for EFI applications.

   Legacy USB Support             [Enabled]
   USB3.0 Support                 [Enabled]
   XHCI Hand-off                  [Enabled]
   EHCI Hand-off                  [Enabled]



                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit


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```

Legacy USB Support
Enable   Enables Legacy USB.
Auto   Disables support for Legacy when no USB devices are connected.
Disable   Keeps USB devices available only for EFI applications.

USB3.0 Support
Enables or disables USB 3.0 controller support.

XHCI Hand-off and EHCI Hand-off
This is a workaround for OSs that does not support XHCI hand-off and EHCI hand-off. The XHCI and EHCI ownership change should be claimed by the XHCI and EHCI driver respectively.

Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.

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

► South Bridge                          South Bridge Parameters




                                        →←: Select Screen
                                        ↑↓: Select Item
                                        Enter: Select
                                        +/-: Change Opt.
                                        F1: General Help
                                        F2: Previous Values
                                        F3: Optimized Defaults
                                        F4: Save & Exit
                                        ESC: Exit

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```
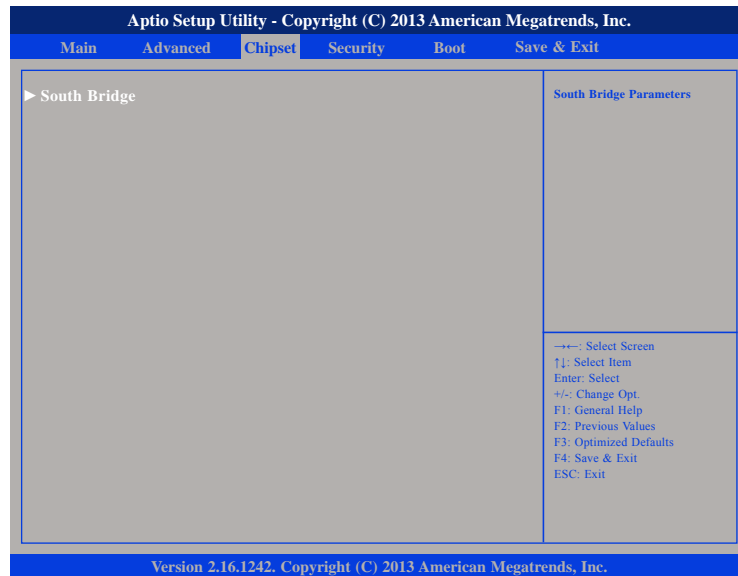
South Bridge
Enters the South Bridge submenu.

South Bridge

```
Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
                        Chipset

► USB Configuration                     USB Configuration Settings
► PCI Express Configuration

High Precision Timer          [Enabled]
Restore AC Power Loss         [Power On]




                                        →←: Select Screen
                                        ↑↓: Select Item
                                        Enter: Select
                                        +/-: Change Opt.
                                        F1: General Help
                                        F2: Previous Values
                                        F3: Optimized Defaults
                                        F4: Save & Exit
                                        ESC: Exit

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

High Precision Timer
Enables or disables high precision event timer.

Restore AC Power Loss
Select the AC power state when power is re-applied after a power failure.

USB Configuration

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Chipset		
USB Configuration XHCI Mode	[Disabled]	Control the USB EHCI (USB 2.0) functions. One EHCI controller must always be enabled
USB 2.0(EHCI) Support	[Enabled]	
USB RMH Mode	**[Enabled]**	
USB EHCI debug	**[Disabled]**	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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USB 2.0(EHCI) Support

Enables or disables the Enhanced Host Controller Interface (USB 2.0), one EHCI controller must always be enabled.

USB RMH Mode

Enables or disables PCH USB rate matching hubs mode.

USB EHCI debug

Enables or disables PCH EHCI debug capability.

PCI Express Configuration

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Chipset		
PCI Express Configuration PCI Express Port 0	[Enabled]	Enable or Disable the PCI Express Port 0 in the Chipset.
PCI Express Port 1	**[Enabled]**	
PCI Express Port 2	**[Enabled]**	
PCI Express Port 3	**[Enabled]**	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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PCI Express Port 0 to PCI Express Port 3

Enables or disables the PCI Express ports 0 to 3 on the chipset.

Security

```
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  Main      Advanced    Chipset    Security    Boot      Save & Exit

  Password Description                                    Set Administrator Password

  If ONLY the Administrator's password is set,
  then this only limits access to Setup and is
  only asked for when entering Setup.
  If ONLY the User's password is set, then this
  is a power on password and must be entered to
  boot or enter Setup. In Setup the User Will
  have Administrator rights.
  The password length must be
  in the following range:
  Minimum length              3
  Maximum length              20                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
  Administrator Password                                  +/-: Change Opt.
  User Password                                           F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit


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```

Administrator Password
Select this to reconfigure the administrator's password.

User Password
Select this to reconfigure the user's password.

Boot

```
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  Main      Advanced    Chipset    Security    Boot      Save & Exit

  Boot Configuration                                      Select the keyboard NumLock
  Bootup NumLock State          [On]                      state
  Fast Boot                     [Disabled]


  Boot Option Priorities
  Boot Option #1                [Windows Boot Manage. . .]
  Boot Option #2                [MMC - R1J57L]
  Boot Option #3                [UEFI: Built-in EFI . . .]

  Hard Drive BBS Priorities                               →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit


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```

Bootup NumLock State
This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Fast Boot
When enabled, the BIOS will shorten or skip some check items during POST. This will decrease the time needed to boot the system.
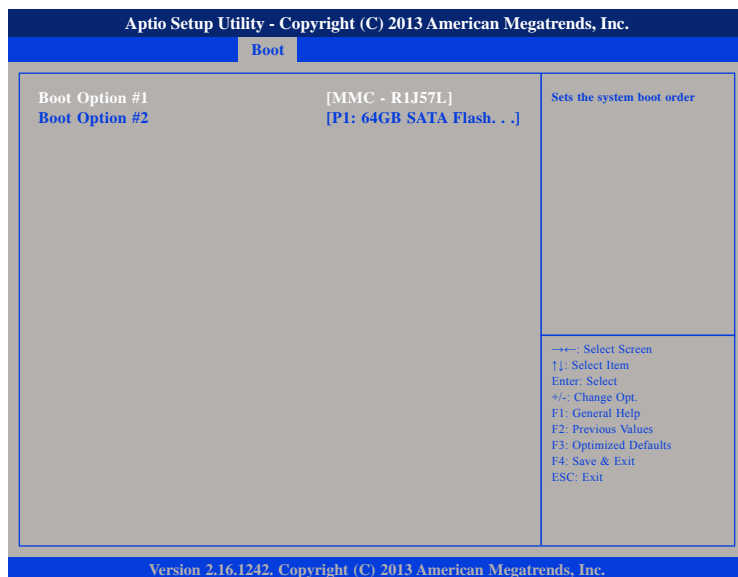
Boot Option Priorities
Adjust the boot sequence of the system. Boot Option #1 is the first boot device that the system will boot from, next will be #2 and so forth.

Hard Drive BBS Priorities
Sets the order of the legacy devices in this group.

Hard Drive BBS Priorities
Boot Option #1 and Boot Option #2

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
─────────────────────────────────────────────────────────────────────────────
  Boot
─────────────────────────────────────────────────────────────────────────────

  Boot Option #1              [MMC - R1J57L]            Sets the system boot order
  Boot Option #2              [P1: 64GB SATA Flash. . .]


                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

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```

Sets the first and second legacy device to boot from.

Save & Exit

```
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  Main      Advanced    Chipset    Security    Boot    Save & Exit
─────────────────────────────────────────────────────────────────────────────

  Save Changes and Reset                        Reset the system after saving
  Discard Changes and Reset                     the changes.

  Restore Defaults



                                                →←: Select Screen
                                                ↑↓: Select Item
                                                Enter: Select
                                                +/-: Change Opt.
                                                F1: General Help
                                                F2: Previous Values
                                                F3: Optimized Defaults
                                                F4: Save & Exit
                                                ESC: Exit

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```

Save Changes and Reset
To save the changes and reset, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Discard Changes and Reset
To exit the Setup utility and reset without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting.

Restore Defaults
To restore the BIOS to default settings, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

APPENDIX A: POWER CONSUMPTION

Power Consumption Management

Purpose

The purpose of the power consumption test is to verify the power dissipation of the system, and the loading of the power supply.

Test Equipment / Software

1. DC power supply
2. Operating System OS: Windows 10 64-bit
3. Burn-In Test Ver: 8.1 Pro (1025)
4. Intel® Thermal Analysis Tool software version: 6.0.1013
5. Network test program
6. Function port fixture:

Functional Port	Front / Rear Panel
USB 2.0 x2	5V, 0.5A (Cement Resistor)
COM 1	RS232 Loopback (115200 baud rate)
HDMI	LCD Monitor
USB	Keyboard & Mouse

Test Procedure

1. Make sure mechanical structure and electrical functionality are normal before testing.
2. Install all I/O load devices and according as system input voltage specifications to set up DC power supply voltage.
3. Measure system maximum power consumption as below mode:
   – BIOS Mode
   – ACPI Sleep State Mode (S3)
   – 100% Full Loading Mode (Include USB load fixture)
4. Measure and record system maximum power consumption value.

Test Data

Voltage & Current Measurement		Total (W)
Voltage (V)	Current (A)	
BIOS Mode Power Consumption		
12 V	0.550 A	6.6 W
ACPI Sleep (S3) Mode Power Consumption		
12 V	0.2 A	2.4 W
100% Full Loading Mode Power Consumption		
12 V	1.76 A	21 W

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APPENDIX B: EC COMMAND DOCUMENTATION

General Purpose of EC

ACPI defines a standard hardware and software communications interface between an OS driver and an embedded controller. This allows any OS to provide a standard driver that can directly communicate with an embedded controller in the system, thus allowing other drivers within the system to communicate with and use the resources of system embedded controllers.

Abbreviation

The Input Buffer Full (IBF) flag is set when the host has written a byte of data to the command or data port, but the embedded controller has not yet read it. After the embedded controller reads the status byte and sees the IBF flag set, the embedded controller reads the data port to get the byte of data that the host has written. After the embedded controller reads the data byte, the IBF flag is automatically cleared by hardware. This is the signal to the host that the data has been read by the embedded controller and that the host is free to write more data to the embedded controller.

The Output Buffer Full (OBF) flag is set when the embedded controller has written a byte of data into the command or data port but the host has not yet read it. After the host reads the status byte and sees the OBF flag set, the host reads the data port to get the byte of data that the embedded controller has written. After the host reads the data byte, the OBF flag is cleared automatically by hardware. This signals the embedded controller that the data has been read by the host and the embedded controller is free to write more data to the host.

PM1 (Power Management Channel1) Overview

PWM 1 is LPC IO channel between CPU and embedded controller.
The embedded controller contains three registers at two address locations: EC_SC and EC_DATA. The EC_SC, or Embedded Controller Status/Command register, acts as two registers: a status register for reads to this port and a command register for writes to this port. The EC_DATA (Embedded Controller Data register) acts as a port for transferring data between the host CPU and the embedded controller.

The status/command register is **0x66**. Data register is **0x62**. These two registers act importantly in EC controlled function.

Note: Some commands are skipped (content with "x") in RW sample code. Because RW runs under Windows 7 and with API interface to display result. For those using EC command in different OS, such as Linux or real-time OS, every command in sequence is needed for complete function command.

1. HW Monitor

1.1 Command Register and Address Description:

Command for HW monitor:

Command	Description
0x80	Read

Address for HW monitor:

Address	Description
0xB5-0xB6	VCC5 (MSB: 0xB5 LSB: 0xB6) (Decimal point two)
0xB7-0xB8	VCC3 (MSB: 0xB7 LSB: 0xB8) (Decimal point two)
0xB9-0xBA	VCORE (MSB: 0xB9 LSB: 0xBA) (Decimal point two)
0xBB-0xBC	TEMP_SENSOR (MSB: 0xBB LSB: 0xBC)

1.2 Read HW Monitor Description:

This command is to read HW monitor.

Sequence to read HW monitor:

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x80 to 0x66	Send read command	>o 0x66 0x80
2	Wait IBF clear		x
3	Write RAM address to 0x62 port	Send HW monitor address 0xB3~0xC0	>o 0x62 0xB5
4	Wait OBF set		x
5	Read 0x62 port	Get HW monitor data in current address	>i 0x62

2. Fan RPM

2.1 Command Register and Address Description:

Command	Description
0x80	Read

Address for RPM:

Address	Description
0x72-0x73	Fan1RPM (MSB: 0x72 LSB: 0x73)
0x74-0x75	Fan2RPM (MSB: 0x74 LSB: 0x75)

2.2 Read Fan RPM Description:

This command is to read fan RPM.

Sequence to read fan RPM:

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x80 to 0x66	Send read command	>o 0x66 0x80
2	Wait IBF clear		x
3	Write RAM address to 0x62 port	Send panel type address 0x72 or 0x73.	>o 0x62 0x72
4	Wait OBF set		x
5	Read 0x62 port	Get Fan1 RPM data in current address	>i 0x62

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3. Watchdog

3.1 Command Register and Address Description:

Command for watchdog:

Command	Description
0x89	Reset watchdog time interval
0x28	Start watchdog
0x29	Stop watchdog
0x2A	Reset watchdog

Address for watchdog:

Watchdog is used to set up time interval and also keep event status. Unit time interval is 1ms. Time setting requires a word (8 bit) long length. You can set up watchdog event time from 0 to 0xFFFFFFFE. Write 0xFFFFFFFF to time interval setting means disable watchdog event. So the interval time range is from 0ms to 497 days (0~0x0FFFFFFFE).

Address	Description
0x50-0x53	0~0xFFFFFFFE

3.2 Set Up Watchdog Time Interval Description:

Sequence to set up watchdog time interval:

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x89 to 0x66	Send read command	>o 0x66 0x89
2	Wait IBF clear		x
3	Write RAM address to 0x62 port	Send watchdog address 0x50~0x53.	>o 0x62 0x50
4	Wait OBF set		x
5	Write watchdog time interval value to 0x62	Values from 0~0x0FFFFFFFE, but two bit in each address, please refer to sample code explanation	>o 0x62 0x90

Sample explanation:
To set up watchdog time interval to 4 seconds, here are the values that should be filled in each address.

4sec = 400ms (decimal) = 190 (hexadecimal)

Address	0x50	0x51	0x52	0x53
Data	0x00	0x00	0x01	0x90

Complete command set sequence:

Further Description	Command	Address	Data
Set watchdog interval, write to address 0x50~0x53 and Data "00000190"	1>o 0x66 0x89	2>o 0x62 0x50	3>o 0x00
	4>o 0x66 0x89	5>o 0x62 0x51	6>o 0x00
	7>o 0x66 0x89	8>o 0x62 0x52	9>o 0x01
	10>o 0x66 0x89	11>o 0x62 0x53	12>o 0x90

3.3 Reset Watchdog Time Interval Description:

This command is used to reset watchdog time.

Sequence to reset watchdog time interval:

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x2A to 0x66	Send reset watchdog command	>o 0x66 0x2A
2	Wait OBF set		x
3	Read 0x62 port	If setup is successful, EC will return 0x03.	x (check 0x03 output on display)

3.4 Start Watchdog Description:

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x28 to 0x66	Send start watchdog command	>o 0x66 0x28
2	Wait IBF clear		x
3	Write 0x01 to 0x62		>o 0x62 0x01 (check 0x03 output on display)
4	Wait OBF set		x
5	Read 0x62 port	If setup is successful, EC will return 0x01.	x (check 0x01 output on display)

3.5 Stop Watchdog Description:

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x29 to 0x66	Send stop watchdog command	>o 0x66 0x29
2	Wait OBF set		x
3	Read 0x62 port	If setup is successful, EC will return 0x02.	x (check 0x02 output on display)

4. GPIO Control

This command set is used to control GPIO. System sends HW pin number which is taken from the dynamic control table to EC. Then EC uses this code to control real pin. System can read/write/set direction/set internal pull up/down GPIO. Only GPIO type device id in the dynamic control table can be a controller. EC does not allow system to control other pins which are not defined in the table.

4.1 Command Register and Address Description:

Command	Description
0x10	Write pin number into index
0x11	According to index, get GPIO pin status. 1-active, 0-unactive, 0xFF-fail
0x12	According to index, change GPIO pin status. 1-active, 0-unactive
0x1D	According to index, get GPIO input/output type. 1-output, 0-input, 0xFF-fail

Bit7 & Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x10 Input	✗	✗	✗	0x10Pull-up		✗
0x01 Output	✗	✗	✗	0x01Pull-dn		✗

0x1E	According to index, change GPIO input/output type. 1-output, 0-input

Bit7 & Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x10 Input	✗	✗	✗	0x10Pull-up		✗
0x01 Output	✗	✗	✗	0x01Pull-dn		✗

4.2 GPIO Default Table

There are 8 alternate GPIOs in the COM specification. The system can use commands to control these pins. The system can also set up a default table to configure these GPIO behaviors when power resumes for the first time. This table can be stored into the EEPROM for first time use. The addresses in the ACPI RAM are as follows:

Default Table in ACPI RAM

GPIO0 start address: 0xD8	GPIO4 start address: 0xE4
GPIO1 start address: 0xDB	GPIO5 start address: 0xE7
GPIO2 start address: 0xDE	GPIO6 start address: 0xEA
GPIO3 start address: 0xE1	GPIO7 start address: 0xED

Offset	Name	Description
0x00	Pin	HW pin number. EC will set up this value.
0x01	Type control	Value type is same as command 0x1D.
0x02	Default control	Set up default pin behavior

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
✗	✗	✗	✗	✗	✗	✗	HiLow

HiLow – If type control is input type, 1-high active and 0-low active.

If type control is output type, 1-default output high and 0-default output low.

4.3 Read GPIO Status Sequence

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x10 to 0x66	Send GPIO index command	>o 0x66 0x10
2	Wait IBF clear		x
3	Write pin number to 0x62	Write pin number to index	>o 0x62 0x07(GPIO7)
4	Wait OBF set		x
5	Read 0x62 port	If index setup is successful, EC will return pin number. If failed, EC will return 0xFF.	>i 0x62
6	Wait IBF clear		x
7	Write 0x11 to 0x66	Send read GPIO status command.	>o 0x66 0x11
8	Wait OBF set		x
9	Read 0x62 port	EC will return pin status according to the pin number which you set in index. 1-GPIO is high. 0-GPIO is low. 0xFF-fail.	>i 0x62

4.4 Write GPIO Status Sequence

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x10 to 0x66	Send GPIO index command	>o 0x66 0x10
2	Wait IBF clear		x
3	Write pin number to 0x62	Write pin number to index	>o 0x62 0x07(GPIO7)
4	Wait OBF set		x
5	Read 0x62 port	If index setup is successful, EC will return pin number. If failed, EC will return 0xFF.	>i 0x62
6	Wait IBF clear		x
7	Write 0x12 to 0x66	Send write GPIO status command.	>o 0x66 0x12
8	Wait OBF clear		x
9	Write pin status to 0x62 port	Write 0x01, GPIO pin will be set high. Write 0x00, GPIO pin will be set low.	>o 0x62 0x00(low)

4.5 Read GPIO Direction Sequence

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x10 to 0x66	Send GPIO index command	>o 0x66 0x10
2	Wait IBF clear		x
3	Write pin number to 0x62	Write pin number to index	>o 0x62 0x07(GPIO7)
4	Wait OBF set		x
5	Read 0x62 port	If index setup is successful, EC will return pin number. If failed, EC will return 0xFF.	>i 0x62
6	Wait IBF clear		x
7	Write 0x1D to 0x66	Send read GPIO status command	>o 0x66 0x1D
8	Wait OBF set		x
9	Read 0x62 port	EC will return pin status according to the pin number which you set in index. 0x80-input, 0x40-output. 0xFF-fail	>i 0x62

4.6 Write GPIO Direction Sequence

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x10 to 0x66	Send GPIO index command	>o 0x66 0x10
2	Wait IBF clear		x
3	Write pin number to 0x62	Write pin number to index	>o 0x62 0x07(GPIO7)
4	Wait OBF set		x
5	Read 0x62 port	If index setup is successful, EC will return pin number. If failed, EC will return 0xFF.	>i 0x62
6	Wait IBF clear		x
7	Write 0x1E to 0x66	Send write GPIO status command	>o 0x66 0x1E
8	Wait OBF clear		x
9	Write pin status to 0x62 port	Write 0x40, GPIO pin will be set output. Write 0x80, GPIO pin will be set input.	>o 0x62 0x40(output)

5. LED Control

5.1 Command Register and Address Description:

Command for LED control:

Command	Description
0xF0	Write
0xF1	Read

Data for LED:

Data	Description
Bit0	PG0 LED enable or disable; 0x01 to enable, 0x00 to disable
Bit1	PG1 LED enable or disable; 0x01 to enable, 0x00 to disable

5.2 Read Description:

Sequence to read LED:

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x80 to 0x66	Send read command	>o 0x66 0xF1
2	Wait OBF set		x
3	Read 0x62 port	data	>i 0x62

5.3 Write Description:

Sequence to write LED:

Step	Action	Description	RW Sample Code Command
0	Wait IBF clear		x
1	Write 0x81 to 0x66	Send write command	>o 0x66 0xF0
2	Wait IBF clear		x
3	Write RAM address to 0x62 port	Send control cata 0x01 to enable LED	>o 0x62 0x01