NEXCOM International Co., Ltd.

Industrial Computing Solutions

Embedded Computing (Industrial Motherboard)

NEX 604

User Manual

NEXCOM International Co., Ltd.
Published June 2012

www.nexcom.com

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PREFACE

Copyright

Disclaimer

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Acknowledgements

NEX 604 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

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

Declaration of Conformity

FCC

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

CE

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

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2002/95/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.

Warranty and RMA

NEXCOM Warranty Period

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

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."
- Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

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

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System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

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

Cautions

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

Safety Information

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

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

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

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

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

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

Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

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

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

5. Keep this equipment away from humidity.

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

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

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

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

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

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

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

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

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

15. Do not place heavy objects on the equipment.

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

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

Technical Support and Assistance

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

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 NEX 604 package that you received is complete. Your package should have all the items listed in the following table.

NEX 604 CPU Cooler (P/N: 10G00060402X0)

Item	Part Number	Name	Qty
1	5044440079X00	GASKET FOR VIA CPU KGS:C-4505(20X20x1)+G4000	1
2	5044440090X00	(H)THERMAL PAD APUS:3A2015001001500	1
3	5050300517X00	CPU HEATSINK FOR NEX605 SHYUNG SHUHN	1

Ordering Information

The following information below provides ordering information for NEX 604.

NEX 604-2550 (P/N: 10G00060403X0) RoHS Compliant

Mini ITX Board with Intel® Atom™ D2550 processor and based on Intel® integrated graphics engine w/ VGA/18-bit LVDS/6 x USB2.0/4 x COMs/2 x Mini-PCIe/2 x Gigabit LAN/2 x SATA/ 1X LPT / 1 x PCI

Chapter 1: Product Introduction

Overview

Key Features

- Intel® Atom™ Dual-Core D2550/ 1.86GHz processor
- Intel® NM10 Express chipset
- Dual 204-pins DDR3 SO-DIMMs support max. 4GB SDRAM memory
- Support VGA/ HDMI, VGA/ LVDS or HDMI/ LVDS dual displays
- 6x USB, 4x COM, 2x GbE, 2x SATA, 1x LPT, 1x PCI
- Audio Mic-in/ Line-out, (internal Line-in)
- 2x Mini-PCIe (1x full/ SIM tray, 1x half-size)
- Single +12V DC input by AT/ ATX mode

Hardware Specifications

CPU Support

- Intel® Atom™ processor D2550 1.86GHz CPU

Main Memory

- Dual 204-pin SO-DIMM socket supports up to 4 GB DDR3 800/1066 MHz SDRAM

Chipset

- Intel® NM10 Express chipset

BIOS

- AMI BIOS
- Plug & Play support
- Advanced Power Management
- Advanced Configuration & Power Interface
- 8M bits SPI ROM

On-board LAN

- 2x Realtek® PCI Express Gigabit Ethernet
- Support Boot From LAN (PXE)
- 2x RJ45 with LED

Display

- Intel® Atom™ processor D2550 integrated 3D graphics engine, which enhances Gfx & Video, support DX10.1, OpenGL 3.0, and Full HD-Decode (MPEG2,VC1,AVC,H.264), delivers sophisticated graphics for large display applications, supports dual independent display at graphics base frequency up to 640MHz, and provides a wealth of options for high-resolution displays.
- Analog VGA interface
  - Resolution up to 1920x1200 @ 75Hz
- HDMI interface
  - 1x HDMI Interface
  - Resolution up to 1920x1200
- LVDS interface
  - Single (24bit) LVDS panel, resolution up to 1440 x 900 DF13 20-pin LVDS connector for internal connection
- CCFL interface
  - 1x CCFL for LCD Panel Backlight Inverter

Audio

- Realtek ALC886 CODEC for High Definition
- 1x Mic-in/ 1x speaker-out by audio jack on edge I/O and 1x Line-in by pin header

Expansion

- 2x Mini-PCIe (1x full-size/ SIM tray and 1x half-size slots)
- 1x PCI slot (32bit/ 33Mhz)

I/O Interface

- Serial port: 4 ports
  - COM1, RS232 by DB-9 male on edge I/O
  - COM2, 3, 4 ports, support 3x RS232 by three 2x 5-pins box-headers
- USB 2.0: 8 ports
  - 4x ports by 2x dual stack USB2.0 on edge I/O (port 0~ 3)
  - 2x ports by 2x 5-pins header pitch 2.54mm (port 4~ 5)
  - 2x ports to Mini-PCIe slots (port 6, 7)
- 2x 5-pins header for Power LED and HDD Active LED/ Reset/ Power On-Off
- 2x 4-pins fan connector (for CPU and system)
- 1x 5-pins pin-headers IrDA (Tx/Rx) and 1x 4-pins pin-header for SMbus
- 1x 13-pins box-header for legacy parallel port/ LPT

Edge I/O Interface

- 1x 5-pins AT power connectors for +12V DC input
- 1x dual stack PS2 for Keyboard/ Mouse
- 1x dual stack DB9 male for COM1 + DB15 female VGA
- 1x HDMI connector
- 2x RJ45 LAN + dual stack USB connectors
- 1x Mic-in/ 1x Speaker-out Jack

Watchdog Timer

- Watchdog timeout can be programmed by software from 1 second to 255 seconds, and from 1 minute to 255 minutes (Tolerance 15% under room temperature 25°C)

Storage

- 2x SATA port
- 2x 4-pins power connectors for SATA/ HDD

System Monitor

- Monitoring of 4 voltages and 2 temperatures
- 4 Voltage (Vcore, +12V , +3.3V , 5V)
- 2 Temperatures (CPU, System)
- 2 Fans Speed detection

On-board RTC

- On-chip RTC with battery backup
- 1x External Li-Ion battery

Power Input

- Support AT and ATX mode (1x 3pins) by jumper setting

Power Requirements

- Power requirement: DC +12V Input
- 1x 5-pins AT power connector on edge I/O
- One 2x2-pins ATX power connecto

Dimensions

- Mini-ITX form factor/170mm (L) x 170mm (W) (6.7”x6.7”)

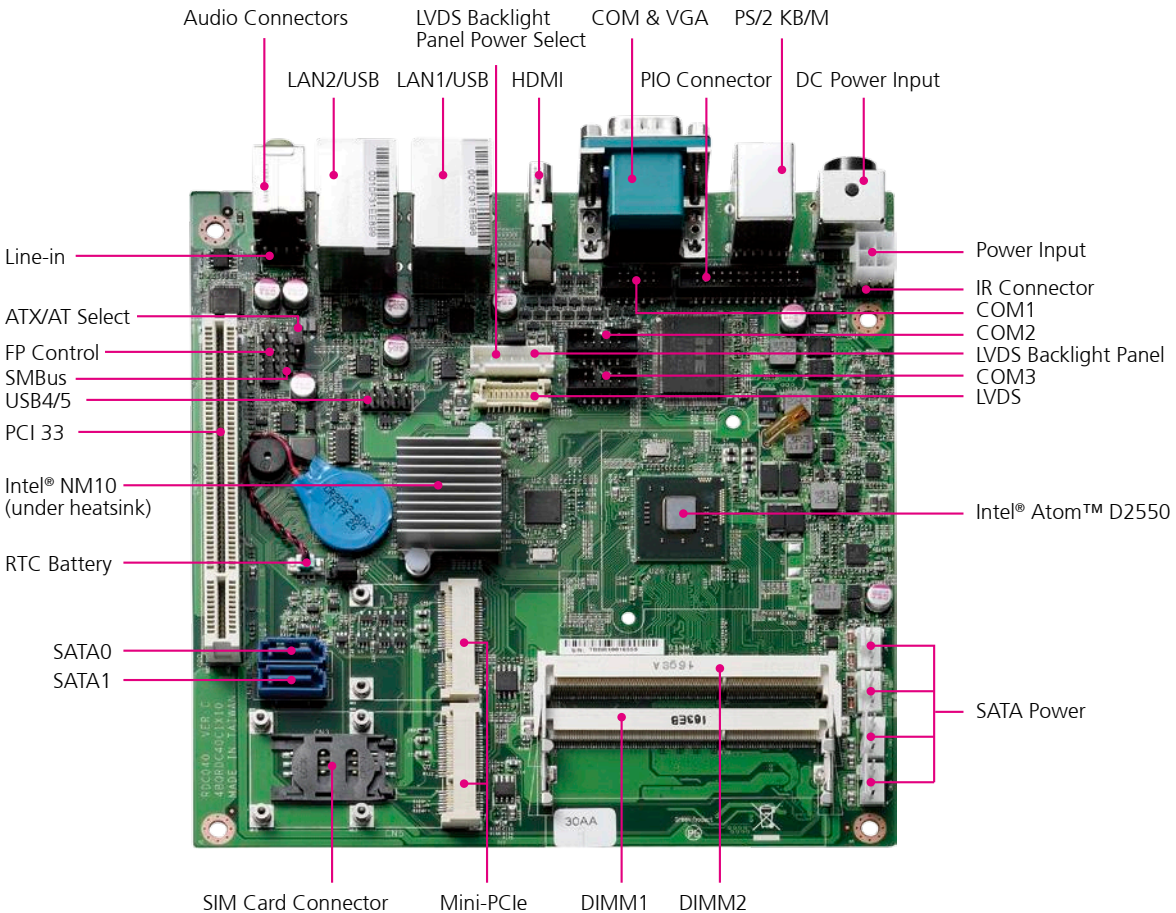
Environment

- Operating temperatures: -15°C to 60°C
- Storage temperature: -20°C to 85°C
- Relative humidity: Operating 10% to 90%, non-condensing

Certifications

- CE approval
- FCC Class A

Knowing Your NEX 604



Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the NEX 604 motherboard.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers screwdrivers
  - A grounding strap
  - An anti-static pad
- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.
- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

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

Follow the guidelines below to avoid damage to your computer or yourself:

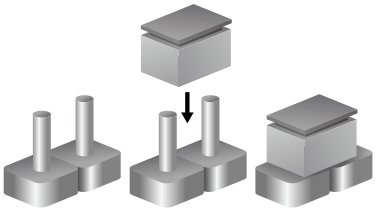
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

Jumper Settings

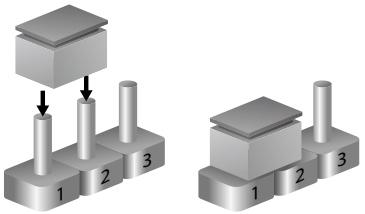
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

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

Two-Pin Jumpers: Open (Left) and Short (Right)

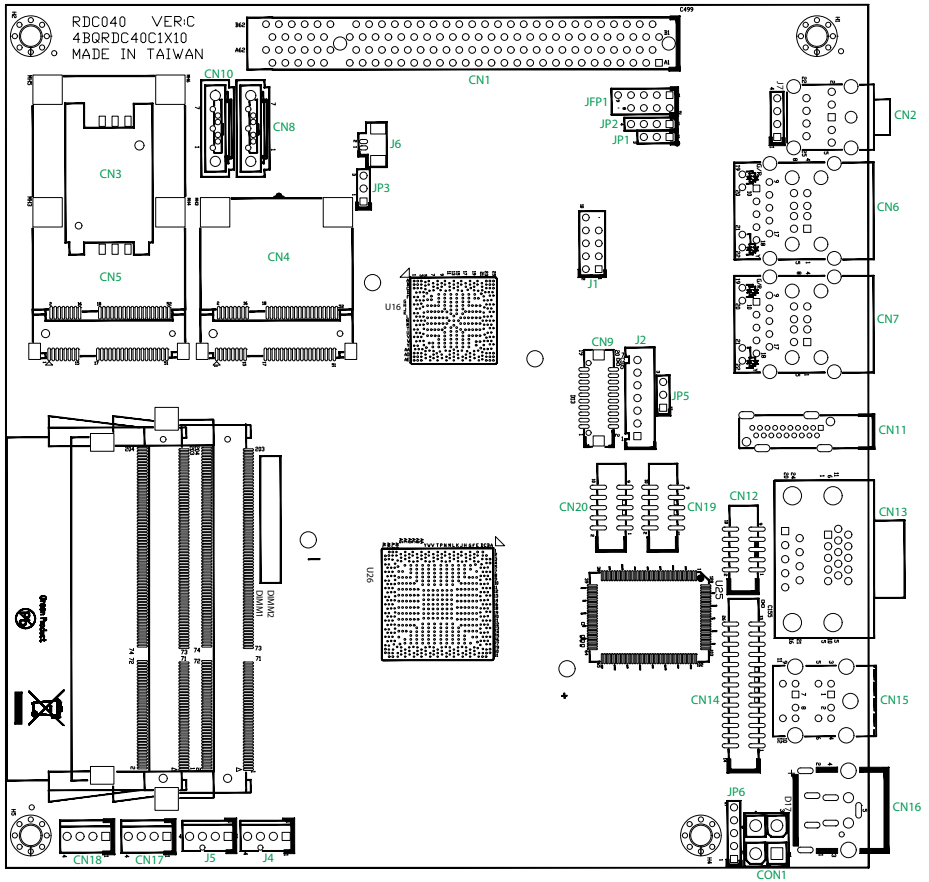


Three-Pin Jumpers: Pins 1 and 2 are Short



Locations of the Jumpers and Connectors

The figure below shows the location of the jumpers and connectors.



Jumpers

CMOS Clear Select

Connector type: 1x3 3-pin header
Connector location: JP3

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

1-2 On: default

Power Mode Select

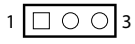
Connector type: 1x3 3-pin header
Connector location: JP1

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

1-2 On: default

LVDS Power Select

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



Pin	Definition
1	VCC3
2	VCC_SEL
3	VCC5

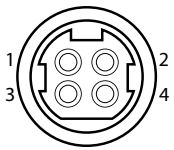
1-2 On: default

Connector Pin Definitions

External I/O Interfaces

DC Power Input

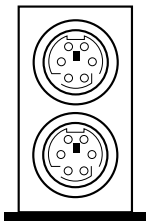
Connector type: 4-pin DC Jack
Connector location: CN16



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

PS/2 Mouse and Keyboard Ports

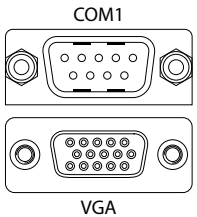
Connector type: PS/2, Mini-DIN6
Connector location: CN15



Pin	Definition	Pin	Definition
1	KB DATA	2	NC
3	GND	4	5VDUAL
5	KB CLOCK	6	NC
7	MS DATA	8	NC
9	GND	10	5VDUAL
11	MS CLOCK	12	NC

COM1 and VGA Ports

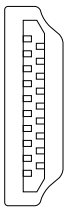
Connector type: DB-9 port, 9-pin D-Sub (COM1)
DB-15 port, 15-pin D-Sub (VGA)
Connector location: CN13



Pin	Definition	Pin	Definition
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	NC	12	DDC DATA
13	HSYNC	14	VSYNC
15	DDC CLOCK	16	DCD
17	RXD	18	TXD
19	DTR	20	GND
21	DSR	22	RTS
23	CTS	24	RI

HDMI

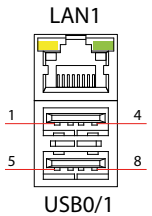
Connector type: HDMI port
Connector location: CN11



Pin	Definition	Pin	Definition
1	Data2+	2	GND
3	Data2–	4	Data1+
5	GND	6	Data1–
7	Data0+	8	GND
9	Data0–	10	Clock+
11	GND	12	Clock-
13	NC	14	NC
15	HDMI SCL	16	HDMI SDA
17	GND	18	+5V
19	HPD	20	

USB0/1 Ports

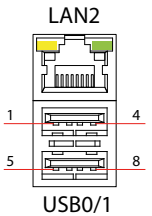
Connector type: RJ45 port with LEDs (LAN1)
Dual USB port, Type A (USB0/1)
Connector location: CN7



Pin	Definition	Pin	Definition
1	5VDUAL	2	USB0_N
3	USB0_P	4	GND
5	5VDUAL	6	USB1_N
7	USB1_P	8	GND
9	TCT	10	LAN1_MDI0P
11	LAN1_MDI0N	12	LAN1_MDI1P
13	LAN1_MDI1N	14	LAN1_MDI2P
15	LAN1_MDI2N	16	LAN1_MDI3P
17	LAN1_MDI3N	18	GND
19	LAN1_100M#	20	LAN1_1G#
21	LAN1_ACTLED#	22	LAN1_ACTLED# POWER

LAN2 and USB2/3 Ports

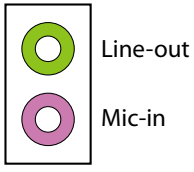
Connector type: RJ45 port with LEDs (LAN2)
Dual USB port, Type A (USB2/3)
Connector location: CN6



Pin	Definition	Pin	Definition
1	5VDUAL	2	USB2_N
3	USB2_P	4	GND
5	5VDUAL	6	USB3_N
7	USB3_P	8	GND
9	TCT	10	LAN2_MDI0P
11	LAN2_MDI0N	12	LAN2_MDI1P
13	LAN2_MDI1N	14	LAN2_MDI2P
15	LAN2_MDI2N	16	LAN2_MDI3P
17	LAN2_MDI3N	18	GND
19	LAN2_100M#	20	LAN2_1G#
21	LAN2_ACTLED#	22	LAN2_ACTLED# POWER

Audio Connectors

Connector type: 2x 3.5mm TRS
Connector location: CN2



Pin	Definition	Pin	Definition
1	GND	2	MIC1_L
3	GND	4	MIC1_JD
5	MIC1_R	22	FRONT_L
23	GND	24	FRONT_JD
25	FRONT_R		

Internal Connectors

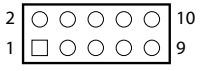
Line-in Connector

Connector type: 1x4 4-pin header
Connector location: J7

Pin	Definition
1	LINEIN_R
2	LINEIN_JD
3	GND
4	LINEIN_L

FP Control Connector

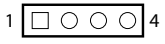
Connector type: 2x5 10-pin header
Connector location: JFP1



Pin	Definition	Pin	Definition
1	SATA_LED_P	2	PWER_LED_P
3	SATA_LED_N	4	GND
5	GND	6	PWRBT_N
7	RST_BTN_N	8	GND
9	NC		

SMBus Connector

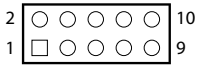
Connector type: 1x4 4-pin header
Connector location: JP2



Pin	Definition
1	3VSB
2	SMB_DATA
3	SMB_CLK
4	GND

USB4/5 Connector

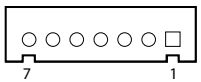
Connector type: 2x5 10-pin header
Connector location: J1



Pin	Definition	Pin	Definition
1	5VDUAL	2	5VDUAL
3	DATA4_N	4	DATA5_N
5	DATA4_P	6	DATA5_P
7	GND	8	GND
		10	NC

LVDS Backlight Connector

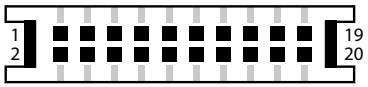
Connector type: 1x7 JST, 7-pin header, 2.5mm pitch
Connector location: J2



Pin	Definition
1	+5V
2	Backlight power(+12V)
3	Backlight power(+12V)
4	Backlight brightness control
5	GND
6	GND
7	Backlight enable

LVDS Connector

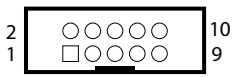
Connector type: 2x10 20-pin header, 1.25mm pitch
Connector location: CN9



Pin	Definition	Pin	Definition
1	NC	2	NC
3	VCC_LCD	4	TX0+
5	TX3+	6	TX0--
7	TX3-	8	VCC_LCD
9	GND	10	TX1+
11	TXCLK+	12	TX1-
13	TXCLK-	14	GND+
15	GND	16	Backlight power(+12V)
17	TX2+	18	Backlight power(+12V)
19	TX2-	20	GND
MH1	GND	MH2	GND

COM2 Connector (RS232)

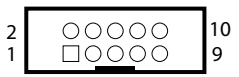
Connector type: 2x5 10-pin boxed header
Connector location: CN12



Pin	Definition	Pin	Definition
1	DCD2	2	RXD2
3	TXD2	4	DTR2
5	GND	6	DSR2
7	RTS2	8	CTS2
9	RI2	10	GND

COM3 Connector (RS232)

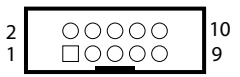
Connector type: 2x5 10-pin boxed header
Connector location: CN20



Pin	Definition	Pin	Definition
1	DCD3	2	RXD3
3	TXD3	4	DTR3
5	GND	6	DSR3
7	RTS3	8	CTS3
9	RI3	10	GND

COM4 Connector (RS232)

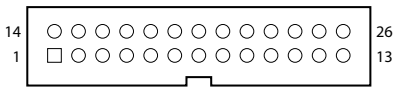
Connector type: 2x5 10-pin boxed header
Connector location: CN19



Pin	Definition	Pin	Definition
1	DCD4	2	RXD4
3	TXD4	4	DTR4
5	GND	6	DSR4
7	RTS4	8	CTS4
9	RI4	10	GND

PIO Connector

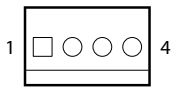
Connector type: 2x13 26-pin header
Connector location: CN14



Pin	Definition	Pin	Definition
1	STB#	2	D0
3	D1	4	D2
5	D3	6	D4
7	D5	8	D6
9	D7	10	ACK#
11	BUSY	12	PE
13	SLCT	14	AFD#
15	ERR#	16	INIT#
17	SLIN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND	26	GND

SATA Power Connector

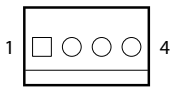
Connector type: 1x4 4-pin Wafer
Connector location: CN18 and CN17



Pin	Definition
1	+12V
2	GND
3	GND
4	+5V

FAN Connectors

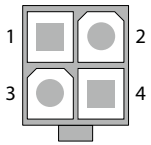
Connector type: 1x4 4-pin Wafer
Connector location: J5 and J4



Pin	Definition
1	GND
2	+12V
3	FAN_TAC
4	FAN_CTL

ATX Power Output Connector

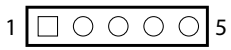
Connector type: 2x2 Aux power connector
Connector location: CON1



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

IR Connector

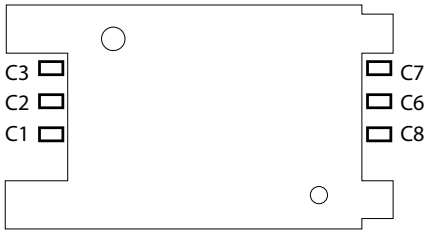
Connector type: 1x5 5-pin header
Connector location: JP6



Pin	Definition
1	+5V
2	NC
3	IRRX
4	GND
5	IRTX

SIM Card Connector

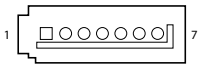
Connector location: CN3



Pin	Definition
C1	Power voltage
C2	RESET
C3	CLK
C4	GND
C5	Program voltage
C6	DATA

SATA 2.0 Connectors

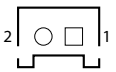
Connector type: Standard Serial ATAII 7P (1.27mm, SATA-M-180)
Connector location: CN8 (SATA0) and CN10 (SATA1)



Pin	Definition
1	GND
2	SATA_TX_P
3	SATA_TX_N
4	GND
5	SATA_RX_P
6	SATA_RX_N
7	GND

RTC Battery IN Connector

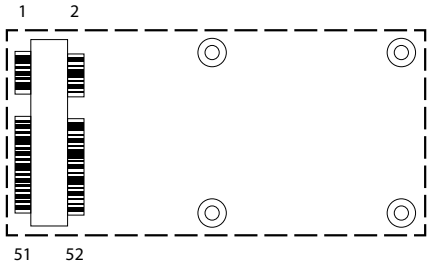
Connector type: 1x2 JST, 2-pin header
Connector location: J6



Pin	Definition
1	GDN
2	RTC battery IN

Mini-PCIe Connector A

Connector location: CN4

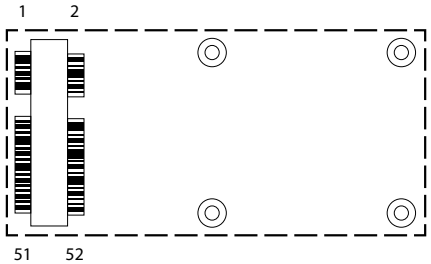


Pin	Definition	Pin	Definition
1	WAKE#	2	3VSB
3	NC	4	GND
5	NC	6	1.5VSB
7	Pull high 10K to 3VSB	8	NC
9	GND	10	NC
11	REFCLK-	12	NC
13	REFCLK+	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	Pull high 100K to 3VSB
21	GND	22	PERST#
23	PE_RX-	24	3VSB
25	PE_RX+	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1.5VSB
29	GND	30	NC
31	PE_TX-	32	NC
33	PE_TX+	34	GND
35	GND	36	USB-
37	GND	38	USB+
39	3VSB	40	GND
41	3VSB	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	1.5VSB
49	NC	50	GND
51	NC	52	3VSB

Mini-PCIe Connector B

Connector location: CN5

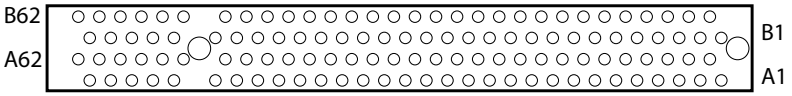


Pin	Definition	Pin	Definition
1	WAKE#	2	3VSB
3	NC	4	GND
5	NC	6	1.5VSB
7	Pull high 10K to 3VSB	8	UIM_PWR
9	GND	10	UIM_DATA
11	REFCLK-	12	UIM_CLK
13	REFCLK+	14	UIM_RST
15	GND	16	UIM_VCCP
17	NC	18	GND
19	NC	20	Pull high 100K to 3VSB
21	GND	22	PERST#
23	PE_RX-	24	3VSB
25	PE_RX+	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1.5VSB
29	GND	30	NC
31	PE_TX-	32	NC
33	PE_TX+	34	GND
35	GND	36	USB-
37	GND	38	USB+
39	3VSB	40	GND
41	3VSB	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	1.5VSB
49	NC	50	GND
51	NC	52	3VSB

PCI 33 Slot

Connector location: CN1



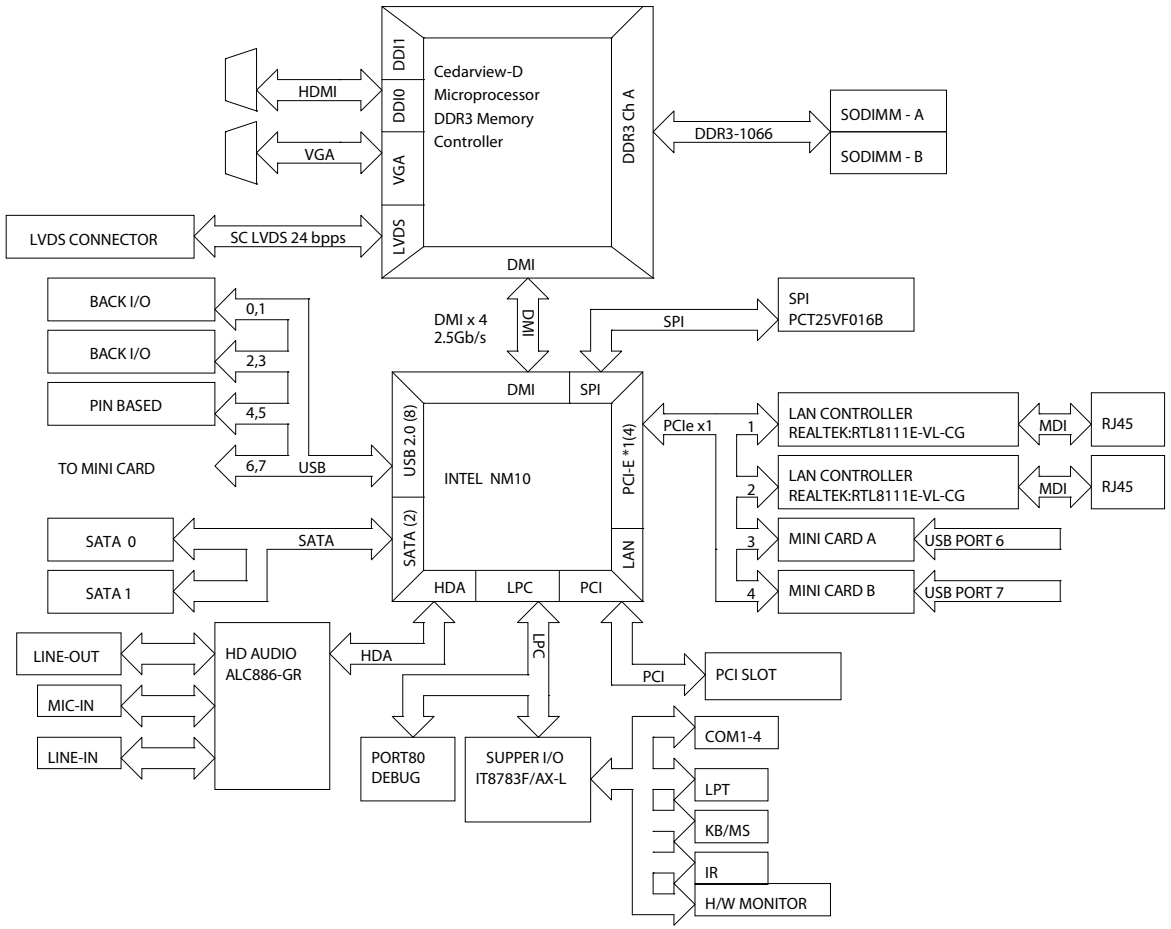
Pin	Definition	Pin	Definition
A1	Pull down 5.6K to GND	A2	+12V
A3	Pull high 1K to +5V	A4	Pull high 1K to +5V
A5	+5V	A6	Interrupt A#
A7	Interrupt C#	A8	+5V
A9	CLKRUN#	A10	+5V
A11	GNT#2	A12	GND
A13	GND	A14	3.3VAUX
A15	Reset#	A16	+5V
A17	GNT#1	A18	GND
A19	PME#	A20	Address and Data 30
A21	+3.3V	A22	Address and Data 28
A23	Address and Data 26	A24	GND
A25	Address and Data 24	A26	IDSEL
A27	+3.3V	A28	Address and Data 22
A29	Address and Data 20	A30	GND
A31	Address and Data 18	A32	Address and Data 16

Pin	Definition	Pin	Definition
B1	-12V	B2	Pull down 5.6K to GND
B3	GND	B4	NC
B5	+5V	B6	+5V
B7	Interrupt B#	B8	Interrupt D#
B9	Connect 10nf to Ground	B10	REQ#2
B11	Connect 10nf to Ground	B12	GND
B13	GND	B14	Clock2
B15	GND	B16	Clock1
B17	GND	B18	REQ#1
B19	+5V	B20	Address and Data 31
B21	Address and Data 29	B22	GND
B23	Address and Data 27	B24	Address and Data 25
B25	+3.3V	B26	CBE #3
B27	Address and Data 23	B28	GND
B29	Address and Data 21	B30	Address and Data 19
B31	+3.3V	B32	Address and Data 17

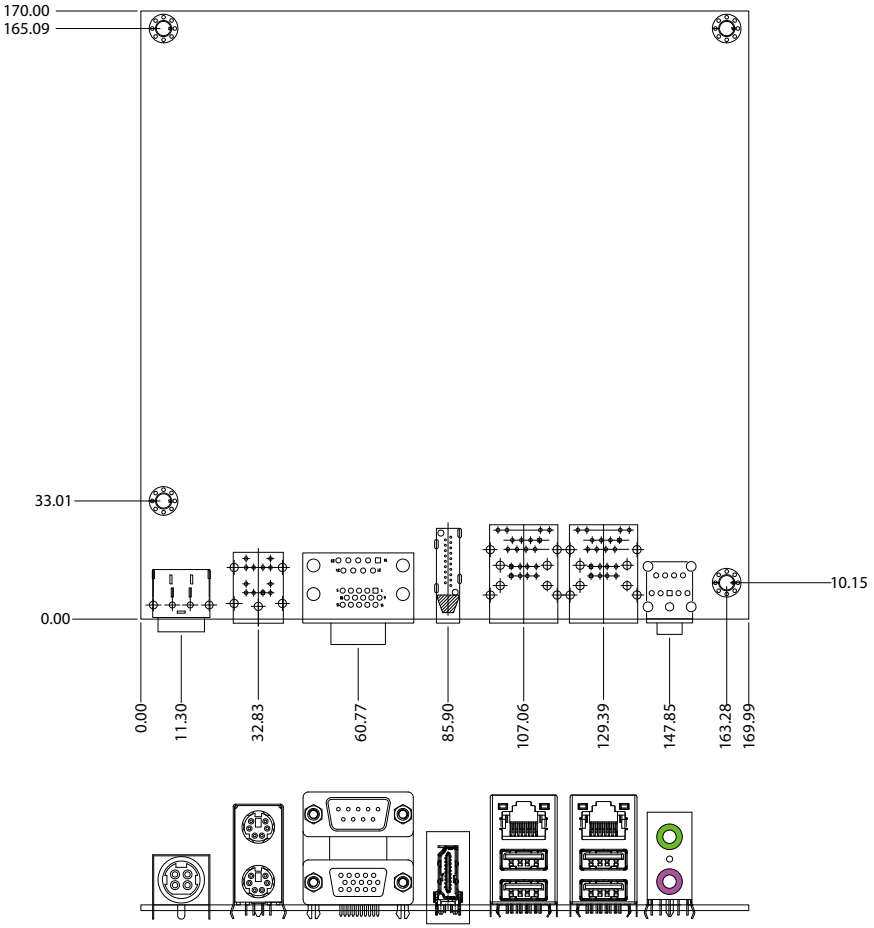
Pin	Definition	Pin	Definition
A33	+3.3V	A34	Frame#
A35	GND	A36	TRDY#
A37	GND	A38	Stop#
A39	+3.3V	A40	Pull high 5.6K to +5V
A41	Pull high 5.6K to +5V	A42	GND
A43	PAR	A44	Address and Data 15
A45	+3.3V	A46	Address and Data 13
A47	Address and Data 11	A48	GND
A49	Address and Data 9	A50	Connector Key
A51	Connector Key	A52	CBE#0
A53	+3.3V	A54	Address and Data 6
A55	Address and Data 4	A56	GND
A57	Address and Data 2	A58	Address and Data 0
A59	+5V	A60	Pull high 2.7K to +3.3V
A61	+5V	A62	+5V

Pin	Definition	Pin	Definition
B33	CBE#2	B34	GND
B35	IRDY#	B36	+3.3V
B37	DEVSEL#	B38	GND
B39	LOCK#	B40	PERR#
B41	+3.3V	B42	SERR#
B43	+3.3V	B44	CBE#1
B45	Address and Data 14	B46	GND
B47	Address and Data 12	B48	Address and Data 10
B49	GND	B50	Connector Key
B51	Connector Key	B52	Address and Data 8
B53	Address and Data 7	B54	+3.3V
B55	Address and Data 5	B56	Address and Data 3
B57	GND	B58	Address and Data 1
B59	+5V	B60	Pull high 2.7K to +3.3V
B61	+5V	B62	+5V

Block Diagram



Board Dimensions



Chapter 3: BIOS Setup

This chapter describes how to use the BIOS setup program for the NEX 604. 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.

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

Scroll Bar

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

Submenu

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

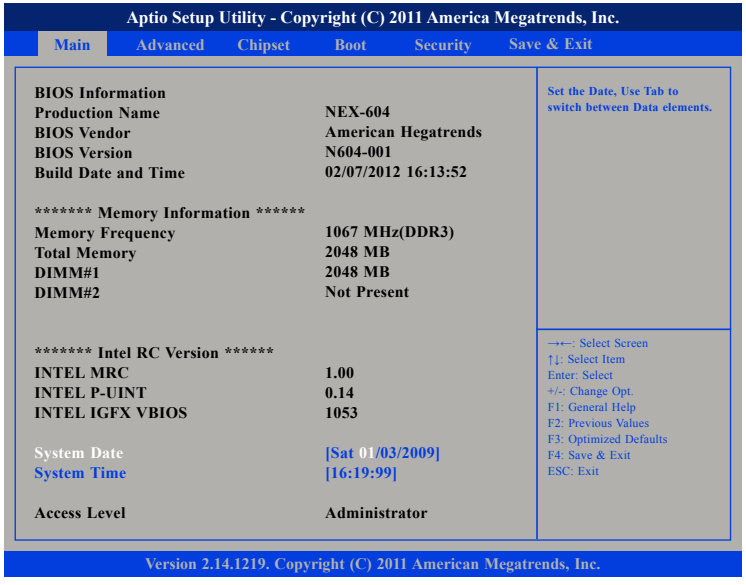
.

BIOS Setup Utility

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

Main

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



System Date

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

System Time

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

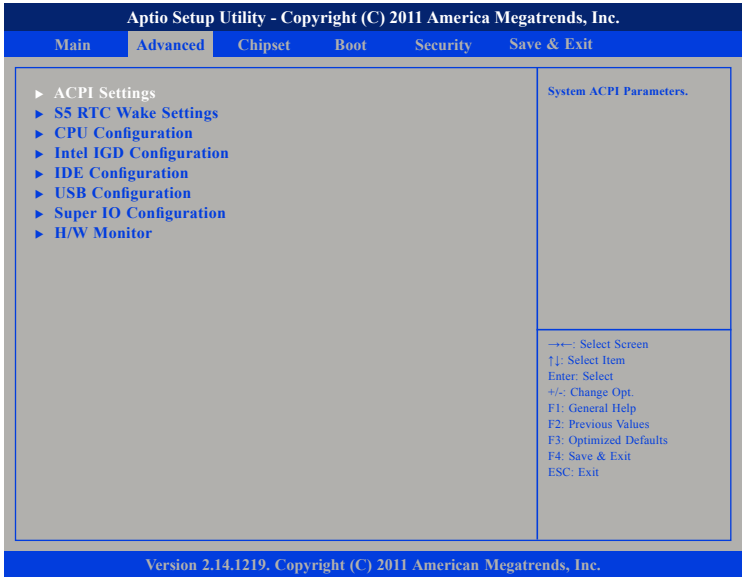
Access Level

Displays the access level of the current user in the BIOS.

Advanced

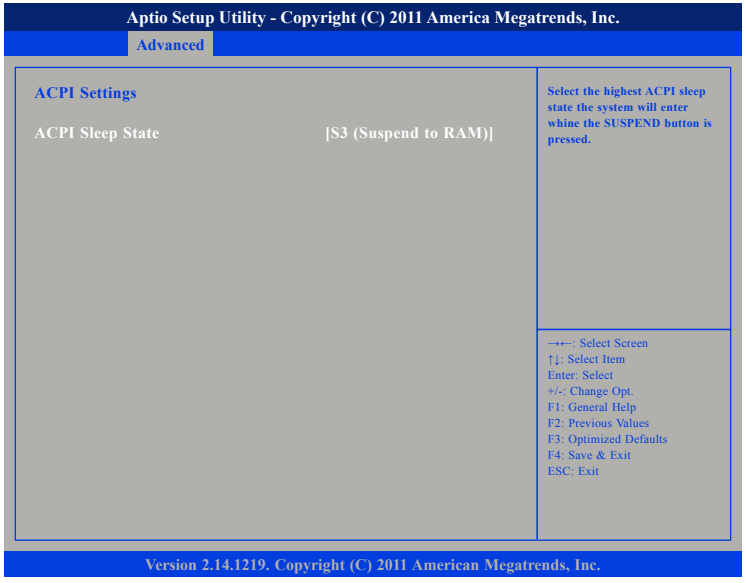
The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Setting incorrect field values may cause the system to malfunction.



ACPI Settings

This section is used to configure ACPI settings.



ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the suspend button is pressed. The options are Suspend Disabled, S1 (CPU Stop Clock) and S3 (Suspend to RAM).

S5 RTC Wake Settings

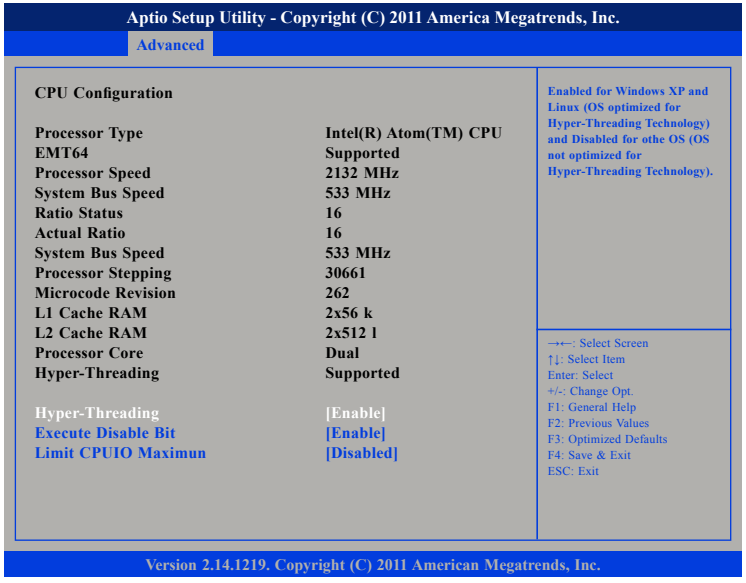
This section is used to configure S5 RTC Wake Settings.

Wake system with Fixed Time

Enables or disables system wake on alarm event. When enabled, the system will wake on the hr::min::sec specified.

CPU Configuration

This section is used to configure the CPU.



Hyper-threading

Disable or Enable hyper-threading technology.

Execute Disable Bit

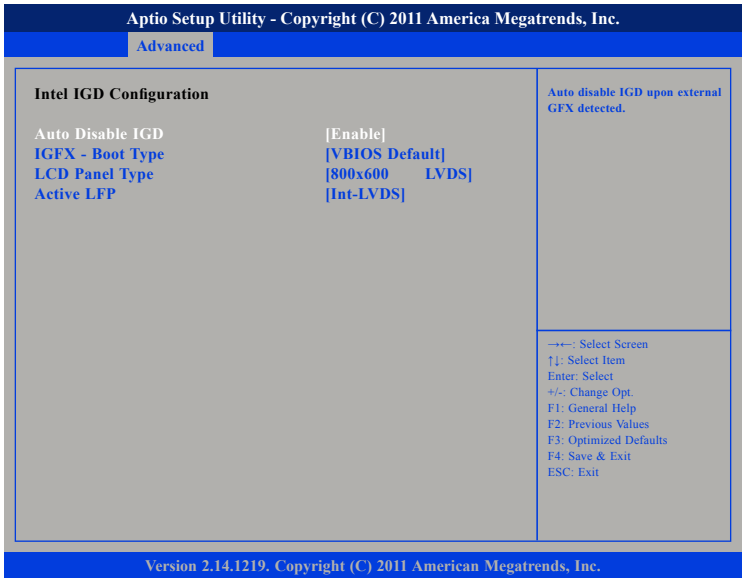
When this field is set to Disabled, it will force the XD feature flag to always return to 0. XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3).

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.

Intel® IGD Configuration

This section is used to configure Intel® IGD Configuration.



Auto Disable IGD

Auto disable IGD upon detecting external GFX

IGFX – Boot Type

Select the video device which will be activated during POST. Has no effect if external graphics is present. The options are VIOS Default, CRT, LVDS, HDMI, CRT + LVDS, CRT + HDMI and LVDS + HDMI.

LCD Panel Type

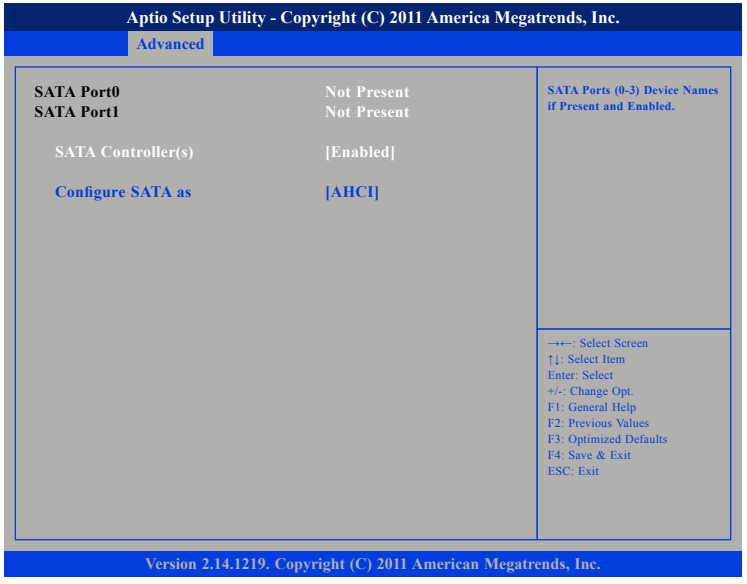
Select the LCD panel used by the internal graphics device. The options are 640x480 LVDS, 800x600 LVDS, 1024x768 LVDS, 1280x1024 LVDS, 1366x768 LVDS, 1224x600 LVDS and 1280x800 LVDS.

Active LFP

Select the Active LFP configuration. The options are No LVDS and Int-LVDS

IDE Configuration

This section is used to configure the SATA drives.



SATA Controller(s)

Enables or disables SATA ports 0-3.

Configure SATA As

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

RAID This option allows you to create RAID or Intel Matrix Storage configuration on Serial ATA devices.

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

Intel® Fast Flash Standy

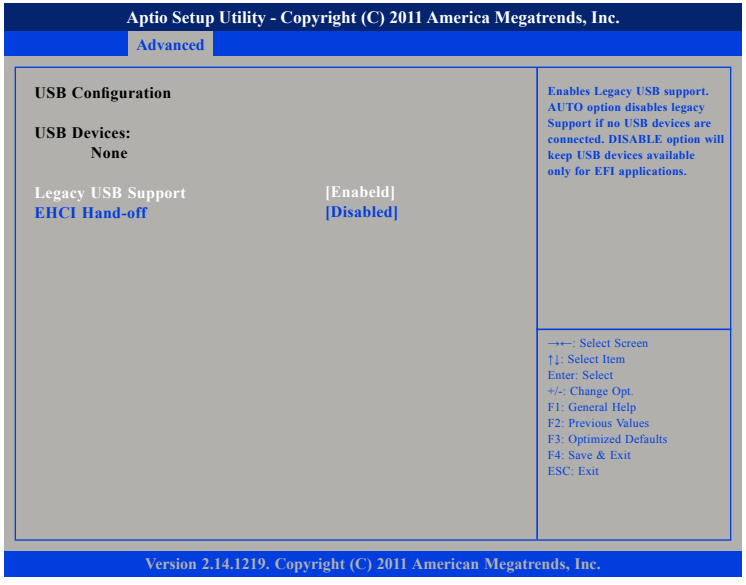
This section is used to configure Intel® Fast Flash Standy.

iFFS Support

Enables or disables iFFS.

USB Configuration

This section is used to configure the USB.



Legacy USB Support

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

EHCI Hand-Off

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

Super IO Configuration

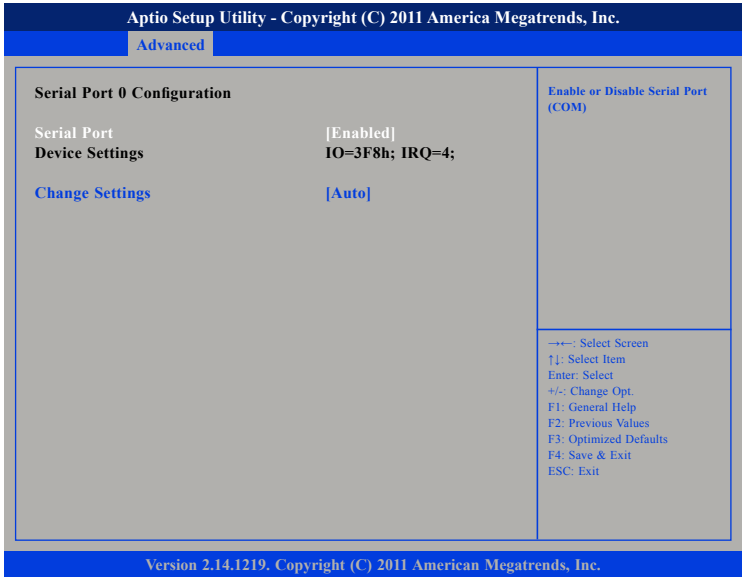
This section is used to configure the serial ports.

Super IO Chip

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

Serial Port 0 Configuration

This section is used to configure serial port 0.



Serial Port

Enables or disables the serial port.

Change Settings

Selects an optimal setting for the Super IO device.

Serial Port 1 Configuration

This section is used to configure serial port 1.

Serial Port

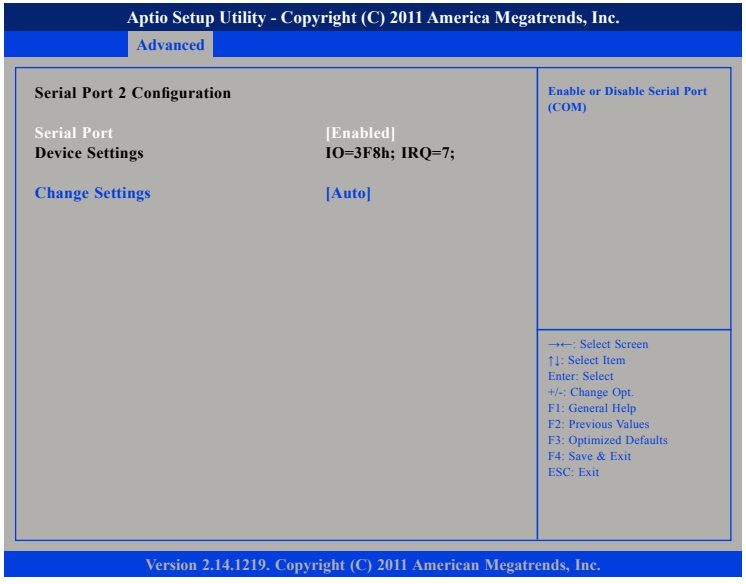
Enables or disables the serial port.

Change Settings

Selects an optimal setting for the Super IO device.

Serial Port 2 Configuration

This section is used to configure serial port 2.



Serial Port

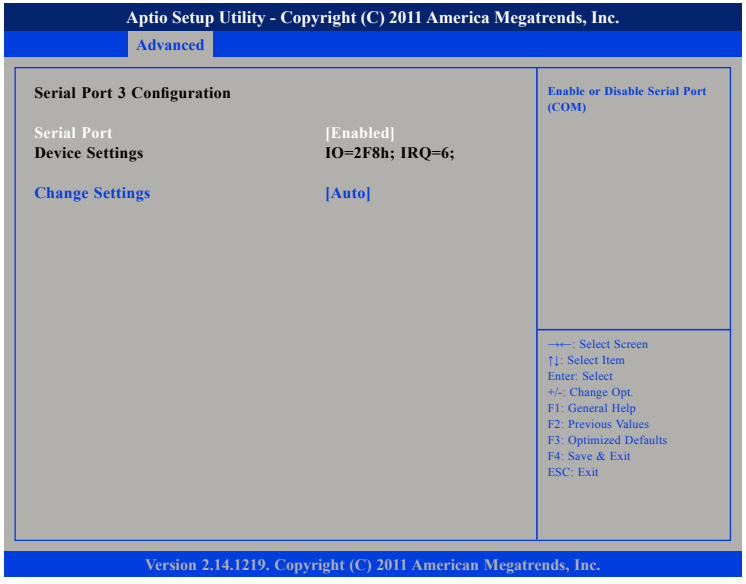
Enables or disables the serial port.

Change Settings

Selects an optimal setting for the Super IO device.

Serial Port 3 Configuration

This section is used to configure serial port 3.



Serial Port

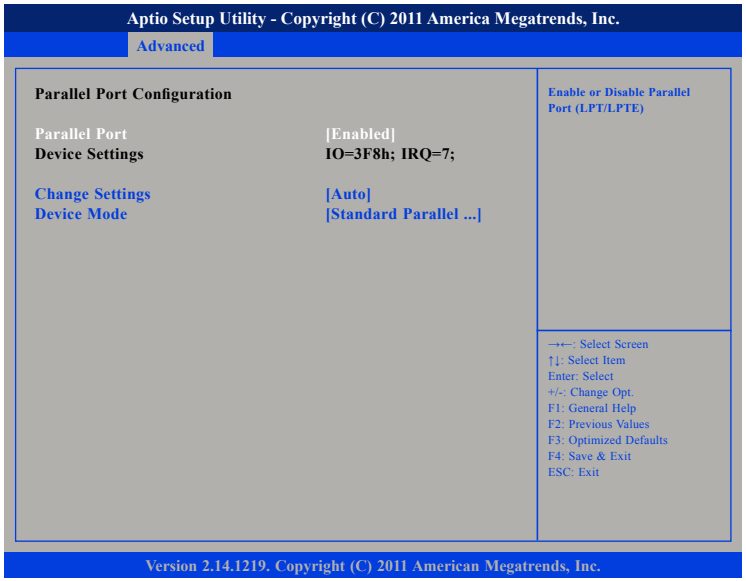
Enables or disables the serial port.

Change Settings

Selects an optimal setting for the Super IO device.

Parallel Port Configuration

This section is used to configure the parallel port.



Parallel Port

Enables or disables parallel port (LPT/LPTE).

Change Settings

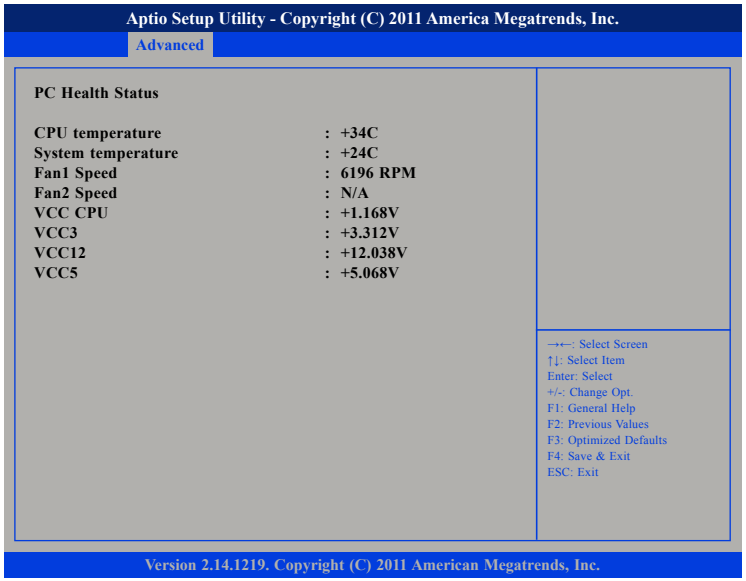
Selects an optimal setting for the Super IO device.

Device Mode

This option specifies the parallel port mode.

H/W Monitor

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



CPU Temperature

Detects and displays the current CPU temperature.

System Temperature

Detects and displays the current system temperature.

Fan1 Speed

Detects and displays Fan1 speed.

Fan2 Speed
Detects and displays Fan2 speed.

VCC CPU
Detects and displays the VCC CPU voltage.

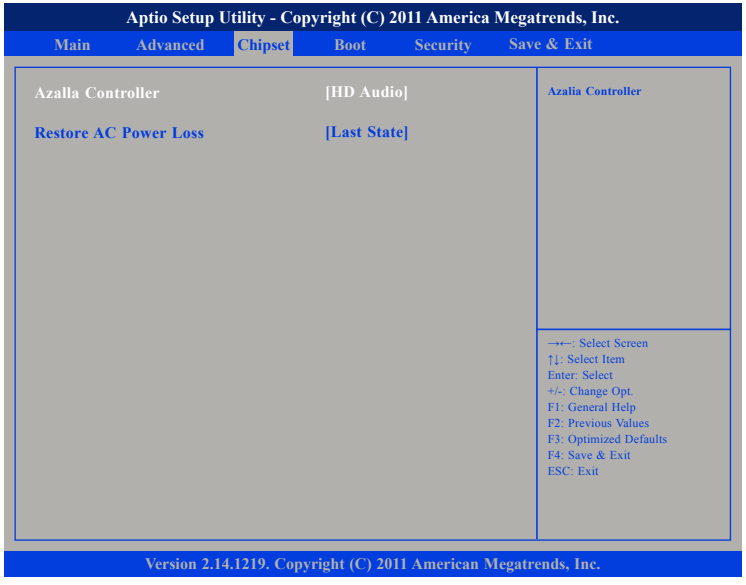
VCC3
Detects and displays VCC3 voltage.

VCC12
Detects and displays VCC12 voltage.

VCC5
Detects and displays VCC5 voltage.

Chipset

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



Restore AC Power Loss

Power Off — When power returns after an AC power failure, the system's power is off. You must press the power button to power-on the system.

Power On — When power returns after an AC power failure, the system will automatically power-on.

Last State When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

Azalia Controller
Enables or disables the Azalia HD audio.

Boot

This section is used to configure the boot features.

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.

Boot Option Priorities
Adjust the boot sequence of the system. Boot Option #1 is the first boot device that the system will boot from, next will be #2 and so forth.numeric keypad is the arrow keys.

Security

Administrator Password

Select this to reconfigure the administrator's password.

User Password

Select this to reconfigure the user's password.

Save & Exit

Save Changes and Reset

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

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.

Restore Defaults

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

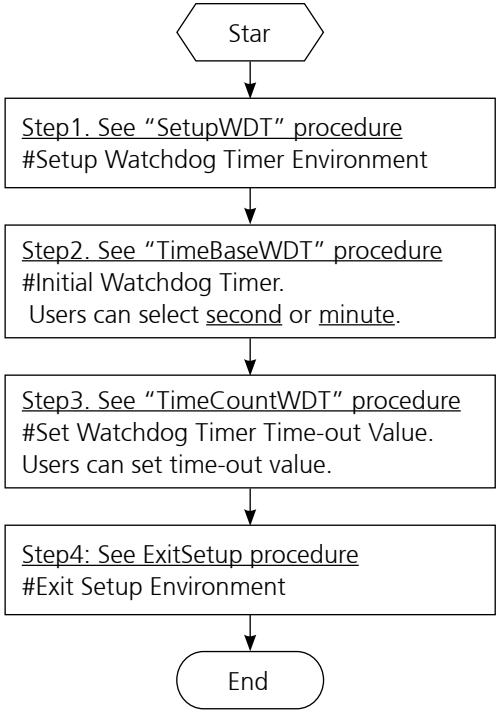
Boot Override

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

Appendix A: Watchdog Timer

WDT Programming Guide

NEX 604 Watch Dog Function Configuration Sequence Description:



```
;------------------------------------------------
SetupWDT        PROC
        mov     dx, 2eh
        mov     al, 087h
        out     dx, al
        nop
        nop
        mov     al, 01h
        out     dx, al
        nop
        nop
        mov     al, 55h
        out     dx, al
        nop
        nop
        out     dx, al          ;Write operations to special address
port (2E) for entering MB PnP Mode.

        mov     al, 07h
        out     2eh, al
        mov     al, 07h ;Select logical device for Watch Dog.
        out     2fh, al
        ret
SetupWDT        ENDP

;------------------------------------------------
TimeBaseWDT             PROC
        mov     al, 72h
        out     2eh, al
        mov     al, 10h ;Set WDT reset upon PWROK
        or      al, 80h ;Here!! set 80h for second, set 00h for minute
        out     2fh, al
        ret
TimeBaseWDT     ENDP

;------------------------------------------------
TimeCountWDT    PROC
        mov     al, 73h ;WDT Time-out register.
        out     2eh, al
        mov     al, 03h ;Here!! Set count 3.
        out     2fh, al
        ret
TimeCountWDT    ENDP

;------------------------------------------------
ExitSetup       PROC
        mov     al, 02h
        out     2eh, al
        mov     al, 02h
        out     2fh, al
        ret
ExitSetup       ENDP
;------------------------------------------------
```