NEXCOM International Co., Ltd.

Network and Communication Solutions

Network Security Appliance

NSA 5130

User Manual

NEXCOM International Co., Ltd.
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Preface

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Acknowledgements

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Regulatory Compliance Statements

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

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

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

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

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

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

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force in 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 2006 will be RoHS compliant. They will use the usual NEXCOM naming convention.

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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.

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.

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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.

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 needlenose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

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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. Do not leave this equipment in either an unconditioned environment or in a above 40°C storage temperature as this may damage the equipment.
8. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.
9. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
10. 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.
11. All cautions and warnings on the equipment should be noted.
12. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
13. Never pour any liquid into an opening. This may cause fire or electrical shock.
14. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
15. 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.
16. Do not place heavy objects on the equipment.
17. 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.
18. 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.
19. The computer is provided with CD drives that comply with the appropriate safety standards including IEC 60825.

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Technical Support and Assistance

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

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

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.
2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.
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.

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Package Contents

Before continuing, verify that the NSA 5130 package that you received is complete. Your package should have all the items listed in the following table.

Item	P/N	Name	Description	Qty
1	19S00513000X0	NSA5130 ASSY		1
2	5044440031X00	RUBBER FOOT KANG YANG:RF20-5-4P	19.8x18x5.0mm	4
3	6012200052X00	PE ZIPPER BAG #8	170x240mm,W/China RoHS SYMBOL	1
4	6012200053X00	PE ZIPPER BAG #3	100x70mm,W/China RoHS SYMBOL	1
5	6023309081X00	CABLE EDI:232091081804-RS	COM PORT. DB9 FEMALE TO RJ45 8P8C L:1800mm	1
6	6029900037X00	DOW CORNING 340 Silcone Heat Sink Compound (3g)		1
7	50311F0102X00	(H)ROUND HEAD SCREW LONG FEI:P6#32Tx 1/4/SW7*0.8	W/SPRING+FLAT WASHER P6#32Tx 1/4/SW7x0.8 NI	4
8	5043330272X00	TP10 CF BRACKET CHYUAN-JYH:L10Z361	46.4x49.2x8.8mm 301 STAINLESS STELL T:0.5mm	1
9	60233ATA12X00	SATA CABLE FOR NISE 1000 BEST:109-0707-150R	26AWG L:150mm	1
10	60177A0232X00	(N)NSA5130 QUICK REFERENCE GUIDE VER:A	KRAMER	1
11	602DCD0355X00	(N)NSA5130 CD DRIVER VER:1.0	JCL	1
12	6014401238X00	NSA5130 W/O LCM MEMBRANE VER:A GREATWOOD	42x427.8x0.582mm	1

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Ordering Information

The following provides ordering information for NSA 5130.

- **Barebone**
  NSA 5130 (P/N: 10S00513000X0)
  - Supports Intel® 2nd generation Core™ processors, 4 DDR3 memory slots, 8 PCIe GbE LAN ports, CompactFlash socket, USB ports, VGA port, 1 PCIe x8 expansion slot, w/o LCM
- **Options**

	P/N	Controller	Interface Type	Ports	Bypass/Segment	Expansion Slot	Location Slot
NSK5380-C8	10SK0538000X0	INTEL® NH82580EB	PCIe x8	8 Copper	Dual Latch/2	None	All Slot
NSK5380-F8	10SK0538001X0	INTEL® NH82580EB	PCIe x8	8 SFP	None	None	All Slot
NSK5380-C4F4	10SK0538002X0	INTEL® NH82580EB	PCIe x8	4 Copper / 4 SFP	Dual Latch/2	None	All Slot
NSK5380-F4	10SK0538003X0	INTEL® NH82580EB	PCIe x8	4 SFP	None	None	All Slot
NSK5399-F2	10SK0539900X0	INTEL® L82599ES	PCIe x8	2 SFP	None	None	All Slot

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Chapter 1: Product Introduction

Overview

Front

Rear

Key Features

- 1U Rackmount Network Platform
- Intel® 2nd Generation Core™ Processors
- 4x DDR3 1066/1333 Memory, up to 16GB
- 8+8 x GbE LAN Ports
- 1x internal 3.5" HDD Bay / 2x 2.5" HDD Bay (optional)
- 1x PCIe x8 expansion

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Hardware Specifications

NSA 5130 System

Physical Characteristics

- Form Factor
  - 19" 1U
- Construction
  - SECC steel plate, 1.0 mm thick
- Color
  - Nexcom 295U
- Dimensions (W x D x H)
  - 430 mm x 450 mm x 44 mm
- Mounting
  - Mounting ear
- System chassis
  - NSC5130

System Cooling

- Cooling Method
  - Removable system fan at the rear of the chassis
- Cooler Type
  - Four system fans with controllable fan speed
- Ventilation
  - Suction from the side and discharged to the back

Main Board

- NSB 5130
- Intel® 2nd generation Core™ processors, Max 95watt
- Intel® C206
- 4 x 240-pin DDR3 1066/1333MHz DIMM sockets, up to 16GB ECC/ non-ECC SDRAM
- Intel® 82583V LAN chip, LAN Bypass: 4 pairs, 10/100/1000 link speed

I/O Interface - Front

- Console port
  - 1 RJ45 type
- USB port
  - 2 USB ports
- LAN port
  - 8 RJ45 copper LAN ports
- Keypad (optional)
  - LCM keypad
- LCD
  - 2x16 characters LCD module, PIO interface (optional)
- Button
  - 1 GPIO software button
- LAN module bay (optional)
  - 1 LAN module bay
- LEDs
  - Power Status/HDD Status/LAN Status/Bypass Status LED

I/O Interface - Rear

- 1 VGA port (optional)
- 2 USB 2.0 ports (optional)
- 1 expansion slot

Storage

- 1 onboard CompactFlash socket
- 1 internal 3.5" HDD bay or 2 2.5" HDD bay
- 1 SATA DOM device space

Expansion

- 1 x PCIe x8 slot

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Standard Power Supply
- Power type
  - Standard 200W ATX power supply
- Input voltage
  - AC 100V - 240V
- Output voltage
  - DC +5V, -5V, +12V, -12V, +3.3V, +5VSB
- Maximum output power
  - Up to 250W for Standard ATX
  - Up to 400watt for Redundant Power

Environment
- Operating temperature
  - 0°C ~ 40°C
- Storage temperature
  - -20°C ~ 75°C
- Relative humidity
  - 10%~90% non-condensing

Vibration
- Sine wave vibration test (non-operating)
  - Frequency: 5 - 500 Hz
  - Acceleration: 2g
- Random vibration test (operating)
  - Frequency: 5 - 500 Hz
  - Acceleration: 0.3g
- Random vibration test (packing)
  - Frequency: 1 - 200 Hz
  - Acceleration: 1.15g

Shock
- Non-OP shock
- RoHS

Acoustic Noise
- ISO 11201:1995(E)/ISO 7779:1999/ Amd.1:2003(E)

Dimensions
- Chassis Dimensions: 426mm x 450mm x 44mm
- Carton Dimensions: 560mm x 620mm x 190mm

Weight
- Without Packing: 8Kg
- With Packing: 12Kg

Certification
- CE
- FCC Class A
- UL

ESD
- 2/4KV contact discharge
- 2/4/8KV air discharge
- Criteria B

Safety
- UL
- LVD

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Main Board (NSB 5130)

Processor
- CPU
  - Intel® 2nd generation Core™ processors, Max 95watt

Chipset
- Intel® C206

Memory
- Technology
  - DDR3 1066/1333MHz ECC and Non-ECC memory
- Sockets
  - Four 240-pin DDR3 DIMM sockets
- Capacity
  - 16GB maximum memory

Network
- Onboard LAN controller
  - Intel 82583V x8 (connected from Intel 3450 PCIe bus)
- Link speed
  - 10/100/1000
- Bypass
  - 4 pairs (dual latch bypass, Active Bypass status report)
- Media type
  - Copper
- PXE boot
  - ETH1 (the left side of LAN)
- LAN module (optional)
  - One PCIe x8 connected to CPU PCIe bus
  - Supports Nexcom NSK53xx series modules

Storage
- SATA
  - Two SATA connectors with power connector for one 3.5" HDD (default) or two 2.5" HDD (optional)
- SATA DOM
  - One SATA DOM connector with power connector (JST 2-pin)
- CompactFlash
  - JMicron JMD330 SATA to IDE bridge
  - One CompactFlash socket

Status Indicator
- Power LED
  - Green: Lights green when the system is On.
- HDD LED
  - Yellow: Lights yellow when the HDD is active.
- GPIO LED
  - Yellow
- Bypass LED
  - Yellow

RTC
- Controller
  - Built-in controller
- Backup battery
  - Lithium ion battery

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System Management

- Watchdog
  - Watchdog timeout is programmable by software from 1 second/min. to 256 sec. (from Winbond W83627 Super I/O)
- System Monitor
  - Monitors voltages (system temperature sensor, monitors system voltage, monitors battery voltage, monitors fan speed of system and module) (W83792 monitor chip)
  - Fan speed controller: 2 fan connectors with fan speed control function

I/O Port

- Internal I/O
  - Serial ports: two reserved 2x5 2.0mm box headers (COM1 and COM2)
  - USB ports: one 1x6 2.0mm JST connector
  - SATA ports: three SATA ports
  - PS/2 keyboard/mouse: one 2x4 2.54mm pin header
  - GPIO: one 2x2 2.0mm pin header
- Rear I/O
  - 1x PCIe x16 slot for a x8 slot on the riser card
  - 1x VGA port
  - 2x USB ports
- Front I/O
  - 2x USB ports
  - 1x RJ45 type console port
  - 8x RJ45 copper LAN ports
  - Power status / HDD status / LAN status / Bypass status LED
  - 1x GPIO software button
  - 1x LAN module bay (optional)

Expansion

- PCI Express
  - One PCIe x8 slot on the riser card

Power

- Connector type
  - ATX power connector
- Power mode
  - AT mode (default), ATX mode
    Use the jumper to change the setting. The BIOS can auto detect the power mode status.

BIOS

- Flash ROM
  - 64MB (SPI)
- Type
  - AMI BIOS

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Software

- Standard OS
  - Windows 2003, Linux Kernel 2.6 (Fedora Core, SUSE)
- Drivers
  - VGA, LAN, WDT, GPIO, Hardware Monitor, Bypass
- Sample code
  - LCM sample string display, LCM testing program, GPIO, WTD, Bypass, Hardware Monitor

Environment

- Operating Temperature
  - 0°C - 40°C
- Storage Temperature
  - -20°C - 75°C
- Relative Humidity
  - 10%-90% non-condensing
- EMI/EMC
  - CE/FCC Class A
- ESD
  - 2/4KV contact discharge, 2/4/8KV air discharge, Criteria B

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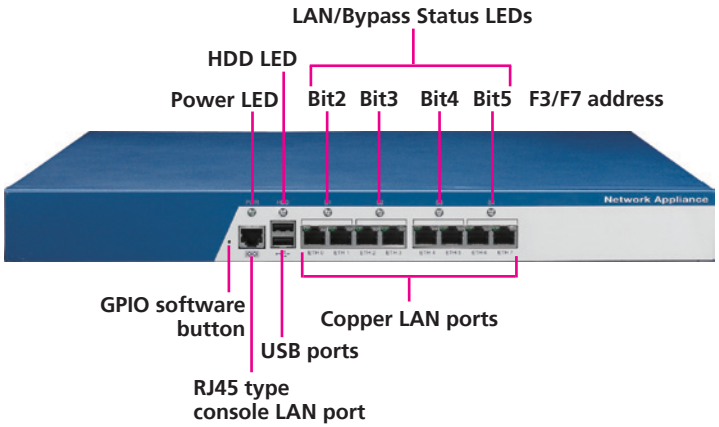
Getting to Know NSA 5130

Front Panel



Power LED
Indicates the power status of the system.

HDD LED
Indicates the status of the hard drive.

LAN/Bypass Status LEDs
Indicates the status of the LAN/Bypass (F3/F7 bit2 to bit5).

USB Ports
Used to connect USB 2.0/1.1 devices.

Console LAN Port
Used to connect RJ45 type Console port.

GPIO Software Button
This is a GPIO software button.

Copper LAN Ports
Used to connect LAN network devices.

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Rear Panel

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

Expansion Slot
Used to install a PCI Express x8 card.

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Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers on the motherboard. Note that the following procedures are generic for NSA 5130.

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 environment 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 the 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.

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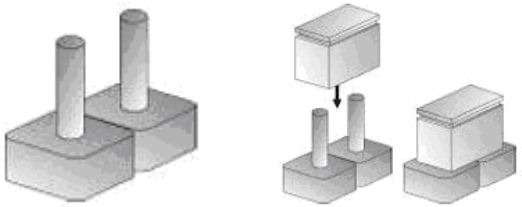
Jumper Settings

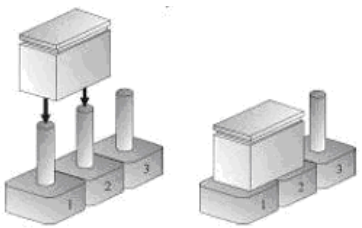
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is **short**. If you remove the jumper cap, or place the jumper cap on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



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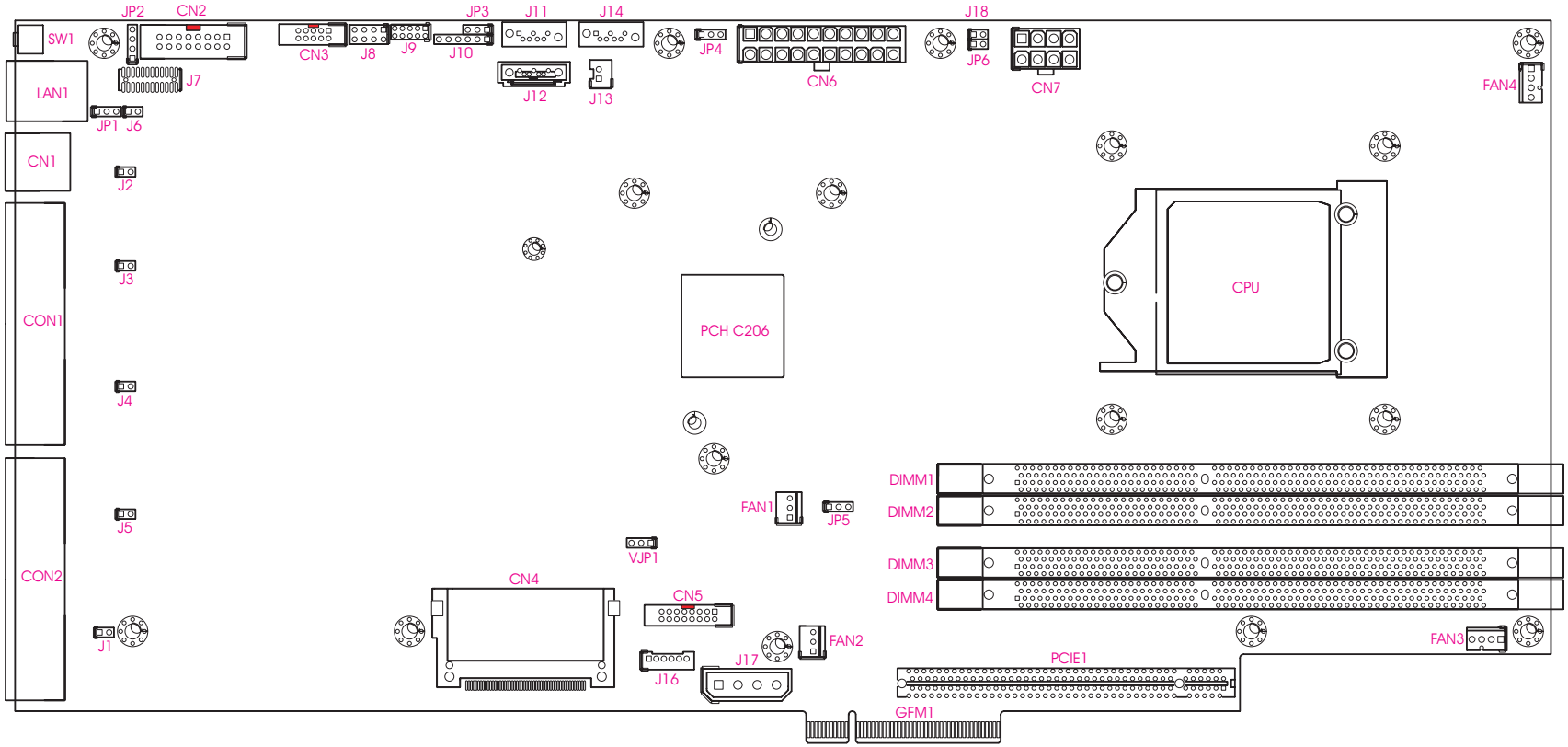
Locations of the Jumpers and Connectors

NSB 5130

The figure on the right is the NSB 5130 main board which is the main board used in the NSA 5130 system. It shows the locations of the jumpers and connectors.



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Jumpers

CMOS Clear

Connector type: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP5

Pin	Settings
1-2 On	Normal
2-3 On	CMOS Clear

1-2 On: default

Pin	Definition
1	NC
2	ICH_RTCRST_N
3	Battery GND

ME Force Update

Connector type: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP3

Pin	Settings
1-2 On	Normal
2-3 On	ME Force Update

1-2 On: default

Pin	Definition
1	NC
2	GPIO24
3	GND

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Console Type Select

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

Pin	Settings
1-2 On	RTS to CTS
2-3 On	Normal

1-2 On: default

Pin	Definition
1	SP_RTS1_R
2	SP_CTS1_R
3	SP_CTS1_CON

Power Type Select

Connector type: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP4

Pin	Definition
1-2 On	ATX
2-3 On	AT

2-3 On: default

Pin	Definition
1	3VSB
2	AT_ATX_SELECT
3	GND

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Connector Pin Definitions

External I/O Interface

Status Indicators

Connector location: LED9

PWR

HDD

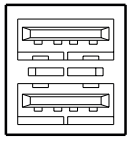
GPIO (F6 bit0)

GPIO (F6 bit1)

Status	LED Color
PWR	Green
HDD	Yellow
F6 0	Yellow
F6 1	Yellow

USB Ports

Connector type: Dual USB port
Connector location: CN1



Pin	Definition	Pin	Definition
1	VCC	5	VCC
2	USB0-	6	USB1-
3	USB0+	7	USB1+
4	GND	8	GND

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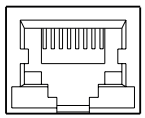
RJ45 Type Console LAN Port (RS232)

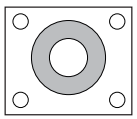
Connector type: RJ45 port
Connector location: LAN1



Pin	Definition	Pin	Definition
1	SP_RTS1_R	2	SP_DTR1_R
3	SP_TXD1_R	4	GND
5	SP_DCD1_R	6	SP_RXD1_R
7	SP_DSR1_R	8	SP_CTS1_CON

Software Push Button

Connector type: 2-pin jack
Connector location: SW1



Pin	Definition
1	GND
2	RW_SW_RST

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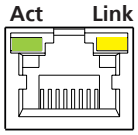
LAN1 Port

Connector type: RJ45 port with LEDs
Connector location: CON1A



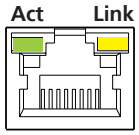
Act	Status
Green Blinking	Data Activity
Off	No Acitivity

Link	Status
Green	1GB
Yellow	100MB
Off	10MB

Pin	Definition	Pin	Definition
A1	LAN1_TXP0_CON	A2	LAN1_TXN0_CON
A3	LAN1_TXP1_CON	A4	LAN1_TXP2_CON
A5	LAN1_TXN2_CON	A6	LAN1_TXN1_CON
A7	LAN1_TXP3_CON	A8	LAN1_TXN3_CON
A9	LAN1_LED_LINK100#	A10	LAN1_LED_LINK1G#
A11	LAN1_LED_ACT#	A12	LAN1_ACTPW
MH1	GND_IO		

LAN2 Port

Connector type: RJ45 port with LEDs
Connector location: CON1B



Act	Status
Green Blinking	Data Activity
Off	No Acitivity

Link	Status
Green	1GB
Yellow	100MB
Off	10MB

Pin	Definition	Pin	Definition
A1	LAN2_TXP0_CON	A2	LAN2_TXN0_CON
A3	LAN2_TXP1_CON	A4	LAN2_TXP2_CON
A5	LAN2_TXN2_CON	A6	LAN2_TXN1_CON
A7	LAN2_TXP3_CON	A8	LAN2_TXN3_CON
A9	LAN2_LED_LINK100#	A10	LAN2_LED_LINK1G#
A11	LAN2_LED_ACT#	A12	LAN2_ACTPW
MH1	GND_IO		

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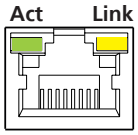
LAN3 Port

Connector type: RJ45 port with LEDs
Connector location: CON1C



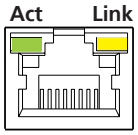
Act	Status
Green Blinking	Data Activity
Off	No Acitivity

Link	Status
Green	1GB
Yellow	100MB
Off	10MB

Pin	Definition	Pin	Definition
A1	LAN3_TXP0_CON	A2	LAN3_TXN0_CON
A3	LAN3_TXP1_CON	A4	LAN3_TXP2_CON
A5	LAN3_TXN2_CON	A6	LAN3_TXN1_CON
A7	LAN3_TXP3_CON	A8	LAN3_TXN3_CON
A9	LAN3_LED_LINK100#	A10	LAN3_LED_LINK1G#
A11	LAN3_LED_ACT#	A12	LAN3_ACTPW
MH1	GND_IO		

LAN4 Port

Connector type: RJ45 port with LEDs
Connector location: CON1D



Act	Status
Green Blinking	Data Activity
Off	No Acitivity

Link	Status
Green	1GB
Yellow	100MB
Off	10MB

Pin	Definition	Pin	Definition
A1	LAN4_TXP0_CON	A2	LAN4_TXN0_CON
A3	LAN4_TXP1_CON	A4	LAN4_TXP2_CON
A5	LAN4_TXN2_CON	A6	LAN4_TXN1_CON
A7	LAN4_TXP3_CON	A8	LAN4_TXN3_CON
A9	LAN4_LED_LINK100#	A10	LAN4_LED_LINK1G#
A11	LAN4_LED_ACT#	A12	LAN4_ACTPW
MH1	GND_IO		

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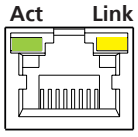
LAN5 Port

Connector type: RJ45 port with LEDs
Connector location: CON2A



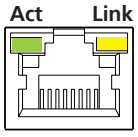
Act	Status
Green Blinking	Data Activity
Off	No Acitivity

Link	Status
Green	1GB
Yellow	100MB
Off	10MB

Pin	Definition	Pin	Definition
A1	LAN5_TXP0_CON	A2	LAN5_TXN0_CON
A3	LAN5_TXP1_CON	A4	LAN5_TXP2_CON
A5	LAN5_TXN2_CON	A6	LAN5_TXN1_CON
A7	LAN5_TXP3_CON	A8	LAN5_TXN3_CON
A9	LAN5_LED_LINK100#	A10	LAN5_LED_LINK1G#
A11	LAN5_LED_ACT#	A12	LAN5_ACTPW
MH1	GND_IO		

LAN6 Port

Connector type: RJ45 port with LEDs
Connector location: CON2B



Act	Status
Green Blinking	Data Activity
Off	No Acitivity

Link	Status
Green	1GB
Yellow	100MB
Off	10MB

Pin	Definition	Pin	Definition
A1	LAN6_TXP0_CON	A2	LAN6_TXN0_CON
A3	LAN6_TXP1_CON	A4	LAN6_TXP2_CON
A5	LAN6_TXN2_CON	A6	LAN6_TXN1_CON
A7	LAN6_TXP3_CON	A8	LAN6_TXN3_CON
A9	LAN6_LED_LINK100#	A10	LAN6_LED_LINK1G#
A11	LAN6_LED_ACT#	A12	LAN6_ACTPW
MH1	GND_IO		

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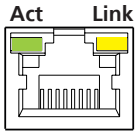
LAN7 Port

Connector type: RJ45 port with LEDs
Connector location: CON2C

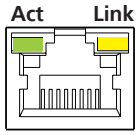


Act	Status
Green Blinking	Data Activity
Off	No Acitivity

Pin	Definition	Pin	Definition
A1	LAN7_TXP0_CON	A2	LAN7_TXN0_CON
A3	LAN7_TXP1_CON	A4	LAN7_TXP2_CON
A5	LAN7_TXN2_CON	A6	LAN7_TXN1_CON
A7	LAN7_TXP3_CON	A8	LAN7_TXN3_CON
A9	LAN7_LED_LINK100#	A10	LAN7_LED_LINK1G#
A11	LAN7_LED_ACT#	A12	LAN1_ACTPW
MH1	GND_IO		

LAN8 Port

Connector type: RJ45 port with LEDs
Connector location: CON2D



Act	Status
Green Blinking	Data Activity
Off	No Acitivity

Pin	Definition	Pin	Definition
A1	LAN8_TXP0_CON	A2	LAN8_TXN0_CON
A3	LAN8_TXP1_CON	A4	LAN8_TXP2_CON
A5	LAN8_TXN2_CON	A6	LAN8_TXN1_CON
A7	LAN8_TXP3_CON	A8	LAN8_TXN3_CON
A9	LAN8_LED_LINK100#	A10	LAN8_LED_LINK1G#
A11	LAN8_LED_ACT#	A12	LAN8_ACTPW
MH1	GND_IO		

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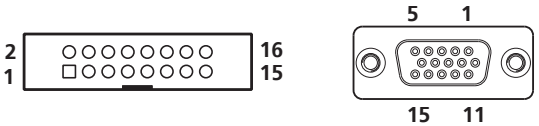
VGA Connector

Connector type: 2x8 16-pin box header, 2.0 mm pitch
Connector location: CN5



Pin	Definition	Pin	Definition
1	VGA_R_CON	9	VGA_VCC
2	VGA_G_CON	10	GND
3	VGA_B_CON	11	NC
4	NC	12	VGA_I2CDAT_CON
5	GND	13	VGA_HSYNC_CON
6	GND	14	VGA_VSYNC_CON
7	GND	15	VGA_I2CCLK_CON
8	GND	16	NC

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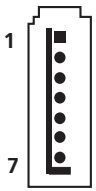
Internal Connectors

SATA2 Port

Connector type: Standard Serial ATAII, 1.27mm
Connector location: J12



Pin	Definition
1	GND
2	SATA_TX2P
3	SATA_TX2N
4	GND
5	SATA_RX2N
6	SATA_RX2P
7	GND

SATA3 Port

Connector type: Standard Serial ATAII, 1.27mm
Connector location: J11

Pin	Definition
1	GND
2	SATA_TX1P
3	SATA_TX1N
4	GND
5	SATA_RX1N
6	SATA_RX1P
7	GND

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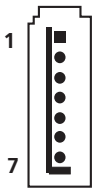
SATA4 Port

Connector type: Standard Serial ATAII, 1.27mm
Connector location: J14



Pin	Definition
1	GND
2	SATA_TX0P
3	SATA_TX0N
4	GND
5	SATA_RX0N
6	SATA_RX0P
7	GND

SATA Power Connector

Connector type: 1x4 4-pin header
Connector location: J17

Pin	Definition
1	VCC12
2	GND
3	GND
4	VCC5

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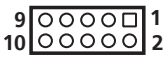
SATA DOM Power Connector

Connector type: 1x2 2-pin boxed header, 2.5 mm JST
Connector location: J13

Pin	Definition
1	VCC5
2	GND

Digital I/O Connector (4 Input, 4 Output)

Connector type: 2x5 10-pin header, 2.0 mm
Connector location: J9



Pin	Definition	Pin	Definition
1	VCC5	2	GND
3	SIO_GP32	4	SIO_GP06
5	SIO_GP03	6	SIO_GP07
7	SIO_GP04	8	SIO_GP76
9	SIO_GP05	10	SIO_GP77

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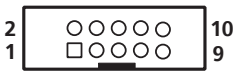
COM2 Connector

Connector type: 2x5 10-pin boxed header, 2.0 mm
Connector location: CN3



Pin	Definition	Pin	Definition
1	SP_DCD2	2	SP_RXD2
3	SP_TXD2	4	SP_DTR2
5	COM2_GND	6	SP_DSR2
7	SP_RTS2	8	SP_CTS2
9	SP_RI2	10	COM2_GND

USB Connector

Connector type: 1x6 6-pin, 2.0 mm JST
Connector location: J16

Pin	Definition
1	VCC
2	USB2-
3	USB2+
4	USB3-
5	USB3+
6	GND

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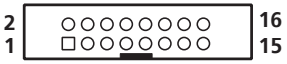
Parallel Interface for LCM Module

Connector type: 2x8 16-pin boxed header, 2.54 mm pitch
Connector location: CN2



Pin	Definition	Pin	Definition
1	P5V	2	GND
3	LPT_SLIN#R	4	LPT_RES
5	LPT_AFD#R	6	LPT_INIT#R
7	LPT_PDR1	8	LPT_PDR0
9	LPT_PDR3	10	LPT_PDR2
11	LPT_PDR5	12	LPT_PDR4
13	LPT_PDR7	14	LPT_PDR6
15	LPT_PW	16	VCC5

LCM Keypad Connector

Connector type: 1x4 4-pin header, 2.54 mm
Connector location: JP2

Pin	Definition
1	KEY_PIN1
2	KEY_PIN2
3	KEY_PIN3
4	KEY_PIN4

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HW Reset Button

Connector type: 1x2 2-pin header, 2.54 mm pitch
Connector location: JP6

Pin	Definition
1	PCH_SYS_RESET_N_R
2	GND

Power Button

Connector type: 1x2 2-pin header, 2.54 mm pitch
Connector location: J18

Pin	Definition
1	GND
2	PCH_PWRBTN_N

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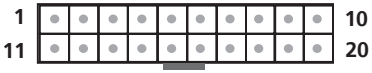
Power Connector

Connector type: 2x10 20-pin header
Connector location: CN6



Pin	Definition	Pin	Definition
1	VCC3_3	2	VCC3_3
3	GND	4	VCC5
5	GND	6	VCC5
7	GND	8	ATXPWROK
9	5VSB	10	VCC12
11	VCC3_3	12	NC
13	GND	14	SIO_PSON_N
15	GND	16	GND
17	GND	18	NC
19	VCC5	20	VCC5

GAL Programming Connector

Connector type: 1x6 6-pin header, 2.54 mm
Connector location: J10

Pin	Definition
1	3VSB
2	GND
3	GAL_TCK
4	GAL_TDO
5	GAL_TDI
6	GAL_TMS

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System Fan

Connector type: 1x3 3-pin Wafer, 2.54 mm pitch
Connector location: FAN1

Pin	Definition
1	GND
2	VCC12
3	FAN2

System Fan

Connector type: 1x3 3-pin Wafer, 2.54 mm pitch
Connector location: FAN2

Pin	Definition
1	GND
2	VCC12
3	FAN3

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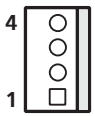
CPU Fan Connector

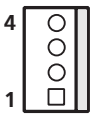
Connector type: 1x4 4-pin Wafer, 2.54 mm pitch
Connector location: FAN3



Pin	Definition
1	GND
2	VCC12
3	CPU_FAN
4	CPU_FANPWM

System Fan Connector

Connector type: 1x4 4-pin Wafer, 2.54 mm pitch
Connector location: FAN4



Pin	Definition
1	GND
2	VCC12
3	FAN1
4	AUX_FANPWM

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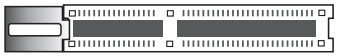
PCIe Slot

Connector type: 2x82-pin PCIe x8 slot
Connector location: PCIE1



Pin	Definition	Pin	Definition
A1	PCIE16_PRSNT1	B1	VCC12
A2	VCC12	B2	VCC12
A3	VCC12	B3	VCC12
A4	GND	B4	GND
A5	VCC3_3	B5	PCIE16_SMC
A6	VCC3_3	B6	PCIE16_SMD
A7	VCC3_3	B7	GND
A8	VCC3_3	B8	VCC3_3
A9	VCC3_3	B9	VCC12
A10	VCC3_3	B10	3VSB
A11	PLT_RST_BUF3_N	B11	PCIE_WAKE_L
A12	GND	B12	VCC12
A13	PCIE_X16_CLK_1P	B13	GND
A14	PCIE_X16_CLK_1N	B14	PEG_SLOT_TX15P
A15	GND	B15	PEG_SLOT_TX15N
A16	PEG_SLOT_RX15P	B16	GND
A17	PEG_SLOT_RX15N	B17	PCIE16_PRSNT2_1
A18	GND	B18	GND
A19	VCC12	B19	PEG_SLOT_TX14P
A20	GND	B20	PEG_SLOT_TX14N
A21	PEG_SLOT_RX14P	B21	GND
A22	PEG_SLOT_RX14N	B22	GND
A23	GND	B23	PEG_SLOT_TX13P
A24	GND	B24	PEG_SLOT_TX13N
A25	PEG_SLOT_RX13P	B25	GND
A26	PEG_SLOT_RX13N	B26	GND
A27	GND	B27	PEG_SLOT_TX12P
A28	GND	B28	PEG_SLOT_TX12N
A29	PEG_SLOT_RX12P	B29	GND
A30	PEG_SLOT_RX12N	B30	VCC12
A31	GND	B31	PCIE16_PRSNT2_2
A32	VCC12	B32	GND
A33	VCC12	B33	PEG_SLOT_TX11P
A34	GND	B34	PEG_SLOT_TX11N
A35	PEG_SLOT_RX11P	B35	GND
A36	PEG_SLOT_RX11N	B36	GND
A37	GND	B37	PEG_SLOT_TX10P
A38	GND	B38	PEG_SLOT_TX10N
A39	PEG_SLOT_RX10P	B39	GND
A40	PEG_SLOT_RX10N	B40	GND
A41	GND	B41	PEG_SLOT_TX9P
A42	GND	B42	PEG_SLOT_TX9N
A43	PEG_SLOT_RX9P	B43	GND

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Pin	Definition	Pin	Definition
A44	PEG_SLOT_RX9N	B44	GND
A45	GND	B45	PEG_SLOT_TX8P
A46	GND	B46	PEG_SLOT_TX8N
A47	PEG_SLOT_RX8P	B47	GND
A48	PEG_SLOT_RX8N	B48	PCIE16_PRSNT2_3
A49	GND	B49	GND
A50		B50	PEG_SLOT_TX7P
A51	GND	B51	PEG_SLOT_TX7N
A52	PEG_SLOT_RX7P	B52	GND
A53	PEG_SLOT_RX7N	B53	GND
A54	GND	B54	PEG_SLOT_TX6P
A55	GND	B55	PEG_SLOT_TX6N
A56	PEG_SLOT_RX6P	B56	GND
A57	PEG_SLOT_RX6N	B57	GND
A58	GND	B58	PEG_SLOT_TX5P
A59	GND	B59	PEG_SLOT_TX5N
A60	PEG_SLOT_RX5P	B60	GND
A61	PEG_SLOT_RX5N	B61	GND
A62	GND	B62	PEG_SLOT_TX4P
A63	GND	B63	PEG_SLOT_TX4N
A64	PEG_SLOT_RX4P	B64	GND
A65	PEG_SLOT_RX4N	B65	GND
A66	GND	B66	PEG_SLOT_TX3P
A67	GND	B67	PEG_SLOT_TX3N
A68	PEG_SLOT_RX3P	B68	GND

Pin	Definition	Pin	Definition
A69	PEG_SLOT_RX3N	B69	GND
A70	GND	B70	PEG_SLOT_TX2P
A71	GND	B71	PEG_SLOT_TX2N
A72	PEG_SLOT_RX2P	B72	GND
A73	PEG_SLOT_RX2N	B73	GND
A74	GND	B74	PEG_SLOT_TX1P
A75	GND	B75	PEG_SLOT_TX1N
A76	PEG_SLOT_RX1P	B76	GND
A77	PEG_SLOT_RX1N	B77	GND
A78	GND	B78	PEG_SLOT_TX0P
A79	GND	B79	PEG_SLOT_TX0N
A80	PEG_SLOT_RX0P	B80	GND
A81	PEG_SLOT_RX0N	B81	PCIE_X16_CLK_2P
A82	GND	B82	PCIE_X16_CLK_2N

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PCIe Gold Finger (for LAN Module)

Connector type: 2x49-pin
Connector location: GFM1

Pin	Definition	Pin	Definition
A1	PLT_RST_BUF3_N	B1	PCIE3_SEL1
A2	LPC_AD0	B2	PCIE3_SEL2
A3	LPC_AD1	B3	PCIE3_SEL3
A4	LPC_AD2	B4	VCC3_3
A5	LPC_AD3	B5	SMB_CLK_MAIN
A6	LPC_FRAME_N	B6	SMB_DATA_MAIN
A7	VCC3_3	B7	VCC3_3
A8	PLT_RST_BUF3_N	B8	VCC3_3
A9	VCC3_3	B9	GF_SUSCLK
A10	VCC3_3	B10	VCC3_3
A11	PCH_PWROK	B11	SMB_ALERT_N
A12	SYS_FAN	B12	USB_OC2_N
A13	VCC3_3	B13	WAKE_N
A14	VCC3_3	B14	3VSB
A15	PCIE_X8_GF_CLK_P	B15	3VSB
A16	PCIE_X8_GF_CLK_N	B16	3VSB
A17	VCC3_3	B17	USB_4P
A18	CLK_GF_33M	B18	USB_4N
A19	VCC3_3	B19	VCC3_3
A20	AUX_TEMP	B20	VCC3_3
A21	CPU-	B21	VCC3_3
A22	ATX_PWROK4	B22	ATX_PWROK5
A23	ATX_PWROK4	B23	ATX_PWROK5
A24	GND	B24	GND
A25	PCIEX8_TX0P	B25	PCIEX8_RX0P
A26	PCIEX8_TX0N	B26	PCIEX8_RX0N
A27	GND	B27	GND
A28	PCIEX8_TX1P	B28	PCIEX8_RX1P
A29	PCIEX8_TX1N	B29	PCIEX8_RX1N
A30	GND	B30	GND
A31	PCIEX8_TX2P	B31	PCIEX8_RX2P
A32	PCIEX8_TX2N	B32	PCIEX8_RX2N
A33	GND	B33	GND
A34	PCIEX8_TX3P	B34	PCIEX8_RX3P
A35	PCIEX8_TX3N	B35	PCIEX8_RX3N
A36	GND	B36	GND
A37	PCIEX8_TX4P	B37	PCIEX8_RX4P
A38	PCIEX8_TX4N	B38	PCIEX8_RX4N
A39	GND	B39	GND
A40	PCIEX8_TX5P	B40	PCIEX8_RX5P
A41	PCIEX8_TX5N	B41	PCIEX8_RX5N
A42	GND	B42	GND
A43	PCIEX8_TX6P	B43	PCIEX8_RX6P

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Pin	Definition	Pin	Definition
A44	PCIEX8_TX6N	B44	PCIEX8_RX6N
A45	GND	B45	GND
A46	PCIEX8_TX7P	B46	PCIEX8_RX7P
A47	PCIEX8_TX7N	B47	PCIEX8_RX7N
A48	GND	B48	GND
A49	GND	B49	GND

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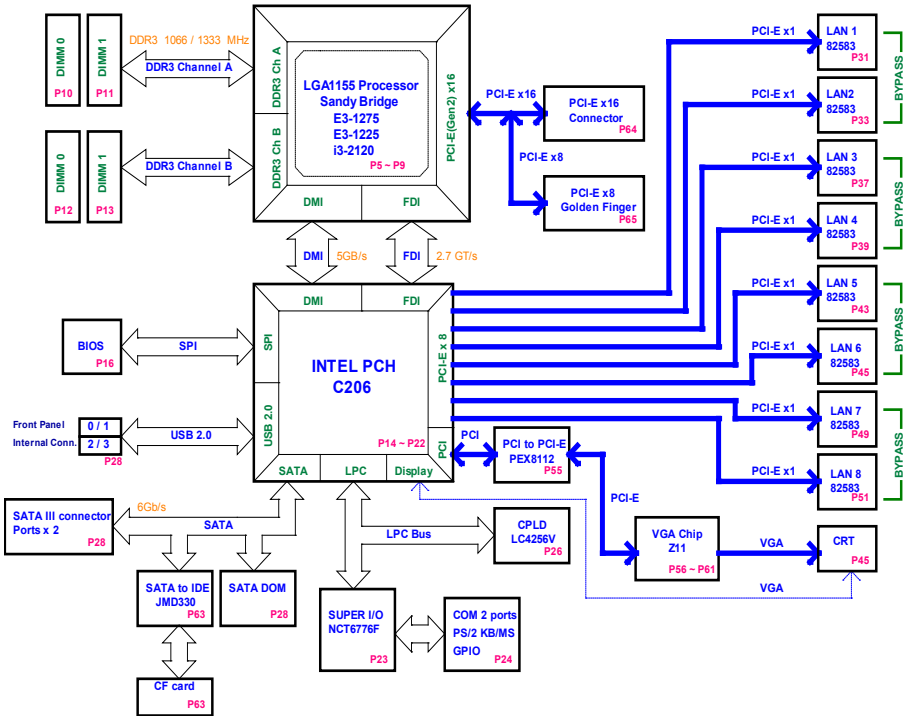
Block Diagram of the Main Board



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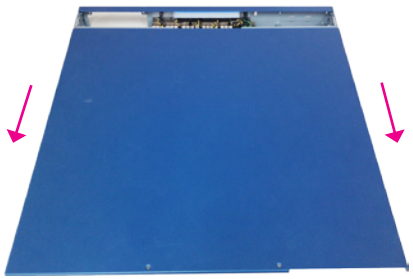
Chapter 3: System Setup

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. The 6 screws around the cover are used to secure the cover to the chassis. Remove these screws and put them in a safe place for later use.

2. Slide the cover backward and then remove it from the chassis.



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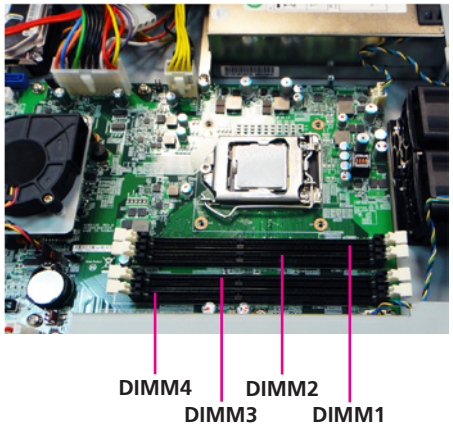
Installing a DIMM

1. The 4 DDR3 sockets are divided into 2 channels.



- DIMM 1 and DIMM 2 = Channel B
  DIMM 3 and DIMM 4 = Channel A
- Always populate DIMM1 first. The system will not boot when the first module is installed in DIMM2, DIMM3 or DIMM4.
- When installing 2 modules for single channel configuration, populate DIMM1 and DIMM2 first.
- When installing 2 modules for dual channel configuration, populate DIMM1 and DIMM3 first.

2. Push the ejector tabs which are at the ends of the socket outward. This indicates that the socket is unlocked.

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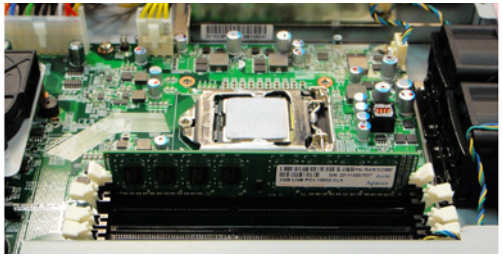
3. Note how the module is keyed to the socket. Grasping the module by its edges, align the module with the socket so that the "notch" on the module is aligned with the "key" on the socket. The key ensures the module can be plugged into the socket in only one direction.

4. Seat the module vertically, pressing it down firmly until it is completely seated in the socket. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.



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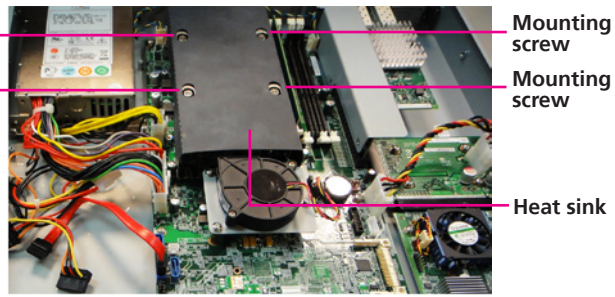
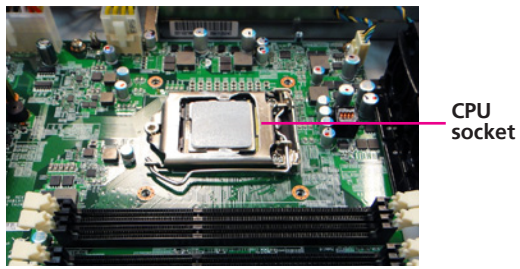
Installing the CPU

1. If the system came with the heat sink already installed, loosen the mounting screws that secure the heat sink to the board.



- Before you proceed, make sure (1) the CPU socket comes with a protective cap, (2) the cap is not damaged and (3) the socket's contact pins are not bent.
- Make sure all power cables are unplugged before you install the CPU.
- The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.

2. Remove the heat sink to access the CPU socket.



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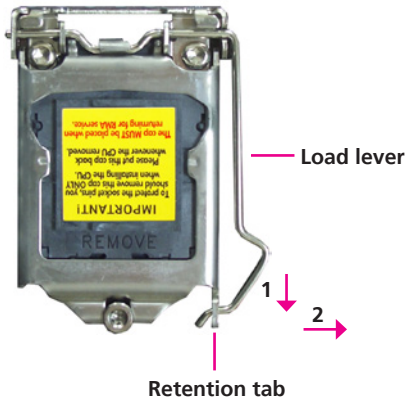
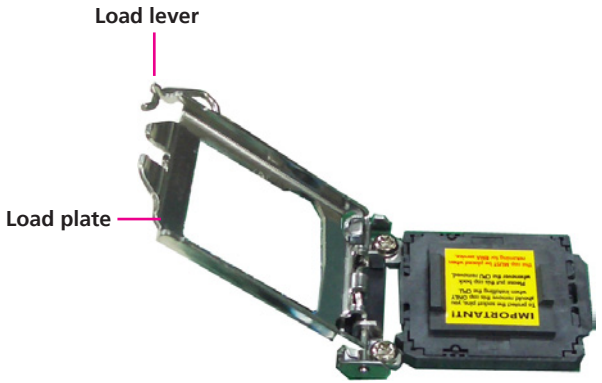
3. Unlock the socket by pushing the load lever down (1), moving it sideways (2) until it is released from the retention tab; then lift the load lever up.



4. Lifting the load lever will at the same time lift the load plate.

   Lift the load lever up to the angle shown on the photo.



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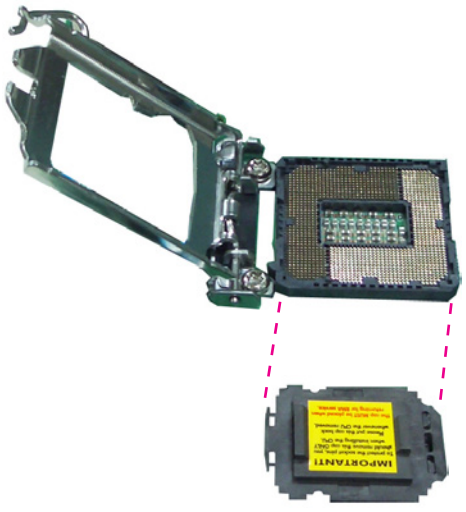
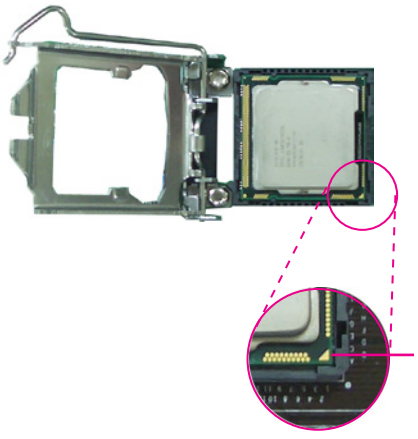
5. Remove the protective cap from the CPU socket. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.



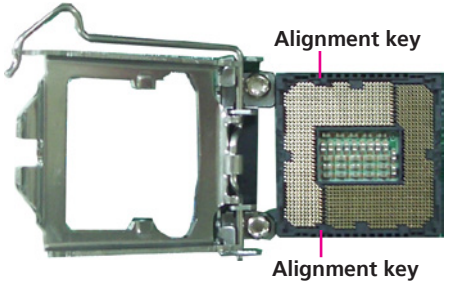
Protective cap

6. Insert the CPU into the socket. The gold triangular mark on the CPU must align with the corner of the CPU socket shown on the photo.



Gold triangular mark

The CPU's notch will at the same time fit into the socket's alignment key.



Alignment key

Alignment key

- Handle the CPU by its edges and avoid touching the pins.
- The CPU will fit in only one orientation and can easily be inserted without exerting any force.

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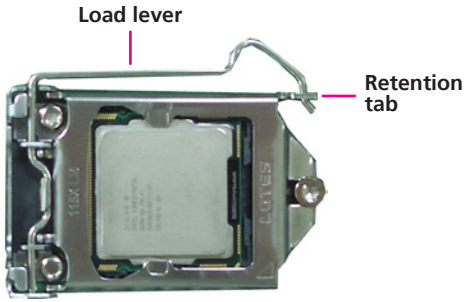
7. Close the load plate and then push the load lever down.

   While closing the load plate, make sure the front edge of the load plate slides under the retention knob.

Do not force the CPU into the socket. Forcing the CPU into the socket may bend the pins and damage the CPU.

8. Hook the load lever under the retention tab.



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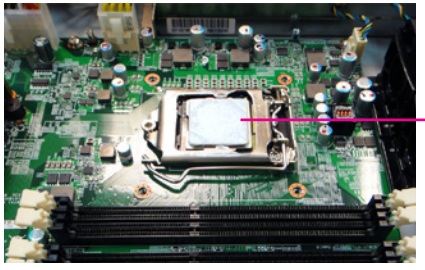
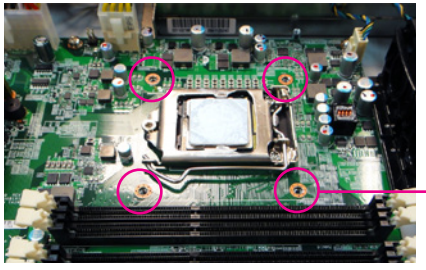
9. Apply thermal compound on top of the CPU. Do not spread the compound all over the surface. When you later place the heat sink on top of the CPU, the compound will disperse evenly.



10. Align the mounting screws of the heat sink with the mounting holes on the board.



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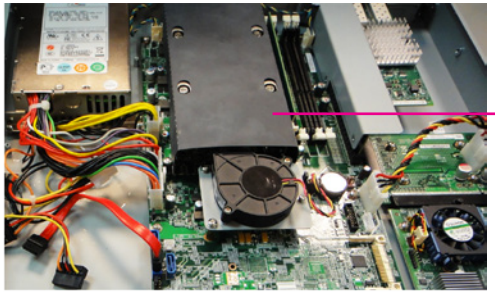
11. Tighten the screws to secure the heat sink in place.



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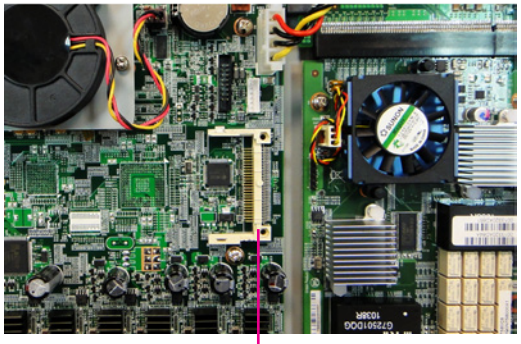
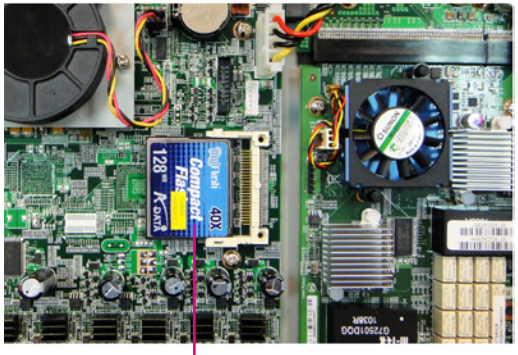
Installing a CompactFlash Card

1. Locate for the CompactFlash socket on the board.



CompactFlash socket

2. With the CompactFlash card's label facing up, position the card to the socket.



CompactFlash card

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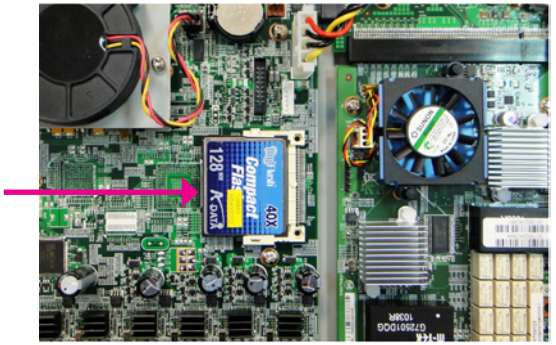
3. Insert the card until it is completely seated in the socket.



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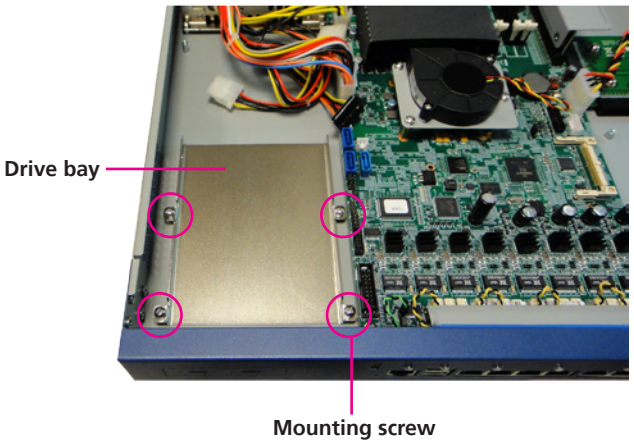
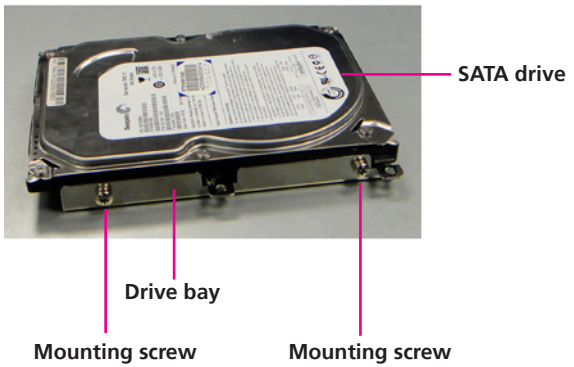
Installing a 3.5" SATA Hard Drive

1. Remove the mounting screws that secure the drive bay to the chassis. Remove the drive bay. The drive bay is used to hold a 3.5" SATA hard drive.



2. Place the SATA hard drive onto the drive bay. Align the mounting holes that are on the sides of the SATA drive with the mounting holes on the drive bay. Use the provided mounting screws to secure the SATA drive in place.



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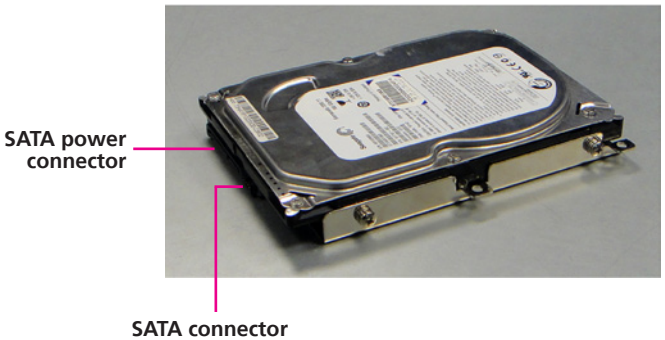
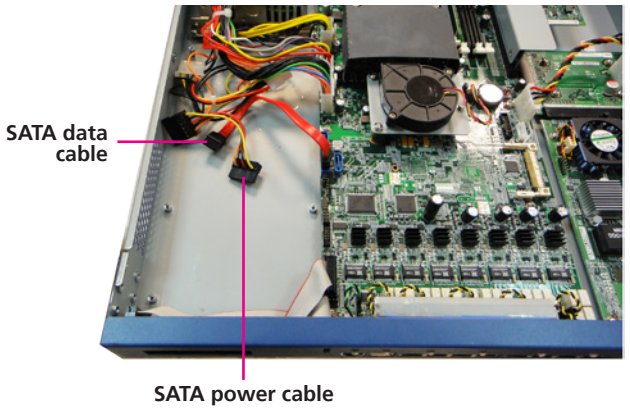
3. Locate for the SATA connector and the SATA power connector on the SATA drive.



4. Locate for the SATA cable and the SATA power cable.



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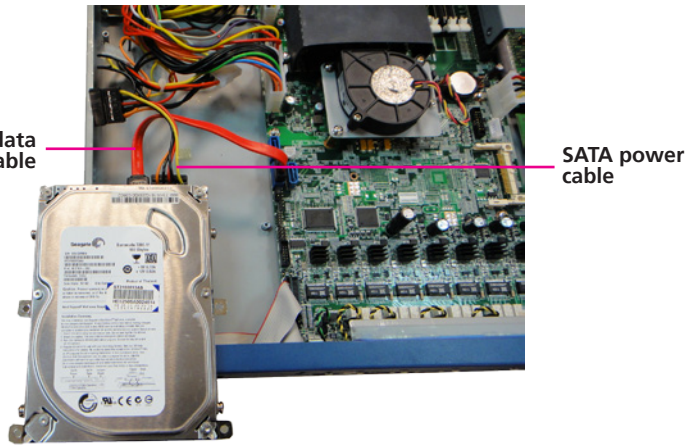
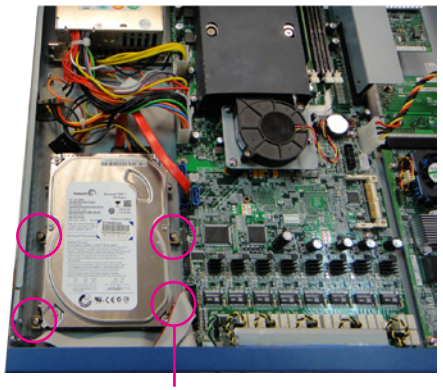
5. Connect the SATA power cable and SATA data cable to the SATA drive.



6. Place the drive into the chassis and then use the provided mounting screws to secure the drive bay in place.



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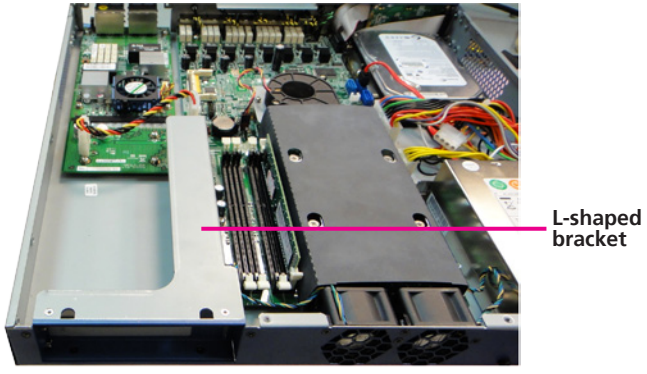
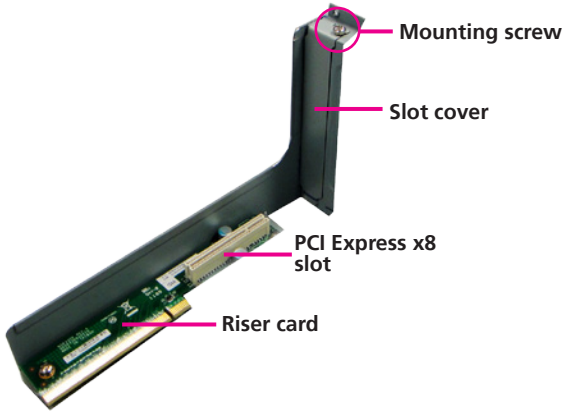
Installing a PCI Express x8 Card

1. By default, the system comes equipped with a PCI Express x8 slot. The slot is on a riser card that is attached on an L-shaped bracket.

   Remove the mounting screws that secure the L-shaped bracket to the chassis and then remove the bracket.



2. Remove the slot cover's mounting screw.



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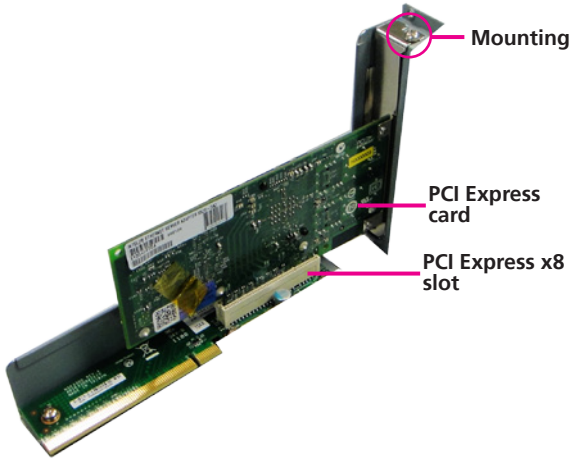
3. Align the PCI Express card with the PCI Express x8 slot and then push it down firmly until it is completely seated in the slot.

   Secure the card with the mounting screw you removed in step 2.



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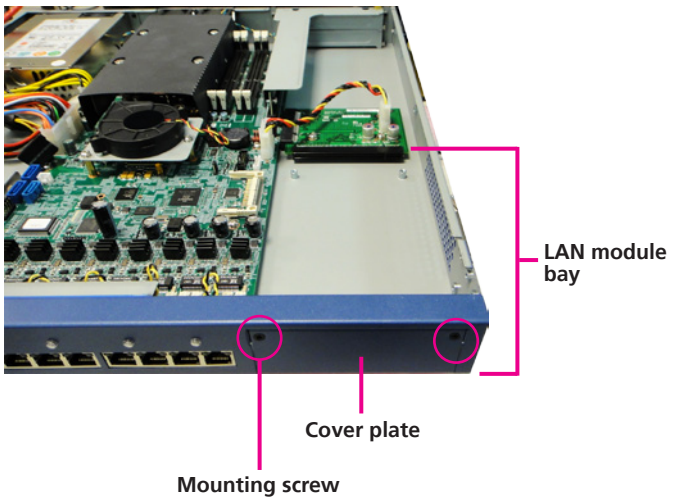
Replacing the LAN Module

The system is equipped with 1 LAN module bay. To remove and replace the LAN module, please follow the instructions below.

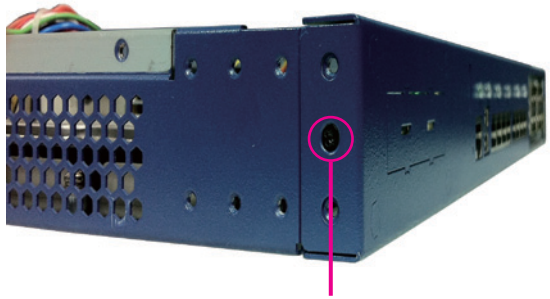
Please correctly follow the below instructions and noted items to avoid making unnecessary damages. Make sure the power supply is switched off and disconnected from the power sources before replacing or adding LAN modules to prevent electric shock or system damage.

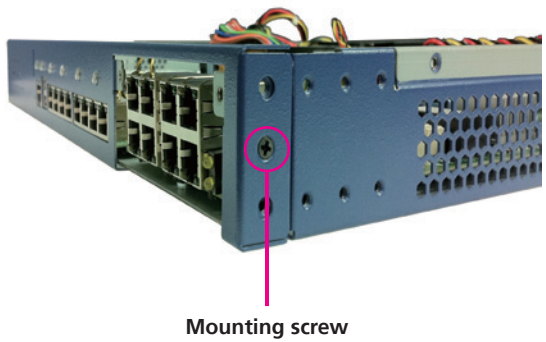
1. Remove the mounting screws on the cover plate of the LAN module.



Only plug approved mini-GBIC module into the slot.

2. On each side of the chassis, remove the mounting screws securing the front panel.





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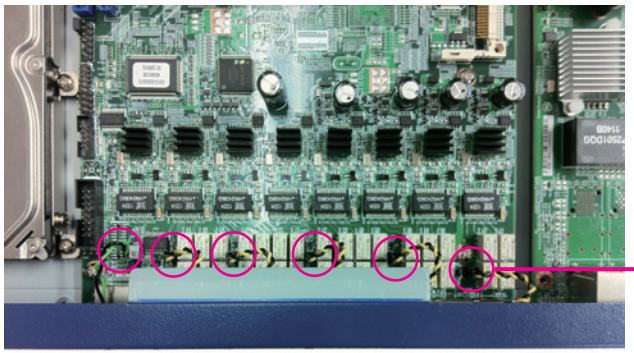
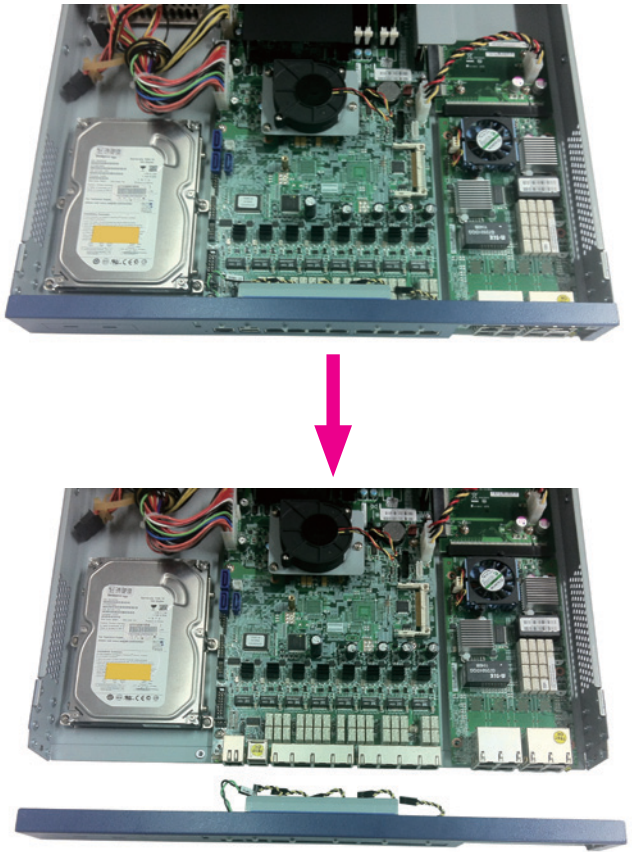
3. Turn to the bottom of the chassis and lay it against a stable surface. Remove the mounting screws on the bottom of the front panel.

4. Once all the mounting screws are removed, lay the chassis back down and unplug all the LED connectors behind the front panel.



5. Grab both ends of the front panel, and gently pull it outwards from the chassis.



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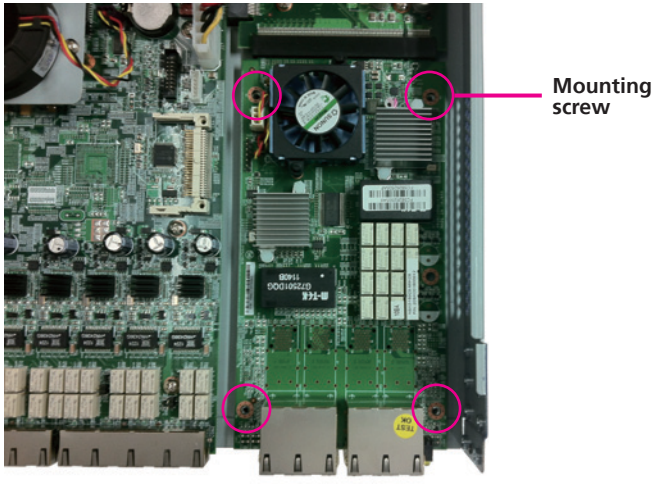
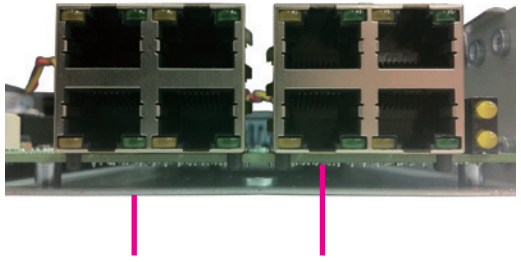
6. Remove the mounting screws on the LAN module.



7. Grab onto the shielded modular PCB jack, and gently pull the LAN module outwards.

The components on the bottom of the LAN module is mounted very close to the base plate of the chassis, you may damage the components if excessive force is used. When removing, please handle the LAN module carefully by pulling it gently.



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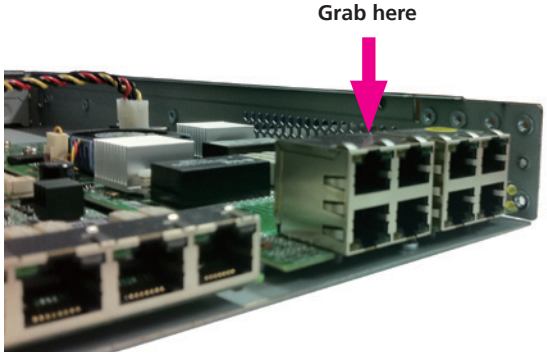
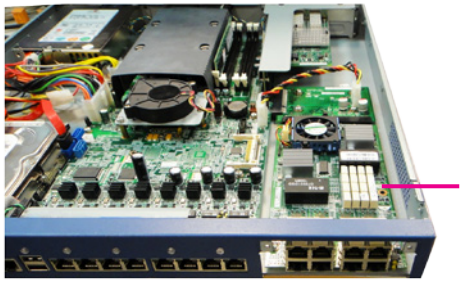


8. Once the module is removed, insert the new LAN module into the tray making sure the connector side of the module is at the rear side of the tray. Tighten screws in the mounting holes to secure the new module, then replace the front panel and replug the LED connectors, and replace the cover plate and the chassis cover to finish.



Top view

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Rackmount Bracket Kit (optional)

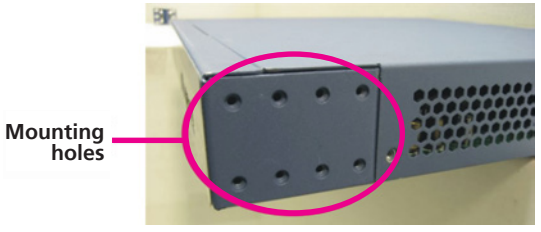
The rackmount bracket kit provides a convenient and economical way of installing the server into a rack cabinet.

Attaching the Long Rack Ears

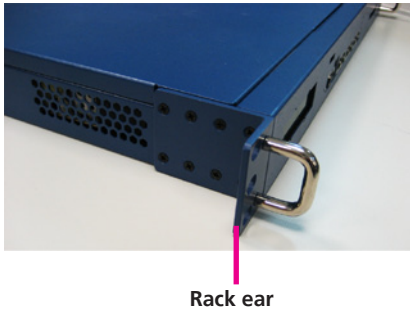
The long rack ears are used to support the server in a rack cabinet.

1. The rackmount bracket kit comes with a pair of long rack ears and 16 screws.

2. There are 8 mounting holes on each side of the front panel.



3. Align the mounting holes on the rack ear with the mounting holes on the front panel. Give special attention to the orientation of the rack ear. Secure the rack ear with mounting screws.



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4. Repeat step 3 to secure the other rack ear.

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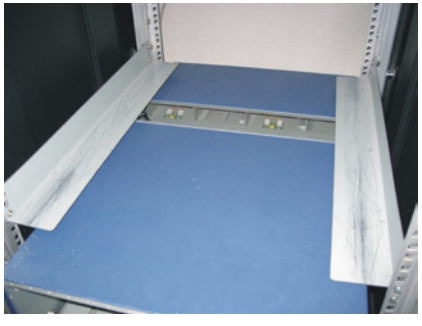
Installing the Server into a Rack Cabinet

1. Select a one unit space (1U) in the rack cabinet where you intend to install the server.
2. On one side of the rack, attach 3 nuts each at the front and back. Repeat this to the other side of the rack.



3. Slide the server into the rack cabinet.

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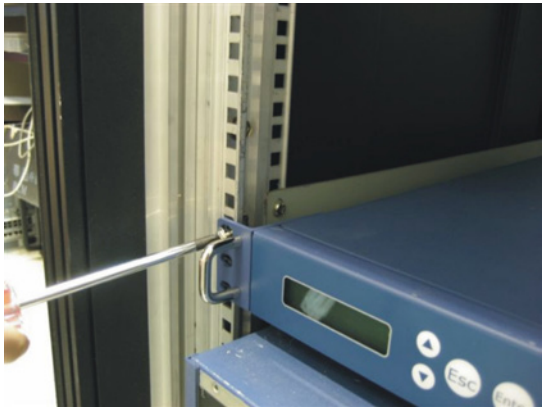
4. Use the provided mounting screws to secure the server in the rack cabinet.



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Chapter 4: BIOS Setup

This chapter describes how to use the BIOS setup program for the NSA 5130. 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.

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.

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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 <CTRL-ALT-ESC>
Press the <Del> key to enter Setup:
```

Legends

Key	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the highlight up or down between sub-menus or fields.
<Esc>	Exits to the BIOS Setup Utility.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
<F1>	Displays General Help.
<F4>	Saves and exits the Setup program.
<Enter>	Press <Enter> to enter the highlighted sub-menu.

Scroll Bar

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

Submenu

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

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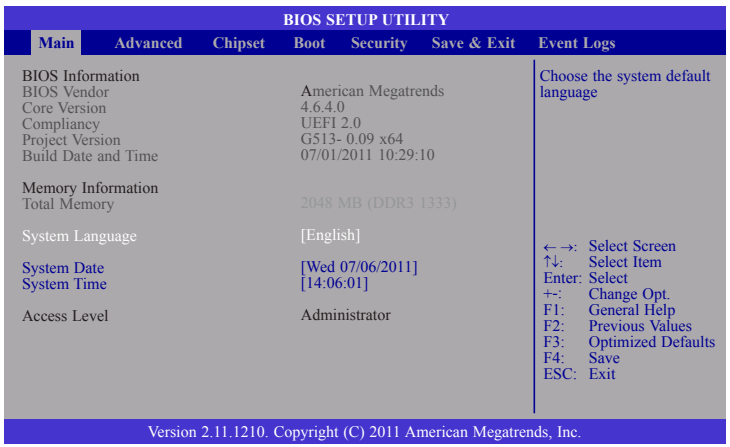
BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from six setup functions and one exit choices. 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.



BIOS Information

Displays the detected BIOS information.

Memory Information

Displays the detected system memory information.

System Language

Selects the system's language.

System Date

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

System Time

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

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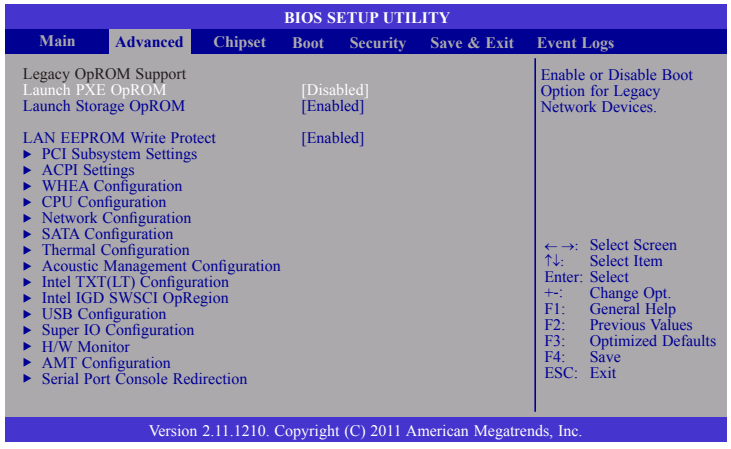
Advanced

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.



Launch PXE OpROM

Enables or disables the boot option for legacy network devices.

Launch Storage OpROM

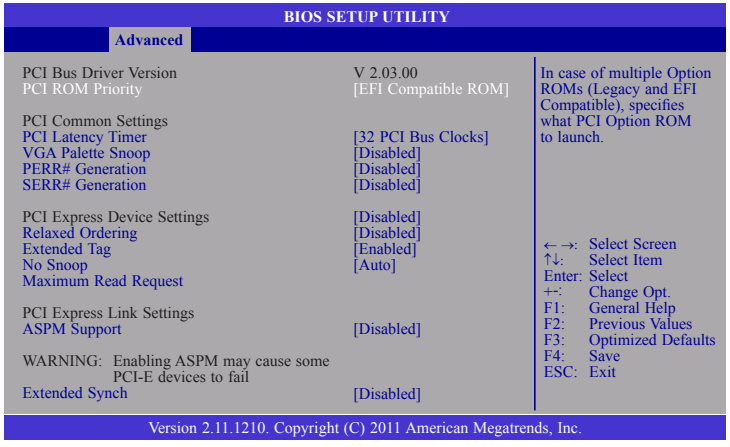
Enables or disables the boot option for legacy mass storage devices with option ROM.

LAN EEPROM Write Protect

Enables or disables the LAN write protect function.

PCI Subsystem Settings

This section is used to configure the PCI.



PCI ROM Priority

In case multiple option ROMs (Legacy and EFI Compatible) exist, select the PCI option ROM to launch.

PCI Latency Timer

This feature is used to select the length of time each PCI device will control the bus before another takes over. The larger the value, the longer the PCI device can retain control of the bus. Since each access to the bus comes with an initial delay before any transaction can be made, low values for the PCI Latency Timer will reduce the effectiveness of the PCI bandwidth while higher values will improve it.

VGA Palette Snoop

Enables or disables the VGA palette registers snooping.

PERR# Generation

Enables or disables the PCI device to generate PERR#.

SERR# Generation

Enables or disables the PCI device to generate SERR#.

Relaxed Ordering

Enables or disables the PCI Express device relaxed ordering.

Extended Tag

When this function is enabled, it allows a device to use 8-bit tag field as a request.

No Snoop

Enables or disables the PCI device's no snoop option.

Maximum Read Request

Selects the maximum read request size of the PCI Express devices.

ASPM Support

Selects the ASPM level.

Force L0	Forces all links to L0 state.
Auto	The BIOS automatically select an ASPM level.
Disable	Disables ASPM.

Extended Synch

When this function is enabled, it allows generation of extended synchronization patterns.

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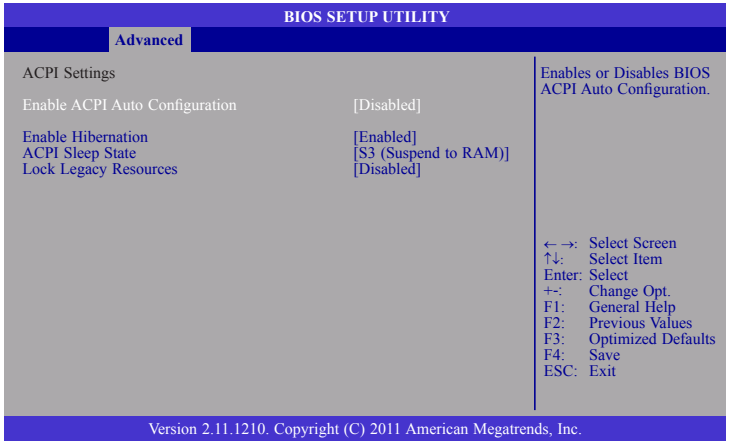
ACPI Settings

This section is used to configure the ACPI.



Enable ACPI Auto Configuration

Enables or disables the ACPI auto configuration.

Enable Hibernation

When this function is enabled, the system will enter the hibernate mode (OS/S4 sleep state). This function is not applicable to some OS.

ACPI Sleep State

Selects the highest ACPI sleep state the system will enter when the Suspend button is pressed.

S1(POS) Enables the Power On Suspend function.
S3(STR) Enables the Suspend to RAM function.

Lock Legacy Resources

Enables or disables the lock of legacy resources.

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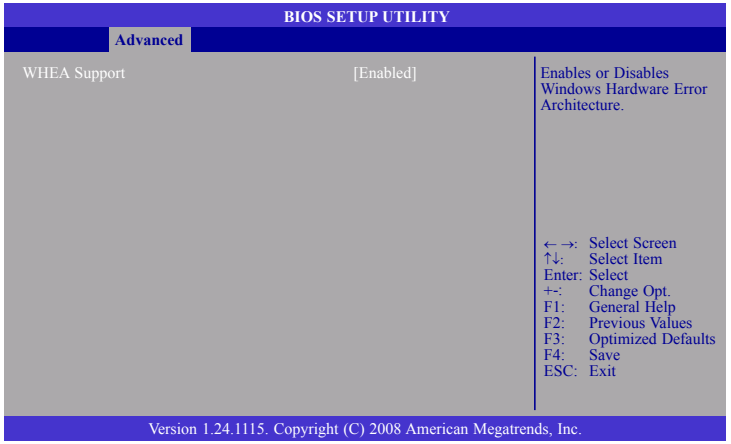
WHEA Configuration

This section is used to configure the WHEA.



WHEA Support

Enables or disables the Windows hardware error architecture.

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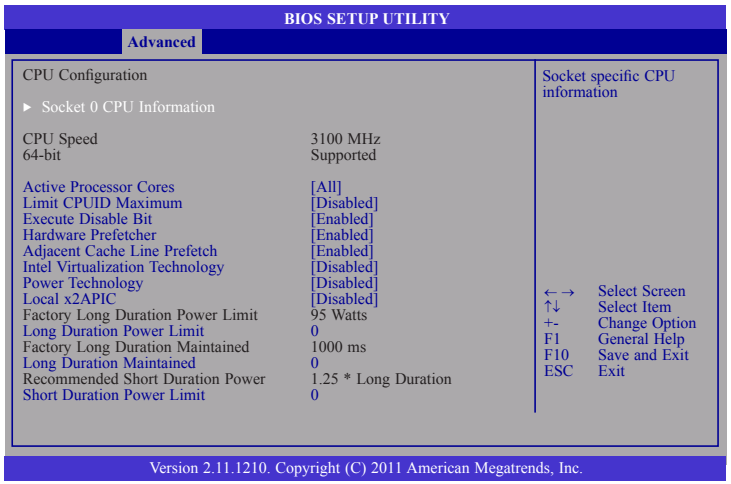
CPU Configuration

This section is used to configure the CPU. It will also display detected CPU information.



Active Processor Core
This field is used to enter the number of cores to enable in each processor package.

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

Execute Disable Bit
When this field is set to Disabled, it will force the XD feature flag to always return to 0.

Hardware Prefetcher
Turns on or off the mid level cache (L2) streamer prefetcher.

Adjacent Cache Line Prefetch
Turns on or off prefetching of adjacent cache lines.

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

Power Technology
Enables or disables the power management features.

Local x2APIC
Enables or disables Local x2APIC.

Long Duration Power Limit
Selects the long duration power limit in Watts.

Long Duration Maintained
Selects the time when the long duration power is maintained.

Short Duration Power Limit
Selects the short duration power limit in Watts.

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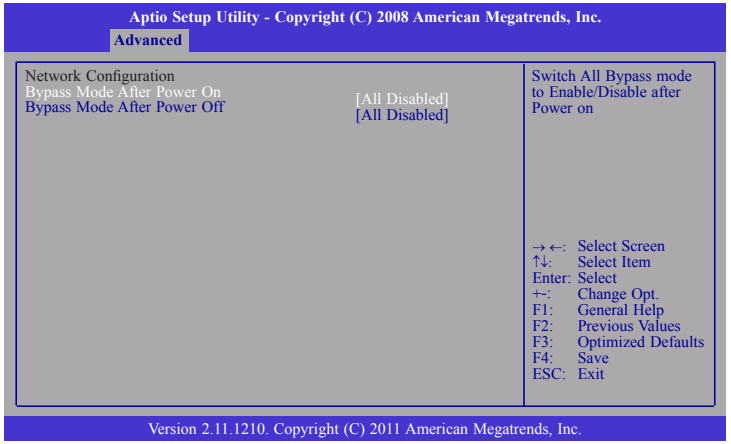
Network Configuration

This section is used to configure the LAN module.



Bypass Mode After Power On

Enables or disables the LAN module bypass mode after the system powers on.

Bypass Mode After Power Off

Enables or disables the LAN module bypass mode after the system powers off.

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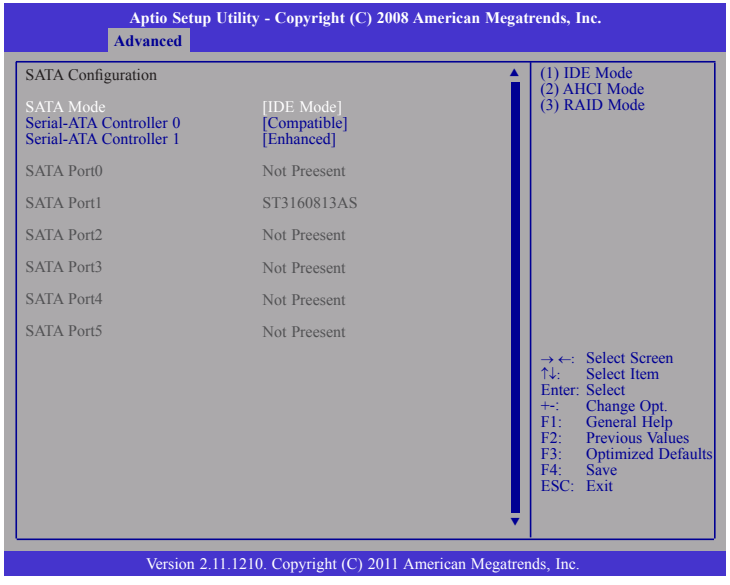
SATA Configuration

This section is used to configure SATA.



SATA Mode

IDE This option configures the Serial ATA drives in IDE mode.
RAID This option enables the RAID function for Serial ATA drives.
AHCI This option configures the Serial ATA drives in AHCI mode.

Serial-ATA Controller 0 / Serial-ATA Controller 1

Configures the Serial ATA controller to Compatible or Enhanced mode.

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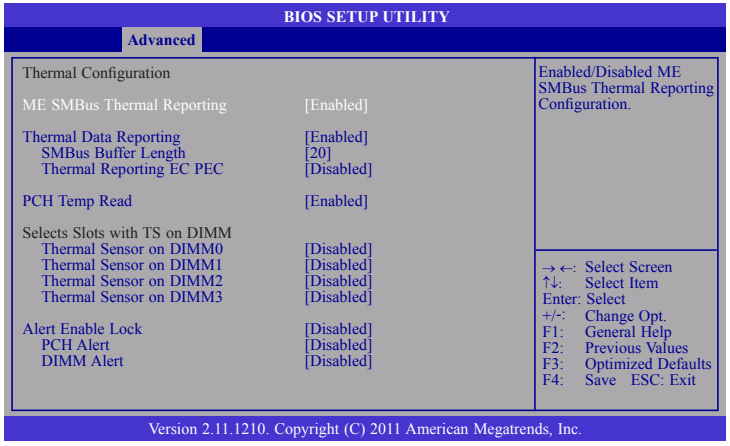
Thermal Configuration

This section is used to configure the intelligent power sharing function.



ME SMBus Thermal Reporting
Enables or disables the ME SMBus thermal reporting configuration.

Thermal Data Reporting
Enables or disables the thermal data reporting.

SMBus Buffer Length
Selects the length of SMBus block read message for EC.

Thermal Reporting EC PEC
Enables or disables the Packet Error Checking (PEC) for SMBus block read.

PCH Temp Read
Enables or disables the PCH temperature read.

Thermal Sensor on DIMM0 to Thermal Sensor on DIMM3
Enables or disables the thermal sensor.

Alert Enable Lock
Locks all alert enable settings.

PCH Alert
Enables or disables the PCH alert.

DIMM Alert
Enables or disables the DIMM alert.

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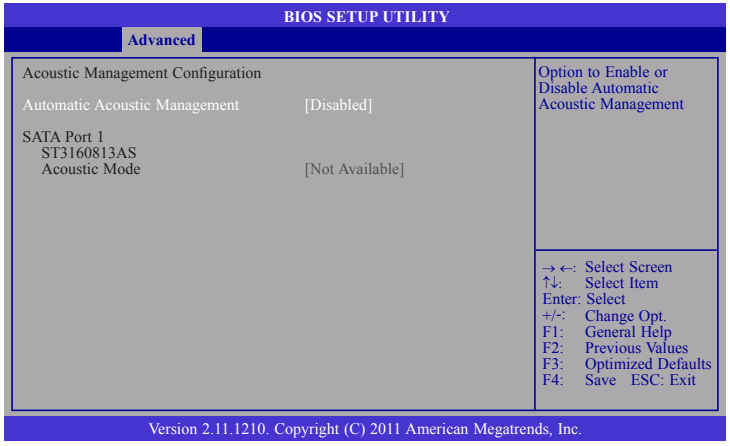
Acoustic Management Configuration

This section is used to configure the intelligent power sharing function.

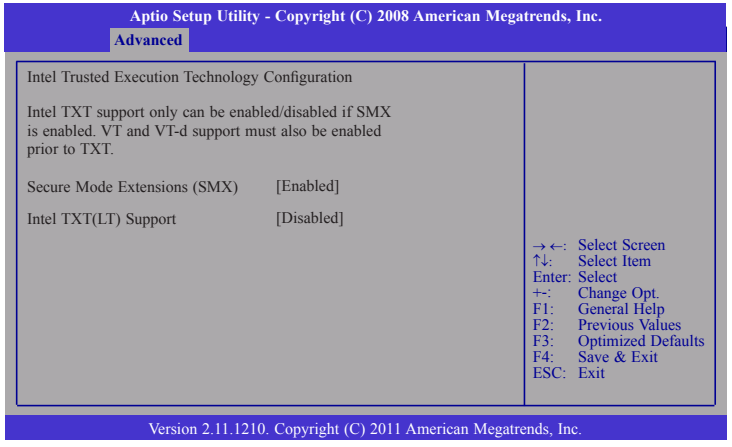


Automatic Acoustic Management
Enables or disables the automatic acoustic management.

Acoustic Mode
Configures the acoustic mode.

Intel TXT(LT) Configuration

This section is used to configure the Intel TXT(LT).



Secure Mode Extensions (SMX)
Enables or disables Secure Mode Extensions.

Intel TXT(LT) Support
Enables or disables Intel TXT(LT).

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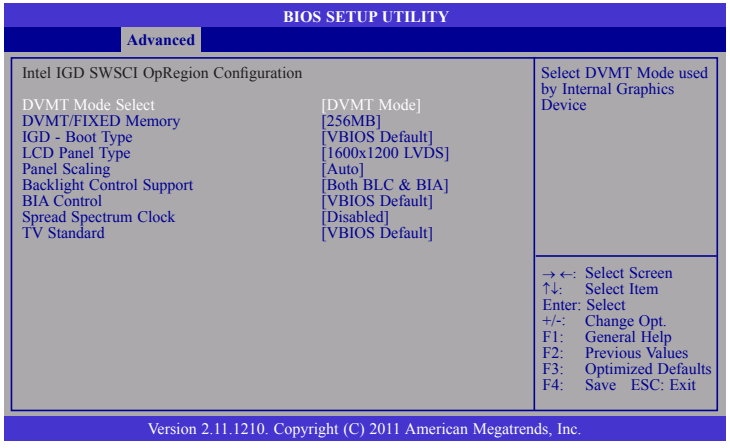
Intel IGD SWSCI OpRegion

This section is used to configure the Intel graphics display.



DVMT Mode Select
Selects the DVMT mode used by the internal graphics device.

DVMT/FIXED Memory
Selects the DVMT/FIXED mode memory size used by the internal graphics device.

IGD - Boot Type
Selects the video device that will be activated during POST. This will not affect any external graphics that may be present.

LCD Panel Type
Selects the LCD panel used by the internal graphics device.

Panel Scaling
Selects the LCD panel scaling used by the internal graphics device.

Backlight Control Support
The options are Both “BLC & BIA Disabled” and “BLC Enabled”.

BIA Control
The options are VBIOS Default, Disabled and Level 1 to Level 5.

Spread Spectrum Clock
Enables or diasbles the spread spectrum clock.

TV Standard
Selects the TV standard connected to the system.

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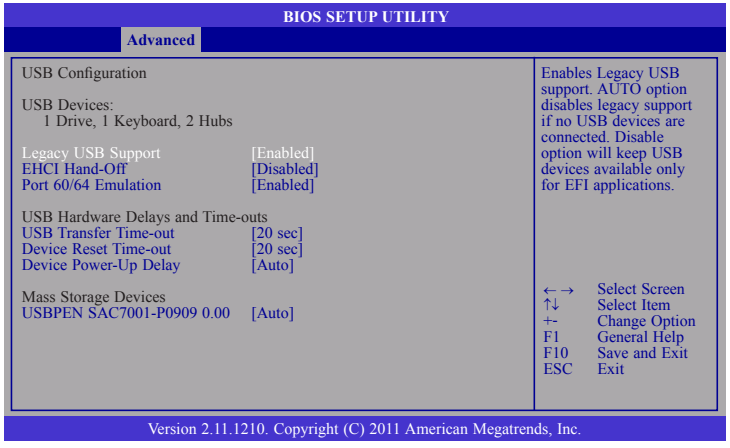
USB Configuration

This section is used to configure USB devices.



Legacy USB Support

Due to the limited space of the BIOS ROM, the support for legacy USB keyboard (in DOS mode) is by default set to Disabled. With more BIOS ROM space available, it will be able to support more advanced features as well as provide compatibility to a wide variety of peripheral devices.
If a PS/2 keyboard is not available and you need to use a USB keyboard to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

EHCI Hand-Off

Enable this field when using operating systems without the EHCI hand-off support.

Port 60/64 Emulation

Enables the I/O port 60h/64h emulation. This should be enabled for complete USB keyboard legacy support for non-USB OSes.

USB Transfer Time-out

Selects the time-out value for Control, Bulk, and Interrupt transfers.

Device Reset Time-out

Selects the time-out value of the USB mass storage device's start unit command.

Device Power-Up Delay

Selects the maximum time the device will take before it properly reports itself to the Host Controller.

USBPEN SAC7001-P0909 0.00

Selects the mass storage device emulation type.

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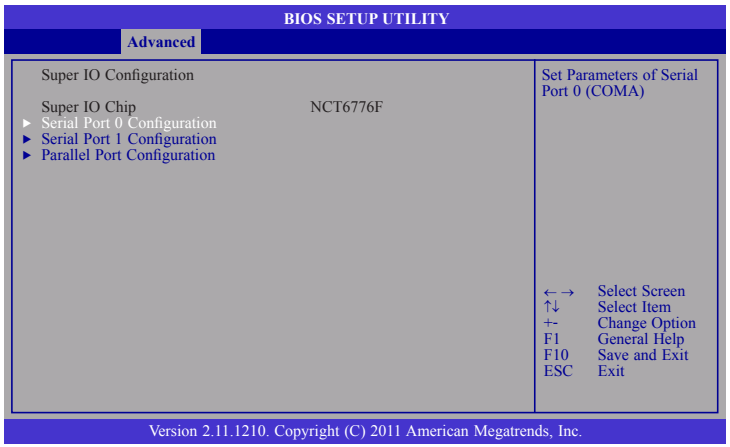
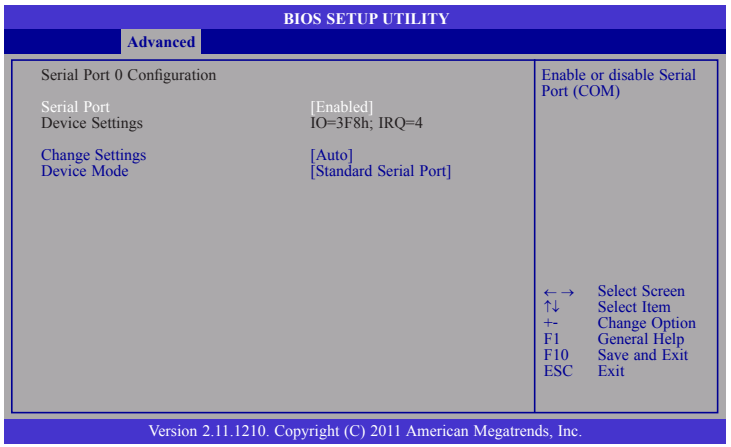
Super IO Configuration

This section is used to configure the I/O functions supported by the on-board Super I/O chip.



Serial Port 0 Configuration and Serial Port 1 Configuration



Serial Port

Enables or disables the serial port.

Change Settings

Selects the optimal setting for the Super IO device.

Device Mode

Selects the serial port mode.

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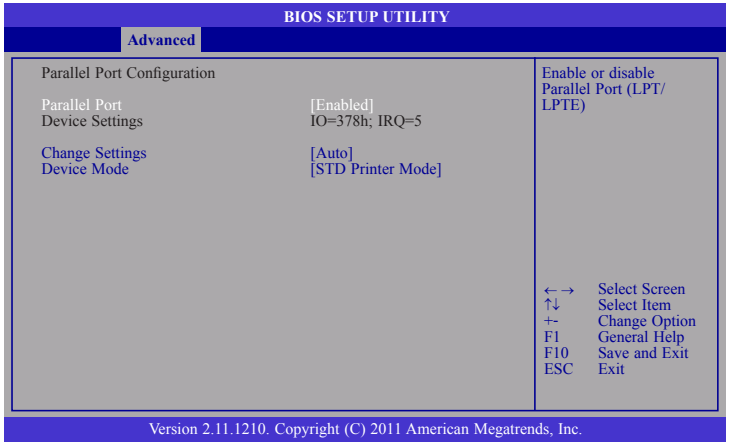
Parallel Port Configuration



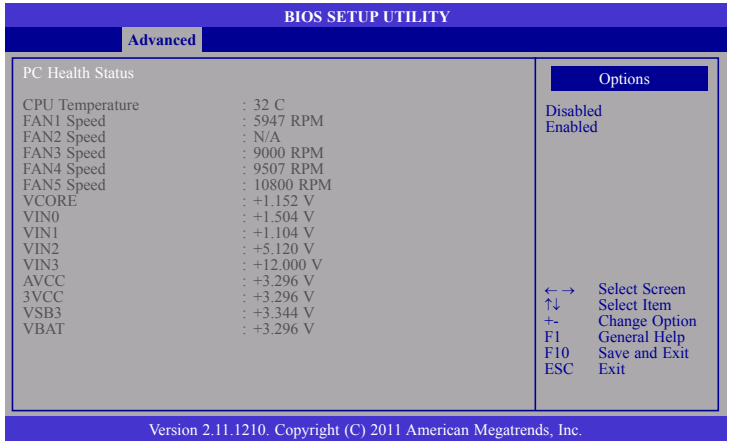
Parallel Port
Enables or disables the parallel port.

Change Settings
Selects the optimal setting for the Super IO device.

Device Mode
Selects the parallel port mode.

H/W Monitor

This section is used to configure the hardware monitoring events such as temperature, fan speed and voltages.



CPU Temperature

Detects and displays the current temperature of the CPU.

Fan1 Speed to FAN5 Speed

Detects and displays the current fan speed in RPM (Revolutions Per Minute).

VCORE to VBAT

Detects and displays the output voltages.

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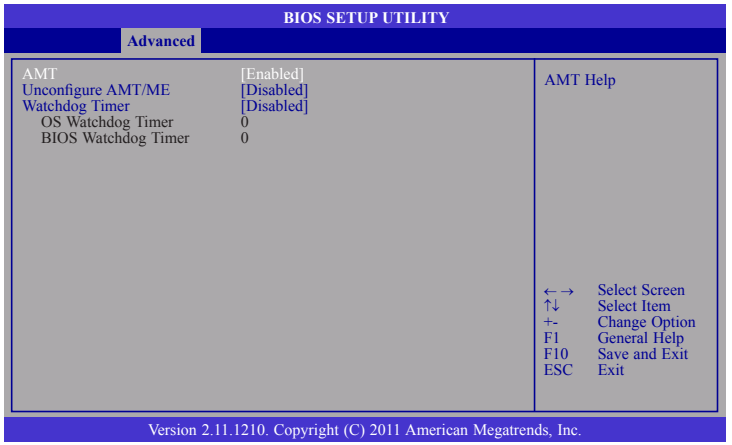
AMT Configuration



AMT

Enables or disables the AMT function.

Unconfigure AMT/ME

Used to unconfigure AMT/ME even without a password.

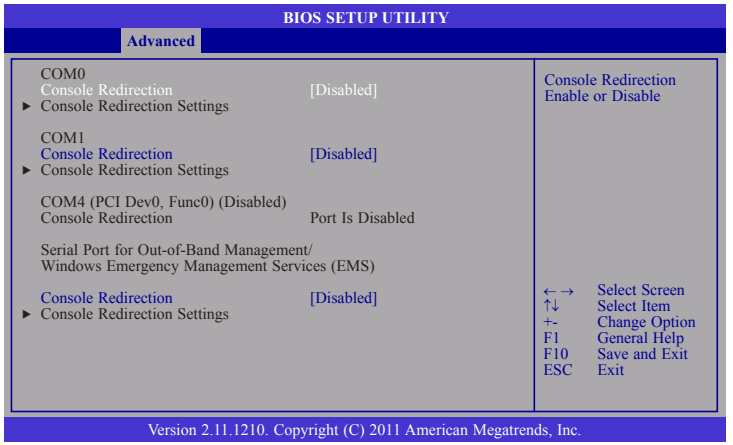
Watchdog Timer

Enables or disables the Watchdog Timer function.

OS Watchdog Timer and BIOS Watchdog Timer

Configures the OS Watchdog Timer and the BIOS Watchdog Timer.

Serial Port Console Redirection



Console Redirection

Enables or disables the Console Redirection.

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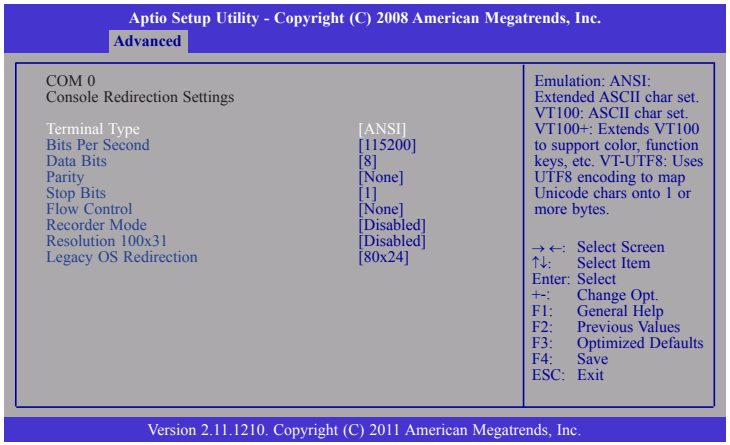
Console Redirection Settings

Specifies how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.



Terminal Type

ANSI Extended ASCII character set.
VT100 ASCII character set.
VT100+ Extends VT100 to support color, function keys, etc.
VT-UTF8 Uses UTF8 encoding to map Unicode characters onto 1 or more bytes.

Bits Per Second

Selects the serial port transmission speed. The speed must match the other side. Long or noisy lines may require a lower speed.

Data Bits

The options are 7 and 8.

Parity

A parity bit can be sent with the data bits to detect some transmission erros.

Even Parity bit is 0 if the number of 1's in the data bits is even.
Odd Parity bit is 0 if number of 1's in the data bits is odd.

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

Flow Control

Flow control can prevent data loss from buffer overflow. When sending data and the receiving buffers are full, a "stop" signal can be sent to stop the data flow.

Recorder Mode

When this field is enabled, only text will be sent. This is to capture the terminal data.

Resolution 100x31

Enables or disables extended terminal resolution.

Legacy OS Redirection

Selects the number of rows and columns that support redirection.

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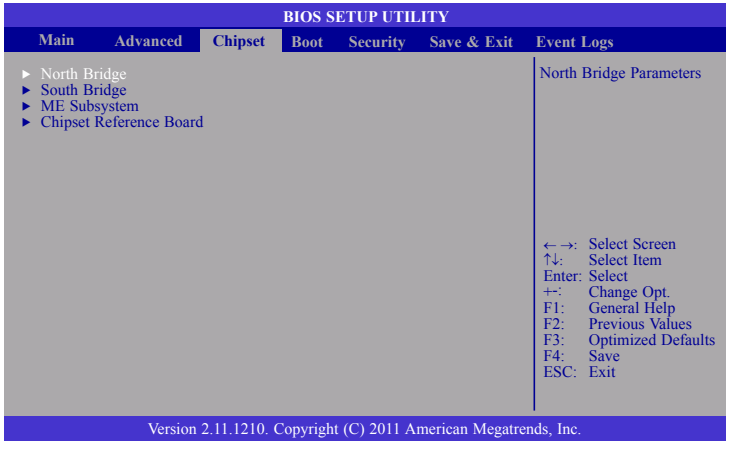
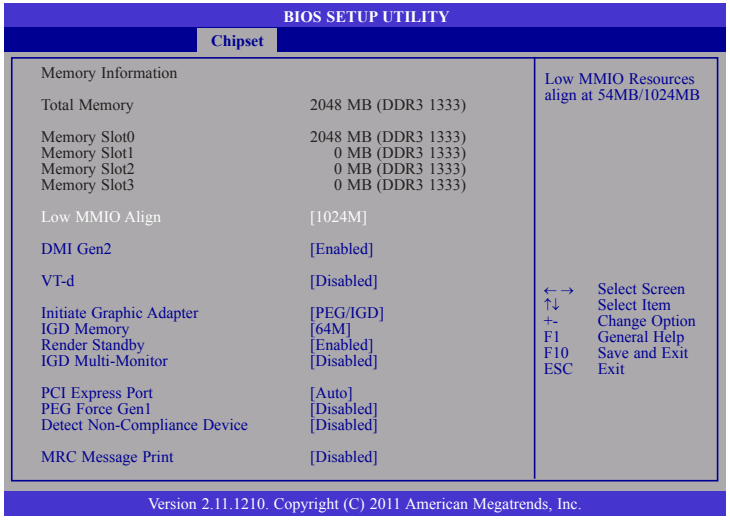
Chipset

This section is used to configure the system based on the specific features of the chipset.

Setting incorrect field values may cause the system to malfunction.



North Bridge



Low MMIO Align

Selects the Low MMIO Resources.

DMI Gen2

Enables or disables the DMI Gen2.

VT-d

Enables or disables the VT-d.

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Initiate Graphic Adapter

Selects the graphics controller to use as the primary boot device.

IGD Memory

Selects the IGD shared memory size.

Render Standby

Enables or disables the Render Standby of the internal graphics device.

IGD Multi-Monitor

Enables or disables the IGD Multi-Monitor of the internal graphics device.

PCI Express Port

Enables or disables the PCI Express port.

PEG Force Gen1

Enables or disables the PCI Express port Force Gen1.

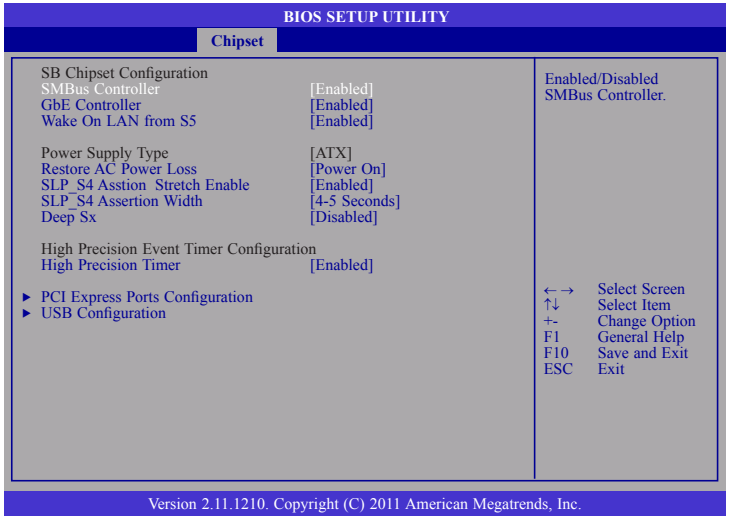
Detect Non-Compliance Device

Enables or disables the detection of non-compliance devices.

MRC Message Print

Enables or disables the print memory initialize message.

South Bridge



SMBus Controller

Enables or disables the SMBus controller.

GbE Controller

Enables or disables the GbE controller.

Wake On LAN from S5

Enables or disables the GbE control PME in S5.

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Power Supply Type

Selects the power supply type.

Restore AC Power Loss

Selects the state to return to when power resumes after a power failure (G3 state).

SLP_S4 Assertion Stretch Enable

Enables or disables the SLP_S4# assertion stretch.

SLP_S4 Assertion Width

Selects the minimum assertion width of the SLP_S4# signal.

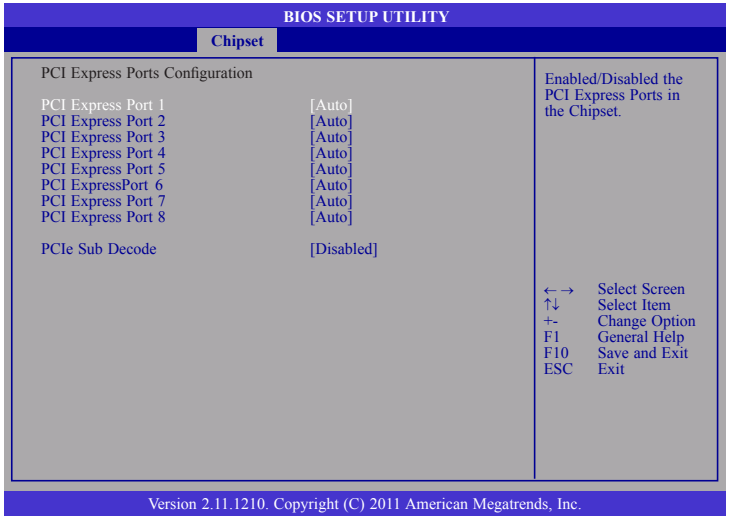
Deep Sx

Enables or disables Deep Sx.

High Precision Timer

Enables or disables the high precision event timer.

PCI Express Ports Configuration



PCI Express Port 1 to PCI Express Port 8

Enables or disables the PCI Express port.

PCIe Sub Decode

Enables or disables the PCIe sub decode port.

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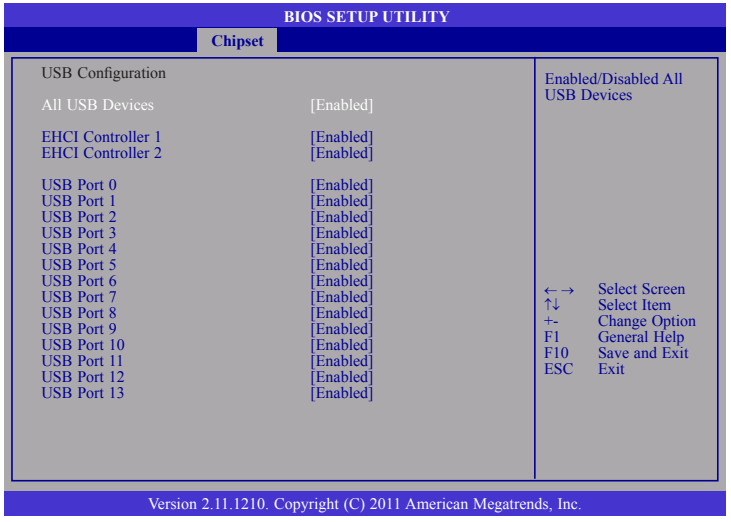
USB Configuration



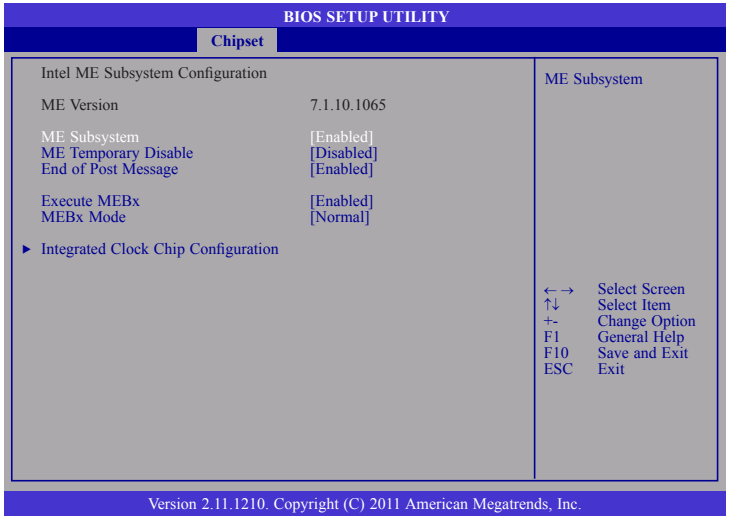
All USB Devices

Enables or disables USB devices.

EHCI Controller 1 and EHCI Controller 2

Enables or disables the the USB 2.0 (EHCI) support.

ME Subsystem



ME Subsystem

Enables or disables the ME subsystem.

ME Temporary Disable

Enables or disables the ME temporary disable.

End of Post Message

Enables or disables the end of post message.

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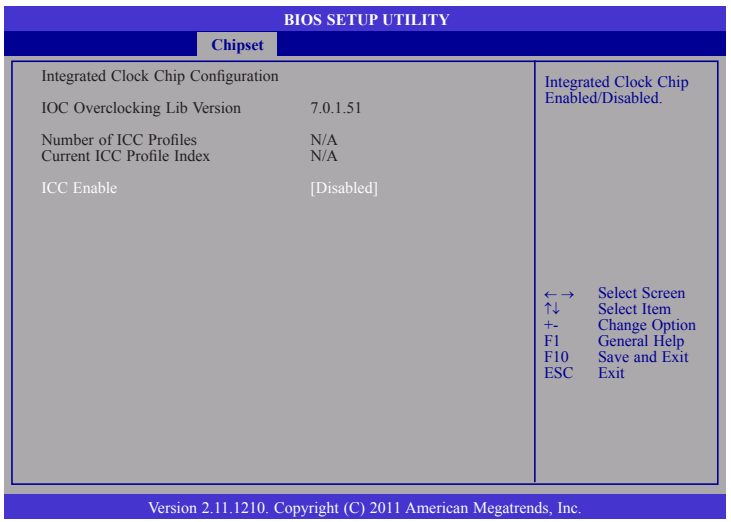
Execute MEBx

Enables or disables execute MEBx.

MEBx Mode

Selects the MEBx mode.

Integrated Clock Chip Configuration



ICC Enable

Enables or disables the integrated clock chip.

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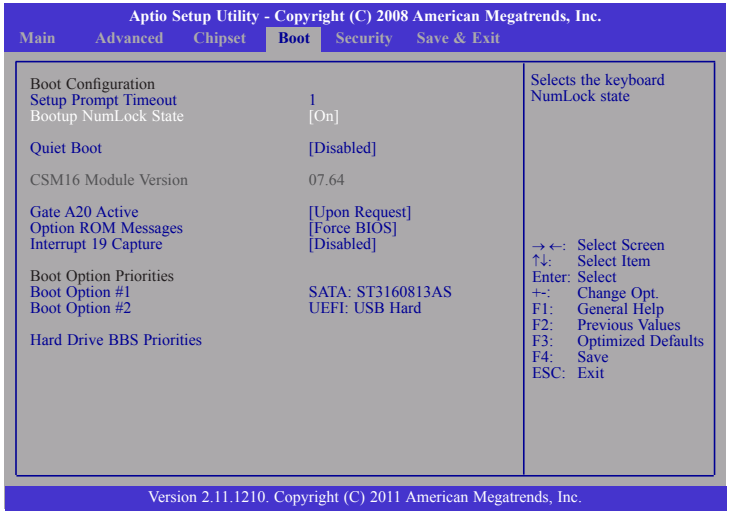
Boot



Setup Prompt Timeout

Selects the number of seconds to wait for the setup activation key. 65535(0xFFFF) denotes 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

Enables or disables Quiet Boot.

Gate A20 Active

Upon	Request GA20 can be disabled using BIOS services.
Always	Does not allow disabling GA20. This option is useful when any RT code is executed above 1MB.

Option ROM Messages

Configures the ROM messages.

Interrupt 19 Capture

When enabled, it allows the optional ROM to trap interrupt 19.

Boot Option #1 and Boot Option #2

Selects the system boot order.

Hard Drive BBS Priorities

Selects the order of the legacy devices in this group.

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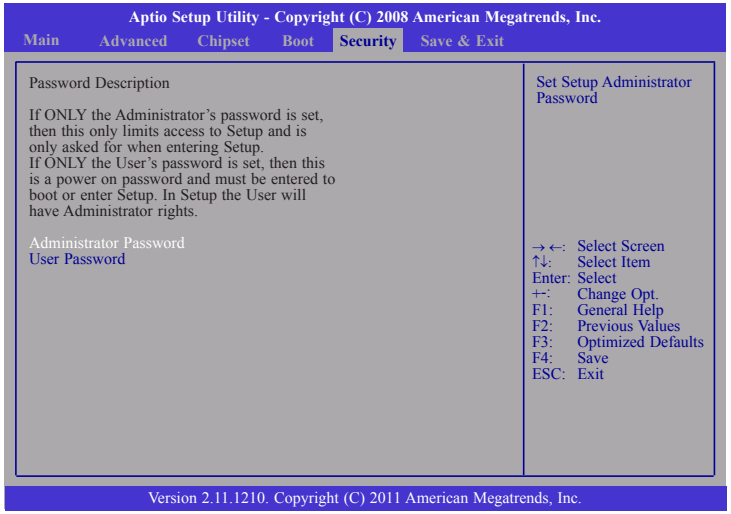
Security



Administrator Password

Sets the administrator password.

User Password

Sets the user password.

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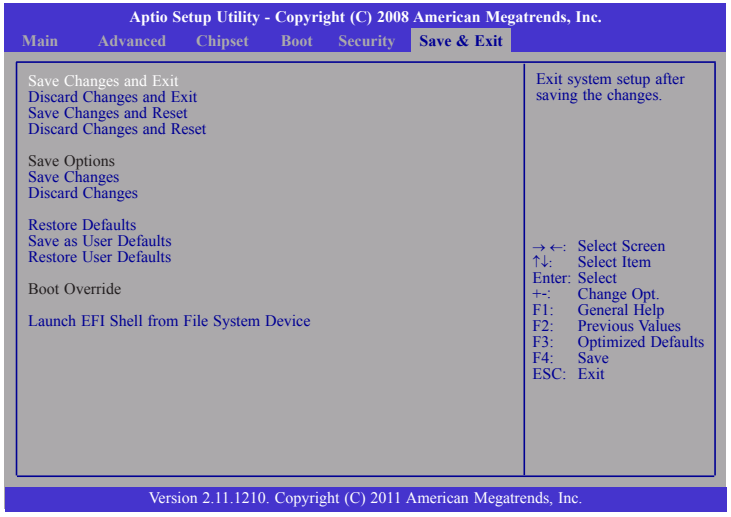
Save & Exit



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 <F10> 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.

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.

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Appendix A: Watchdog Timer

Watchdog Timer Setting

NSA 5130 features a watchdog timer that resets the CPU or generates an interrupt if the processor stops operating for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

Set pin 89 as a WDTO output. Write '0' to CR2B[4].

1. Select timer type (Sec/Min). LD8 CRF5[3] (0: sec, 1: min)
2. Clear timeout status. Write '0' to LD8 CRF7[4].
3. Set the timeout value. Meanwhile the timer will start to count down.
4. Write a value to LD8 CRF6. When a timeout occurs, pin 89 will become active (high level).
5. CRF6 must be 0x0. Write another 0x00 to CRF6 (timeout disable) even though it is already 0x00. Clear the timeout status. Write '0' to LD8 CRF7[4]. pin 89 will fall at the same time.

CRFC6 (Default 0x00)

Watchdog Timer Time-out Value

Writing a non-zero value to this register causes the counter to load the value to Watchdog Counter and start counting down. If Bit 7 and Bit 6 are set, any Mouse Interrupt or Keyboard Interrupt event will also cause the reload of previously-loaded non-zero value to Watchdog Counter and start counting down. Reading this register returns current value in Watchdog Counter.

Dog Timer Time-out Value

BIT	Definition
7-0	0x00 time-out disabled 0x01 time-out occurs after 1sec./min. 0x02 time-out occurs after 2 sec./min. 0x03 time-out occurs after 3 sec./min. 0xFF time-out occurs after 255 sec./min.

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Watch Dog Sample Code

```
;#########################################################
;ENTER THE SIO CONFIGURATION MODE
;#########################################################
MOV     DX, 2EH
MOV     AL, 87H
OUT     DX, AL
OUT     DX, AL

MOV     AL, 07H         ;POINT TO LOGICAL DEVICE NUMBER REG
OUT     DX, AL
INC     DX
MOV     AL, 08H
OUT     DX, AL

;#########################################################
;SET UNITS
;#########################################################
MOV     DX, 2EH
MOV     AL, 0F5H
OUT     DX, AL
INC     DX
IN      AL, DX
AND     AL, NOT 8       ;SECEND MODE.
OUT     DX, AL

;#########################################################
;SET TIME OUT VALUE
;#########################################################
MOV     DX, 2EH
MOV     AL, 0F6H
OUT     DX, AL
MOV     AL, NUMBER OF TIME OUT VALUE IN SECENDS (0-255)
INC     DX
OUT     DX, AL

;#########################################################
;EXIT THE SIO CONFIGURATION MODE
;#########################################################

MOV     DX, 2EH
MOV     AL, 0AAH
OUT     DX, AL
```

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Appendix B: GPI/O Programming Guide

This appendix provides definitions for the four GPI/O pins on NSA 5130. GPI/O (General Purpose Input/Output) pins are provided for custom system design. The pin programmed as input mode (GPI) or output mode (GPO) depends on the configuration.

GPIO (J9)

Pin 3	Pin 5	Pin 7	Pin 9	Pin 4	Pin 6	Pin 8	Pin 10
GPIN10	GPIN11	GPIN12	GPIN13	GPOUT14	GPOUT15	GPOUT16	GPOUT17

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GPIO Sample Code

```
;############################################################
;MSB LSB
GPIO17 GPIO16 GPIO15 GPIO14 GPIO13 GPIO12 GPIO11 GPIO10
;############################################################
;############################################################
;Enable Configuration mode.
;############################################################
out 2eh, 87h
out 2eh, 87h
;############################################################
;Select logical device (GPIO1).
;############################################################
out 2eh, 07h
out 2fh, 07h
;############################################################
;Activate GPIO Function.
;############################################################
out 2eh, 30h
out 2fh, 01h
;############################################################
;CRF0 (GP10-GP17 I/O selection register. Default 0xFF)
;When set to a '1', respective GPIO port is programmed as an input port.
;When set to a '0', respective GPIO port is programmed as an output port.
;############################################################
out 2eh, 0f0h
out 2fh, f0h ;GPIO10-13 as output pin , GPIO14-17 as input pin
;############################################################
;CRF1 (GP10-GP17 data register. Default 0x00)
;If a port is programmed to be an output port, then its respective bit can be read/written.
;If a port is programmed to be an input port, then its respective bit can only be read.
;############################################################
out 2eh, 0f1h
in 2fh
```

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SW1

Read GPI57 Sample Code

```
mov dx,4BBh
in al,dx
and al,1 ;now al (bit4) is GPIO56 value.
```

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Appendix C: Bypass Specifications

NSA 5130 provides LAN bypass functionality to ensure that data can still pass through the device, even when it is powered off. This feature helps ensure the continuous flow of data through the device in the event of a hardware failure. For network security appliances deployed at the gateway, for example, it is crucial that they provide LAN bypass functionality to ensure that hardware failure on these appliances will not bring down the entire network.

Bypass Control Register Map

BTCR - Bypass Timer Configuration Register = 0XF2

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
R	X	X	X	X	R/W		
Timer expired	Not used	Not used	Not used	Not used	Global timeout value		

Power ON State Bypass Control Status Register = 0XF3

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
W		X	X	X	X	W	W
Bypass mode		Not used	Not used	Segment 4	Segment 3	Segment 2	Segment 1

Power OFF State Bypass Control Status Register = 0XF7

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
X	X	X	X	X	X	W	W
Not used	Not used	Not used	Not used	Segment 4	Segment 3	Segment 2	Segment 1

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Bypass Control Register Bit Definitions

Bypass Timer Configuration Register F2

Bit Field	Name	Value
2:0	Timer value	000 = 0 second, timer immediately expired 001 = 1 second 010 = 2 seconds 011 = 4 seconds 100 = 8 seconds 101 = 16 seconds 110 = 32 seconds 111 = 64 seconds Note: This is a write only field. Upon reads these bit values are undefined. A Timer value of 1 to 7 is required to be written before expiration of the hardware timer. When the timer expires, all segments which have been enabled in bits 2:0 of Power ON state Bypass Control Status Register set relays closed to form bypass segments. It is the responsibility of the software to keep track of the time to ensure writes to this register occur no greater than TimerValueInSeconds / 2. A write of the timer value will automatically reset the expiration timer and set it to the value expressed in bit 2:0.
3	Not used	No activity taken if written, value is undetermined and not needed on read operation.
4	Not used	No activity taken if written, value is undetermined and not needed on read operation.
5	Not used	No activity taken if written, value is undetermined and not needed on read operation.
6	Not used	No activity taken if written, value is undetermined and not needed on read operation.
7	Timer expired	Read only bit: 0 = Timer has not expired 1 = Timer has expired Note: A read operation on Bypass Timer Configuration Register should not cause the timer value to refresh.

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Power ON State Bypass Control Status Register F3

Bit Field	Name	Value
1:0	Segment 1 to 2	Segment control bit mask. Each bit corresponds to a specific segment numbered 1 thru 3. Write: If a segment mask bit is set to false (0) no action on that segment will take place. If a segment mask bit has been set to true (1), action will take place on this segment according to the bypass mode settings in bits 7:6. Read: Upon read operations the bit mask returned indicates true (1) for those segments which have been enabled and false (0) for those segments which are disabled.
2-5	Not used	No active taken if written, value is undetermined and not needed on read operation.
7:6	Bypass Mode	These two bits defined the bypass mode for one or more segments. These bits are Write only and on reads returns undetermined values which will be ignored by the driver.

Bit 7	Bit 6	Action
0	0	Ignore, no action taken.
0	1	Force Enable - Engage bypass relays on segments enabled in segment mask.
1	0	Force Disable - Disable bypass relays immediately on segments enabled in mask.
1	1	Timer Enable - Segments enabled in mask are under Timer control.

Power OFF state Bypass Control Status Register F7

Bit Field	Name	Value
0	Segment 1	0 = Set segment bypass disable when power off 1 = Set segment bypass enable when power off
1	Segment 2	0 = Set segment bypass disable when power off 1 = Set segment bypass enable when power off
2	Segment 3	0 = Set segment bypass disable when power off 1 = Set segment bypass enable when power off
3	Segment 4	0 = Set segment bypass disable when power off 1 = Set segment bypass enable when power off
7:4	Not used	No active taken if written, value is undetermined and not needed on read operation.

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Appendix D: Power Consumption

Power Consumption

Voltage / Chipset	Voltage	+12V	5VSB	3VSB	5V	3.3V	1.5V	1.05V	1.8V	1.05V
	Net Name	VCC12	5VSB	3VSB	VCC5	VCC3_3	P1V5_VDDQ	P1V05_PCH	P1V8	PVCCP_CPU
	+ Tolerance	+5%	+5%	+5%	+5%	+5%	+5%	+5%	+5%	+5%
Chipset	- Tolerance	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%
CPU							6.5		2	11
PCH (C206)			0.001	0.129	0.001	0.45		7.5	0.25	0.001
DDR3 * 4							18.76			
FAN x5		1.5								
CK505						0.57				
PCI to PCI-E Bridge (PEX8112)						0.116				
VGA chip (Z11)						1.32				
Intel 82583V * 8						1.76				
SATA to IDE Bridge (JMD330)					0.06	0.03				
CF card					0.2					
Super I/O (NCT6776F)						0.025				
Relay * 32					1.6					
USB x4					2					
SATA DOM					0.2					
PCI-E x16 slot		5.5		0.75		6				
PCI-E x8 Golden Finger		0.5			1	7				
4 Pin Power connector		0.5			1					
Total consumption(A)		8	0.001	0.879	6.061	17.271	25.26	7.5	2.25	11.001
		96	0.005	2.9	30.305	57	37.89	7.875	4.05	11.551

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0.75V	VCCSA (VID)	VAXG (VID)	VCORE (VID)	1.05VSB	Subtotal Power
P0V75_VTT_DIMM	PVCCUSA_CPU	V_AXG	VCORE	P1V05_AUX	
+5%	+5%	+5%	+5%	+5%	
-5%	-5%	-5%	-5%	-5%	
	8.8	35	112		
				3.5	
1.08					
1.08	8.8	35	112	3.5	
0.81	8.14	53.2	95	3.675	408.401

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