



**NEXCOM International Co., Ltd.**

# **IoT Automation Solutions Business Group**

## **Fan-less Computer**

### **NISE 300**

#### User Manual

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# Preface

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## Acknowledgements

NISE 300 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 B 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 B 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.

## 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.



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.

## 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 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. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. 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.
15. Do not place heavy objects on the equipment.
16. 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.
17. **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](http://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.
3. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash storage card.

## 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.



**Safety Warning:** This equipment is intended for installation in a Restricted Access Location only.

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## Package Contents

Before continuing, verify that the NISE 300 package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Name	Description	Qty
1	4NCPF00204X00	Terminal Blocks 2P Phoenix Contact:1777989	5.08mm Female DIP Green	1
2	4NCPM00203X00	Terminal Blocks 2P Phoenix Contact:1803578	3.81mm Male DIP Green	1
3	50311F0100X00	(H)Round Head Screw w/Spring+Flat Washer Long FEI:P3x6L	P3x6 iso/SW6x0.5 NI	1
4	50311F0295X00	Flat Head Screw Long FEI:F2x4 NYLOK NIGP	F2x4 NIGP NYLOK	2
5	50311F0326X00	Flat Head Screw Long FEI:F3x5 NYLOK NI+Heat Treatment	F3x5 NYLOK NI+Heat Treatment	8
6	50311F0330X00	Round Head Screw Long FEI:P2x3 ISO+Nylon	P2x3 NI NYLOK	12
7	5040450007X00	(H)NISE 300 IO Bracket VER.A for Antenna CHYUAN-JYH	57.6(L)x2.5(W)x25.35(H)(mm) Aluminum Alloy	1
8	5060900226X00	Mini PCIe Bracket CHYUAN-JYH	29x30x2.1mm SPCC t=1.0mm NI	1
9	6012200052X00	PE Zipper Bag #8	170x240mm, w/China RoHS Symbol	1
10	6012200053X00	PE Zipper Bag #3	100x70mm, w/China RoHS Symbol	1
11	60177B0272X00	(N)NISE 300 Quick Reference Guide VER:B SIZE:A4	KRAMER	1
12	602DCD0786X00	(N)NISE 300 DVD Driver VER:1.0	JCL	1
13	7800000078X00	DVI-I TO VGA Adapter For NISE 104 ST:ADDH27B	DVI-I (24+5)Pin Male to VGA 15Pin Female	1

## Ordering Information

The following information below provides ordering information for NISE 300.

- **Barebone**

### **NISE 300 System (P/N: 10J00030000X0)**

- **19V, 120W AC to DC power adapter w/o power core (P/N: 7400120013X00)**

# Chapter 1: Product Introduction

## Overview



## Key Features

- Onboard BGA type 4th Generation Intel® Core™ i7/i5/i3 Processor
- Mobile Intel® QM87 PCH
- 2x USB 3.0; 2x USB 2.0
- 6x Mini-PCIe, 2x RS232/422/485 with Auto Flow
- Support 1x mSATA, 1x CFast and 2x 2.5" SATA
- User-friendly I/O design; all I/O interfaces at front
- Support wireless communication; optional for Wi-Fi or 3G modules
- Support +9V and +30VDC input; support ATX power mode
- Easy replacement for RTC battery
- Dual Intel® GbE LAN Ports, support WoL, Teaming & PXE

## Hardware Specifications

### CPU Support

- Onboard BGA type 4th generation Intel® Core™ i7/i5/i3 processors
  - Core™ i7-4712HQ, Quad Core™, 3.3GHz
  - Core™ i5-4402E, Dual Core™, 1.6GHz (Onboard Default)
  - Core™ i3-4112E, Dual Core™, 1.8GHz
  - Celeron 2002E, Dual Core™, 1.5GHz
- Mobile Intel® QM87 PCH

### Main Memory

- 2x DDR3/DDR3L SO-DIMM sockets, support up to 8GB DDR3/DDR3L 1333/1600 RAM, un-buffered and non-ECC

### Display Option

- Three independent displays
  - VGA+DVI-D (through DVI-I Y Cable) + HDMI
- Dual independent displays
  - DVI-D + VGA
  - HDMI + VGA

### Front I/O Interface

- ATX power on/off switch
- 1x Remote Power ON/OFF Switch
- 1x Power Status/1x HDD Access LEDs
- 2x USB3.0 ports (Blue Color, 900mA per each)
- 2x USB2.0 Ports (500mA per each)
- 1x DVI-I, 1x HDMI
- 2x DB9 for COM1 & COM2
  - support RS232/422/485 with Auto Flow Control
  - support 5V/12V/Ring function by jumper setting

- 2x Intel® 82574L GbE LAN Ports, support PXE/Teaming/WoL
- 1x External CFast socket
- 1x SIM Card holder
- 1x External RTC Li-ion Battery holder
- 1x Line out and 1x Mic-in

### Internal I/O Interface

- 4x GPI and 4 GPO (5V, TTL Type)
- 4x COM Ports Box Header (RS232 only)
- 1x USB 2.0 Internal Connector, for USB dongle
- 2x USB 2.0 Internal Box Header

### Storage Device

- 1x CFast (SATA 3.0)
- 1x mSATA (SATA 3.0)
- 2x 2.5" HDD (SATA 3.0)

### Expansion Slot

- 1x Mini-PCIe socket for GSM/Wi-Fi
- 1x Mini-PCIe socket for mSATA
- 4x Mini-PCIe socket for expansion modules

### Power Requirement

- ATX Power Mode
- Typical +9V ~ +30VDC Input
- Power adapter: Optional AC to DC power adapter (+19VDC, 120W)



## Dimensions

- 310mm (W) x 212mm (D) x 80mm (H) without Wall-Mount bracket

## 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: -40°C to 85°C
- Operating humidity: 10% ~ 90% relative humidity, non-condensing  
Limits to be at 90% RH at max 40°C
- Shock Protection:  
HDD: 20G, half sine, 11ms, IEC60068-27  
CFast: 50G, half sine, 11ms, IEC60068-27
- Vibration Protection w/HDD Condition:  
Random: 0.5Grms @ 5~500 Hz, IEC60068-2-64  
Sinusoidal: 0.5Grms @ 5~500 Hz, IEC60068-2-6

## Certifications

- CE/FCC Class A

## OS Support List

- Windows 7 32-bit and 64-bit
- Windows 8.1 32-bit and 64-bit

## Optional Fieldbus Kit

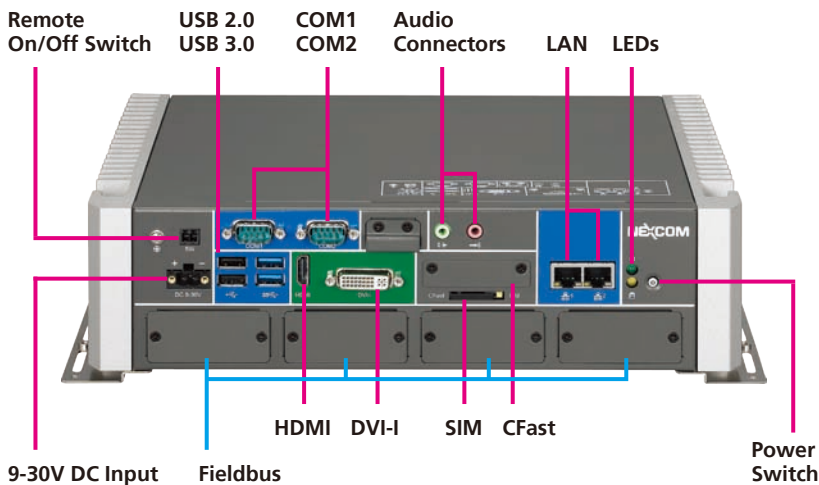
88J50090E00X0	FBI 90E-PNM KIT (w/25cm Cable)	PROFINET Master Module Kit
88J50090E01X0	FBI 90E-EP KIT (w/25cm Cable)	EtherNet/IP Master Module Kit
88J50090E02X0	FBI 90E-ECM KIT (w/25cm Cable)	EtherCAT Master Module Kit
88J50090E03X0	FBI 90E-PBM KIT (w/25cm Cable)	PROFIBUS Master Module Kit
88J50090E04X0	FBI 90E-DNM KIT (w/25cm Cable)	DeviceNet Master Module Kit
88J50090E13X0	FBI 90E-COM KIT (w/25cm Cable)	CANopen Master Module Kit
88J50090E15X0	FBI 90E-S3M KIT (w/25cm Cable)	SERCOSIII Master Module Kit

## Optional Module Kit

88J00030004X0	NISE300 3.5G Module Kit SIERRA: MC8090(SMS)	US
88J00030009X0	NISE300 3.5G Module Kit SIERRA: MC8092(SMS)	EU
88J00030009X0	NISE300 WiFi Module Kit INTEL: 7260.HMWWB.R	Dual Band Wireless-AC 7260, 2x2 AC+BT, HMC
88J00030002X0	NISE300 WiFi Module Kit INTEL: 7260.HMWBWNB.R	WLAN+ BLUETOOTH COMBO MODULE
88JK0ECOM03X0	NISKECOM3 UNIVERSAL KIT (w/25 cm DB26 cable)	Mini-PCIe to 4x COM Module w/isolation RS232/422/485 Auto Flow Control w/Universal Bracket
88JK0ECOM07X0	NISKECOM4 UNIVERSAL KIT (w/25 cm DB26 cable)	Mini-PCIe to 4 PORT RS232 MODULE w/ Universal Bracket

## Knowing Your NISE 300

### Front View



#### Remote On/Off Switch

Used to connect a remote to power on/off the system.

#### USB 3.0/2.0 Ports

Two USB 3.0 and two USB 2.0 ports to connect the system with USB 3.0/2.0 devices.

#### COM1 and COM2

Support RS232/422/485 with auto flow control.

### Rear View



#### Audio Connectors

A line-out and mic-in port to connect speakers or microphones.

#### LAN

2 Intel GbE LAN to connect the system to a local area network.

#### LEDs

Indicates the power status and hard drive activity of the system.

### **9-30V DC Input**

Used to plug a DC power cord.

### **HDMI**

Used to connect a high-definition display.

### **DVI-I**

Used to connect a digital LCD panel.

### **SIM**

Used to install a SIM card.

### **CFast**

Used to install a CFast card.

### **Fieldbus**

4 expansion slots for add-on fieldbus modules.

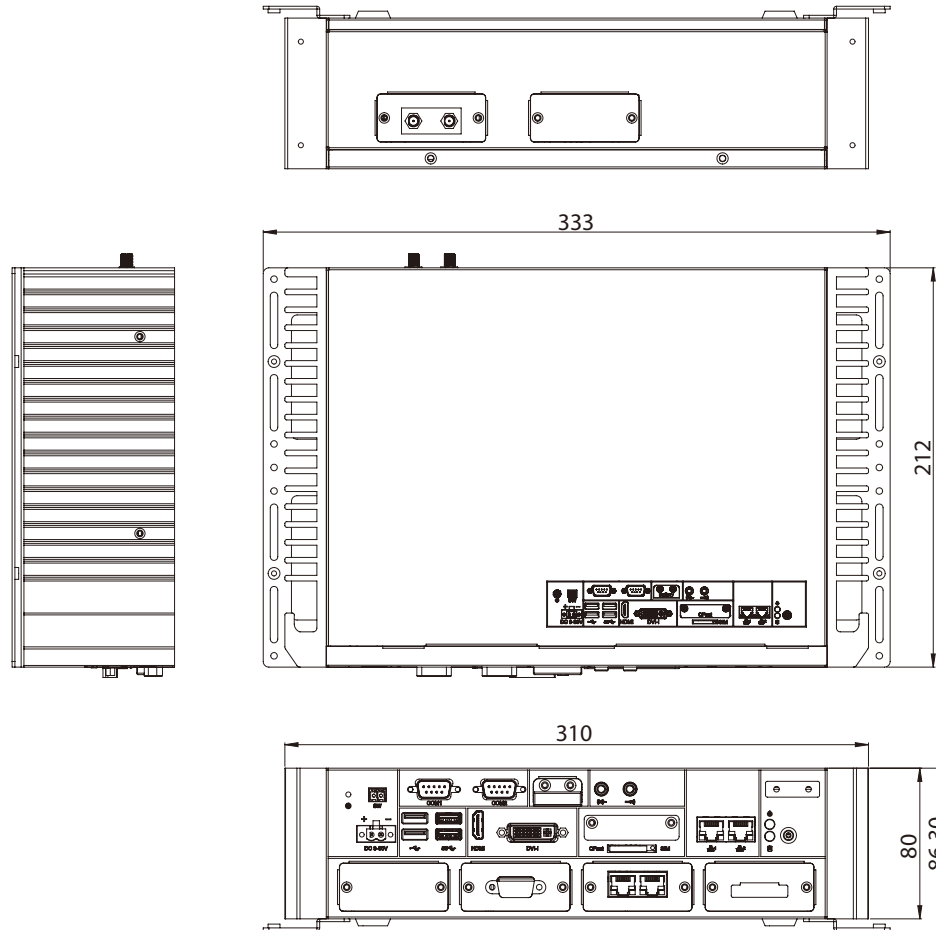
### **Power Switch**

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

### **Antenna Cover**

Used to connect an external antenna for Wi-Fi module.

# Mechanical Dimensions



# Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the NISE 300 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:

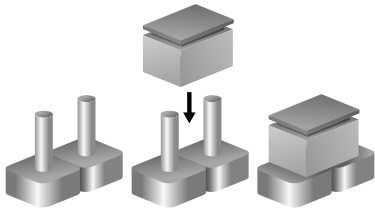
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal 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

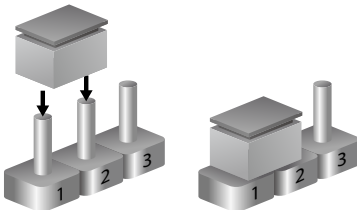
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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



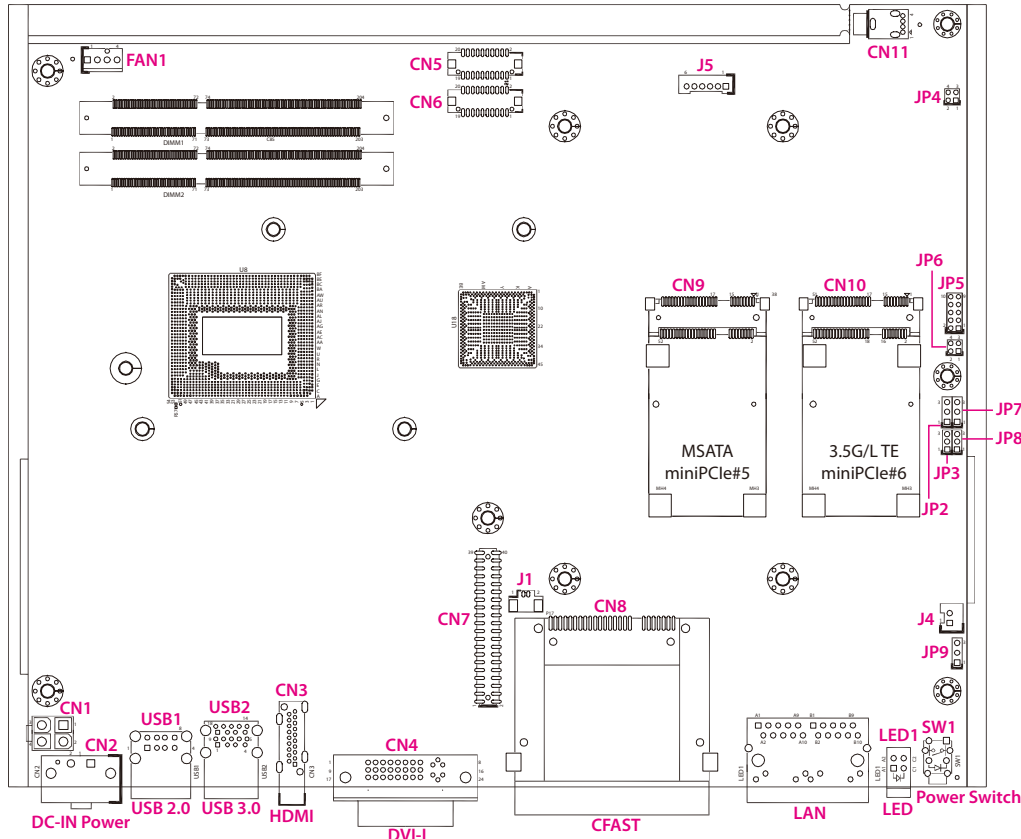
Three-Pin Jumpers: Pins 1 and 2 are Short



# Locations of the Jumpers and Connectors for NISB 300

The figures below are the top and bottom views of the NISB 300 main board used in NISE 300. It shows the locations of the jumpers and connectors.

## Top View



### CN9: miniPCIe#5

Add-On Card Support	Cable Length
mSATA	N/A
Fieldbus I/O	15cm

### CN10: miniPCIe#6

Add-On Card Support	Cable Length
GSM Module	N/A
Wi-Fi Module	30cm

### Bottom View



#### CN13: miniPCIe#1

Add-On Card Support	Cable Length
Fieldbus I/O	15cm

#### CN17: miniPCIe#2

Add-On Card Support	Cable Length
Fieldbus I/O	15cm
NISK300LAN-IO	25cm

#### CN14: miniPCIe#3

Add-On Card Support	Cable Length
Fieldbus I/O	25cm
NISK300LAN-IO	25cm

#### CN18: miniPCIe#4

Add-On Card Support	Cable Length
Fieldbus I/O	15cm
NISK300LAN-IO	25cm



## Jumpers

### CMOS Pin Header

Connector type: 1x3 3-pin header, 2.54mm pitch  
Connector location: JP2



Pin	Definition
1	RTC_RST#_PU
2	RTC_RST#
3	CLR_CMOS

1-2 On: default

### ME Pin Header Clear

Connector type: 1x3 3-pin header, 2.54mm pitch  
Connector location: JP7



Pin	Definition
1	SRTC_RST#_PU
2	SRTC_RST#
3	CLR_ME

1-2 On: default

## AT/ATX Mode Select

Connector type: 1x3 3-pin header, 2.54mm  
Connector location: JP9



Pin	Definition
1	NC
2	PWRON#
3	AT_MODE

1-2 On: default

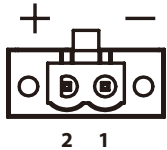
## Connector Pin Definitions

### External I/O Interfaces - Front Panel

#### 9V to 30VDC Input

Connector type: 1x2 2-pin terminal block

Connector location: CN2

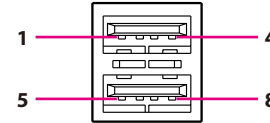


Pin	Definition
1	VIN_GND
2	VIN

#### USB 2.0

Connector type: Dual USB 2.0 ports

Connector location: USB1

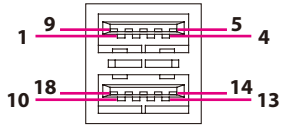


Pin	Definition	Pin	Definition
1	5VSB	2	USB_6N
3	USB_6P	4	GND
5	5VSB	6	USB_7N
7	USB_7P	8	GND
MH1	F_GND	MH2	F_GND
MH3	F_GND	MH4	F_GND

## USB 3.0

Connector type: Dual USB 3.0 ports

Connector location: USB2

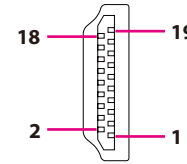


Pin	Definition	Pin	Definition
1	5VSB	2	USB_ON
3	USB_OP	4	GND
5	USB3_RX0_N	6	USB3_RX0_P
7	GND	8	USB3_TX0_N
9	USB3_TX0_P	10	5VSB
11	USB_1N	12	USB_1P
13	GND	14	USB3_RX1_N
15	USB3_RX1_P	16	GND
17	USB3_TX1_N	18	USB3_TX1_P
MH1	F_GND	MH2	F_GND
MH3	F_GND	MH4	F_GND

## HDMI

Connector type: HDMI port

Connector location: CN3

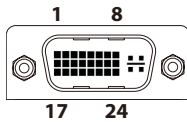


Pin	Definition	Pin	Definition
1	HDMI_DATA2_P_R	2	GND
3	HDMI_DATA2_N_R	4	HDMI_DATA1_P_R
5	GND	6	HDMI_DATA1_N_R
7	HDMI_DATA0_P_R	8	GND
9	HDMI_DATA0_N_R	10	HDMI_CLK_P_R
11	GND	12	HDMI_CLK_N_R
13	NC	14	NC
15	HDMI2_CTRL_CLK	16	HDMI2_CTRL_DATA
17	NC	18	HDMI2_VCC5
19	HDMI2_HPD_R	MH1	F_GND
MH2	F_GND	MH3	F_GND
MH4	F_GND		

## DVI-I

Connector type: 24-pin D-Sub, 2.0mm-M-180

Connector location: CN4

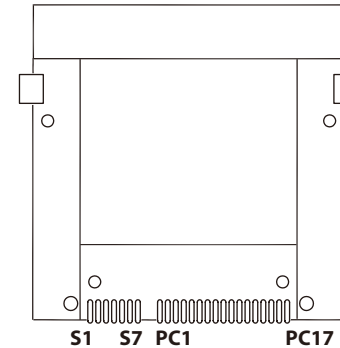


Pin	Definition	Pin	Definition
1	CHC_TX2_N	2	CHC_TX2_P
3	GND	4	NC
5	NC	6	DVI_I_DDC_C
7	DVI_I_DDC_D	8	VSYNC_VGA
9	CHC_TX1_N	10	CHC_TX1_P
11	GND	12	NC
13	NC	14	DVI_I_5V
15	GND	16	DVI_I_5V
17	CHC_TX0_N	18	CHC_TX0_P
19	GND	20	DDCCLK_VGA
21	DDCDATA_VGA	22	GND
23	CHC_CLK_P	24	CHC_CLK_N
MH1	F_GND	MH2	F_GND
C1	RED_VGA	C2	GREEN_VGA
C3	BLUE_VGA	C4	HSYNC_VGA
C5B	CRT_GND	C5A	VGADET

## CFast

Connector type: CFast Socket

Connector location: CN8

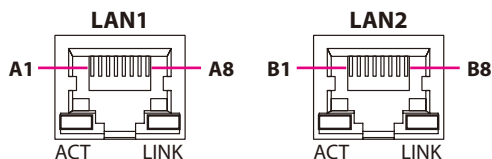


Pin	Definition	Pin	Definition
S1	GND	PC6	NC
S2	SATA_TXP0	PC7	GND
S3	SATA_TXN0	PC8	CFAST_LED1_C
S4	GND	PC9	CFAST_LED2_C
S5	SATA_RXN0	PC10	NC
S6	SATA_RXP0	PC11	NC
S7	GND	PC12	NC
PC1	CFAST_CDI	PC13	VCC3
PC2	GND	PC14	VCC3
PC3	NC	PC15	GND
PC4	NC	PC16	GND
PC5	NC	PC17	CFAST_CDO

## LAN1 and LAN2 Ports

Connector type: Dual RJ45 port with LEDs

Connector location: LAN1A (LAN1) and LAN1B (LAN2)



### LAN1

Pin	Definition	Pin	Definition
A1	MDI0P_LAN1	A2	MDI0N_LAN1
A3	MDI1P_LAN1	A4	MDI1N_LAN1
A5	MDI2P_LAN1	A6	MDI2N_LAN1
A7	MDI3P_LAN1	A8	MDI3N_LAN1
A9	VCC_LAN1	A10	GND
A11	3VSB	A12	LED_ACT#_LAN1
A13	LINK100#_LAN1	A14	LINK1G#_LAN1
MH1	F_GND		

### LAN2

Pin	Definition	Pin	Definition
B1	MDI0P_LAN2	B2	MDI0N_LAN2
B3	MDI1P_LAN2	B4	MDI1N_LAN2
B5	MDI2P_LAN2	B6	MDI2N_LAN2
B7	MDI3P_LAN2	B8	MDI3N_LAN2
B9	VCC_LAN2	B10	GND
B11	3VSA	B12	LED_ACT#_LAN2
B13	LINK100#_LAN2	B14	LINK1G#_LAN2
MH2	F_GND		

## LED Indicators

Connector location: LED1



LED	Status
Power	Light On: Power On Light Off: Power Off
CFast/HDD	Blinking: Active

Pin	Definition
A1	LED_HDDP
A2	LED_PWRP
C1	HD_LEDN
C2	LED_PWRN

## Power Switch

Connector location: SW1



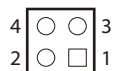
Pin	Definition	Pin	Definition
1	GND	2	PBT_PU
3	PBT_PU	4	GND
A1	PWR_SW_P	C1	PWR_SW_N
MH1	GND	MH2	GND

## Internal Connectors

### External SMBus

Connector type: 2x2 4-pin header, 2.0mm pitch

Connector location: JP4



Pin	Definition
1	GND
2	VCC3
3	SMB_DATA
4	SMB_CLK

### SIM Card Line-out Pin Header

Connector type: 1x3 3-pin header, 2.0mm pitch

Connector location: JP8



Pin	Definition
1	LOUT_RL
2	LOUT_RR
3	ANGND



## SIM Card Mic-in Pin Header

Connector type: 1x3 3-pin header, 2.0mm pitch

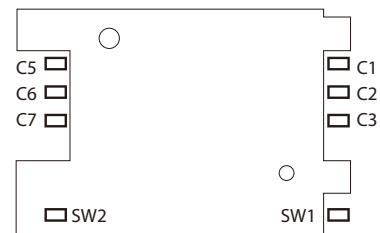
Connector location: JP3



Pin	Definition
1	MIC_RL
2	MIC_RR
3	ANGND

## SIM Card Socket

Connector location: IDE1

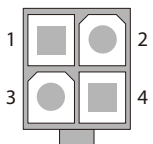


Pin	Definition	Pin	Definition
C1	UIM_PWR	C2	UIM_RESET
C3	UIM_CLK	C5	GND
C6	UIM_VPP	C7	UIM_DATA
SW1	NC	SW2	NC

## DC-In Power Connector

Connector type: 2x2 4-pin header

Connector location: CN1



Pin	Definition
1	GND
2	GND
3	VIN
4	VIN

## Reset JST Connector

Connector type: 1x2 2-pin header, 2.5mm pitch

Connector location: J4

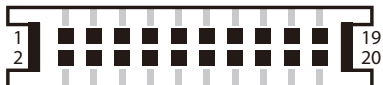


Pin	Definition
1	PM_RESET#_J
2	GND

## LVDS Channel A Connector

Connector type: 2x10 20-pin header, 1.25mm pitch

Connector location: CN5

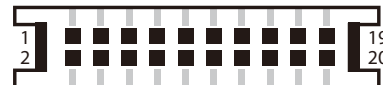


Pin	Definition	Pin	Definition
1	LVDS_DDC_CLK	2	LVDS_DDC_DATA
3	PANEL1_VDD	4	LVDSA_DATA0
5	LVDSA_DATA3	6	LVDSA_DATA#0
7	LVDSA_DATA#3	8	PANEL1_VDD
9	GND	10	LVDSA_DATA1
11	LVDSA_CLK	12	LVDSA_DATA#1
13	LVDSA_CLK#	14	GND
15	GND	16	PANEL1_BACKLIGHT
17	LVDSA_DATA2	18	PANEL1_BACKLIGHT
19	LVDSA_DATA#2	20	GND
MH1	GND	MH2	GND

## LVDS Channel B Connector

Connector type: 2x10 20-pin header, 1.25mm pitch

Connector location: CN6

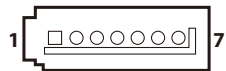


Pin	Definition	Pin	Definition
1	LVDS_DDC_CLK	2	LVDS_DDC_DATA
3	PANEL1_VDD	4	LVDSB_DATA0
5	LVDSB_DATA3	6	LVDSB_DATA#0
7	LVDSB_DATA#3	8	PANEL1_VDD
9	GND	10	LVDSB_DATA1
11	LVDSB_CLK	12	LVDSB_DATA#1
13	LVDSB_CLK#	14	GND
15	GND	16	PANEL1_BACKLIGHT
17	LVDSB_DATA2	18	PANEL1_BACKLIGHT
19	LVDSB_DATA#2	20	GND
MH1	GND	MH2	GND

## SATA3 Connector 2

Connector type: 1x7 7-pin header, 1.27mm pitch

Connector location: CN16

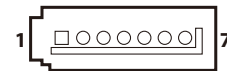


Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP5
3	SATA_TXN5	4	GND
5	SATA_RXN5	6	SATA_RXP5
7	GND		

## SATA3 Connector 1

Connector type: 1x7 7-pin header, 1.27mm pitch

Connector location: CN19



Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP1
3	SATA_TXN1	4	GND
5	SATA_RXN1	6	SATA_RXP1
7	GND		

## SATA3 Power Connector 1

Connector type: 1x4 4-pin header, 2.54mm pitch

Connector location: CN15



Pin	Definition
1	+12V
2	GND
3	GND
4	VCC5

## SATA3 Power Connector 2

Connector type: 1x4 4-pin header, 2.54mm pitch

Connector location: CN20



Pin	Definition
1	+12V
2	GND
3	GND
4	VCC5

### USB 2.0 JST Connector

Connector type: 1x6 JST, 6-pin header, 2.0mm pitch  
 Connector location: J5



Pin	Definition	Pin	Definition
1	5VSB	2	USB_10N
3	USB_10P	4	USB_11N
5	USB_11P	6	GND

### COM6 Connector

Connector type: 1x10 10-pin header, 1.0mm pitch  
 Connector location: J6



Pin	Definition	Pin	Definition
1	SP6_DCD_CN10_22	2	SP6_RXD_CN10_32
3	SP6_TXD_CN10_24	4	SP6_DTR_CN10_34
5	GND	6	SP6_DSR_CN10_36
7	SP6_RTS_CN10_26	8	SP6_CTS_CN10_38
9	SP6_RI_CN10_28	10	VCC5
MH1	GND	MH2	GND

### COM2 RS232 5V/12V RI# Pin Power Select

Connector type: 1x5 5-pin header, 2.00mm pitch

Connector location: JP2(4-5)

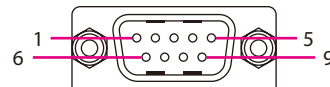


Pin	Definition	Pin	Definition
1	VCC5_RI#	2	SP2_RI_T
3	+12V_RI#	4	SP2_RI_T
5	SP2_RI		

### COM1 and COM2 Connectors

Connector type: DB-9 port, 9-pin D-Sub

Connector location: COM1 and COM 2



#### RS232/RS422/RS485 Pin Definition for COM1 & COM2:

RS232		RS422		RS485	
Pin	Definition	Pin	Definition	Pin	Definition
1	SP1_DCD	1	SP1_TX-	1	SP1_DATA-
2	SP1_RXD	2	SP1_TX+	2	SP1_DATA+
3	SP1_TXD	3	SP1_RX+	3	NC
4	SP1_DTR	4	SP1_RX-	4	NC
5	GND	5	GND	5	GND
6	SP1_DSR	6	SP1_RTS-	6	NC
7	SP1_RTS	7	SP1_RTS+	7	NC
8	SP1_CTS	8	SP1_CTS+	8	NC
9	SP3_RI	9	SP1_CTS-	9	NC

### COM5 Connector

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

Connector location: J9



Pin	Definition	Pin	Definition
1	SP5_DCD_CN10_2	2	SP5_RXD_CN10_12
3	SP5_TXD_CN10_4	4	SP5_DTR_CN10_14
5	GND	6	SP5_DSR_CN10_16
7	SP5_RTS_CN10_6	8	SP5_CTS_CN10_18
9	SP5_RI_CN10_8	10	VCC5
MH1	GND	MH2	GND

### COM4 Connector

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

Connector location: J8



Pin	Definition	Pin	Definition
1	SP4_DCD_CN10_21	2	SP4_RXD_CN10_31
3	SP4_TXD_CN10_23	4	SP4_DTR_CN10_33
5	GND	6	SP4_DSR_CN10_35
7	SP4_RTS_CN10_25	8	SP4_CTS_CN10_37
9	SP4_RI_CN10_19	10	VCC5
MH1	GND	MH2	GND



## COM3 Connector

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

Connector location: J7



Pin	Definition	Pin	Definition
1	SP3_DCD_CN10_1	2	SP3_RXD_CN10_11
3	SP3_TXD_CN10_3	4	SP3_DTR_CN10_13
5	GND	6	SP3_DSR_CN10_15
7	SP3_RTS_CN10_5	8	SP3_CTS_CN10_17
9	SP3_RI_CN10_7	10	VCC5
MH1	GND	MH2	GND

## Battery Connector

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

Connector location: J1

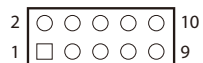


Pin	Definition
1	GND
2	BAT

## GPIO Pin Header

Connector type: 2x5 10-pin header, 2.0mm pitch

Connector location: JP5

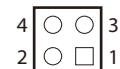


Pin	Definition	Pin	Definition
1	VCC5	2	GND
3	GPO24	4	GPI20
5	GPO25	6	GPI21
7	GPO26	8	GPI22
9	GPO27	10	GPO27

## GPIO LED Pin Header

Connector type: 2x2 4-pin header, 2.0mm pitch

Connector location: JP6



Pin	Definition
1	GPO_LED0
2	GND
3	GPO_LED1
4	GND

## Smart Fan1 Connector

Connector type: 1x4 4-pin Wafer, 2.54mm pitch

Connector location: FAN1

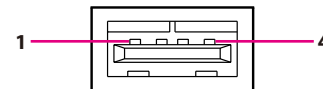


Pin	Definition
1	GND
2	+12V
3	FAN_TAC1
4	FAN_CTL1

## USB Connector

Connector type: USB Port

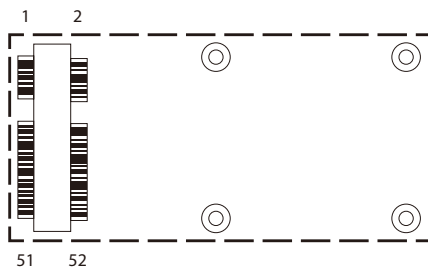
Connector location: CN11



Pin	Definition
1	5VSB
2	USB_12N
3	USB_12P
4	GND

## Mini-PCIe Connector (3.5G/LTE)

Connector location: CN10

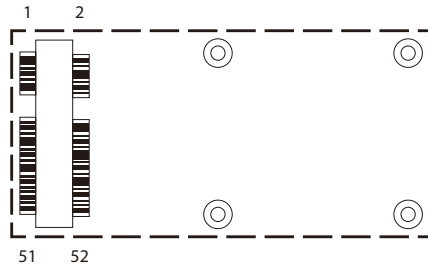


Pin	Definition	Pin	Definition
1	MIC_R	2	3VSB
3	MIC_L	4	GND
5	LOUT_R	6	1V5
7	LOUT_L	8	UIM_PWR
9	GND	10	UIM_DATA
11	CN6_REFCLK-	12	UIM_CLK
13	CN6_REFCLK+	14	UIM_RESET
15	GND	16	UIM_VCCP
17	NC	18	GND
19	NC	20	3VSB
21	GND	22	CN6_RESET
23	PEG_RXNO_MINI	24	3VSB
25	PEG_RXPO_MINI	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1V5
29	GND	30	SMBCLK_MAIN
31	CN6_PCIETXN	32	SMBDATA_MAIN
33	CN6_PCIETXP	34	GND
35	GND	36	USB_4N
37	GND	38	USB_4P
39	3VSB	40	GND
41	3VSB	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	1V5
49	NC	50	GND
51	NC	52	3VSB

## Mini-PCIe Connector (mSATA)

Connector location: CN9

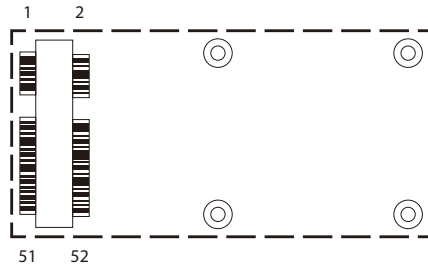


Pin	Definition	Pin	Definition
1	PCIE_WAKE#	2	3VSB_MINI6
3	NC	4	GND
5	NC	6	1V5
7	PCIE_CLKREQ#7	8	NC
9	GND	10	NC
11	CLK_PCIE_MINI4_N	12	NC
13	CLK_PCIE_MINI4_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	3VSB
21	GND	22	BUF_PLT_RST#
23	PCIE_mSATA_RXP	24	3VSB_MINI6
25	PCIE_mSATA_RXN	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1V5
29	GND	30	SMBCLK_MAIN
31	PCIE_TXN3_MINI_PCIE	32	SMBDATA_MAIN
33	PCIE_TXP3_MINI_PCIE	34	GND
35	GND	36	USB_5N
37	GND	38	USB_5P
39	3VSB_MINI6	40	GND
41	3VSB_MINI6	42	NC
43	PCIE_mSATA_RXN	44	NC
45	NC	46	NC
47	NC	48	1V5
49	NC	50	GND
51	PCIE_mSATA_SEL_51	52	3VSB_MINI6

## Mini-PCIe Connector 1

Connector location: CN13

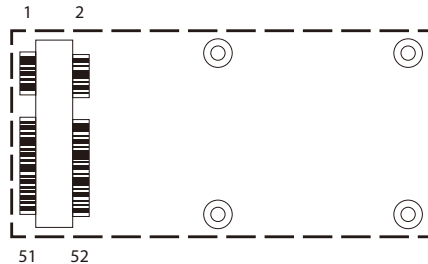


Pin	Definition	Pin	Definition
1	PCIE_WAKE#	2	3VSB_MINI2
3	NC	4	GND
5	NC	6	1V5
7	PCIE_CLKREQ#2	8	NC
9	GND	10	NC
11	CLK_PCIE_MINI2_N	12	NC
13	CLK_PCIE_MINI2_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	3VSB
21	GND	22	BUF_PLT_RST#
23	PCIE_RXN3_MINI_PCIE	24	3VSB
25	PCIE_RXP3_MINI_PCIE	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1V5
29	GND	30	SMBCLK_MAIN
31	PCIE_TXN3_MINI_PCIE	32	SMBDATA_MAIN
33	PCIE_TXP3_MINI_PCIE	34	GND
35	GND	36	USB_9N
37	GND	38	USB_9P
39	3VSB_MINI2	40	GND
41	3VSB_MINI2	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	1V5
49	NC	50	GND
51	NC	52	3VSB_MINI2

## Mini-PCIe Connector 2

Connector location: CN17

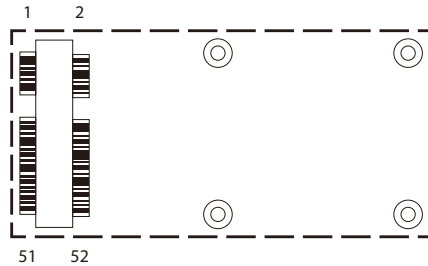


Pin	Definition	Pin	Definition
1	PCIE_WAKE#	2	3VSB_MINI4
3	NC	4	GND
5	NC	6	1V5
7	PCIE_CLKREQ#4	8	NC
9	GND	10	NC
11	CLK_PCIE_MINI4_N	12	NC
13	CLK_PCIE_MINI4_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	3VSB
21	GND	22	BUF_PLT_RST#
23	PCIE_RXN8_MINI_PCIE	24	3VSB
25	PCIE_RXP8_MINI_PCIE	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1V5
29	GND	30	SMBCLK_MAIN
31	PCIE_TXN8_MINI_PCIE	32	SMBDATA_MAIN
33	PCIE_TXP8_MINI_PCIE	34	GND
35	GND	36	USB_3N
37	GND	38	USB_3P
39	3VSB_MINI4	40	GND
41	3VSB_MINI4	42	NC
43	GND	44	NC
45	PCIE_TXN4_MINI_PCIE	46	NC
47	PCIE_TXP4_MINI_PCIE	48	1V5
49	PCIE_RXN4_MINI_PCIE	50	GND
51	PCIE_RXP4_MINI_PCIE	52	3VSB_MINI4

## Mini-PCIe Connector 3

Connector location: CN14



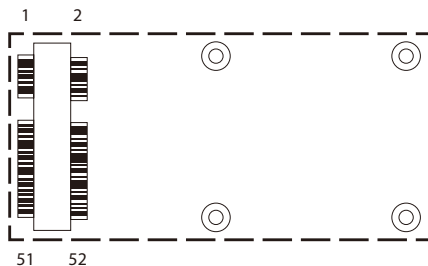
Pin	Definition	Pin	Definition
1	PCIE_WAKE#	2	3VSB_MINI1
3	NC	4	GND
5	NC	6	1V5
7	PCIE_CLKREQ#1	8	NC
9	GND	10	NC
11	CLK_PCIE_MINI1_N	12	NC
13	CLK_PCIE_MINI1_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	3VSB
21	GND	22	BUF_PLT_RST#
23	PCIE_RXN1_MINI_PCIE	24	3VSB
25	PCIE_RXP1_MINI_PCIE	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1V5
29	GND	30	SMBCLK_MAIN
31	PCIE_TXN1_MINI_PCIE	32	SMBDATA_MAIN
33	PCIE_TXP1_MINI_PCIE	34	GND
35	GND	36	USB_8N
37	GND	38	USB_8P
39	3VSB_MINI1	40	GND
41	3VSB_MINI1	42	NC
43	GND	44	NC
45	PCIE_TXN2_MINI_PCIE	46	NC
47	PCIE_TXP2_MINI_PCIE	48	1V5
49	PCIE_RXN2_MINI_PCIE	50	GND
51	PCIE_RXP2_MINI_PCIE	52	3VSB_MINI1



## Mini-PCIe Connector 4

Connector location: CN18



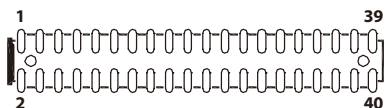
Pin	Definition	Pin	Definition
1	PCIE_WAKE#	2	3VSB_MINI3
3	NC	4	GND
5	NC	6	1V5
7	PCIE_CLKREQ#3	8	NC
9	GND	10	NC
11	CLK_PCIE_MINI3_N	12	NC
13	CLK_PCIE_MINI3_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	3VSB
21	GND	22	BUF_PLT_RST#
23	PCIE_RXN6_MINI_PCIE	24	3VSB
25	PCIE_RXP6_MINI_PCIE	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1V5
29	GND	30	SMBCLK_MAIN
31	PCIE_TXN6_MINI_PCIE	32	SMBDATA_MAIN
33	PCIE_TXP6_MINI_PCIE	34	GND
35	GND	36	USB_2N
37	GND	38	USB_2P
39	3VSB_MINI3	40	GND
41	3VSB_MINI3	42	NC
43	GND	44	NC
45	PCIE_TXN5_MINI_PCIE	46	NC
47	PCIE_TXP5_MINI_PCIE	48	1V5
49	PCIE_RXN5_MINI_PCIE	50	GND
51	PCIE_RXP5_MINI_PCIE	52	3VSB_MINI3

## Board to Board Connector

Connector type: 2x20 40-pin header, 2.0mm pitch

Connector location: CN7



Pin	Definition	Pin	Definition
1	COM2_DCD#	2	COM1_DCD#
3	COM2_RXD	4	COM1_RXD
5	COM2_TXD	6	COM1_TXD
7	COM2_DTR#	8	COM1_DTR#
9	GND	10	GND
11	COM2_DSR#	12	COM1_DSR#
13	COM1_DSR#	14	COM1_RTS#
15	COM2_CTS#	16	COM1_CTS#
17	COM2_RI#	18	COM1_RI#
19	GND	20	GND
21	HDA_SPKR	22	COM2_232_EN#
23	HDA_SDOUT	24	COM2_422_EN#
25	HDA_BIT_CLK	26	COM2_485_EN#
27	HDA_SDINO	28	COM1_232_EN#
29	HDA_SYNC	30	COM1_422_EN#
31	HDA_RST#	32	COM1_485_EN#
33	VCC5_POK	34	BAT
35	PBT_PU	36	ICH_SP_RI
37	GND	38	5VSB
39	+12V	40	5VSB

# Chapter 3: System Setup

## Removing the Top Cover



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. Locate the 2 screws on the back of the top cover and remove them.



2. Lift up the cover and remove it from the chassis.



## Removing the Bottom Cover

1. Locate the 8 screws on the bottom cover and remove them.



2. Remove the bottom cover.



## Installing a SO-DIMM



Remove the top cover first.

1. Locate the SO-DIMM socket.



2. Release the lock on the SO-DIMM socket.



3. Insert the modules into the sockets at an 90 degree angle. Apply firm even pressure to each end of the module until it slips into the socket.



## Installing a mSATA Module

1. Locate the Mini-PCIe slot (CN9) on the board.

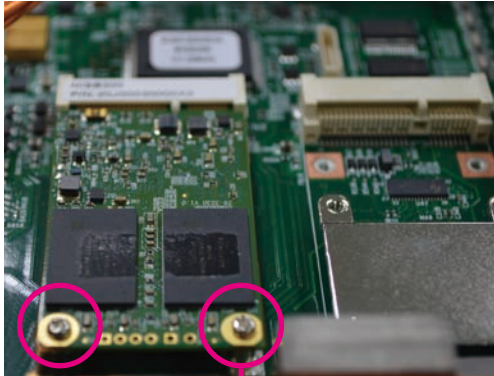


Mini PCI Express slot  
(CN9)

2. Insert the mSATA module into the Mini-PCIe slot at 45 degree angle until the gold-plated connector on the edge of the module completely disappears into the slot.



3. Push the mSATA module down and secure it with screws.

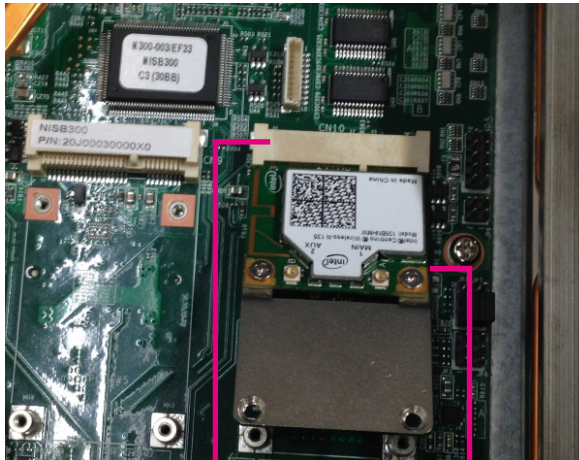


Screw



## Installing a Wi-Fi Module

1. Locate the Mini-PCIe slot (CN10) and insert the Wi-Fi module into the Mini-PCIe slot at 45 degree angle until the gold-plated connector on the edge of the module completely disappears into the slot.



Mini PCI Express slot  
(CN10)

Wi-Fi module

2. Push the Wi-Fi module down and secure it with screws.



Mounting screw

3. Connect the antenna to the RF connector on the Wi-Fi module.



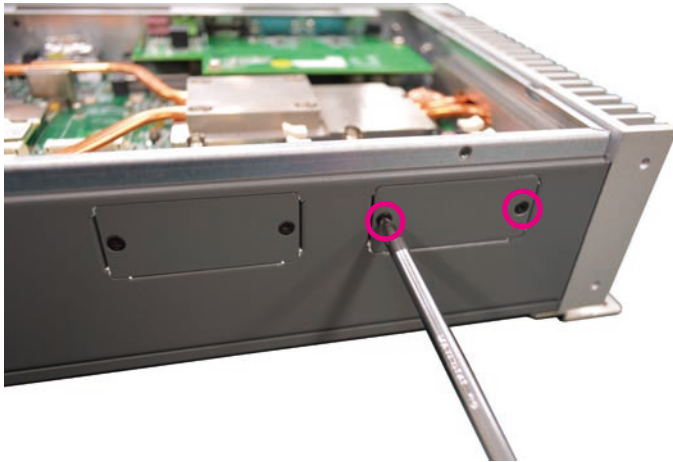
RF connector

4. Ensure the antenna cable is secured tightly to the I/O bracket.

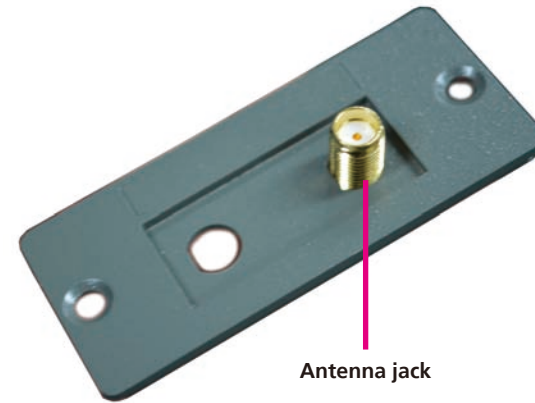


## Installing an Antenna

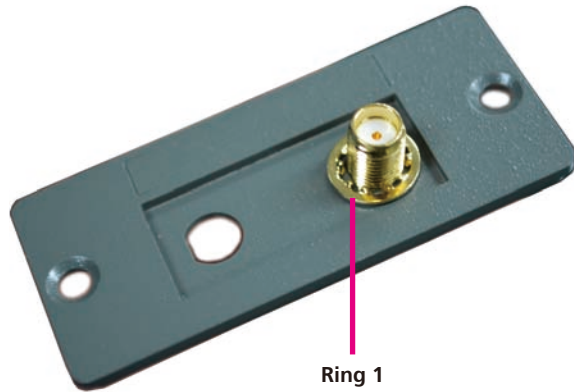
1. Remove the original I/O cover at the back.



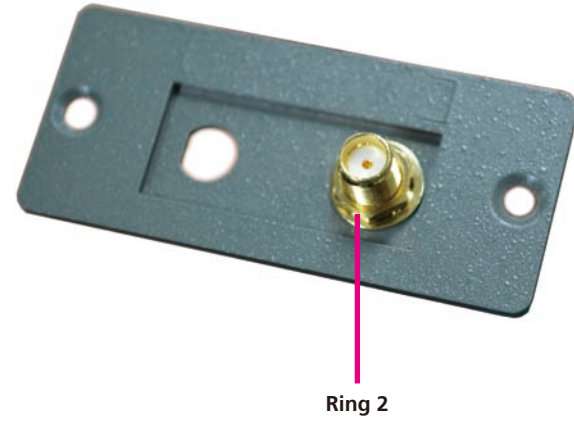
2. Insert the antenna jack into the I/O cover hole.



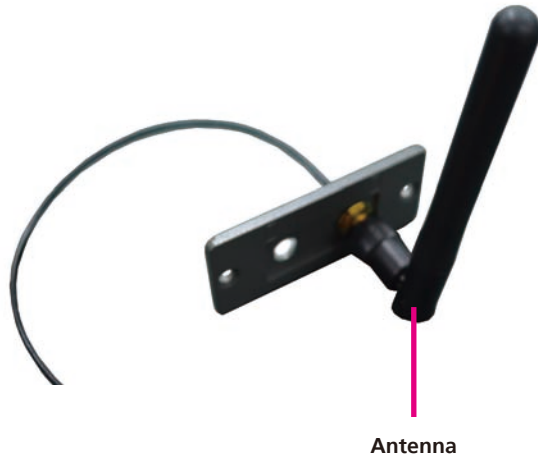
3. Insert Ring 1 onto the antenna jack.



4. Insert Ring 2 onto the antenna jack.

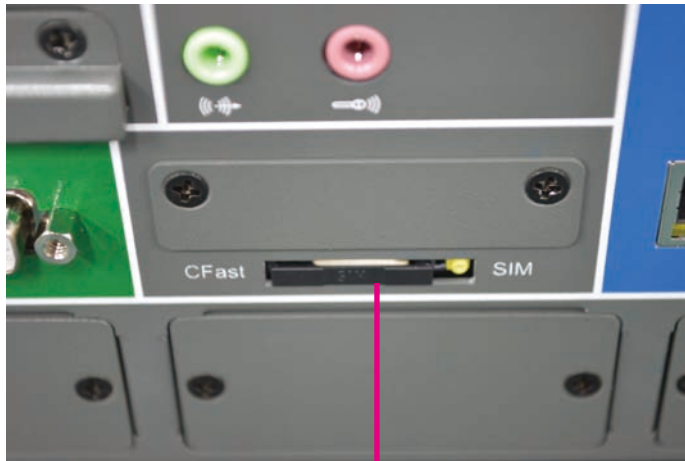


5. Secure the external antenna onto antenna jack.



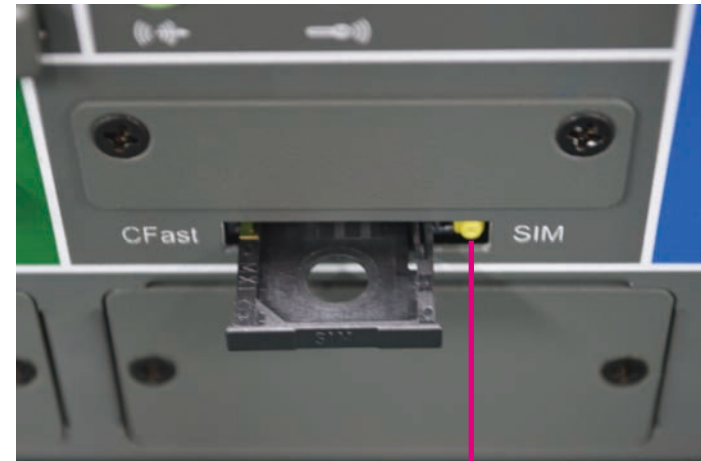
## Installing a SIM Card

1. Locate the SIM card socket on the front panel.



SIM card socket

2. Push the yellow button to release the SIM card holder.



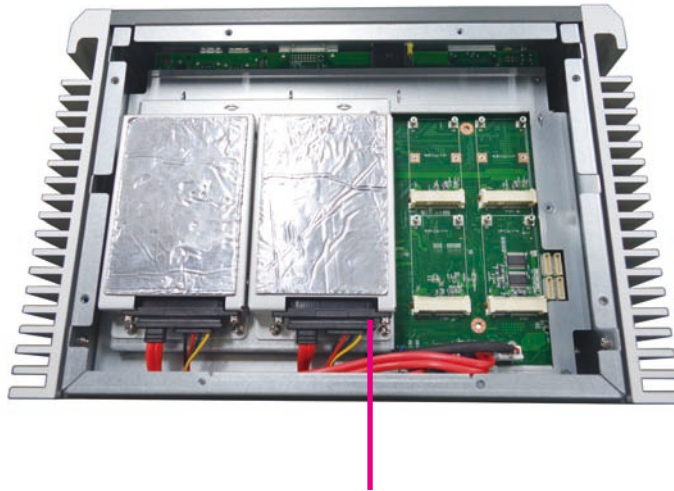
Push button

3. Place the SIM card into the SIM card holder and secure it to the original position.



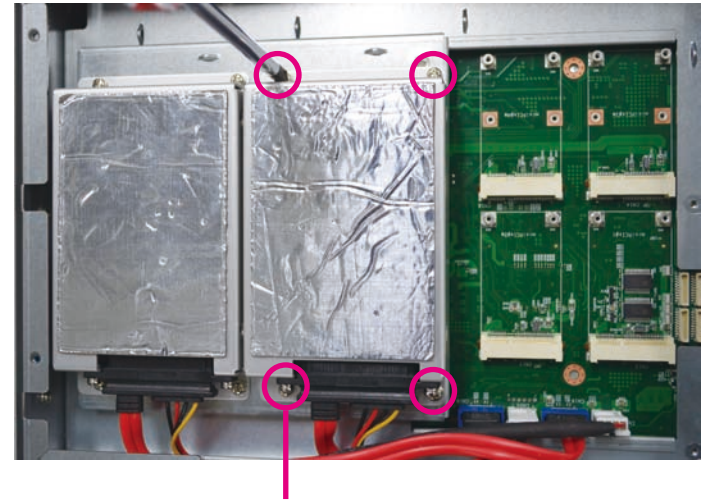
## Installing a SATA Hard Drive

1. Locate the internal HDD bracket.



HDD bracket

2. Unmount the screws to remove the HDD bracket.



Mounting screw

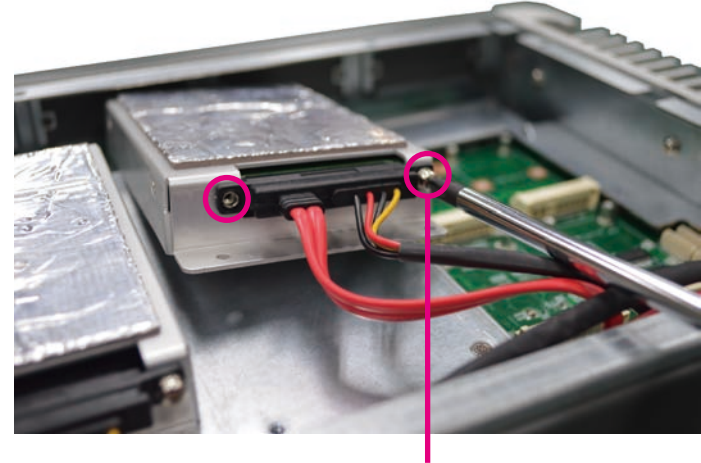


3. Place the 2.5" HDD onto the HDD bracket and secure it with screws.



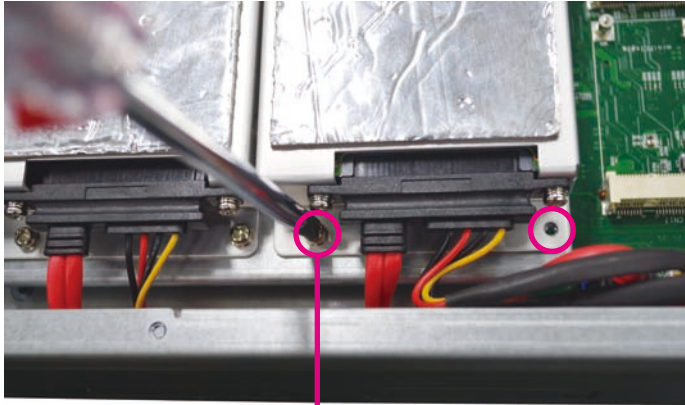
Mounting screw

4. Secure the SATA connector to the HDD bracket.



Mounting screw

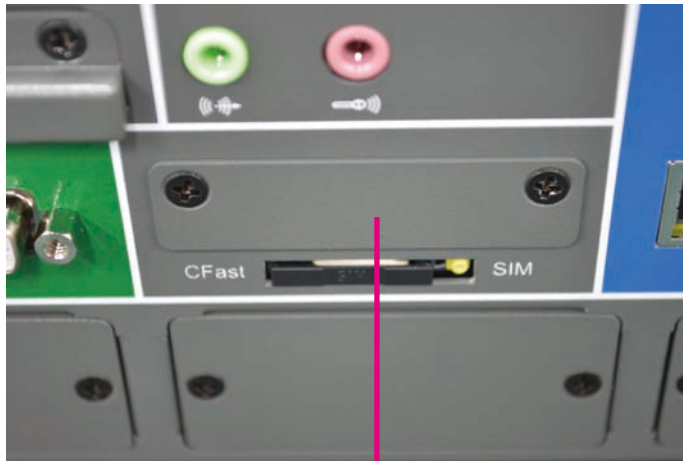
5. Secure the HDD bracket back to its original position.



Mounting screw

## Installing a CFast Card

1. Locate the CFast socket on the front panel.



CFast socket

2. Remove the cover of the CFast socket and insert the CFast card.



3. Secure the CFast cover to the original position.



## Packing



NISE 300 plastic bag and EPE reference.

**Front View of Packing**



**Rear View of Packing**



Top View of Packing



Bottom View of Packing



# Chapter 4: BIOS Setup

This chapter describes how to use the BIOS setup program for the NISE 300. 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 Web site at [www.nexcom.com.tw](http://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. Another way to enter Setup is to power on the computer and wait for the following message during the POST:

TO ENTER SETUP BEFORE BOOT PRESS + +

Press the 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.
	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.
	Selects a field.
	Displays General Help.
	Load previous values.
	Load optimized default values.
	Saves and exits the Setup program.
	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  .

## 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  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.



**Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.**

Main	Advanced	Chipset	Boot	Security	Save & Exit
<b>BIOS Information</b>					
BIOS Vendor	American Megatrends				
Core Version	4.6.5.4				
Compliance	UEFI 2.3.1; PI 1.2				
Project Version	N300-006 x64				
Build Date and Time	02/27/2014 15:13:09				
<b>Processor Information</b>					
Name	Haswell				
Brand String	Intel(R) Core(TM) i5-440				
Frequency	306c3				
Processor ID	C0				
Stepping					
Number of Processors	2Core(s) / 4Thread(s)				
Microcode Revision	8				
GT Info	GT3 (800 MHz)				
<b>IGFX VBIOS Version</b>					
Memory RC Version	2170				
Total Memory	1.5.0.0				
Memory Frequency	2048 MB (DDR3)				
	1333 Mhz				
<b>PCH Information</b>					
Name	LynxPoint				
PCH SKU	QM87				

←→: 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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### 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) 2012 American Megatrends, Inc.**

Main	Advanced	Chipset	Boot	Security	Save & Exit
<ul style="list-style-type: none"> <li>▶ CPU Configuration</li> <li>▶ SATA Configuration</li> <li>▶ USB Configuration</li> <li>▶ IT8783F Super IO Configuration</li> <li>▶ IT8783F H/W Monitor</li> <li>▶ Smart Fan Function</li> </ul>					
					CPU Configuration 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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## CPU Configuration

This section is used to configure the CPU.

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Advanced

CPU Configuration

Intel(R) Core(TM) CPU i5-4402E CPU @ 1.60GHz	
CPU Signature	306c3
Processor Family	6
Microcode Patch	8
FSB Speed	100 MHz
Max CPU Speed	1600 MHz
Min CPU Speed	800 MHz
CPU Speed	1600 MHz
Processor Cores	2
Intel HT Technology	Supported
Intel VT-x Technology	Supported
Intel SMX Technology	Supported
64-bit	Supported
EIST Technology	Supported
CPU C3 state	Supported
CPU C6 state	Supported
CPU C7 state	Supported
L1 Data Cache	32 kB x 2
L1 Code Cache	32 kB x 2
L2 Cache	256 kB x 2
L3 Cache	3072 kB

→←: 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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### Hyper Threading

Enables or disables hyper-threading technology.

### Active Processor 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.

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Advanced

Max CPU Speed	1600 MHz	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
Min CPU Speed	800 MHz	
CPU Speed	1600 MHz	
Processor Cores	2	
Intel HT Technology	Supported	
Intel VT-x Technology	Supported	
Intel SMX Technology	Supported	
64-bit	Supported	
EIST Technology	Supported	
CPU C3 state	Supported	
CPU C6 state	Supported	
CPU C7 state	Supported	
L1 Data Cache	32 kB x 2	
L1 Code Cache	32 kB x 2	
L2 Cache	256 kB x 2	
L3 Cache	3072 kB	
Hyper-threading	[Enabled]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Active Processor Cores	[All]	
Limit CPUID Maximum	[Disabled]	
Intel Virtualization Technology	[Enabled]	
EIST	[Disabled]	
Turbo Mode	[Disabled]	
CPU C states	[Disabled]	

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### Intel® Virtualization Technology

Enables or disables Intel® Virtualization technology.

### EIST

Enables or disables Intel® SpeedStep.

### Turbo Mode

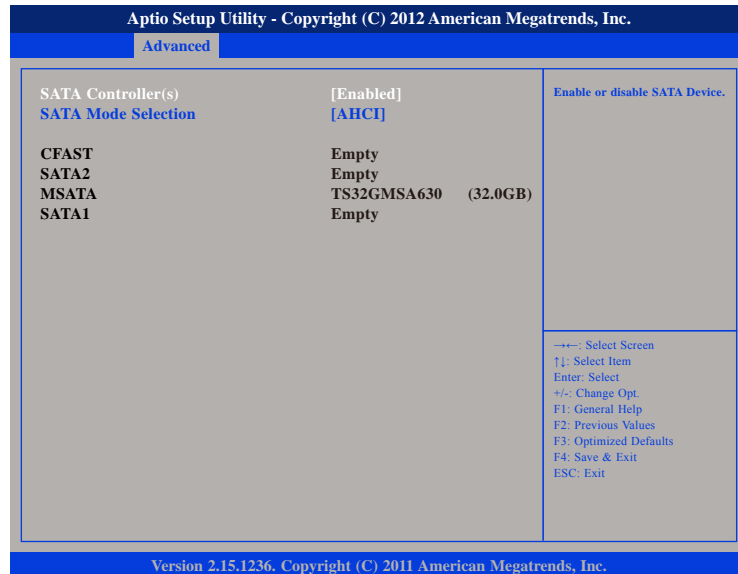
Enables or disables turbo mode.

### CPU C States

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

## SATA Configuration

This section is used to configure the SATA drives.



### SATA Controller(s)

Enables or disables the SATA controller.

### SATA Mode Selection

Configures the SATA as IDE, AHCI or RAID mode.

- IDE This option configures the Serial ATA drives as Parallel ATA physical storage device.
- RAID This option allows you to create RAID or Intel Matrix Storage configuration on Serial ATA devices.
- 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.

## USB Configuration

This section is used to configure the USB.



### 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

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

### EHCI Hand-off

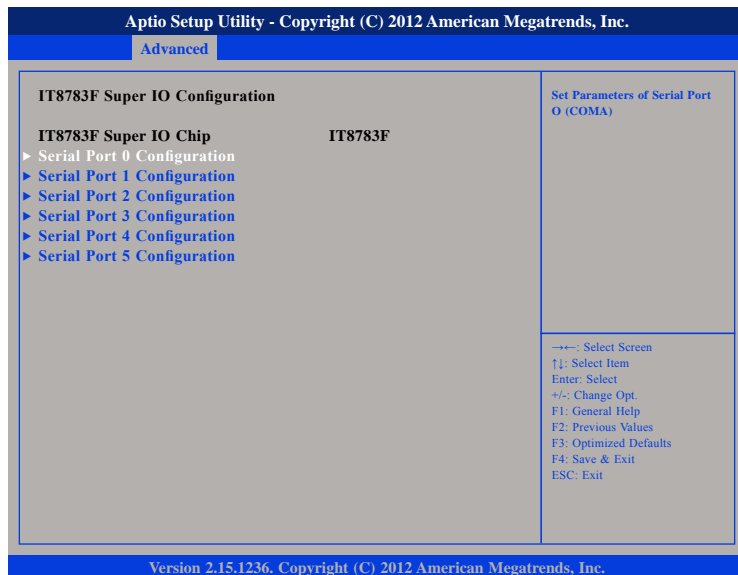
This is a workaround for OSs that does not support EHCI hand-off. The EHCI ownership change should be claimed by the EHCI driver.

### Device Reset Time-out

Configures the USB mass storage device start unit command time-out.

## IT8783F Super IO Configuration

This section is used to configure the serial ports.



### Super IO Chip

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

## Serial Port 0 Configuration

This section is used to configure serial port 0.



### Serial Port

Enables or disables the serial port.

### Change Settings

Selects an optimal setting for the Super IO device.

### Onboard Serial Port 0 Mode

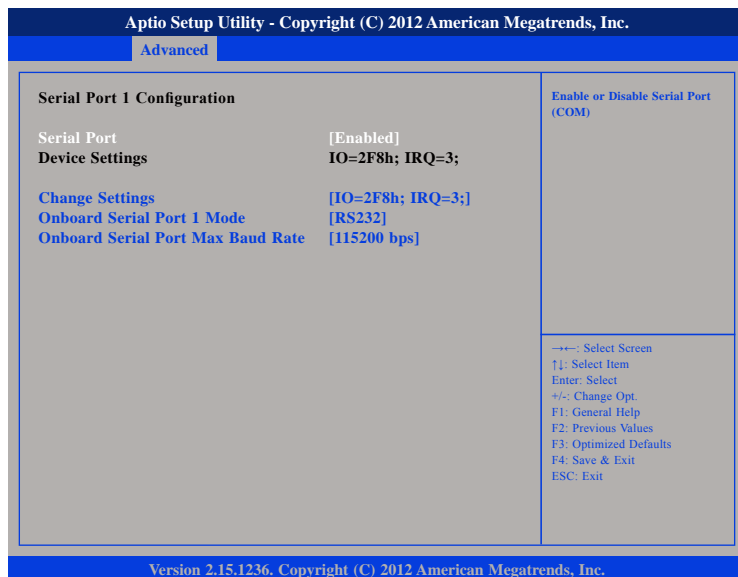
Select this to change the serial port mode to RS232, RS422, RS485 or RS485 Auto.

### Onboard Serial Port Max Baud Rate

Select this to change the max baud rate of the serial port.

## Serial Port 1 Configuration

This section is used to configure serial port 1.



### Serial Port

Enables or disables the serial port.

### Change Settings

Selects an optimal setting for the Super IO device.

### Onboard Serial Port 1 Mode

Select this to change the serial port mode to RS232, RS422, RS485 or RS485 Auto.

### Onboard Serial Port Max Baud Rate

Select this to change the max baud rate of the serial port.

## Serial Port 2 Configuration

This section is used to configure serial port 2.



### Serial Port

Enables or disables the serial port.

### Change Settings

Selects an optimal setting for the Super IO device.

### RS485 Auto Direction

Enables or disables RS485 auto direction.

### Onboard Serial Port Max Baud Rate

Select this to change the max baud rate of the serial port.

## Serial Port 3 Configuration

This section is used to configure serial port 3.



### Serial Port

Enables or disables the serial port.

### Change Settings

Selects an optimal setting for the Super IO device.

### RS485 Auto Direction

Enables or disables RS485 auto direction.

### Onboard Serial Port Max Baud Rate

Select this to change the max baud rate of the serial port.

## Serial Port 4 Configuration

This section is used to configure serial port 4.



### Serial Port

Enables or disables the serial port.

### Change Settings

Selects an optimal setting for the Super IO device.

### Onboard Serial Port Max Baud Rate

Select this to change the max baud rate of the serial port.



## Serial Port 5 Configuration

This section is used to configure serial port 5.



### Serial Port

Enables or disables the serial port.

### Change Settings

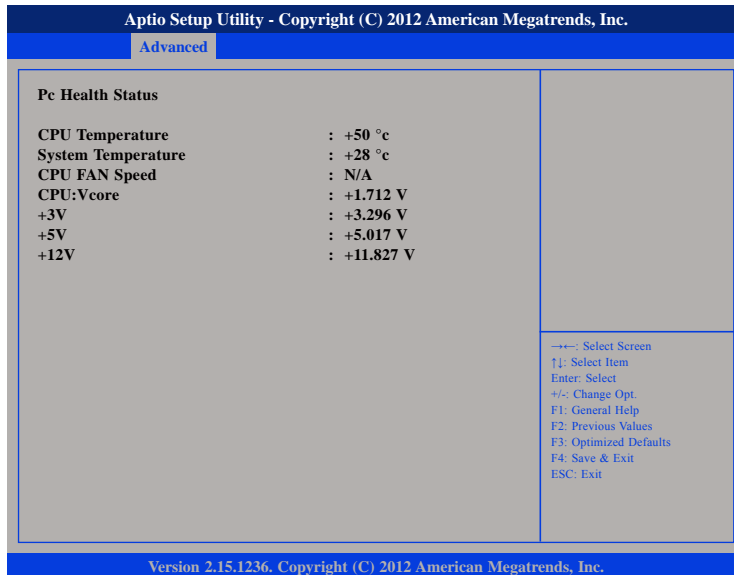
Selects an optimal setting for the Super IO device.

### Onboard Serial Port Max Baud Rate

Select this to change the max baud rate of the serial port.

## IT8783F H/W Monitor

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



The screenshot shows the 'Advanced' tab of the Aptio Setup Utility. Under the 'Pc Health Status' section, the following data is displayed:

CPU Temperature	: +50 °c
System Temperature	: +28 °c
CPU FAN Speed	: N/A
CPU:Vcore	: +1.712 V
+3V	: +3.296 V
+5V	: +5.017 V
+12V	: +11.827 V

Navigation instructions are listed in the bottom right corner of the screen:

- ←→: 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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### CPU:Vcore

Detects and displays the Vcore CPU voltage.

### +3V

Detects and displays 3.3V voltage.

### +5V

Detects and displays 5V voltage.

### +12V

Detects and displays 12V voltage.

### CPU Temperature

Detects and displays the current CPU temperature.

### System Temperature

Detects and displays the current system temperature.

### CPU FAN Speed

Detects and displays the current CPU fan speed.

## Smart Fan Function

This section is used to configure the fan's function.



### Smart Fan Mode

Selects the mode of the fan, the options are Full on Mode, Automatic Mode and Manual Mode.

## 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.



### PCH-IO Configuration

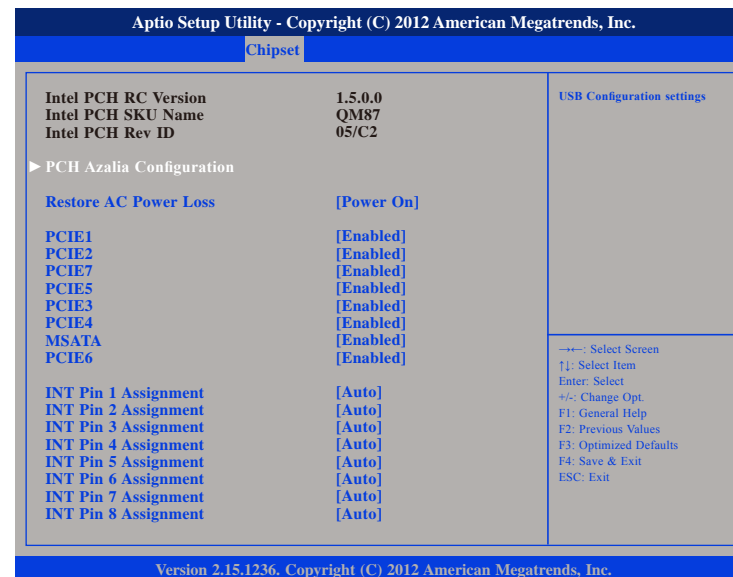
PCH-IO parameters.

### System Agent (SA) Configuration

System Agent (SA) parameters.

## PCH-IO Configuration

This section is used to configure PCH-IO configuration.



### Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.

### PCIE1 to PCIE7

Enables or disables PCIE1/2/3/4/5/6/7.

### mSATA

Enables or disables mSATA.

### INT Pin 1 Assignment to INT Pin 8 Assignment

Configures the IRQ assignment for INT Pin 1/2/3/4/5/6/7/8.

## PCH Azalia Configuration



### Azalia

Control Detection of the Azalia device.

Disabled	Azalia will be unconditionally disabled.
Enabled	Azalia will be unconditionally Enabled.
Auto	Azalia will be enabled if present, disabled otherwise.

## System Agent (SA) Configuration

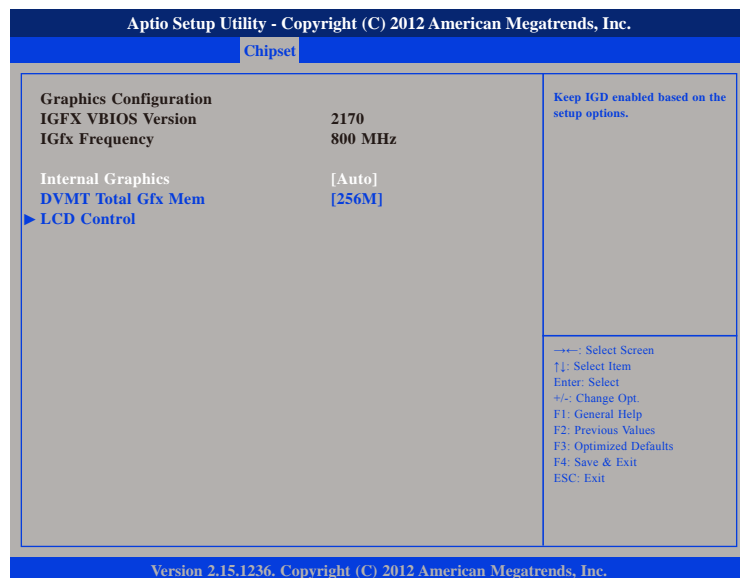
This section is used to configure the System Agent (SA) configuration.



### VT-d

Enables or disables VT-d function on MCH.

## Graphics Configuration



### Internal Graphics

Keep IGD enabled based on the setup options.

### DVMT Total Gfx Mem

Selects DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

## LCD Control



### Primary IGFX Boot Display

Select the video device which will be activated during POST. Has no effect if external graphics is present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.

### Secondary IGFX Boot Display

Select the secondary display device.

### LCD Panel Type

Select the LCD panel used by the internal graphics device by selecting the appropriate setup item.

### Active LFP

Select the Active LFP configuration.

No LVDS

VBIOS does not enable LVDS.

Int-LVDS

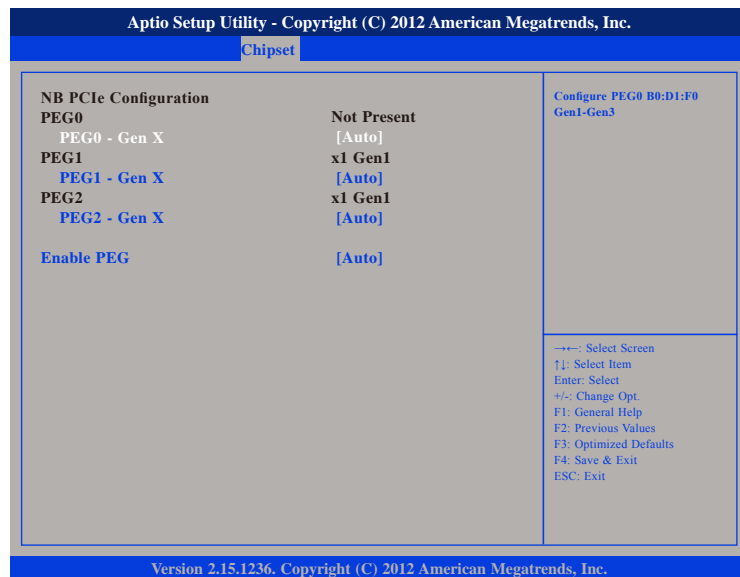
VBIOS enables LVDS driver by Integrated encoder.

### Panel Color Depth

Select the LFP Panel Color Depth.

## NB PCIe Configuration

This section is used to configure Northbridge PCI Express settings.



### PEG0 - Gen X

Configure PEG0 B0:D1:F0 Gen1-Gen3.

### PEG1 - Gen X

Configure PEG1 B0:D1:F1 Gen1-Gen3.

### PEG2 - Gen X

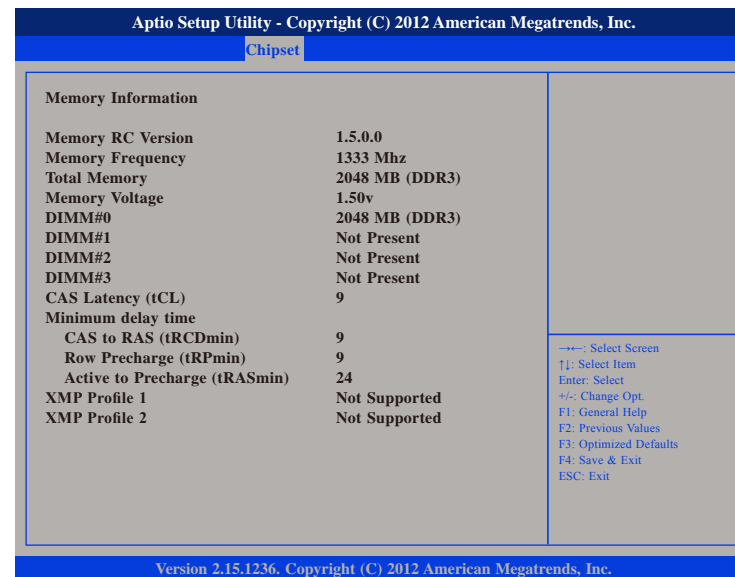
Configure PEG2 B0:D1:F2 Gen1-Gen3.

### Enable PEG

Enables or disables the PEG slot.

## Memory Configuration

This section displays the information of the memory installed in the system.





## Boot

This section is used to configure the boot features.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
<b>Boot Configuration</b>				Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.	
Setup Prompt Timeout		1			
Bootup NumLock State		[On]			
Quiet Boot		[Disabled]			
Fast Boot		[Disabled]			
Launch PXE OpROM policy		[Enabled]			
Onboard LAN PXE		[Disabled]			
<b>Boot Option Priorities</b>					
Boot Option #1		[P4: TS32GMSA630 . . .]			
<b>Hard Drive BBS Priorities</b>				← 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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### Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

### 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.

### Quiet Boot

Enabled Displays OEM logo instead of the POST messages.  
 Disabled Displays normal POST messages.

### Fast Boot

Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

### Launch PXE OpROM Policy

Controls the execution of UEFI and legacy PXE OpROM.

### Onboard LAN PXE

Enables or disables onboard LAN PXE ROM.

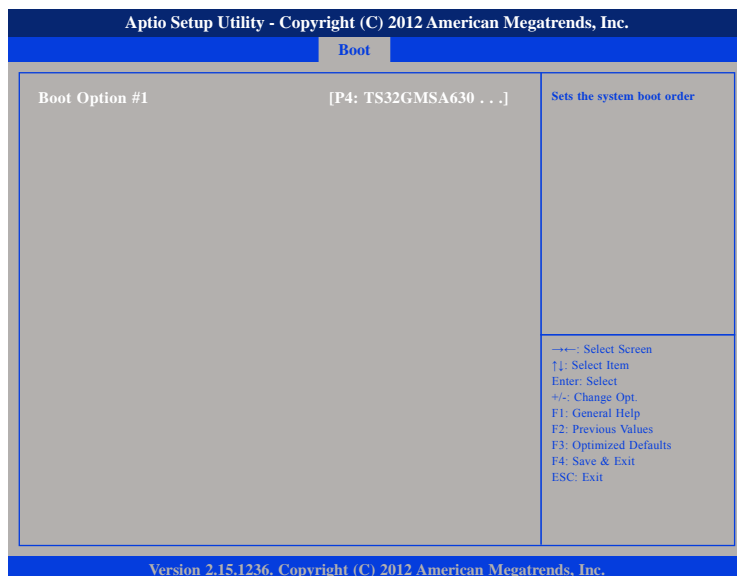
### Hard Drive BBS priorities

Use the Hard Disk Drive BBS priorities options to set the order of the legacy devices in this group.

## 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.

### Boot Option #1



Sets the system boot order.

## Security

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.						
Main	Advanced	Chipset	Boot	Security	Save & Exit	
<p><b>Password Description</b></p> <p>If <b>ONLY</b> the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If <b>ONLY</b> 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:</p> <table border="0"> <tr> <td>Minimum length</td> <td>3</td> </tr> <tr> <td>Maximum length</td> <td>20</td> </tr> </table> <p>Administrator Password User Password</p> <p><b>HDD Security Configuration:</b> P4: TS32GMSA630</p>		Minimum length	3	Maximum length	20	<p>Set Administrator Password</p> <hr/> <p>←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</p>
Minimum length	3					
Maximum length	20					
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.						

### Administrator Password

Select this to reconfigure the administrator's password.

### User Password

Select this to reconfigure the user's password.

### HDD Security Configuration

Select this to configure the HDD security password.

## Save & Exit

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
<p>Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset</p> <p>Save Options Save Changes Discard Changes</p> <p>Restore Defaults Save as User Defaults Restore User Defaults</p> <p>Boot Override P4: TS32GMSA630</p> <p>Launch EFI Shell from filesystem device</p>		<p>Set Administrator Password</p> <hr/> <p>←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</p>			
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.					

### Save Changes and Exit

To save the changes and exit the Setup utility, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes. You can also press <F4> to save and exit Setup.

### Discard Changes and Exit

To exit the Setup utility without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting. You can also press <ESC> to exit without saving the changes.

**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 without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting.

**Save Changes**

To save changes and continue configuring the BIOS, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

**Discard Changes**

To discard the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes to discard all changes made and restore the previously saved settings.

**Restore Defaults**

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

**Save as User Defaults**

To use the current configurations as user default settings for the BIOS, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

**Restore User Defaults**

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

**Boot Override**

To bypass the boot sequence from the Boot Option List and boot from a particular device, select the desired device and press <Enter>.

**Launch EFI Shell from filesystem device**

To launch EFI shell from a filesystem device, select this field and press <Enter>.

# Appendix A: Power Consumption

## NISE 300 Power Consumption Table

### Purpose

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

### Test Equipment/Software

- PROVA CM-07 AC/DC CLAMP METER

### Device Under Test

- DUT: sys#1

### Test Procedure

- Power up the DUT, boot into Windows 7 x64 Ultimate
- Entering standby mode (HDD power down)
- Measure the power consumption and record it.
- Run Burn-in test program to apply 100% full loading
- Measure the power consumption and record it.

### Test Result

	Sys #1 (Disabled Turbo Boot)	Sys #1 (Disabled Turbo Boot)
	+19V	+30V
Full-Loading Mode	2.49A	1.61A
Total	47.31W	48.3W
Standby S3Mode	0.13A	0.11A
Total	2.47W	3.3W

## Test Equipment/Software

System Configuration	Sys#1
Chassis	CHASSIS NISE300 VER:B
CPU	Intel® Core™ i5-4402E Processor (3M Cache, up to 2.70 GHz)
Memory	Transcend 4GB DDR3 1600 SO-DIMM (TS512MSK64V6H) X2
CPU board	N/A
Mother board	NISB300 REV:B
HDD	HDD 2.5" SATA 160GB HITACHI:HTS545016B9A300 X2
FDD	N/A
CD-ROM	N/A
CFast	Apacer CFast 32GB
Power Supply	POWER ADAPTER FSP120-ACB 120W 24V/5A w/PSE MARK
Add-on Card	mSATA (TS128GMSA740), NISK300LAN (x2), Sierra 8790V
CPU Cooler	NISE300 CPU HEATSINK SHYUNG SHUHN
System FAN	N/A
Keyboard	Microsoft Wired Keyboard 600
Mouse	Microsoft Basic Optical Mouse
Monitor	ASUS VS228

# Appendix B: Watchdog Timer Setting

## ITE8783 WatchDog Programming Guide

```
#define SUPERIO_PORT    0x2E
#define WDT_SET        0x72
#define WDT_VALUE      0x73

void main(void)
{
    #Enter SuperIO Configuration
    outputb(SUPERIO_PORT, 0x87);
    outputb(SUPERIO_PORT, 0x01);
    outputb(SUPERIO_PORT, 0x55);
    outputb(SUPERIO_PORT, 0x55);

    # Set LDN
    outputb(SUPERIO_PORT, 0x07);
    outputb(SUPERIO_PORT+1, 0x07);

    # Set WDT setting
    outputb(SUPERIO_PORT, WDT_SET);
    outputb(SUPERIO_PORT+1, 0xC0);           # Use the second
                                           # Use the minute, change value to 0x40

    # Set WDT sec/min
    outputb(SUPERIO_PORT, WDT_VALUE);
    outputb(SUPERIO_PORT+1, 0x05);         #Set 5 seconds
}
```

# Appendix C: GPIO Programming Guide

GPIO (General Purpose Input/Output) pins are provided for custom system design. This appendix provides definitions and its default setting for the ten GPIO pins in the NISE 300. The pin definition is shown in the following table:

Pin	GPIO mode	PowerOn Default	Address	Pin	GPIO mode	PowerOn Default	Address
1	VCC	-	-	2	GND	-	-
3	GPO0	Low	A04h (Bit4)	4	GPIO	High	A04h (Bit0)
5	GPO1	Low	A04h (Bit5)	6	GPIO	High	A04h (Bit1)
7	GPO2	Low	A04h (Bit6)	8	GPIO	High	A04h (Bit2)
9	GPO3	Low	A04h (Bit7)	10	GPIO	High	A04h (Bit3)

Control the GPO pin (3/5/7/9) level from I/O port A04h bit (4/5/6/7).  
The bit is Set/Clear indicated output High/Low

## GPIO programming sample code

```
#define GPIO_PORT      0xA04
#define GPO0           (0x01 << 4)
#define GPO1           (0x01 << 5)
#define GPO2           (0x01 << 6)
#define GPO3           (0x01 << 7)

#define GPO0_HI        outportb(GPIO_PORT, GPO0)
#define GPO0_LO        outportb(GPIO_PORT, 0x00)
#define GPO1_HI        outportb(GPIO_PORT, GPO1)
#define GPO1_LO        outportb(GPIO_PORT, 0x00)
#define GPO2_HI        outportb(GPIO_PORT, GPO2)
#define GPO2_LO        outportb(GPIO_PORT, 0x00)
#define GPO3_HI        outportb(GPIO_PORT, GPO3)
#define GPO3_LO        outportb(GPIO_PORT, 0x00)
void main(void)
{
    GPO0_HI;
    GPO1_LO;
    GPO2_HI;
    GPO3_LO;
}
```