NexAIoT Co., Ltd.

IoT Automation Solutions Business Group

Fan-less Computer

NISE 52

User Manual

NexAIoT Co., Ltd.
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www.nexaiot.com

Contents

PREFACE

Copyright

Disclaimer

The information in this document is subject to change without prior notice and does not represent commitment from NexAIoT Co., Ltd. However, users may update their knowledge of any product in use by constantly checking its manual posted on our website: http://www.nexaiot.com. NexAIoT shall not be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of any product, nor for any infringements upon the rights of third parties, which may result from such use. Any implied warranties of merchantability or fitness for any particular purpose is also disclaimed.

Acknowledgements

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

NexAIoT RoHS Environmental Policy and Status Update

NexAIoT 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, NexAIoT 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 NexAIoT development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NexAIoT 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 NexAIoT 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 NexAIoT naming convention.

Warranty and RMA

NexAIoT Warranty Period

NexAIoT manufactures products that are new or equivalent to new in accordance with industry standard. NexAIoT warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NexAIoT.

NexAIoT Return Merchandise Authorization (RMA)

- Customers shall enclose the "NexAIoT 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 "NexAIoT 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, NexAIoT 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 NexAIoT 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

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

System Level

- Component fee: NexAIoT 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 NexAIoT 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, NexAIoT will return it to the customer without any charge.

Board Level

- Component fee: NexAIoT 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, NexAIoT 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 NexAIoT for further information.

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.

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 NexAIoT products, visit NexAIoT's website at www.nexaiot.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.

Global Service Contact Information

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Package Contents

Before continuing, verify that the package that you received is complete. Your NISE 52 package should have all the items listed in the following table.

Item	Part Number	Description	Qty
1	60177A0796X00	NISE 52-A01 Series Quick Reference Guide VER:A	1
2	6023344362X00	COM Cable w/o NEXCOM Logo	1
3	5060900226X00	Mini PCIe Bracket	1
4	50311F0295X00	Flat Head Screw Long Fei:F2x4 Nylok NIGP	1
5	50311F0330X00	Round Head Screw Long Fei:P2x3 ISO+Nylon	3
6	4NCPM00302X00	Terminal Blocks 3P Phoenix Contact	1
7	4NCPM00203X00	Terminal Blocks 2P Phoenix Contact	1
8	5061600245X00	Washer	4

Ordering Information

The following information below provides ordering information for NISE 52.

NISE 52-A01 (P/N: 10J00005200X0)
- Intel® Celeron® J3455 processor fanless system

- **24V, 60W AC/DC power adapter w/o power cord (P/N: 7400060054X00)**

Chapter 1: Product Introduction

Overview

Key Features

- Onboard Intel® Celeron® processor J3455 Quad Core, 1.50GHz
- 3 x HDMI
- 6 x USB 3.0, 2 x USB 2.0
- 1 x RS232/422/485, 3 x RS232
- 3 x Intel® I210 GbE LAN ports; support WoL, teaming and PXE
- 2 x mini-PCIe sockets support optional mSATA/Wi-Fi/BT/4G LTE module
- Support operating temperature from -5 to 55 Celsius degree
- Support +9V to 30VDC input; support ATX power mode

Hardware Specifications

CPU Support

- Onboard Intel® Celeron® processor J3455 Quad Core, 1.50GHz

Main Memory

- 1 x DDR3L 1866 SO-DIMM socket, support up to 8GB

Display Option

- 3 x HDMI

I/O Interface - Front

- ATX power on/off switch
- 3 x HDMI
- 3 x Intel® I210 GbE LAN ports; support WoL, teaming and PXE
- 2 x USB 2.0 (500mA per each)
- 1 x Antenna hole
- 1 x 2-pin remote power on/off switch

I/O Interface - Rear

- 6 x USB 3.0 ports (900mA per each)
- 1 x DB44 serial port for 4 x COM ports
  - COM1: RS232/422/485 with auto flow control and jumper-free setting
  - COM2 & COM3 & COM4: full RS232 signal
- LED indicator for TX/RX
- 1 x Antenna hole
- 1 x 3-pin DC input, support +9V to 30V DC input

I/O Interface - Internal

- 4 x GPI and 4 x GPO (programmable to GPI or GPO)
- 1 x nano-SIM card holder

Expansion Slot/Storage

- 2 x mini-PCIe sockets for optional Wi-Fi/BT/4G LTE/mSATA

Mini-PCIe	USB	PCIe	SATA	mSATA	4G/LTE	Wi-Fi/BT
Mini_Card1	✓	✗	✓	Support	Support	N/A
Mini_Card2	✓	✓	✓	Support	Support	Support

Power Requirements

- Power input: +9 to +30V DC
- 1 x Optional 24V, 60W power adapter

Supported OS

- Windows 10 64-bit
- Linux Kernel

Dimensions

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

Construction

- Metal chassis with fanless design

Environment

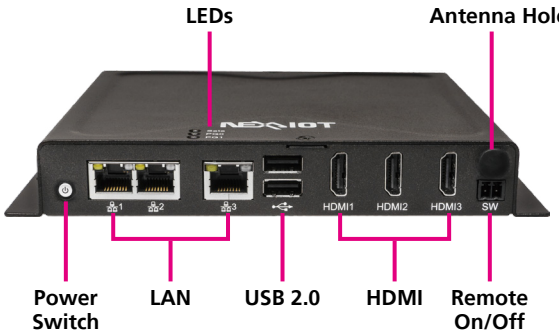
- Operating temperature:
  Ambient with air flow: -5°C to 55°C
  (according to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)
- Storage temperature: -20°C to 75°C
- Relative humidity: 10% to 95% (non-condensing)
- Shock protection:
  – mSATA: 50G, half sine, 11ms, IEC60068-2-27
- Vibration protection with mSATA condition:
  – Random: 2Grms @ 5~500 Hz, IEC60068-2-64
  – Sinusoidal: 2Grms @ 5~500 Hz, IEC60068-2-6

Certifications

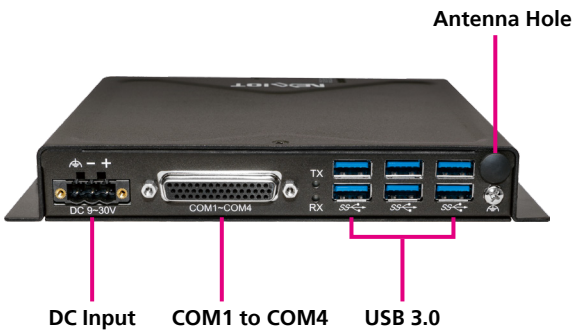
- CE
- FCC Class A

Knowing Your NISE 52

Front Panel



Rear Panel



Antenna Hole
Used to install external antennas.

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

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

LAN
Three RJ45 ports used to connect the system to a local area network.

HDMI
Three HDMI ports used to connect HDMI interface displays.

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

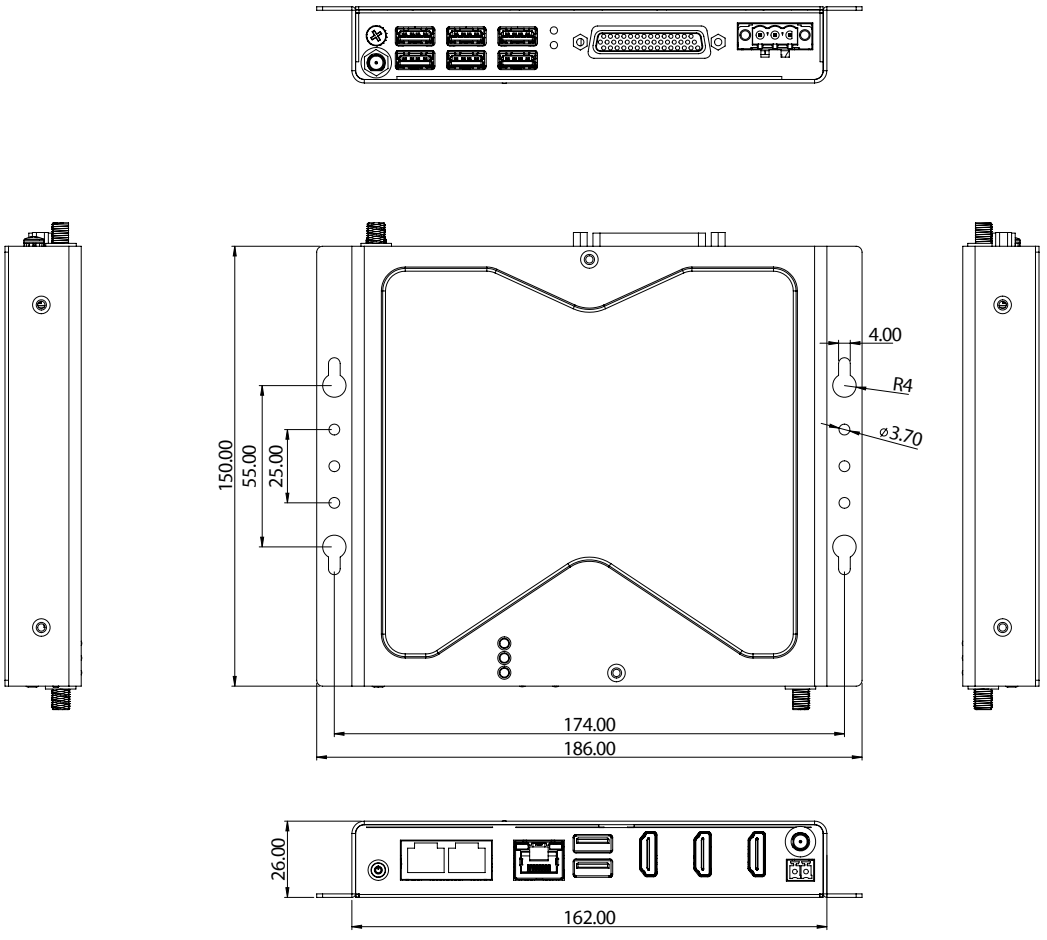
USB 2.0
USB 2.0 ports to connect the system with USB 2.0/1.1 devices.

DC Input
Used to plug a DC power cord.

COM1 to COM4
One DB44 port used to connect serial devices.
- COM1: RS232/422/485 with auto flow control and jumper-free setting
- COM2 & COM3 & COM4: full RS232 signal

Remote On/Off Switch
Used to connect a remote to power on/off the system.

Mechanical Dimensions



Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the NISE 52 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.

Chassis Ground Isolation

Before working with the system, follow the instructions below to ensure the chassis is grounded:

1. Attach a cable lug on the protective conductor screw.
2. Connect the protective conductor screw to a protective grounding connection in your installation site.

The protective conductor screw (round head screw) is located on the bottom right corner of the rear panel as shown below.

Specification of the round head screw:
Round Head Screw Long Fei: p6#32T Nylok P6#32T Outer Teeth Washer Nylok

Functional Ground Isolation

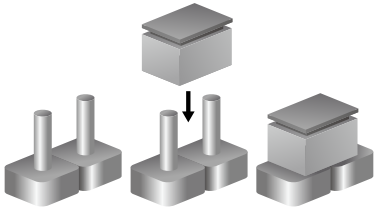
When connecting power to the terminal block connector on the system, ensure the ground pin (marked in red below) on the connector is connected to a grounding stripe.

Jumper Settings

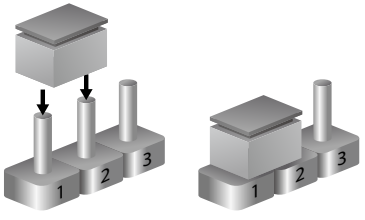
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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



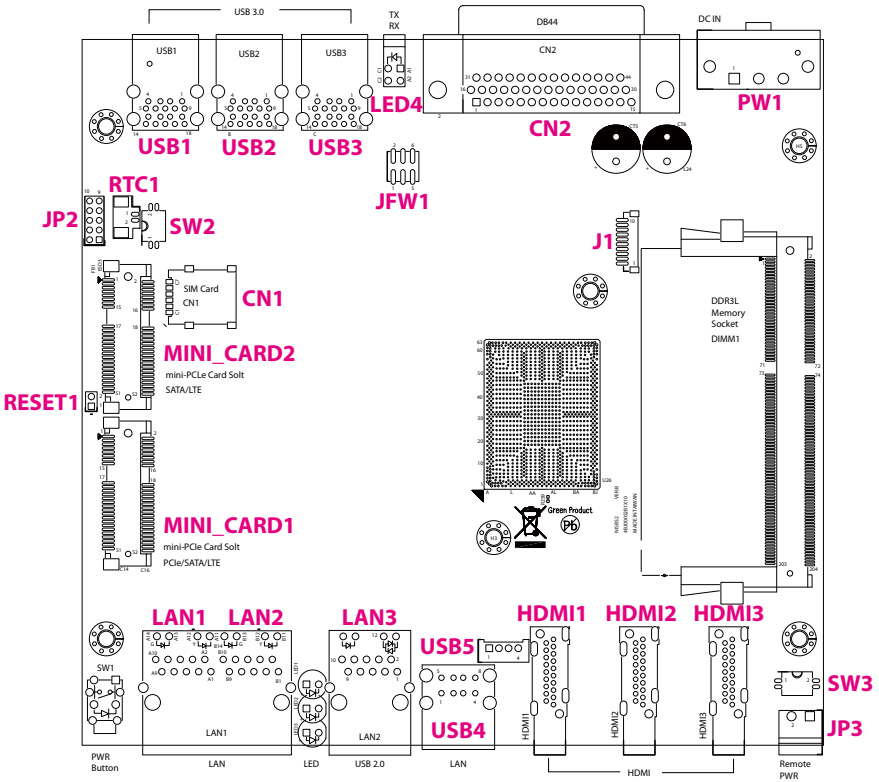
Three-Pin Jumpers: Pins 1 and 2 are Short



Locations of the Jumpers and Connectors for NISB 52

NISB 52

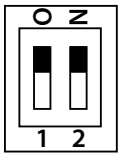
The figure below is the top view of the NISB 52 main board which is the main board used in NISE 52. It shows the locations of the jumpers and connectors.



DIP Switches

AT/ATX Mode Select

Connector type: 2-pin DIP switch
Connector location: SW3



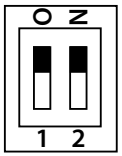
Pin	Settings
1 On, 2 Off	AT
1 Off, 2 On	ATX

1 Off, 2 On: default

Pin	Definition
1	AT_PWRBT#
2	PWRBTN#
3	PBT_TR
4	PWRBTN#

Clear CMOS Select

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



Pin	Definition
1	RTEST#
2	SRTCRST#
3	GND
4	GND

Connector Pin Definitions

External I/O Interfaces - Front Panel

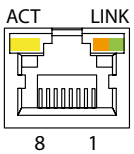
Power Button

Connector location: SW1

Pin	Definition	Pin	Definition
1	GND	2	PBT_TR
3	PBT_TR	4	GND
A1	PWRLED_N	C1	PWRLED_P
MH1	GND	MH2	GND

LAN 1 Port

Connector type: RJ45 with LEDs
Connector location: LAN1



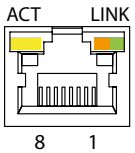
Act	Status
Flashing Yellow	Data activity
Off	No activity

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

Pin	Definition	Pin	Definition
1	LAN1MDI0P	2	LAN1MDI0N
3	LAN1MDI1P	4	LAN1MDI1N
5	LAN1TCT	6	LAN1TCTG
7	LAN1MDI2P	8	LAN1MDI2N
9	LAN1MDI3P	10	LAN1MDI3N
11	LAN1LINK1000L1	12	LAN1LINK1000L
13	LAN1LEDACTL	14	LAN1LEDPWR

LAN 2 Port

Connector type: RJ45 with LEDs
Connector location: LAN2



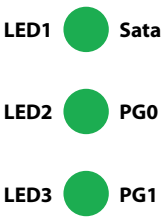
Act	Status
Flashing Yellow	Data activity
Off	No activity

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

Pin	Definition	Pin	Definition
1	LAN2MDI0P	2	LAN2MDI0N
3	LAN2MDI1P	4	LAN2MDI1N
5	LAN2TCT	6	LAN2TCTG
7	LAN2MDI2P	8	LAN2MDI2N
9	LAN2MDI3P	10	LAN2MDI3N
11	LAN2LINK1000L1	12	LAN2LINK1000L
13	LAN2LEDACTL	14	LAN2LEDPWR

LED Indicators

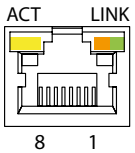
Connector location: LED1, LED2 and LED3



	Pin	Definition	Pin	Definition
LED1	A	N47290333	C	SATA_LED_N
LED2	A	N47290311	C	GPO_PR1
LED3	A	N47290329	C	GPO_PR2

LAN 3 Port

Connector type: RJ45 with LEDs
Connector location: LAN3



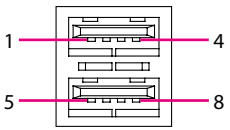
Act	Status
Flashing Yellow	Data activity
Off	No activity

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

Pin	Definition	Pin	Definition
1	LAN3MDI0P	2	LAN3MDI0N
3	LAN3MDI1P	4	LAN3MDI1N
5	LAN3TCT	6	LAN3TCTG
7	LAN3MDI2P	8	LAN3MDI2N
9	LAN3MDI3P	10	LAN3MDI3N
11	LAN3LINK1000L1	12	LAN3LINK1000L
13	LAN3LEDACTL	14	LAN3LEDPWR

USB 2.0 Ports

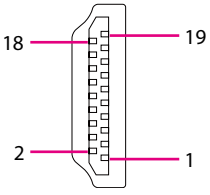
Connector type: Dual USB 2.0 ports
Connector location: USB4



Pin	Definition	Pin	Definition
1	P5V_USB23	2	USB2_N4_C
3	USB2_P4_C	4	GND
5	P5V_USB23	6	USB2_N6_C
7	USB2_P6_C	8	GND

HDMI1 to HDMI 3 Port

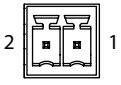
Connector type: HDMI port
Connector location: HDMI1, HDMI2 and HDMI3
Note: Only HDMI1 and HDMI2 support audio



Pin	Definition	Pin	Definition
1	HDMITX2P1	2	GND
3	HDMITX2N1	4	HDMITX1P1
5	GND	6	HDMITX1N1
7	HDMITX0P1	8	GND
9	HDMITX0N1	10	HDMICLKP1
11	GND	12	HDMICLKN1
13	NC	14	NC
15	HDMIDDCSCL	16	HDMIDDCSDA
17	GND	18	VCC5HDMI
19	HDMIHPD		

Remote Power Button

Connector type: 2-pin switch
Connector location: JP3

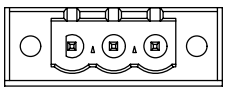


Pin	Definition
1	PBT_TR_C
2	GND

External I/O Interfaces - Rear Panel

DC Power Input

Connector type: 3-pin terminal block
Connector location: PW1



Pin	Definition
1	VIN_1
2	VIN_VSS
3	VINPIN3

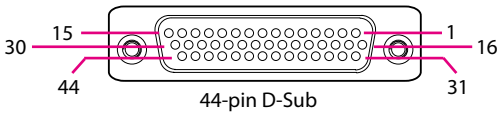
COM Port LED Indicators

Connector location: LED4

Pin	Definition	Pin	Definition
A1	N47620851	C1	COM_RXLEDN
A2	N47291897	C2	COM_TXLEDN

Serial Port (COM1 to COM4)

Connector type: 44-pin D-Sub, 2x22
Connector location: CN2

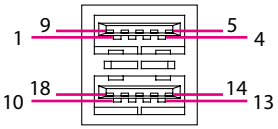


Pin	Definition	Pin	Definition
1	COM1DCDL	2	COM1RXD
3	COM1TXD	4	COM1DTRL
5	GND	6	COM1DSRL
7	COM1RTSL	8	COM1CTSL
9	COM1RIL	10	GND
11	SP2_DCD#	12	SP2_RXD
13	SP2_TXD	14	SP2_DTR#
15	GND	16	SP2_DSR#
17	SP2_RTS#	18	SP2_CTS#
19	SP2_RI#	20	GND
21	SP3_DCD#	22	SP3_RXD

Pin	Definition	Pin	Definition
23	SP3_TXD	24	SP3_DTR#
25	GND	26	SP3_DSR#
27	SP3_RTS#	28	SP3_CTS#
29	SP3_RI#	30	GND
31	SP4_DCD#	32	SP4_RXD
33	SP4_TXD	34	SP4_DTR#
35	GND	36	SP4_DSR#
37	SP4_RTS#	38	SP4_CTS#
39	SP4_RI#	40	GND
41	NC	42	NC
43	NC	44	NC

USB 3.0 Ports

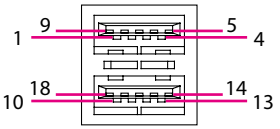
Connector type: Dual USB 3.0 ports
Connector location: USB1



Pin	Definition	Pin	Definition
1	P5V_USB04	2	USB2HUB_N2_C
3	USB2HUB_P2_C	4	GND
5	USB3HUB_RX2N_C	6	USB3HUB_RX2P_C
7	GND	8	USB3HUB_TX2N_C
9	USB3HUB_TX2P_C	10	P5V_USB04
11	USB2HUB_N3_C	12	USB2HUB_P3_C
13	GND	14	USB3HUB_RX3N_C
15	USB3HUB_RX3P_C	16	GND
17	USB3HUB_TX3N_C	18	USB3HUB_TX3P_C

USB 3.0 Ports

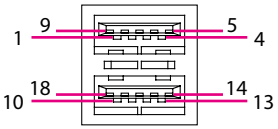
Connector type: Dual USB 3.0 ports
Connector location: USB2



Pin	Definition	Pin	Definition
1	P5V_USB03	2	USB2_N2_C
3	USB2_P2_C	4	GND
5	USB3_RX2N_C	6	USB3_RX2P_C
7	GND	8	USB3_TX2N_C
9	USB3_TX2P_C	10	P5V_USB04
11	USB2HUB_N1_C	12	USB2HUB_P1_C
13	GND	14	USB3HUB_RX1N_C
15	USB3HUB_RX1P_C	16	GND
17	USB3HUB_TX1N_C	18	USB3HUB_TX1P_C

USB 3.0 Ports

Connector type: Dual USB 3.0 ports
Connector location: USB3

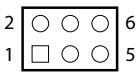


Pin	Definition	Pin	Definition
1	P5V_USB01	2	USB2_N0_C
3	USB2_P0_C	4	GND
5	USB3_RX0N_C	6	USB3_RX0P_C
7	GND	8	USB3_TX0N_C
9	USB3_TX0P_C	10	P5V_USB04
11	USB2_N1_C	12	USB2_P1_C
13	GND	14	USB3_RX1N_C
15	USB3_RX1P_C	16	GND
17	USB3_TX1N_C	18	USB3_TX1P_C

Internal Connectors

BIOS Pin Header

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



Pin	Definition	Pin	Definition
1	VPI	2	GND
3	BIOS_SPI_CS#0	4	BIOS_SPI_CLK
5	BIOS_SPI_SO	6	BIOS_SPI_SI

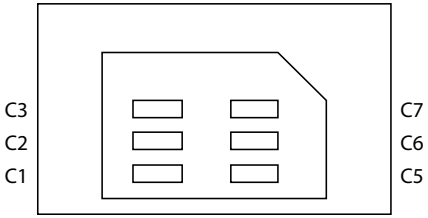
USB 2.0 Pin Header

Connector type: 1x4 4-pin header, 2.0mm pitch
Connector location: USB5

Pin	Definition	Pin	Definition
1	P5V_USB4_P1	2	USB2HUB_N4_C
3	USB2HUB_P4_C	4	GND

SIM Card Connector

Connector location: CN1



Pin	Definition	Pin	Definition
C1	UIM_PWR	C2	UIM_RESET
C3	UIM_SIM_CLK	C5	GND
C6	UIM_VPP	C7	UIM_DATA

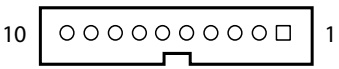
System Reset

Connector type: 1x2 2-pin header, 2.0mm pitch
Connector location: RESET1

Pin	Definition
1	RESETBT
2	GND

80 Port Connector

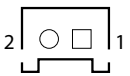
Connector type: 1x10 10-pin header, 1.0mm pitch
Connector location: J1



Pin	Definition	Pin	Definition
1	GND	2	PLTRST#_BUFF_1
3	CLKOUT_LPC1	4	ESPI_CS0#
5	ESPI_IO3	6	ESPI_IO2
7	ESPI_IO1	8	ESPI_IO0
9	SERIRQ	10	VCC3

RTC Battery Connector

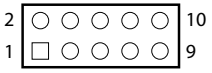
Connector type: 1x2 2-pin header, 1.25mm pitch
Connector location: RTC1



Pin	Definition
1	GND
2	VBAT

GPIO

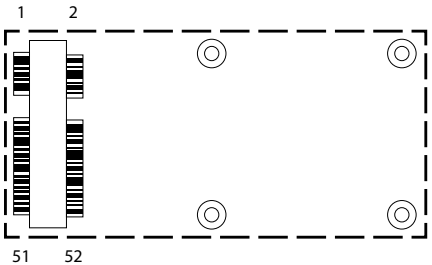
Connector type: 2x5 10-pin header, 2.0mm pitch
Connector location: JP2



Pin	Definition	Pin	Definition
1	GPIO_PWR	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

Mini-PCIe Connector

Connector location: MINI_CARD1

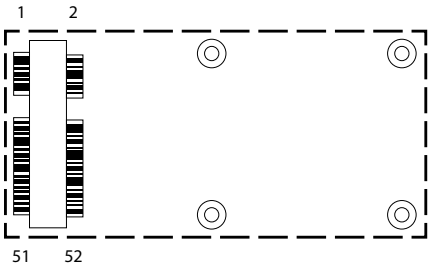


Pin	Definition	Pin	Definition
1	3P3_WAKE0#	2	3VSB_MINI2
3	NC	4	GND
5	NC	6	1V5_MINI2
7	NC	8	UIM_PWR
9	GND	10	UIM_DATA
11	NC	12	UIM_CLK
13	NC	14	UIM_RESET
15	GND	16	UIM_VPP
17	NC	18	GND
19	NC	20	MINICARD2DISL
21	GND	22	MCARD2RESETL
23	mSATA_RXP_C	24	3VSB_MINI2
25	mSATA_RXN_C	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1V5_MINI2
29	GND	30	SMB_CLK_3P3
31	mSATA_TXN_C	32	SMB_DATA_3P3
33	mSATA_TXP_C	34	GND
35	GND	36	USB2_N3
37	GND	38	USB2_P3
39	3VSB_MINI2	40	GND
41	3VSB_MINI2	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	1V5_MINI2
49	NC	50	GND
51	NC	52	3VSB_MINI2

Mini-PCIe Connector

Connector location: MINI_CARD2



Pin	Definition	Pin	Definition
1	3P3_WAKE0#	2	3VSB_MINI1
3	NC	4	GND
5	NC	6	1V5_MINI1
7	PCIE_CLKREQ3#	8	UIM_PWR
9	GND	10	UIM_DATA
11	PCIE_CLKOUT3N	12	UIM_CLK
13	PCIE_CLKOUT3P	14	UIM_RESET
15	GND	16	UIM_VPP
17	NC	18	GND
19	NC	20	MINICARD1DISL
21	GND	22	MCARD1RESETL
23	PCIE_mSATA_RXP	24	3VSB_MINI1
25	PCIE_mSATA_RXN	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1V5_MINI1
29	GND	30	SMB_CLK_3P3
31	PCIE_mSATA_TXN	32	SMB_DATA_3P3
33	PCIE_mSATA_TXP	34	GND
35	GND	36	USB2_N5
37	GND	38	USB2_P5
39	3VSB_MINI1	40	GND
41	3VSB_MINI1	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	1V5_MINI1
49	NC	50	GND
51	PCIE_mSATA_SEL	52	3VSB_MINI1

Chapter 3: System Setup

Removing the Chassis 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.

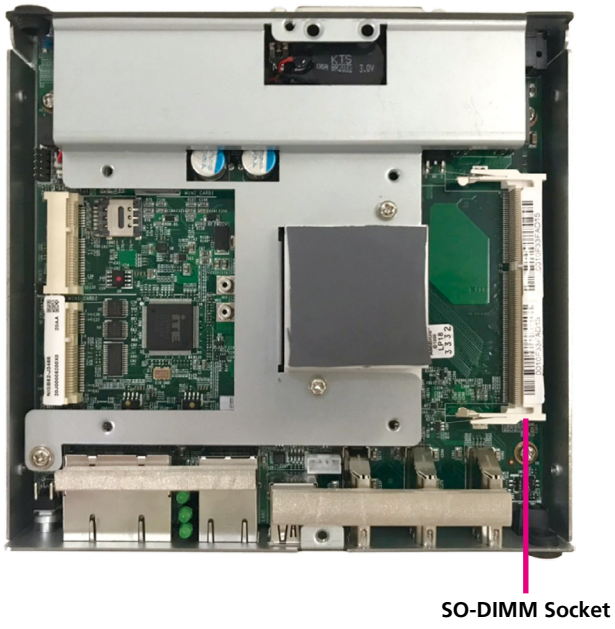
1. Remove the six mounting screws around the chassis cover. There are two screws each on the top and on the sides.

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

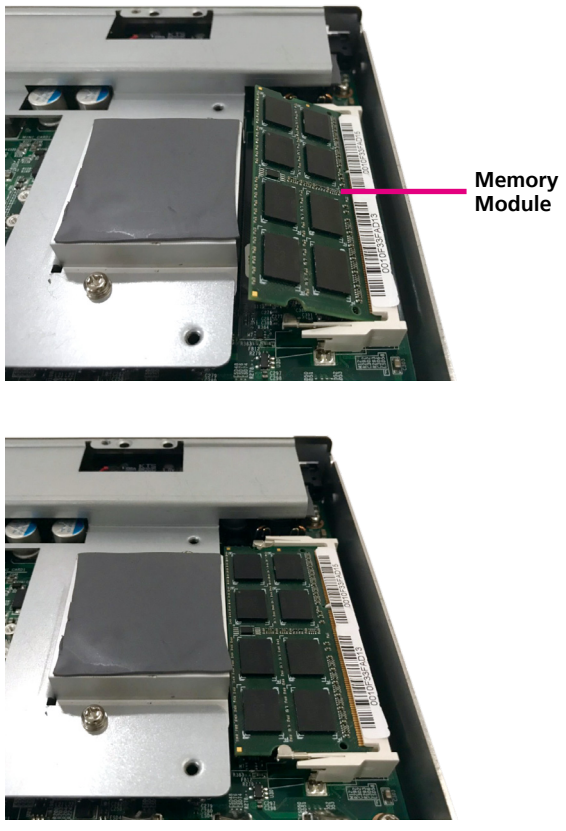
Screws on the sides

Installing a SO-DIMM Memory Module

1. Locate the SO-DIMM socket.

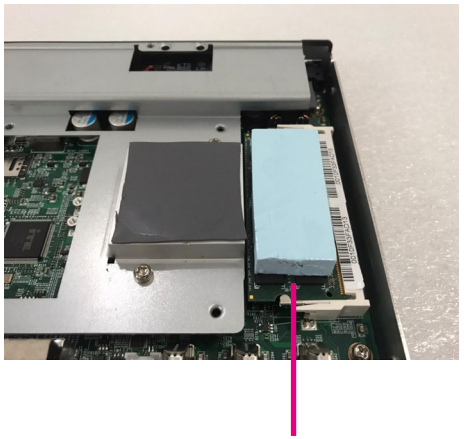


2. Insert the module into the socket at an approximately 30-degree angle. Push the module down until the clips on both sides of the socket lock into position. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.



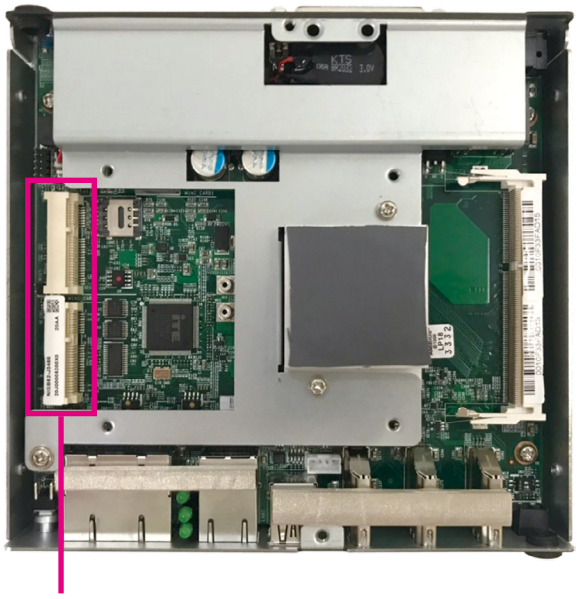
Note:
When installing a memory module, it is recommended that to use an industrial grade memory module with wide operating temperature and a dedicated thermal pad is placed on top of the chipset of the memory module for better heat dissipation.

- Optional Thermal Pad E-LIN 60x20x10mm (P/N: 5060200566X00)



Installing a 4G LTE/mSATA Module (Full-Size)

1. Locate the mini-PCIe slot on the board.



Mini-PCIe Socket

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

3. Push the module down and secure it with a screw.

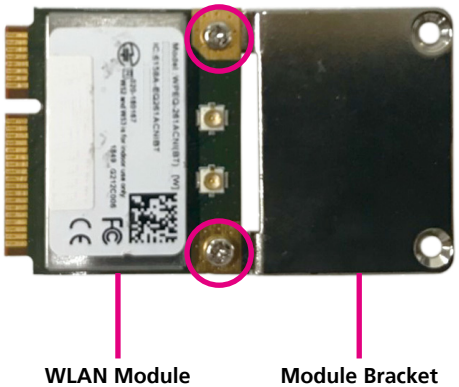
Note:
When installing a mini-PCIe module, it is recommended that to use an industrial grade mSATA module with wide operating temperature and a dedicated thermal pad is placed on top of the chipset of the module for better heat dissipation.

- Optional Thermal Pad E-LIN 30x20x12mm (P/N: 5060200437X00)

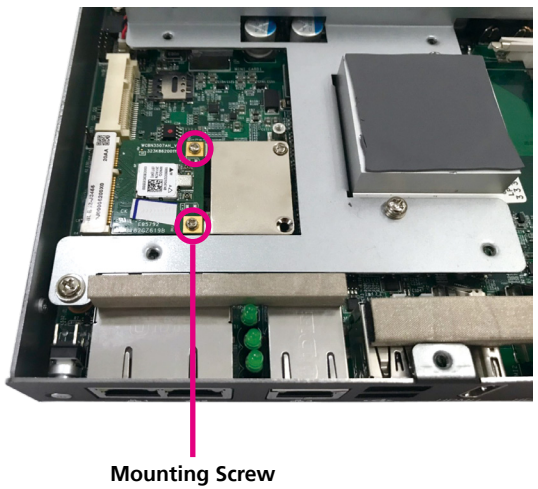
Thermal Pad

Installing a WLAN/Bluetooth Mini-PCIe Module (Half-size)

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

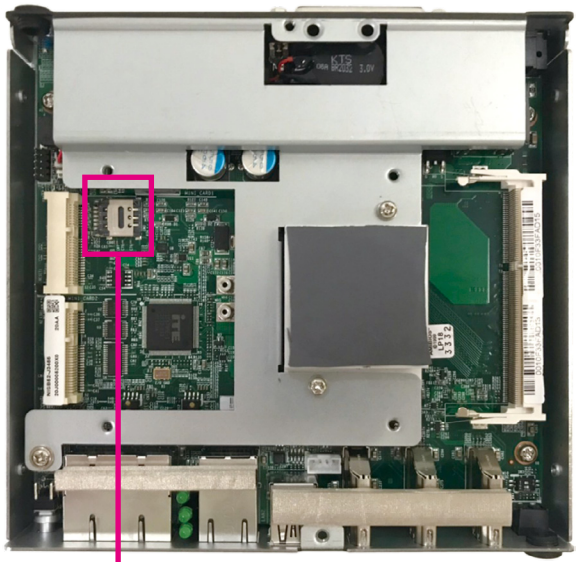


2. Insert the wireless LAN module into the mini-PCI Express slot at a 45-degree angle until the gold-plated connector on the edge of the module completely disappears inside the slot. Push the module down and then secure it with mounting screws.

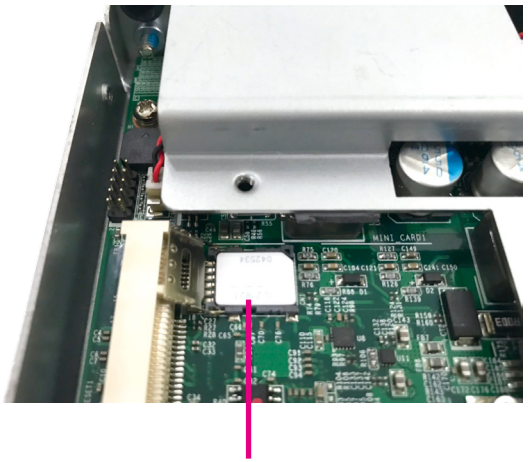


Installing a SIM Card

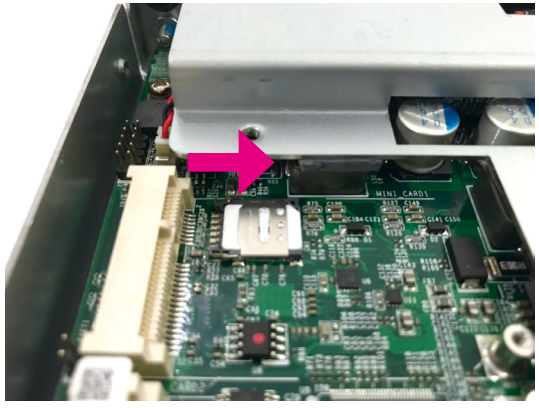
1. Locate the SIM card holder on the motherboard.



2. Release the cover and place the SIM card onto the holder.

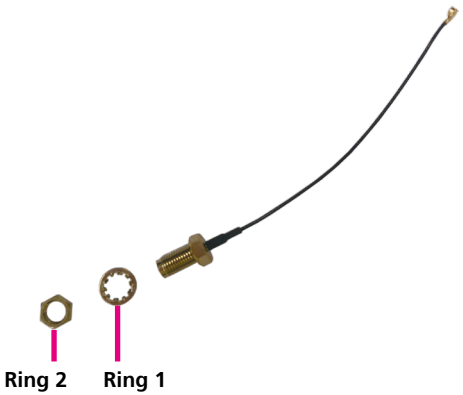


3. Close the cover and secure it to the original position.



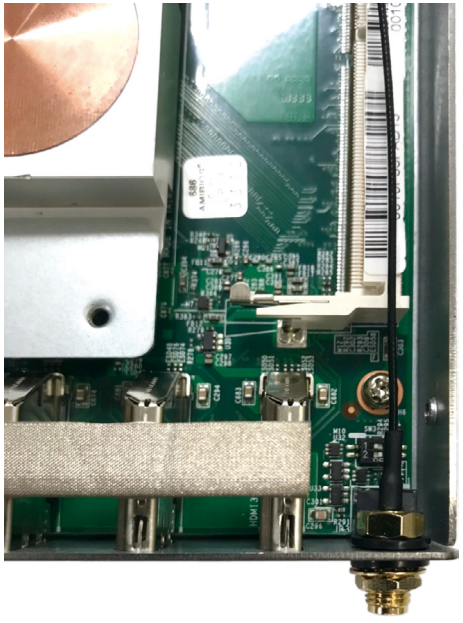
Installing an Antenna

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

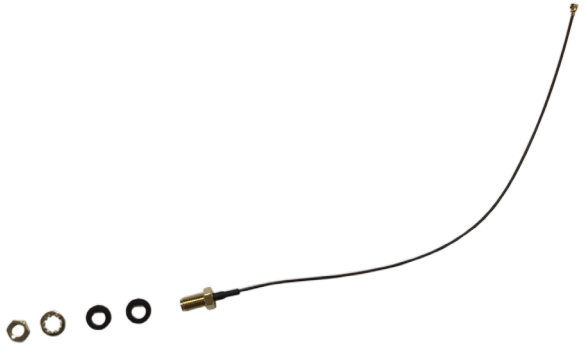


1. Remove the antenna hole cover located on the front and rear panel.

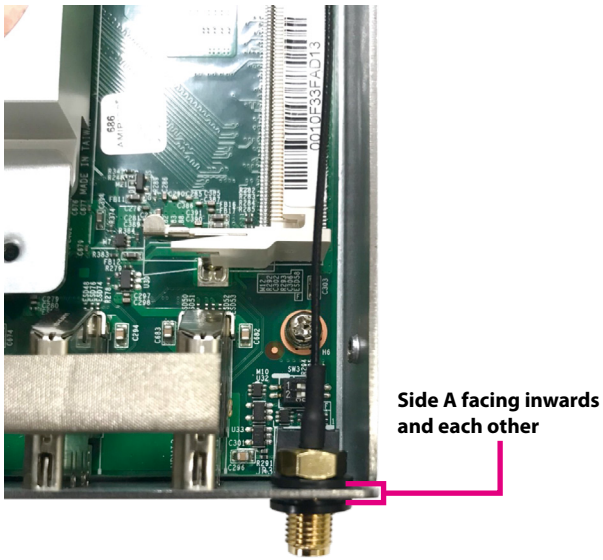
2. Insert the SMA antenna jack end of the cable through the antenna hole, and insert the 2 rings (ring 1 and ring 2) and two washers back to the antenna jack.



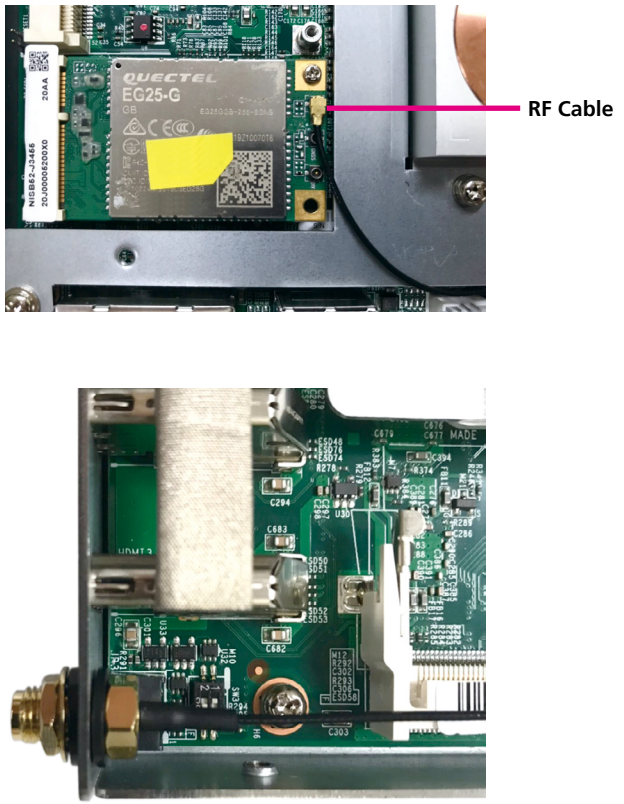
Note: Gasket and washer installation sequence.



Note:
When installing Wi-Fi or 4G LTE antennas, make sure the washers (P/N:5061600245X00) are fitted onto the antenna connector, one on each side as shown below.



3. Attach the RF cable onto the module.



4. Connect the external antenna to the antenna jack.

Chapter 4: BIOS Setup

This chapter describes how to use the BIOS setup program for NISE 52. 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 NexAIoT website at www.nexaiot.com.

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 items such 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

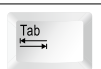
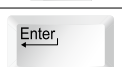
When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- 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 

allows you to enter Setup.

Legends

Key	Function
	Moves the highlight left or right to select a menu.
	Moves the highlight up or down between sub-menu 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 

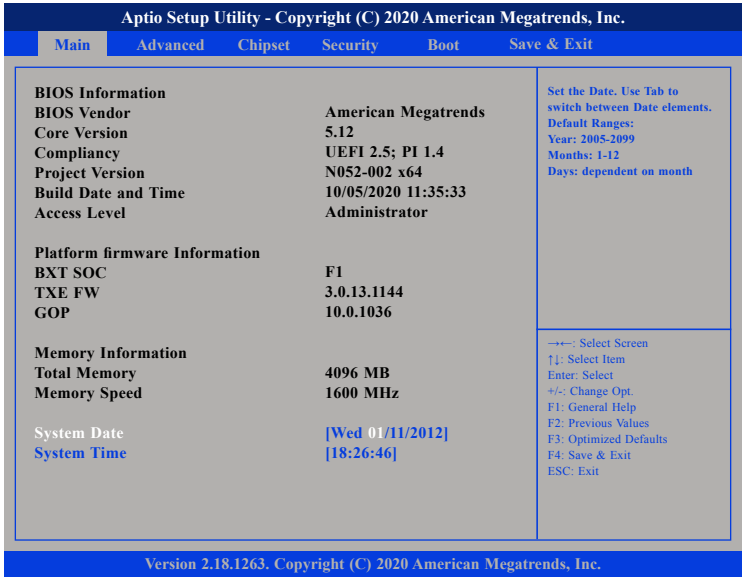
.

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 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 2005 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.

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.

ACPI Settings

This section is used to configure ACPI settings.

Enable Hibernation

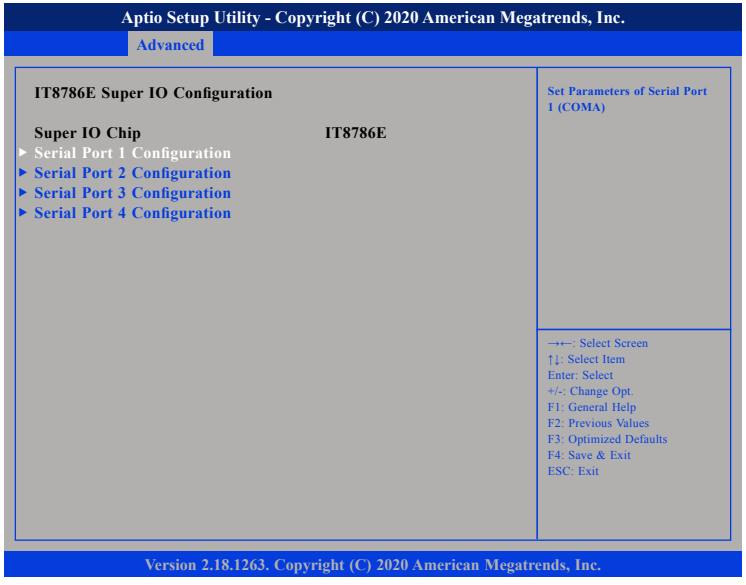
Enables or disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

ACPI Sleep State

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).

IT8786E 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 1 to Serial Port 4 Configuration

Configuration settings for serial port 1 to port 4.

Serial Port 1 Configuration

This section is used to configure serial port 1.

Serial Port

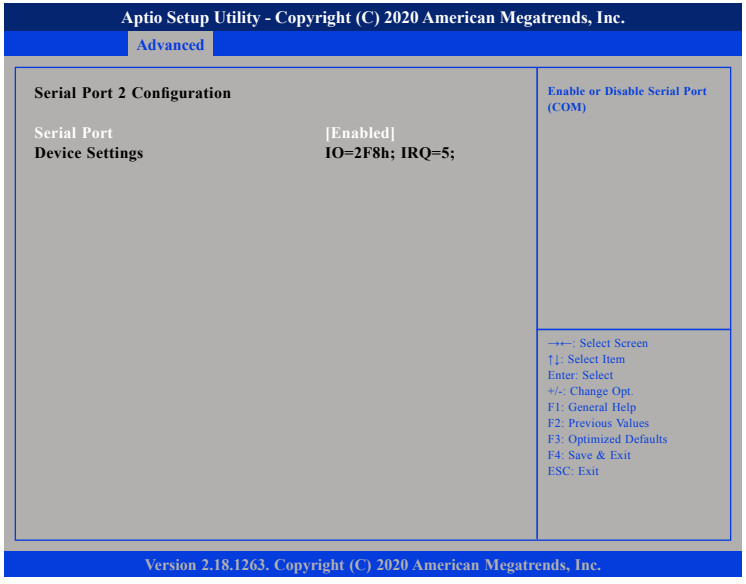
Enables or disables the serial port.

Onboard Serial Port Mode

Select this to change the serial port mode to RS232, RS422, RS485 No Terminator or RS485 With Terminator.

Serial Port 2 Configuration

This section is used to configure serial port 2.

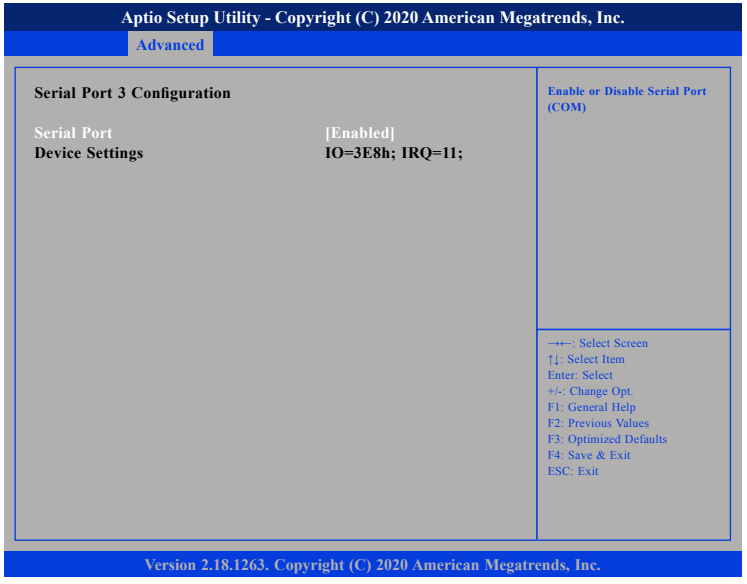


Serial Port

Enables or disables the serial port.

Serial Port 3 Configuration

This section is used to configure serial port 3.

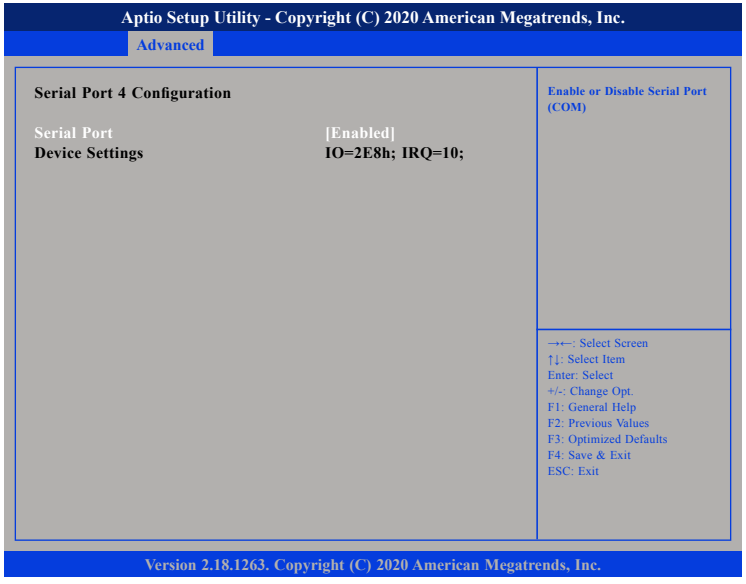


Serial Port

Enables or disables the serial port.

Serial Port 4 Configuration

This section is used to configure serial port 4.

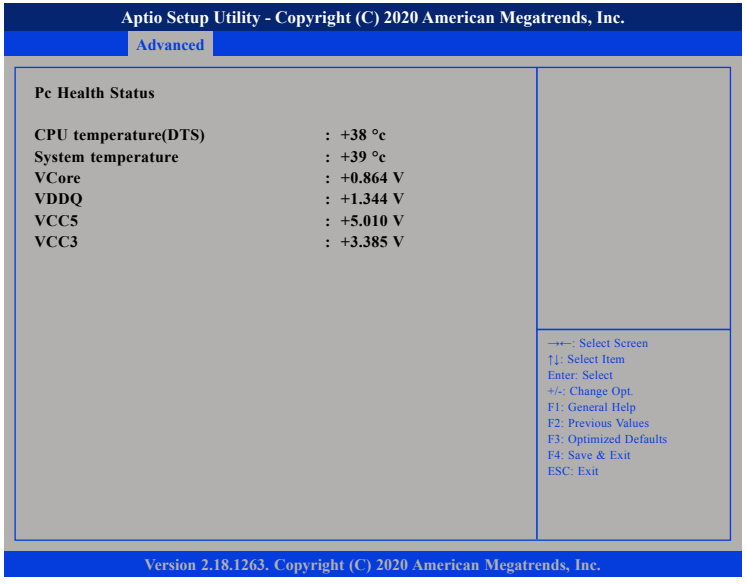


Serial Port

Enables or disables the serial port.

Hardware Monitor

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



CPU temperature(DTS)

Detects and displays the current CPU temperature.

System temperature

Detects and displays the current system temperature.

VCore to VCC3

Detects and displays the output voltages.

CPU Configuration

This section is used to configure the CPU.

Active Processor Core

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

Intel® Virtualization Technology

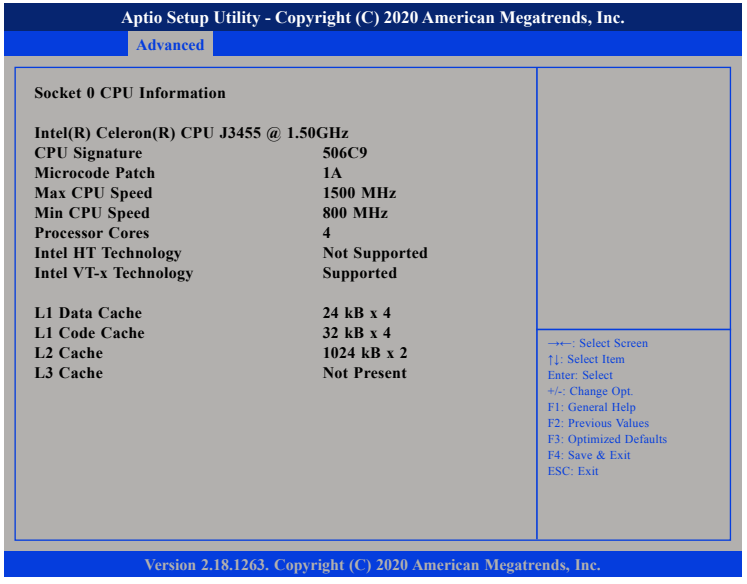
When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

VT-d

Enables or disables Intel® VT-d technology.

Socket 0 CPU Information

This section displays the information of the CPU installed in Socket 0.



CPU Power Management

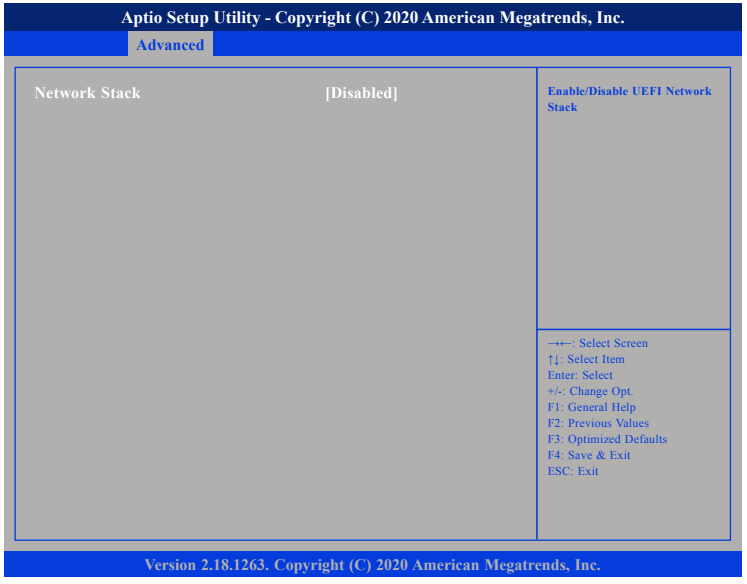
This section is used to configure the CPU power management settings.

EIST

Enables or disables Intel® SpeedStep.

Network Stack Configuration

This section is used to configure the network stack.

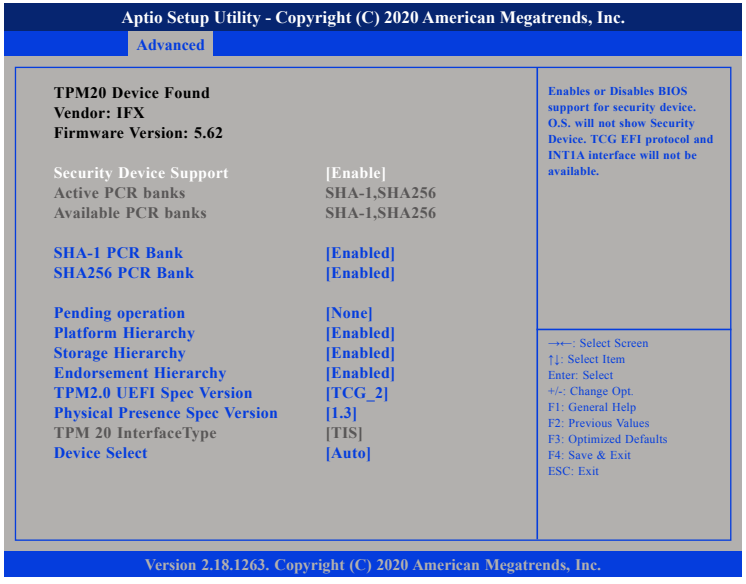


Network Stack

Enables or disables UEFI network stack.

Trusted Computing

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



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.

SHA-1 PCR Bank
Enables or disables SHA-1 PCR Bank.

SHA256 PCR Bank
Enables or disables SHA256 PCR Bank.

Pending operation
Schedules an operation for the security device.

Platform Hierarchy
Enables or disables platform hierarchy.

Storage Hierarchy
Enables or disables storage hierarchy.

Endorsement Hierarchy
Enables or disables endorsement hierarchy.

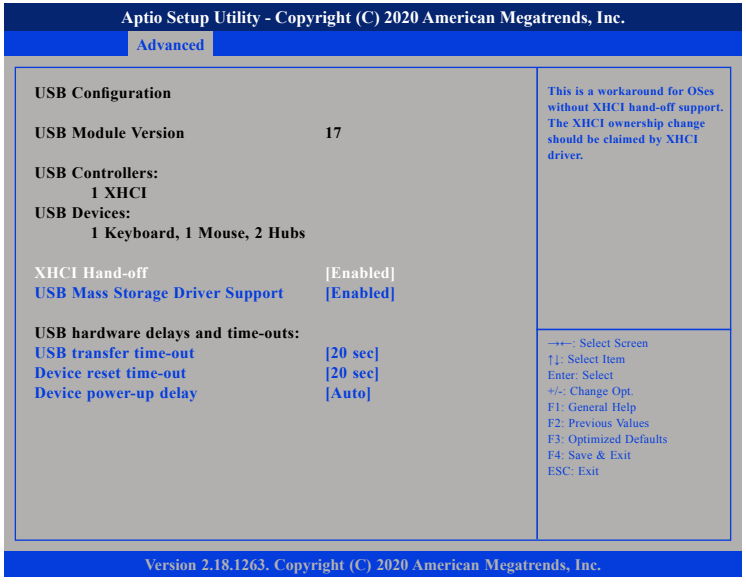
TPM2.0 UEFI Spec Version
Configures the TPM 2.0 UEFI spec version.

Physical Presence Spec Version
Configures the physical presence spec version.

Device Select
Configures the TPM version. TPM 1.2 will restrict support to TPM 1.2 devices and TPM 2.0 will restrict support to TPM 2.0 devices. Auto will support both TPM 1.2 and 2.0 devices with the default set to TPM 2.0 devices if not found, and TPM 1.2 devices will be enumerated.

USB Configuration

This section is used to configure the USB.



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.

USB Mass Storage Driver Support

Enables or disables USB mass storage driver support.

USB transfer time-out

The time-out value for control, bulk, and Interrupt transfers.

Device reset time-out

Selects the USB mass storage device's start unit command timeout.

Device power-up delay

Maximum time the value will take before it properly reports itself to the Host Controller. "Auto" uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

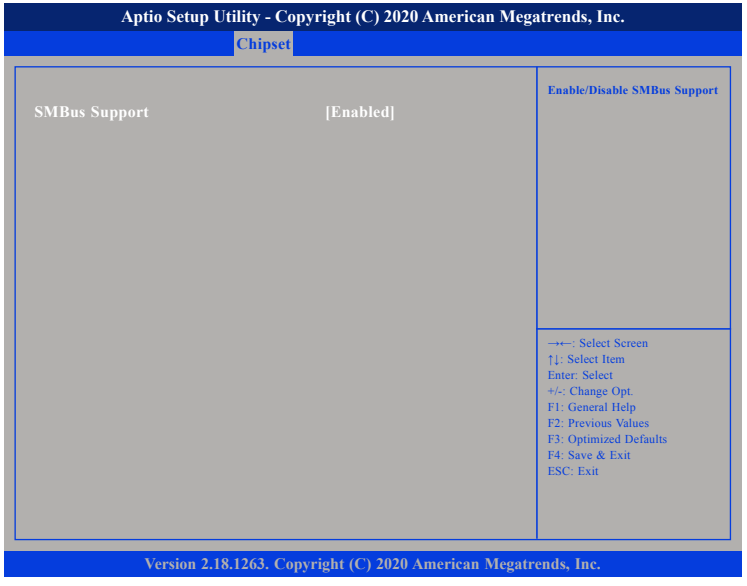
Chipset

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.

South Bridge
Enters the South Bridge submenu.

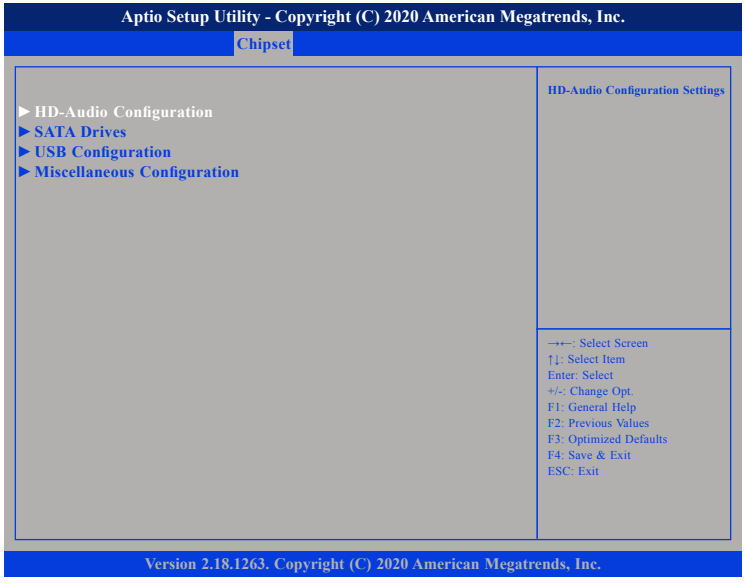
South Cluster Configuration
Enters the South Cluster Configuration submenu.

South Bridge



SMBus Support
Enables or disables SMBus support.

South Cluster Configuration



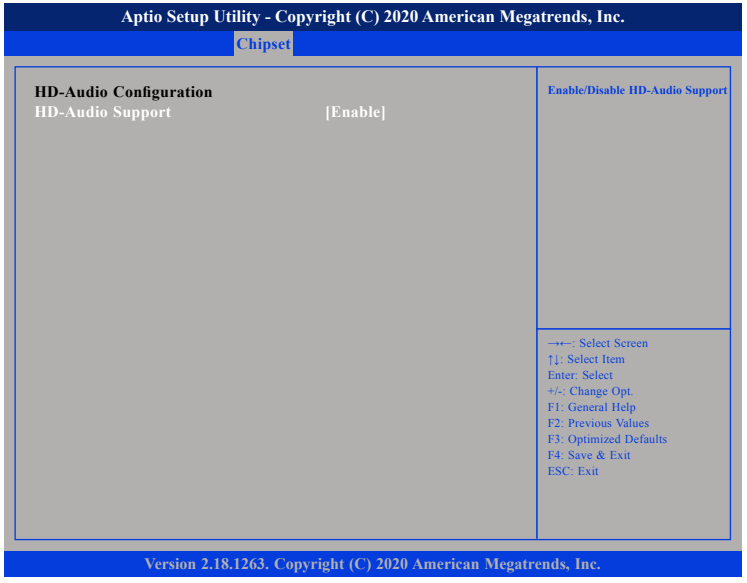
HD-Audio Configuration
Enters the HD-Audio Configuration submenu.

SATA Drives
Enters the SATA Drives submenu.

USB Configuration
Enters the USB Configuration submenu.

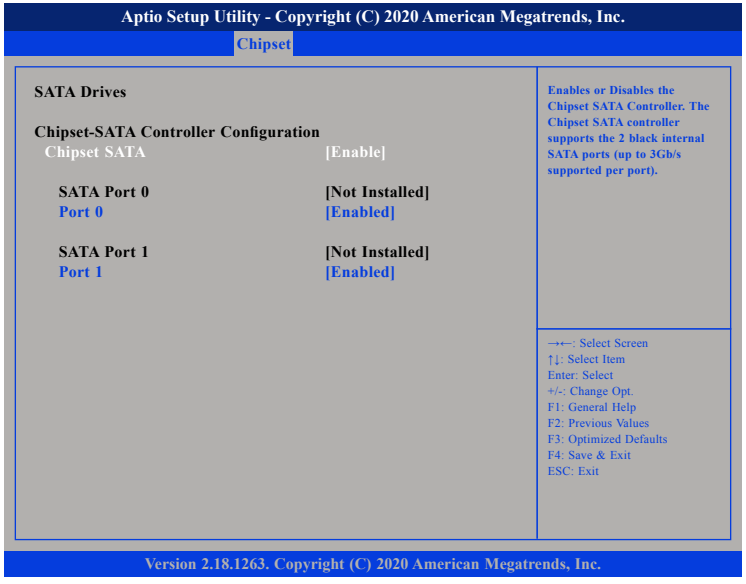
Miscellaneous Configuration
Enters the Miscellaneous Configuration submenu.

HD-Audio Configuration



HD-Audio Support
Enables or disables HD-Audio support.

SATA Drives



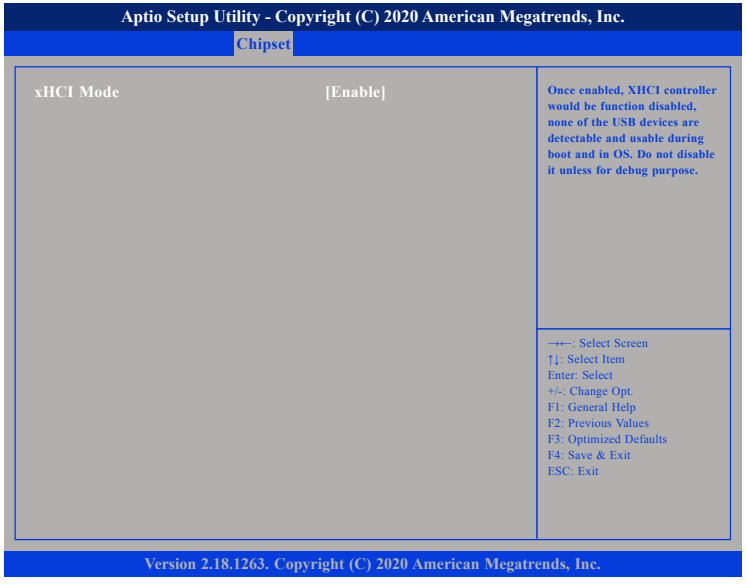
Chipset SATA

Enables or disables the chipset SATA controller.

Port 0 and Port 1

Enables or disables SATA port 0 and SATA port 1.

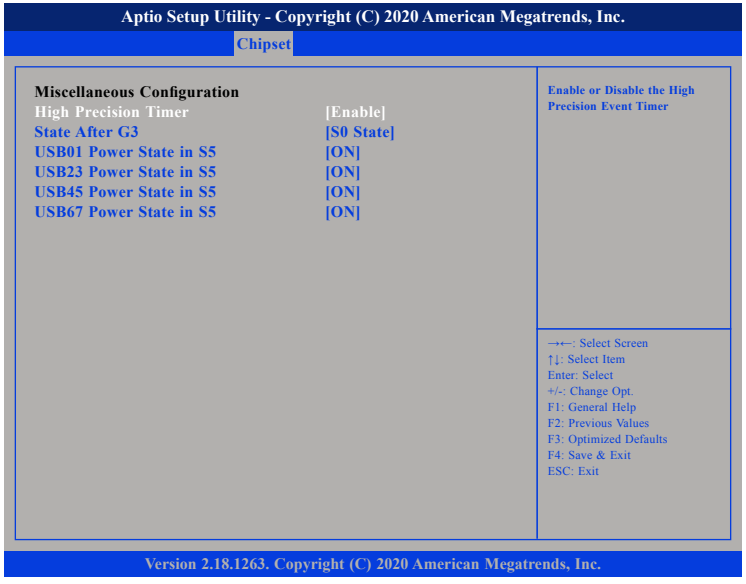
USB Configuration



xHCI Mode

Enables or disables XHCI mode. When enabled, XHCI controller would be disabled and none of the USB devices are detectable and usable during boot and in OS. Do not disable it unless for debugging purposes.

Miscellaneous Configuration



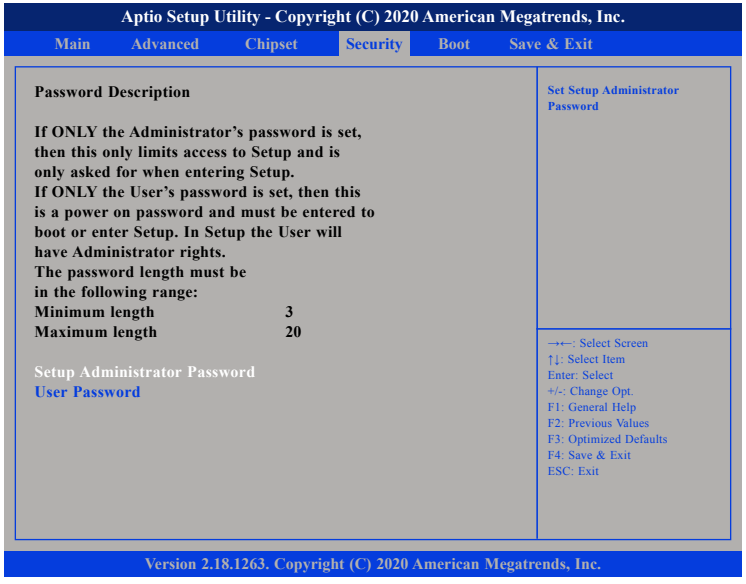
High Precision Timer
Enables or disables high precision event timer.

State After G3
Configures the power state when power is re-applied after a power failure (G3 state).

S0 State System will boot directly as soon as power is applied.
S5 State System stays in power-off state until power button is pressed.

USB01 to USB67 Power State in S5
Configures USB01, USB23, USB45 and USB67 power state in S5.

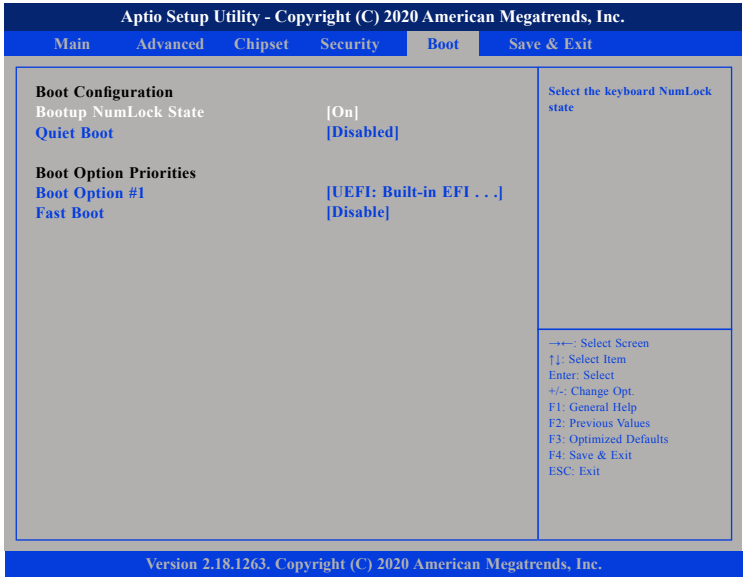
Security



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

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

Boot



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.

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.

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.

Save & Exit

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. You can also press <F4> to save and exit Setup.

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. You can also press <ESC> to exit without saving the changes.

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: GPI/O Programming Guide

GPI/O (General Purpose Input/Output) pins are provided for custom system design. This appendix provides definitions and its default setting for the ten GPI/O pins in the NISE 52 series. 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	A06h (Bit3)	4	GPI0	High	A06h (Bit7)
5	GPO1	Low	A06h (Bit2)	6	GPI1	High	A06h (Bit6)
7	GPO2	Low	A06h (Bit1)	8	GPI2	High	A06h (Bit5)
9	GPO3	Low	A06h (Bit0)	10	GPI3	High	A06h (Bit4)

The bit is Set/Clear indicated output High/Low.

Appendix B: Watchdog Timer Setting

ITE8786 Watchdog Programming Guide

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

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

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

  # Set WDT setting
        outportb(SUPERIO_PORT, WDT_SET);
        outportb(SUPERIO_PORT+1, 0x90);         # Use the second
                                                # Use the minute, change value to 0x10
  # Set WDT sec/min
        outportb(SUPERIO_PORT, WDT_VALUE);
        outportb(SUPERIO_PORT+1, 0x05);         #Set 5 seconds
}
```

Appendix C: Power Consumption

Power Consumption Management

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

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

Functional Port	Front / Rear Panel
USB 2.0 (All ports)	5V, 0.5A (Cement Resistor)
USB 3.0 (All ports)	5V, 1.0A (Cement Resistor)
COM (All ports)	RS232 Loopback (115200 baud rate)
Display Interface	Display Interface 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 set up DC power supply voltage according to system input voltage specifications.
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

BIOS Mode Power Consumption		
Voltage & Current Measurement		Total (W)
Voltage (V)	Current (A)	
24 V	0.10 A	2.4 W
ACPI Sleep (S3) Mode Power Consumption		
24 V	1.35 A (with USB loader)	32.4 W
24 V	0.1 A (without USB loader)	2.4 W
100% Full Loading Mode Power Consumption		
24 V	2.14 A	51.7 W