NEXCOM International Co., Ltd.

IoT Automation Solutions

Embedded Computing (Industrial Motherboard)

NEX 609

User Manual

NEXCOM International Co., Ltd.
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www.nexcom.com

Contents

Preface

Copyright iv
Disclaimer iv
Acknowledgements iv
Regulatory Compliance Statements iv
Declaration of Conformity iv
RoHS Compliance v
Warranty and RMA vi
Safety Information viii
Installation Recommendations viii
Safety Precautions ix
Technical Support and Assistance x
Conventions Used in this Manual x
Global Service Contact Information xi
Package Contents xiii
Ordering Information xiv

Chapter 1: Product Introduction

Overview 1
Key Features 1
Hardware Specifications 2
Knowing Your NEX 609 4
Edge I/O View 5

Chapter 2: Jumpers and Connectors

Before You Begin 6
Precautions 6
Jumper Settings 7
Locations of the Jumpers and Connectors 8
Jumpers 9
CMOS Clear Select 9
ME Clear Select 9
LVDS1 Power Select 10
LVDS1 Dimming Polarity Select 10
LVDS1 CCFL/PWN Mode Select 11
LVDS1 Dimming Voltage Select 11
LVDS2 Power Select (optional) 12
LVDS2 CCFL/PWN Mode Select (optional) 12
LVDS2 Dimming Polarity Select (optional) 13
LVDS2 CCFL Dimming Voltage Select (optional) 13
AT/ATX Mode Select 14
Connector Pin Definitions 15
External Serial Port Connectors 15
COM1 and COM2 Connectors 15
COM6 Connector 16
Internal Connectors 17
ATX Power Input Connector 17
CPU FAN Connector 17
SYSTEM FAN Connector 18
Power On/Off/Reset & PWR/HDD LED Pin Header 18

RS232 Box Header Connector COM2 19
RS232 Box Header Connector COM3 19
RS232 Box Header Connector COM4 20
GPIO 20
USB 1 Connector 21
USB 2 Connector 21
USB 3 Connector 22
Speaker-out Connector 22
SATA Power Connectors 23
LVDS Power Connector 23
LVDS1 Connector A 24
LVDS1 Connector B 24
LVDS Power Connector (optional) 25
LVDS2 Connector A (optional) 25
LVDS2 Connector B (optional) 26
Keyboard and Mouse Pin Header 26
COM1B RI/5V/12V Supply Power Selection 27
Block Diagram 28

Chapter 3: BIOS Setup

About BIOS Setup 29
When to Configure the BIOS 29
Default Configuration 30
Entering Setup 30
Legends 30
BIOS Setup Utility 32
Main 32
Advanced 33
Chipset 43
Boot 46
Security 47
Save & Exit 47

Preface

Copyright

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Acknowledgements

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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

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

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

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

How to recognize NEXCOM RoHS Products?

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

All new product models launched after January 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.

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.

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.

Global Service Contact Information

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Package Contents

Before continuing, verify that the NEX 609 package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Name	Description	Qty
1	602DCD0634X00	(N)NEX609 DVD Driver VER:1.1	JCL	1
2	60233USB48X00	USB CABLE EDI:262082080401-RS	DUAL PORT USB CON TO HOUSING 2x4PIN 2.0mm L:400+-10mm	1
3	60233PW149X00	SATA Power Cable EDI:354204040201-RS	AMP 4PIN PIT:2.54mm TO SATA 15P L:200mm	1
4	60233POW22X00	Power Cable EDI:302204040181-RS	4P 5.08mmx2 TO 2x2 4.2mm L:180+-10mm	1
5	60233ATA48X00	SATA Cable BEST	SATA CON 7P 180D TO 180D Connector L:250mm 28AWG	1
6	60177A0303X00	(N)NEX609 Quick Reference Guide VER:A	KRAMER	1
7	50222A0562X00	NEX609 I/O Panel VER:A Northern Queen	158.75x44.45x4.40mm SUS t=0.2mm	1
8	20G00060900X0	ASSY NEX609		1

Ordering Information

The following information below provides ordering information for NEX 609.

NEX 609 (P/N: 10G00060900X0) RoHS Compliant

Mini ITX, Intel® 3rd generation Intel® Core™ processor family with DVI-I/ HDMI / Two 48-bit LVDS interface/ 2x Gigabit LAN/ 10x USB/ 6x COMs/ TPM (optional)/ MSATA/ Dual 12 & 24 Power input)

CPU Cooler for NEX 609 (P/N: 5050300544X00)

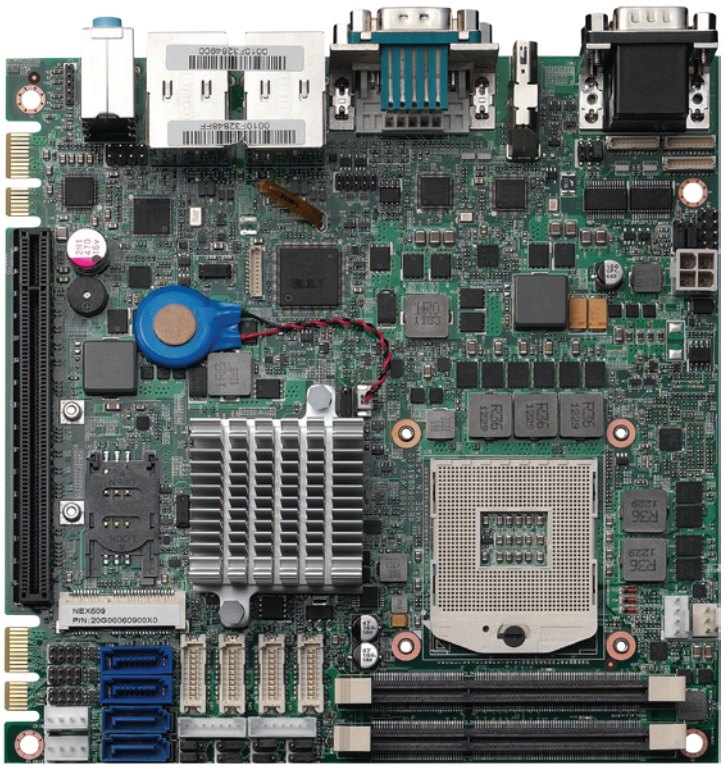
Optional CPU cooler for NEX 609 rPGA 988 socket

DVI Cable for NEX 609 (P/N: 60233DVI18X00)

Optional Y cable for DVI-I & VGA output connector

Chapter 1: Product Introduction

Overview



Key Features

- 3rd generation Intel® Core™ processor family
- Intel® HM76 chipset (QM77 option)
- Two 204-pin SO-DIMM socket supports up to 16GB DDR3
- 1333/ 1600 MHz SDRAM
- Display: DVI-I/ HDMI/ Dual 48bit LVDS (Option LVDS2)
- 1x Mini-PCIe support mSATA or 3G/ SIM, and optionl TPM
- 4x SATA with RAID 0,1,5,10 (optional)
- 2x Intel® Gbe Ethernet
- 10x USB, 4-in/ 4-out GPIO, Mic-in, Line-out
- Serial port: 5x RS232, 1x RS232/422/485 port
- Support AT/ ATX mode and Dual +12VDC/ +24VDC input
- 1x PCIe x16 slot 2x PCIe x1 on edge golden finger

Hardware Specifications

CPU Support

- 3rd generation Intel® Core™ processor

Main Memory

- Two 204-pin SO-DIMM socket supports up to 16 GB DDR3 1333/1600MHz SDRAM

Chipset

- Intel® HM76/ QM77 chipset (optional)

BIOS

- AMI BIOS
- Plug & Play support
- Advanced Power Management
- Advanced Configuration & Power Interface

On-board LAN

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

Display

- 3rd generation Intel® Core™ processor integrated Intel® HD Graphics 4000 engine, Intel® HD Graphics integrates high-performance graphics and media processing right on the processor, delivers sophisticated graphics for large display applications, three independent display support.
- DVI-I interface: Analog VGA support
- HDMI interface:
  - Resolution:
    Up to 2560 x 1600 @60Hz for 1st display port
    Up to 1920 x 1600 @60Hz for 2nd display port
    Up to 1920 x 1200 @60Hz for 3rd display port
  - LVDS1 interface:
    48bit LVDS interface, 2xDF13 20-pin LVDS connector for internal connection
    LVDS2 interface (optional, through SDVO w/ CH7308)
    48bit LVDS interface, 2xDF13 20-pin LVDS connector for internal connection
  - CCFL interface
    2x CCFL for LCD Panel Backlight Inverter with Analog & PWM dimming control

Audio

- Realtek ALC886 CODEC for High Definition
  1x Phone Jack for mic-in
  1x Phone Jack for line-out
  1x Phone Jack for line-in
  1x 5 pin 2.0 pitch pin header for speaker-out

Expansion

- 1x Mini-PCIe
- 1x PCIe x16
- 2x PCIe x1 golden finger

I/O Interface

- Serial port: 6 port
  - COM1, 6: RS232 DB-9 male connector on edge I/O
  - COM2: RS232/422/485 DB-9 male connector on edge I/O
  - COM3, 4, 5: RS232 1x 6 2.0mm JST connector
- USB 2.0/ 3.0: 10 ports
  - USB 3.0 x4 ports edge connector
  - USB 2.0 x6 ports by 2.0mm pin connector
- 8 GPIO lines via header (GPI 0 ~ 3 and GPO0 ~ 3) TTL Level (0/ 5 V)
- Onboard Power LED and HDD Active LED Pin Header
- 1x 4-pin fan connector (for CPU)
- 1x 3-pin fan connector (for System)
- 1x Keyboard/Mouse pin header
- On board Buzzer/ SMBus2.0/ Reset SW/ On & Off switch button

Edge I/O Interface

- 1x dual stack DB9 male + DB9 male for COM1 & COM2
- 1x HDMI
- 1x DVI-I + DB9 male for COM6
- 2x RJ45 + dual stack USB
- 1x Line-Out/ Mic-in/ Line-in

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

- 4x SATA port with RAID 0,1,5,10 function (optional)

System Monitor

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

On-board RTC

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

Power Input

- Support AT and ATX mode

Power Requirements

- Power requirement: Dual +12V & 24V DC Input
- One 4-pin power connector

Dimensions

- Mini-ITX M/B form factor
- 170mm (L) x 170mm (W)

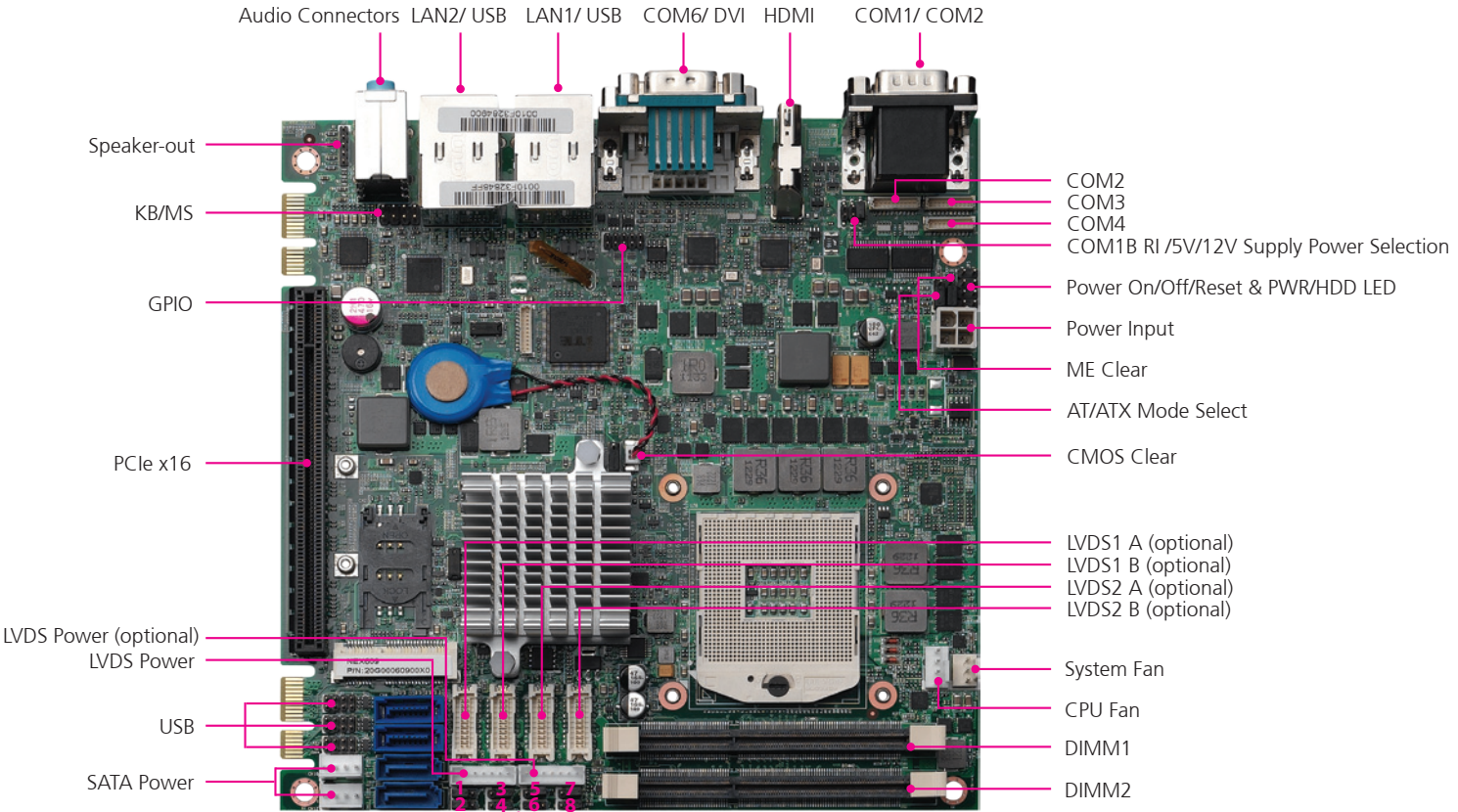
Environment

- Operating temperatures: 0°C to 60°C
- Storage temperature: -20°C to 85°C
- Relative humidity: Operating 10% to 90%, non-condensing

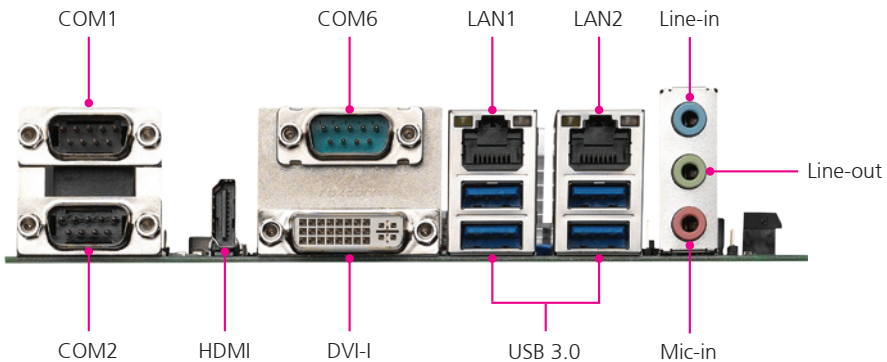
Certifications

- CE approval
- FCC Class A

Knowing Your NEX 609



Edge I/O View



Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the NEX 609 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:

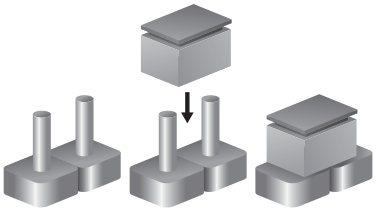
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

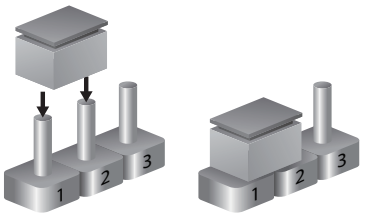
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

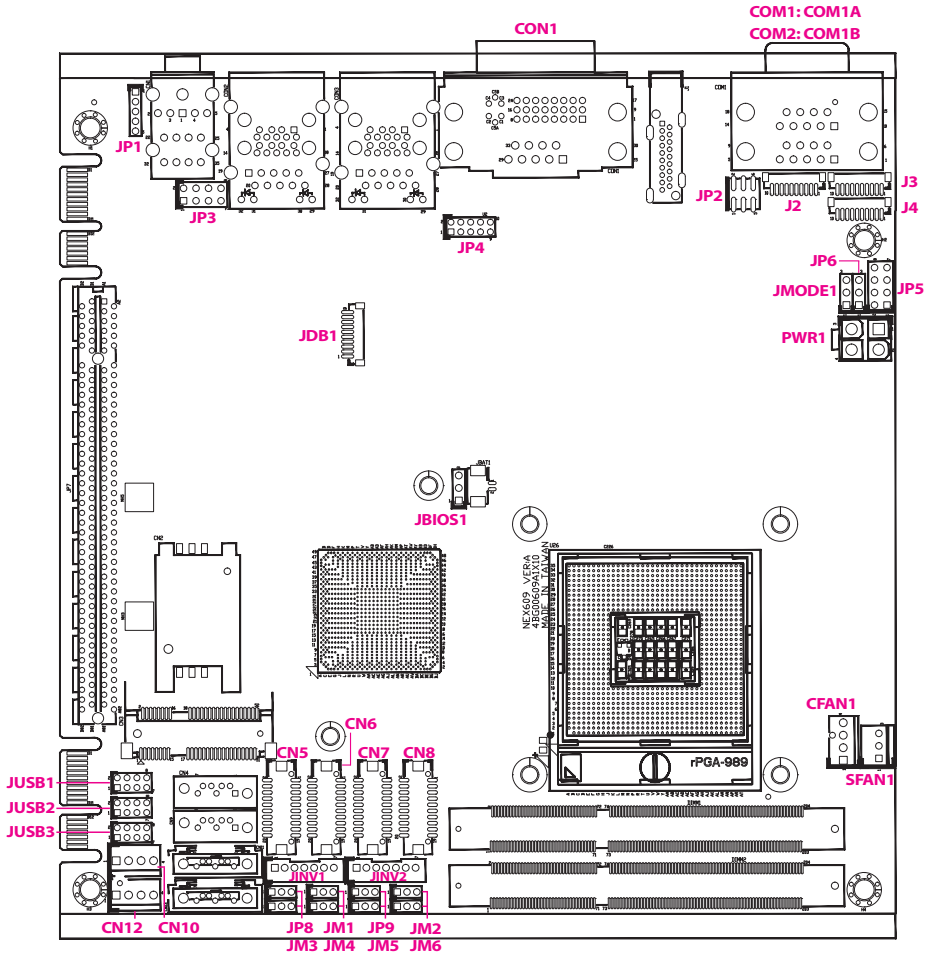


Three-Pin Jumpers: Pins 1 and 2 are Short



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, 2.54mm pitch
Connector location: JBIOS1

Pin	Status	Settings
1-2	Short	Normal
2-3	Short	Clear BIOS Setting

1-2 On: default

ME Clear Select

Connector type: 1x3 3-pin header, 2.54mm pitch
Connector location: JP6

Pin	Status	Settings
1-2	Short	Normal
2-3	Short	Clear ME Setting

1-2 On: default

LVDS1 Power Select

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: JP8

Pin	Status	Settings
1-2	Short	VCC5
2-3	Short	VCC3

2-3 On: default

LVDS1 Dimming Polarity Select

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: JM4

Pin	Status	Settings
1-2	Short	Negative
2-3	Short	Positive

2-3 On: default

LVDS1 CCFL/PWN Mode Select

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: JM3

Pin	Status	Settings
1-2	Short	PWN Mode
2-3	Short	CCFL Mode

2-3 On: default

LVDS1 Dimming Voltage Select

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: JM1

Pin	Status	Settings
1-2	Short	VCC3
2-3	Short	VCC5

2-3 On: default

LVDS2 Power Select (optional)

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: JP9

Pin	Status	Settings
1-2	Short	VCC5
2-3	Short	VCC3

1-2 On: default

LVDS2 CCFL/PWN Mode Select (optional)

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: JM5

Pin	Status	Settings
1-2	Short	PWN Mode
2-3	Short	CCFL Mode

2-3 On: default

LVDS2 Dimming Polarity Select (optional)

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: JM6

Pin	Status	Settings
1-2	Short	Negative
2-3	Short	Positive

2-3 On: default

LVDS2 CCFL Dimming Voltage Select (optional)

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: JM2

Pin	Status	Settings
1-2	Short	VCC3
2-3	Short	VCC5

1-2 On: default

AT/ATX Mode Select

Connector type: 1x3 3-pin header, 2.54mm pitch
Connector location: JMODE1

Pin	Status	Settings
1-2	Short	AT Mode
2-3	Short	ATX Mode

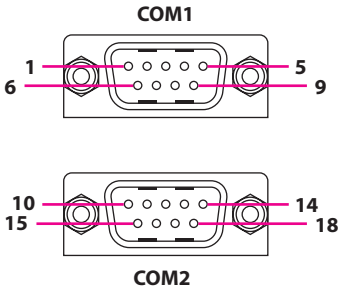
2-3 On: default

Connector Pin Definitions

External Serial Port Connectors

COM1 and COM2 Connectors

Connector type: DB-9 port, 9-pin D-Sub
Connector location: COM1A (COM1) and COM1B (COM2)



COM1: RS-232 Connector

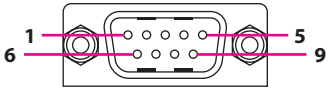
Pin	Definition
1	COM_DCD#1
2	COM_RXD1
3	COM_TXD1
4	COM_DTR#1
5	GND
6	COM_DSR#1
7	COM_RTS#1
8	COM_CTS#1
9	COM_RI#1

COM2: RS-232/RS-422/RS-485 Connector

Pin	RS232	RS422	RS485
10	COM_DCD#2	TX-	DATA-
11	COM_RXD2	TX+	DATA+
12	COM_TXD2	RX+	NC
13	COM_DTR#2	RX-	NC
14	GND	GND	GND
15	COM_DSR#2	RTS-	NC
16	COM_RTS#2	RTS+	NC
17	COM_CTS#2	CTS+	NC
18	COM_RI#2	CTS-	NC

COM6 Connector

Connector type: DB-9 port, 9-pin D-Sub
Connector location: CON1

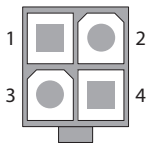


Pin	Definition
1	COM_DCD#6
2	COM_RXD6
3	COM_TXD6
4	COM_DTR#6
5	GND
6	COM_DSR#6
7	COM_RTS#6
8	COM_CTS#6
9	COM_RI#6

Internal Connectors

ATX Power Input Connector

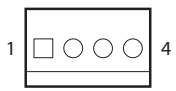
Connector type: 2x2 Aux power connector
Connector location: PWR1



Pin	Definition
1	GND
2	GND
3	+12V / 24V
4	+12V / 24V

CPU FAN Connector

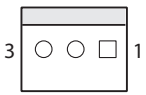
Connector type: 1x4 4-pin Wafer
Connector location: CFAN1



Pin	Definition
1	GND
2	12V
3	CPUFANIN
4	CPUFANOUT

SYSTEM FAN Connector

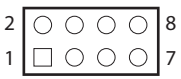
Connector type: 1x3 3-pin Wafer
Connector location: SFAN1



Pin	Definition
1	GND
2	12V
3	SYSFANIN

Power On/Off/Reset & PWR/HDD LED Pin Header

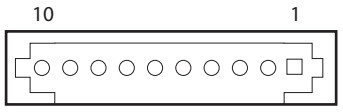
Connector type: 2x4 8-pin header, 2.54mm pitch
Connector location: JP5



Pin	Definition	Pin	Definition
1	SATA_LED_P	2	PWR_LED_P
3	SATA_LED#	4	GND
5	GND	6	BTN_A#
7	RST_BTN#	8	GND

RS232 Box Header Connector COM2

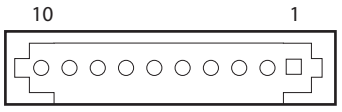
Connector type: 1x10 10-pin Wafer, 1.0mm pitch
Connector location: J2



Pin	Definition	Pin	Definition
1	COM_DCD#5	2	COM_RXD5
3	COM_TXD5	4	COM_DTR#5
5	GND	6	COM_DSR#5
7	COM_RTS#5	8	COM_CTS#5
9	COM_RI#5	10	GND
MH1	GND	MH2	GND

RS232 Box Header Connector COM3

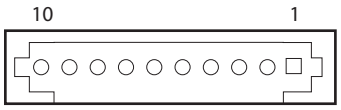
Connector type: 1x10 10-pin Wafer, 1.0mm pitch
Connector location: J3



Pin	Definition	Pin	Definition
1	COM_DCD#3	2	COM_RXD3
3	COM_TXD3	4	COM_DTR#3
5	GND	6	COM_DSR#3
7	COM_RTS#3	8	COM_CTS#3
9	COM_RI#3	10	GND
MH1	GND	MH2	GND

RS232 Box Header Connector COM4

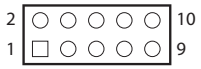
Connector type: 1x10 10-pin Wafer, 1.0mm pitch
Connector location: J4



Pin	Definition	Pin	Definition
1	COM_DCD#4	2	COM_RXD4
4	COM_TXD4	4	COM_DTR#4
5	GND	6	COM_DSR#4
7	COM_RTS#4	8	COM_CTS#4
9	COM_RI#4	10	GND
MH1	GND	MH2	GND

GPIO

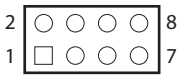
Connector type: 2x5 10-pin header, 2.0mm pitch
Connector location: JP4



Pin	Definition	Pin	Definition
1	VCC5O	2	GND
3	SIO_GPO24	4	SIO_GPI20
5	SIO_GPO25	6	SIO_GPI21
7	SIO_GPO26	8	SIO_GPI22
9	SIO_GPO27	10	SIO_GPI23

USB 1 Connector

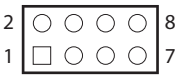
Connector type: 2x4 8-pin header, 2.0mm pitch
Connector location: JUSB1



Pin	Definition	Pin	Definition
1	VCC5	2	GND
4	USB4-	4	USB5+
5	USB4+	6	USB5-
7	GND	8	VCC5

USB 2 Connector

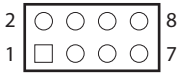
Connector type: 2x4 8-pin header, 2.0mm pitch
Connector location: JUSB2



Pin	Definition	Pin	Definition
1	VCC5	2	GND
4	USB6-	4	USB7+
5	USB6+	6	USB7-
7	GND	8	VCC5

USB 3 Connector

Connector type: 2x4 8-pin header, 2.0mm pitch
Connector location: JUSB3



Pin	Definition	Pin	Definition
1	VCC5	2	GND
4	USB8-	4	USB9+
5	USB8+	6	USB9-
7	GND	8	VCC5

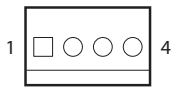
Speaker-out Connector

Connector type: 1x5 5-pin header, 2.0mm pitch
Connector location: JP1

Pin	Definition
1	OUT-LR+
2	OUT-LR-
3	SPKR_GND
4	OUT-RR+
5	OUT-RR

SATA Power Connectors

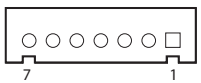
Connector type: 1x4 4-pin Wafer, 2.5mm pitch
Connector location: CN10 and CN12



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

LVDS Power Connector

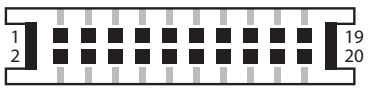
Connector type: 1x7 JST, 7-pin header, 2.5mm pitch
Connector location: JINV1



Pin	Definition	Pin	Definition
1	VCC5	2	12V
3	12V	4	Brightness Control
5	GND	6	GND
7	Backlight Enable		

LVDS1 Connector A

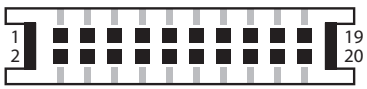
Connector type: 2x10 20-pin header
Connector location: CN6



Pin	Definition	Pin	Definition
1	LVDS_DDC_CLK	2	LVDS_DDC_DATA
3	VCC_LCD1	4	LVDSA_DATA0
5	LVDSA_DATA3	6	LVDSA_DATA#0
7	LVDSA_DATA#3	8	VCC_LCD1
9	GND	10	LVDSA_DATA1
11	LVDSA_CLK	12	LVDSA_DATA#1
13	LVDSA_CLK#	14	GND
15	GND	16	12V
17	LVDSA_DATA2	18	12V
19	LVDSA_DATA#2	20	LCD_GND1

LVDS1 Connector B

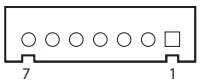
Connector type: 2x10 20-pin header
Connector location: CN5



Pin	Definition	Pin	Definition
1	LVDS_DDC_CLK	2	LVDS_DDC_DATA
3	VCC_LCD1	4	LVDSB_DATA0
5	LVDSB_DATA3	6	LVDSB_DATA#0
7	LVDSB_DATA#3	8	VCC_LCD1
9	GND	10	LVDSB_DATA1
11	LVDSB_CLK	12	LVDSB_DATA#1
13	LVDSB_CLK#	14	GND
15	GND	16	12V
17	LVDSB_DATA2	18	12V
19	LVDSB_DATA#2	20	LCD_GND1

LVDS Power Connector (optional)

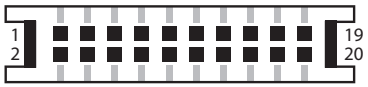
Connector type: 1x7 JST, 7-pin header, 2.5mm pitch
Connector location: JINV2



Pin	Definition	Pin	Definition
1	VCC5	2	12V
3	12V	4	Brightness Control
5	GND	6	GND
7	Backlight Enable		

LVDS2 Connector A (optional)

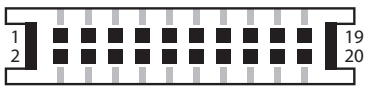
Connector type: 2x10 20-pin header
Connector location: CN7



Pin	Definition	Pin	Definition
1	NC	2	NC
3	VCC_LCD2	4	LVDSA_TXL0P
5	LVDSA_TXL3P	6	LVDSA_TXL0N
7	LVDSA_ TXL3N	8	VCC_LCD2
9	LCD_GND2	10	LVDSA_TXL1P
11	LVDSA_CLK1P	12	LVDSA_TXL1N
13	LVDSA_CLK1N	14	GND
15	LCD_GND2	16	12V
17	LVDSA_TXL2P	18	12V
19	LVDSA_TXL2N	20	LCD_GND2
MH1	LCD_GND2	MH2	LCD_GND2

LVDS2 Connector B (optional)

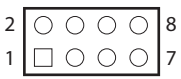
Connector type: 2x10 20-pin header
Connector location: CN8



Pin	Definition	Pin	Definition
1	NC	2	NC
3	VCC_LCD2	4	LVDSA_TXL4P
5	LVDSA_TXL7P	6	LVDSA_TXL4N
7	LVDSA_ TXL7N	8	VCC_LCD2
9	LCD_GND2	10	LVDSA_TXL5P
11	LVDSA_CLK2P	12	LVDSA_TXL5N
13	LVDSA_CLK2N	14	GND
15	LCD_GND2	16	12V
17	LVDSA_TXL6P	18	12V
19	LVDSA_TXL6N	20	LCD_GND2
MH1	LCD_GND2	MH2	LCD_GND2

Keyboard and Mouse Pin Header

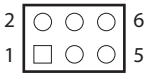
Connector type: 2x4 8-pin header
Connector location: JP3



Pin	Definition	Pin	Definition
1	VCC5	2	VCC5
3	KDAT_R	4	MDAT_R
5	KCLK_R	6	MCLK_R
7	KBMS_GND	8	KBMS_GND

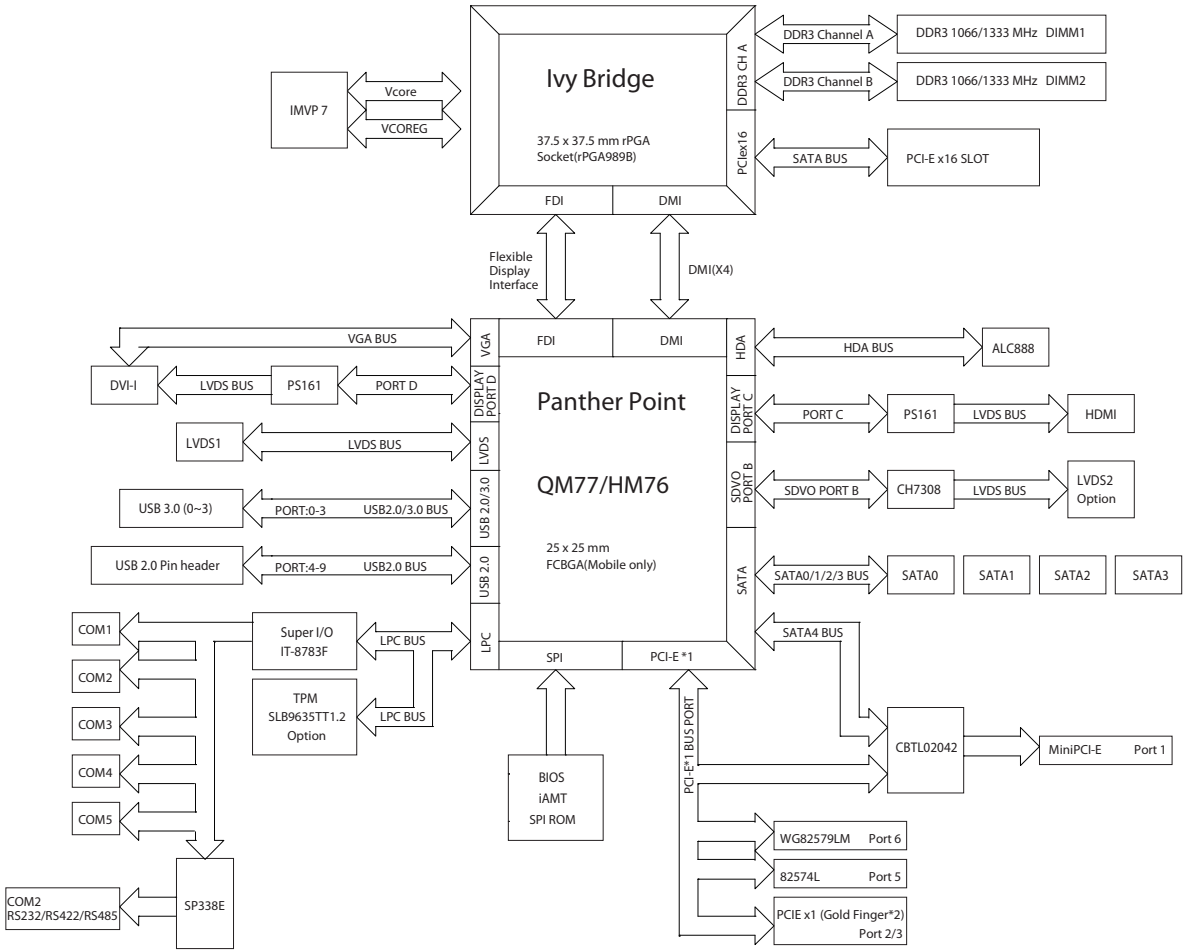
COM1B RI/5V/12V Supply Power Selection

Connector type: 2x3 6-pin header
Connector location: JP2



Pin	Definition	Pin	Definition
1	COM2_RI#	2	VCC5
3	COM2_RI#	4	12V
5	COM2_RI#	6	COM_RI#2

Block Diagram



Chapter 3: BIOS Setup

This chapter describes how to use the BIOS setup program for the NEX 609. 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:

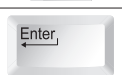
- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

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

Press the 

key to enter Setup:

Legends

Key	Function
	Moves the highlight left or right to select a menu.
	Moves the highlight up or down between sub-menu or fields.
	Exits the BIOS Setup Utility.
	Scrolls forward through the values or options of the highlighted field.
	Scrolls backward through the values or options of the highlighted field.
	Selects a field.
	Displays General Help.
	Load previous values.
	Load optimized default values.
	Saves and exits the Setup program.
	Press <Enter> to enter the highlighted sub-menu

Scroll Bar

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

Submenu

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

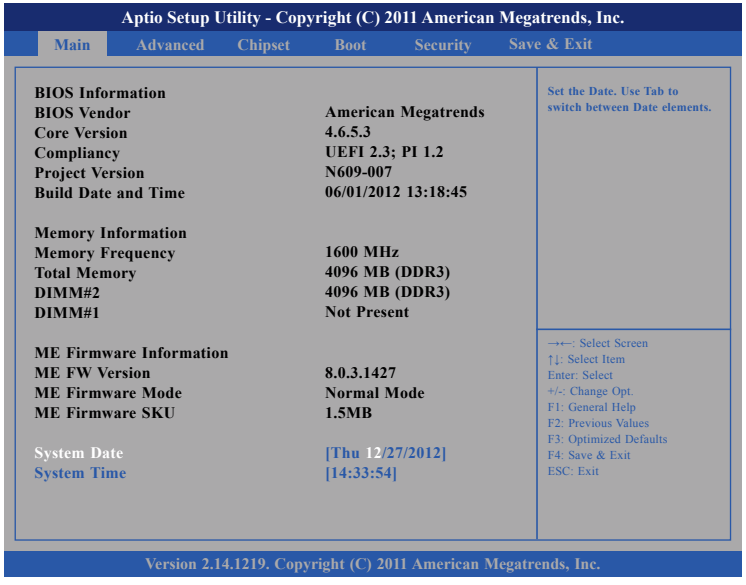
.

BIOS Setup Utility

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

Main

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



System Date

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

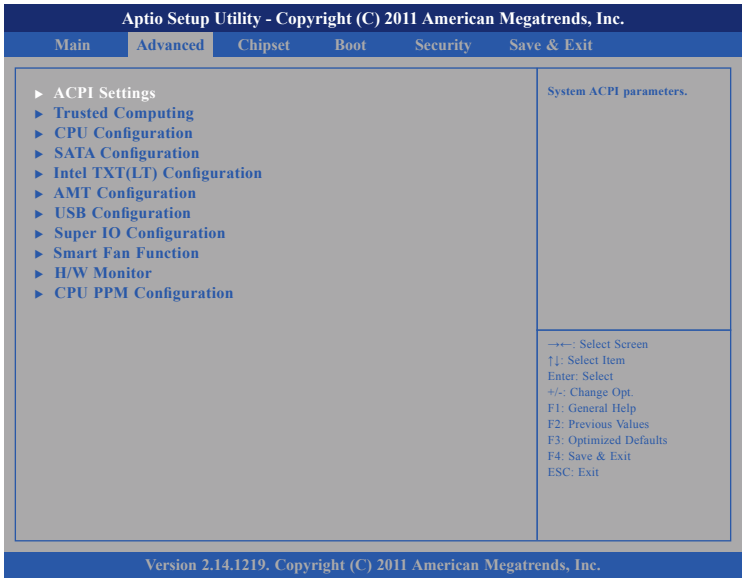
System Time

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.

Advanced

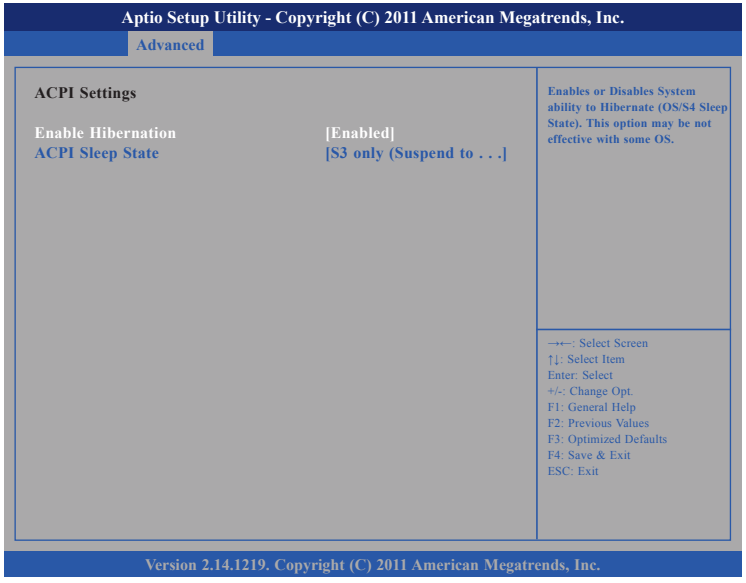
The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Setting incorrect field values may cause the system to malfunction.



ACPI Settings

This section is used to configure ACPI settings.



Enable Hibernation

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

ACPI Sleep State

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

Trusted Computing

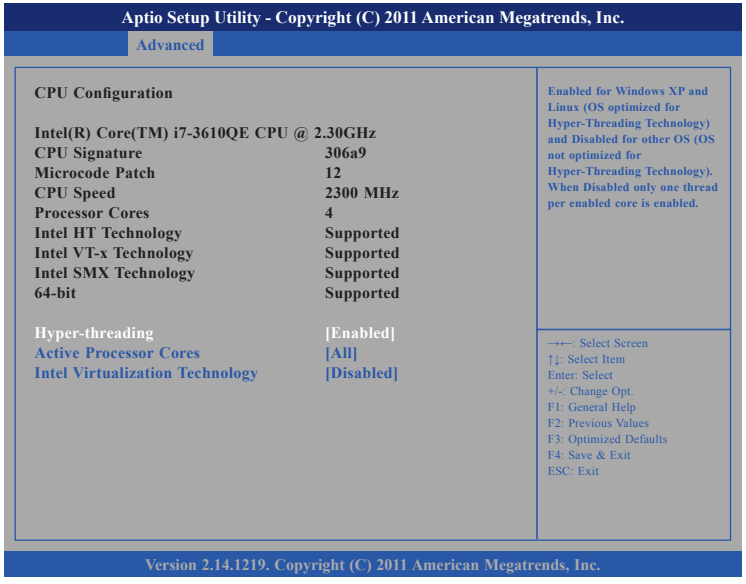
This section is used to configure Trusted Platform Module (TPM) settings.

Security Device Support

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

CPU Configuration

This section is used to configure the CPU.



Hyper-Threading

This field is used to enable or disable hyper-threading.

Active Processors Cores

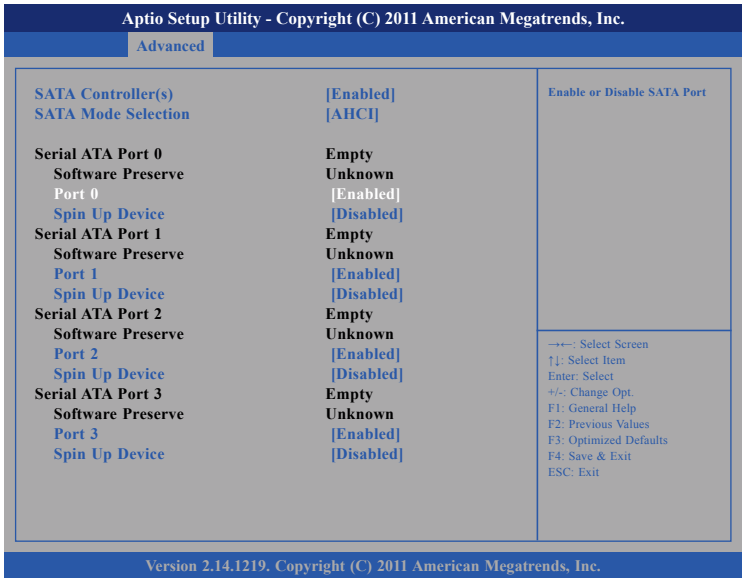
Select the number of cores to enable in each processor package. The options are All, 1, 2 and 3.

Intel® Virtualization Technology

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

SATA Configuration

This section is used to configure the SATA drives.



SATA Controller(s)

Enables or disables SATA device.

SATA Mode Selection

Configures the SATA as IDE, AHCI or RAID mode.

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

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

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

Port 0 to Port 3

Enables or disables SATA port 0 to port 3.

Spin Up Device

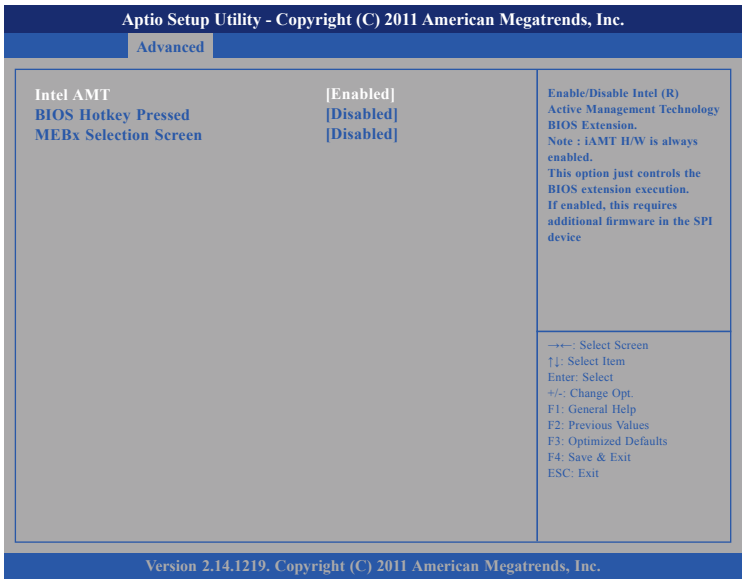
Enables or disables staggered spin up on devices connected to Serial ATA port 0 to port 3.

Intel® TXT(LT) Configuration

This section displays the configuration status of Intel® Trusted Execution Technology Configuration.

AMT Configuration

This section is used to configure Active Management Technology (AMT) options.



Intel® AMT

Enables or disables Intel® Active Management Technology.

BIOS Hotkey Pressed

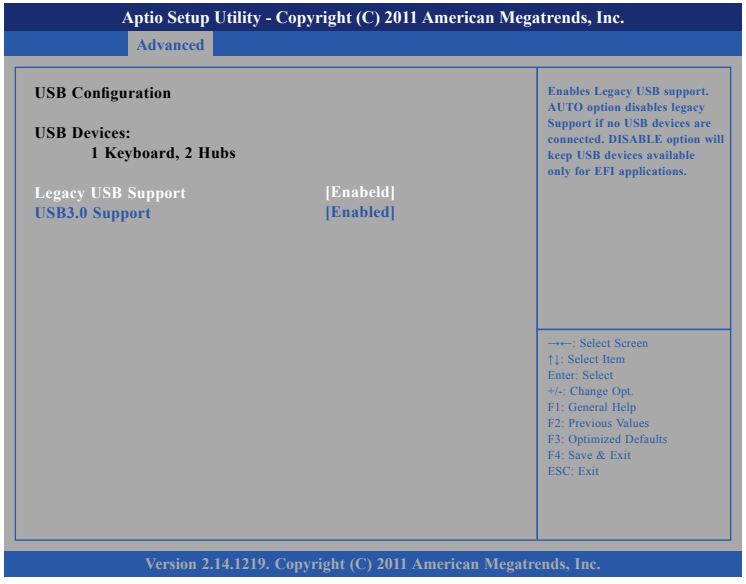
Enables or disables BIOS hotkey press.

MEBx Selection Screen

Enables or disables MEBx selection screen.

USB Configuration

This section is used to configure the USB.



Legacy USB Support

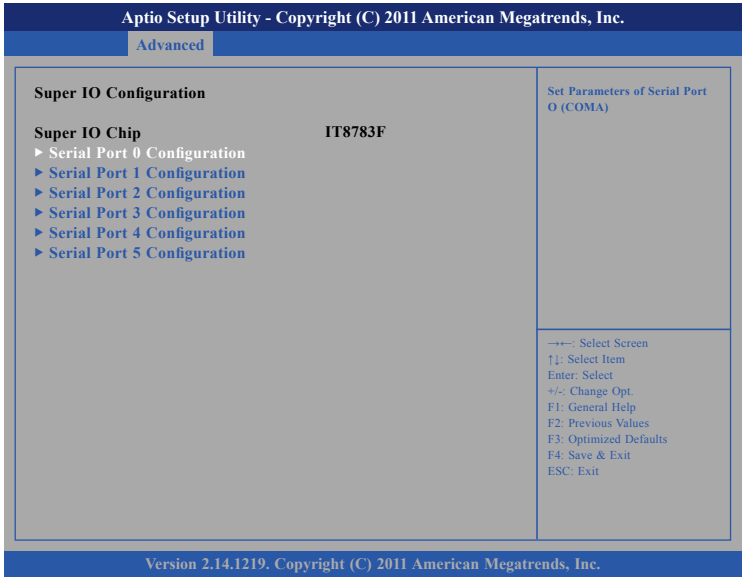
Enable Enables Legacy USB.
Auto Disables support for Legacy when no USB devices are connected.
Disable Keeps USB devices available only for EFI applications.

USB3.0 Support

Enables or disables USB 3.0 controller support.

Super IO Configuration

This section is used to configure the serial ports.

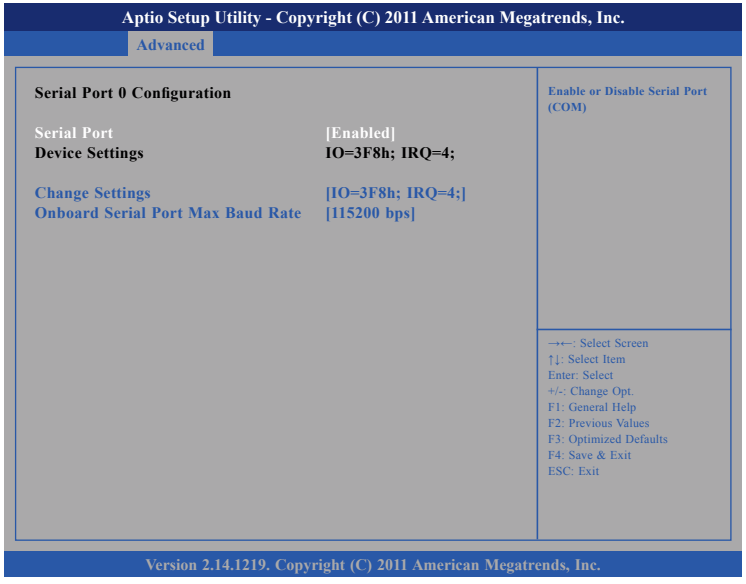


Super IO Chip

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

Serial Port 0 Configuration

This section is used to configure serial port 0.



Serial Port
Enables or disables the serial port.

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

Onboard Serial Port Max Baud Rate
Select this to change the max baud rate of the serial port.

Serial Port 1 Configuration

This section is used to configure serial port 1.

Serial Port
Enables or disables the serial port.

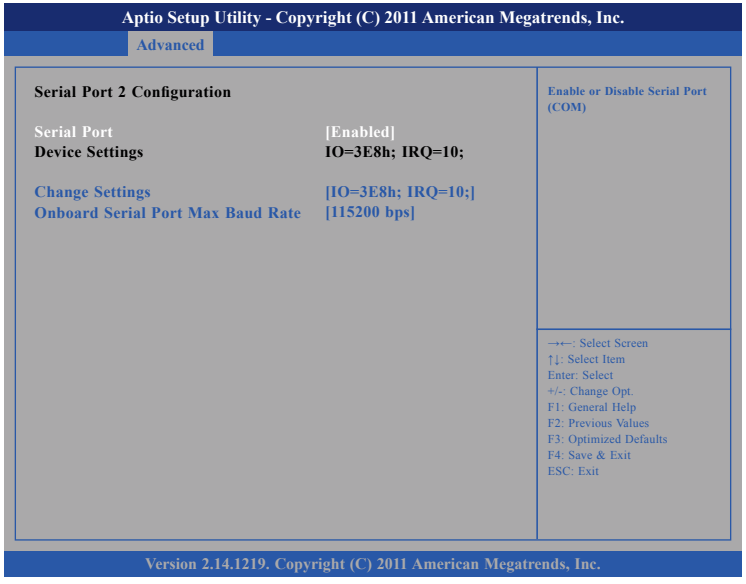
Change Settings
Selects an optimal setting for the Super IO device.

Onboard Serial Port 1 Mode
Select this to change the serial port mode to RS232, RS422, RS485 or RS485 AUTO.

Onboard Serial Port Max Baud Rate
Select this to change the max baud rate of the serial port.

Serial Port 2 Configuration

This section is used to configure serial port 2.



Serial Port

Enables or disables the serial port.

Change Settings

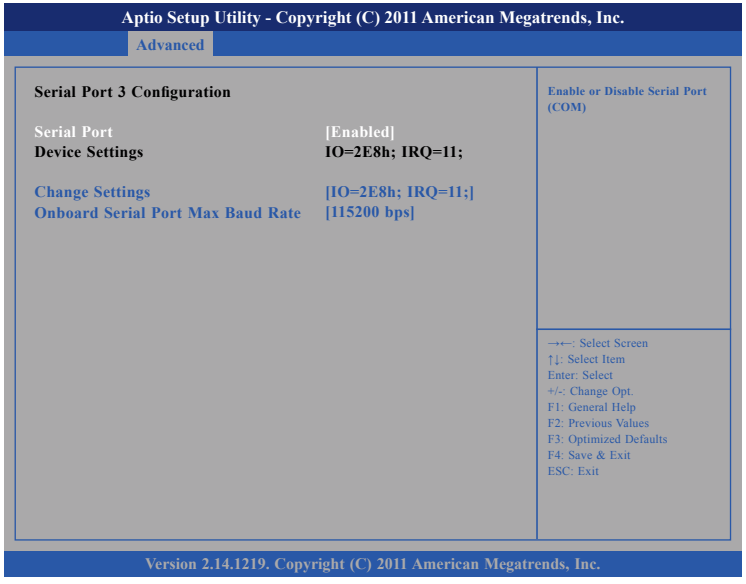
Selects an optimal setting for the Super IO device.

Onboard Serial Port Max Baud Rate

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

Serial Port 3 Configuration

This section is used to configure serial port 3.



Serial Port

Enables or disables the serial port.

Change Settings

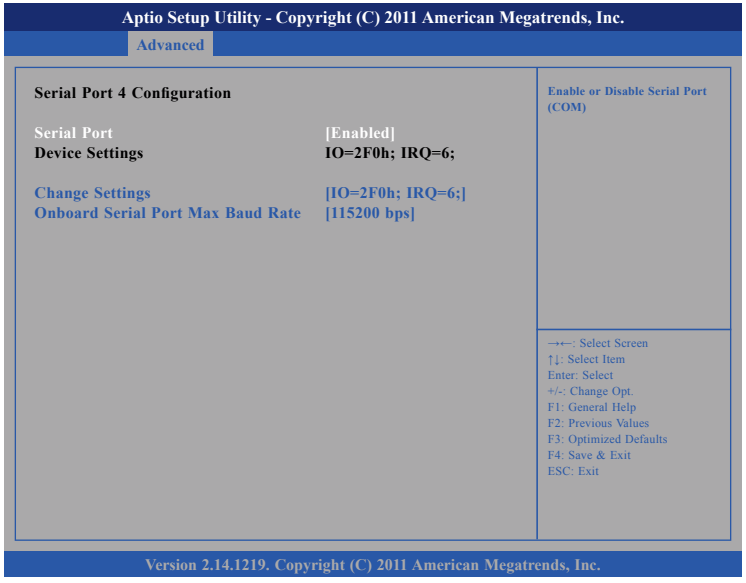
Selects an optimal setting for the Super IO device.

Onboard Serial Port Max Baud Rate

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

Serial Port 4 Configuration

This section is used to configure serial port 4.



Serial Port

Enables or disables the serial port.

Change Settings

Selects an optimal setting for the Super IO device.

Onboard Serial Port Max Baud Rate

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

Serial Port 5 Configuration

This section is used to configure serial port 5.

Serial Port

Enables or disables the serial port.

Change Settings

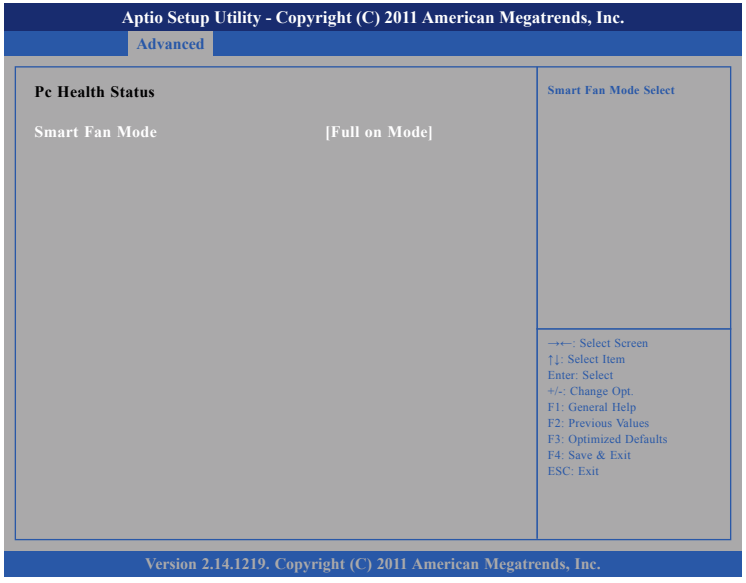
Selects an optimal setting for the Super IO device.

Onboard Serial Port Max Baud Rate

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

Smart Fan Function

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

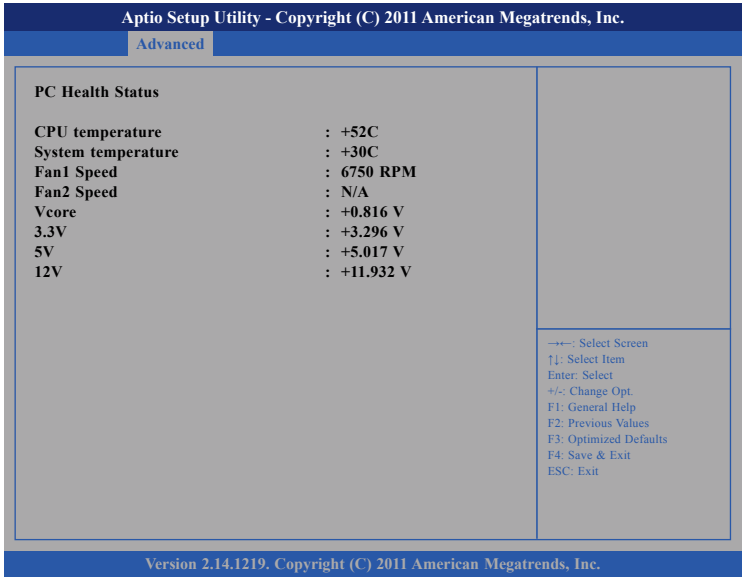


Smart Fan Mode

Configures the fan's operating 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.

Vcore
Detects and displays the Vcore CPU voltage.

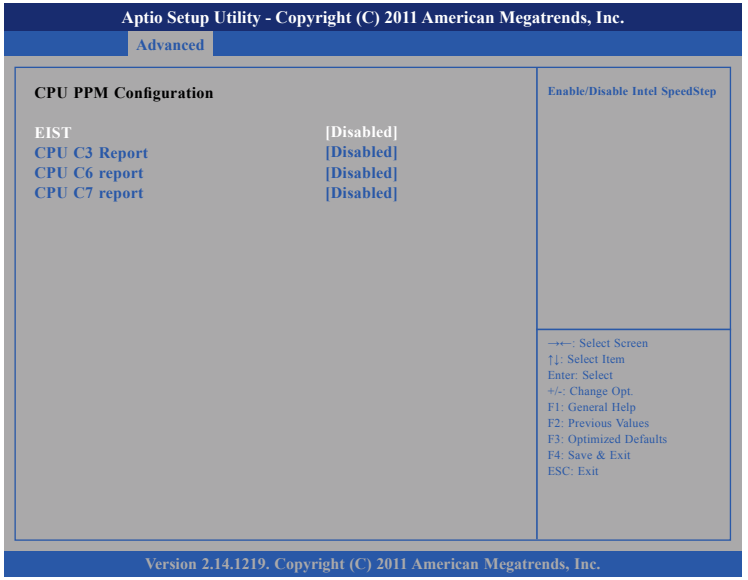
3.3V
Detects and displays 3.3V voltage.

5V
Detects and displays 5V voltage.

12V
Detects and displays 12V voltage.

CPU PPM Configuration

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



EIST
Enables or disables Intel® SpeedStep.

CPU C3 Report
Enables or disables C3 report to the operating system.

CPU C6 Report
Enables or disables C6 report to the operating system.

CPU C7 Report
Enables or disables C7 report to the operating system.

Chipset

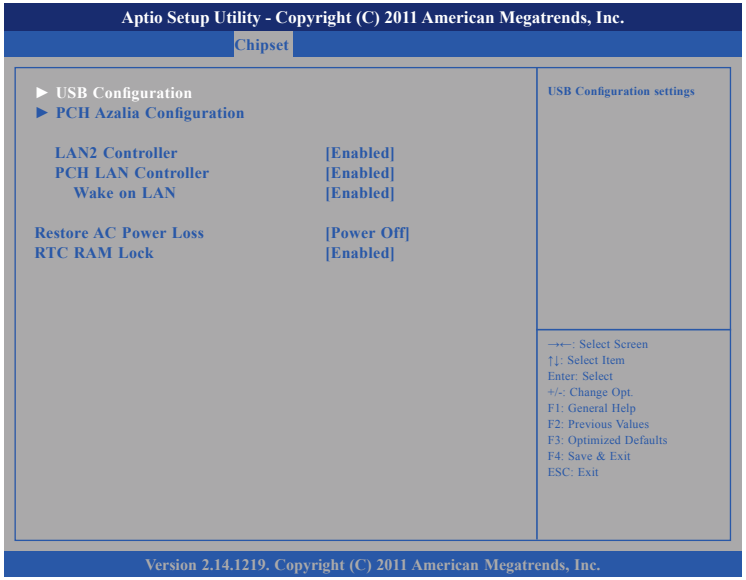
This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.

System Agent (SA) Configuration
System Agent (SA) parameters.

PCH-IO Configuration
PCH-IO parameters.

PCH-IO Configuration

This section is used to configure PCH-IO configuration.



LAN2 Controller
Enables or disables onboard LAN 2 controller.

PCH LAN Controller
Enables or disables onboard NIC.

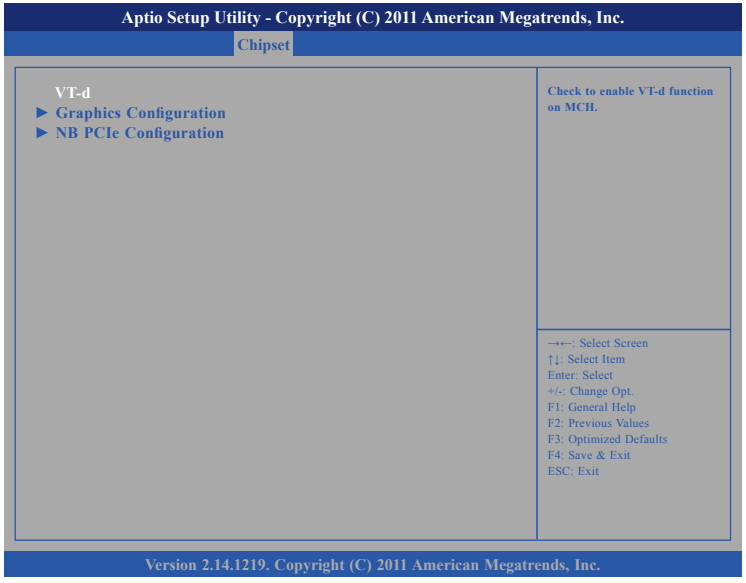
Wake on LAN
Enables or disables integrated LAN to wake the system.

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

RTC RAM Lock
Enables or disables RTC RAM lock.

System Agent (SA) Configuration

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



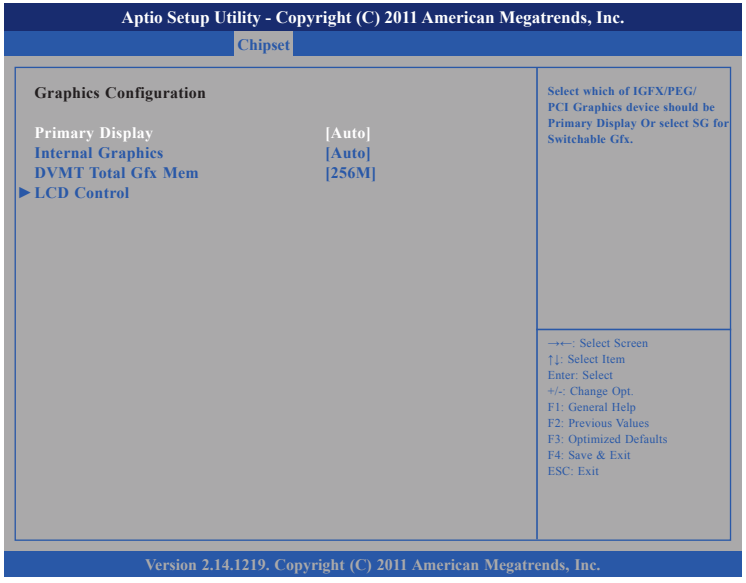
VT-d
Enables or disables VT-d function on MCH.

Graphics Configuration
Configures the graphic chip settings.

NB PCIe Configuration
Configures the NB PCI Express settings.

Graphics Configuration

This section is used to configure the Intel® IGFX configuration.



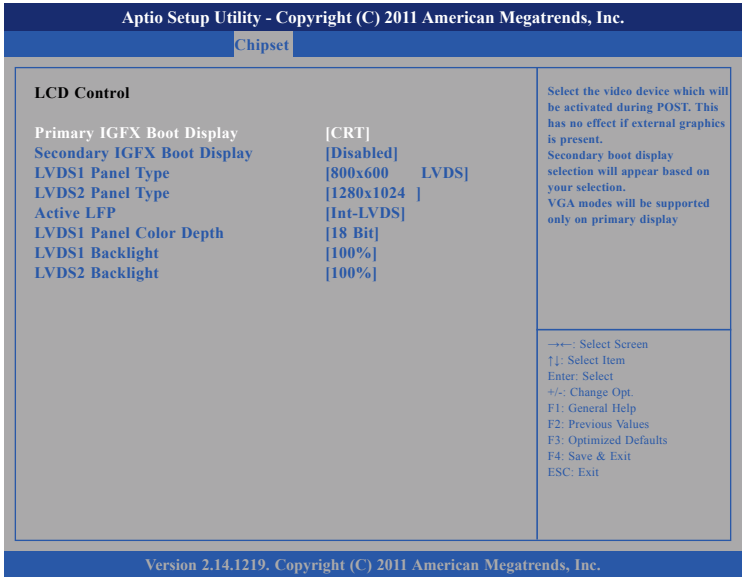
Primary Display
Select which of IGFX/PEG/PCI graphics device should be primary display or select SG for switchable GFx.

Internal Graphics
Keep IGD enabled based on the setup options. The options are Auto, Disabled and Enabled.

DVMT Total Gfx Mem
Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device. The options are 128M, 256M and MAX.

LCD Control

This section is used to configure the LCD functions.



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

Secondary IGFX Boot Display
Select the secondary display device.

LVDS1 Panel Type
Select the LCD panel used by the LVDS1 by selecting the appropriate setup item.

LVDS2 Panel Type
Select the LCD panel used by the LVDS2 by selecting the appropriate setup item.

Active LFP
Select the Active LFP configuration.

No LVDS	VBIOS does not enable LVDS.
Int-LVDS	VBIOS enables LVDS driver by Integrated encoder.

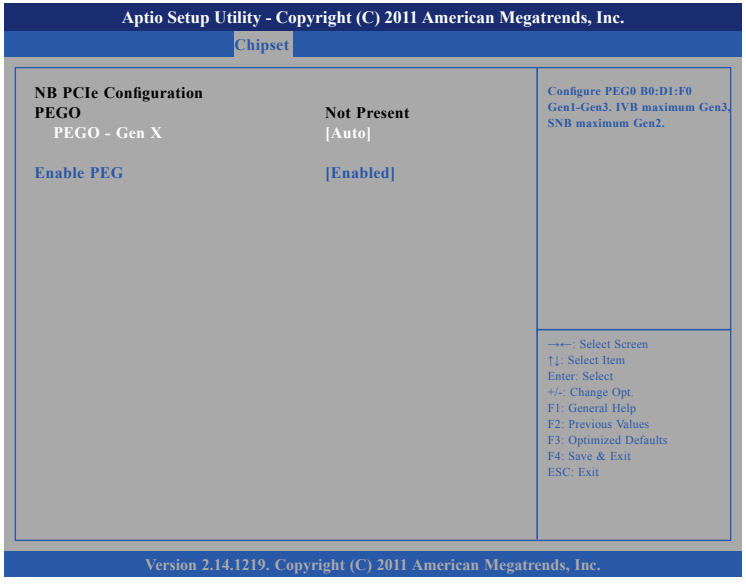
LVDS1 Panel Color Depth
Select the Panel Color Depth for LVDS1.

LVDS1 Backlight
Adjusts the brightness of LVDS1 backlight.

LVDS2 Backlight
Adjusts the brightness of LVDS2 backlight.

NB PCIe Configuration

This section is used to configure Northbridge PCI Express settings.



PEG0 – Gen X

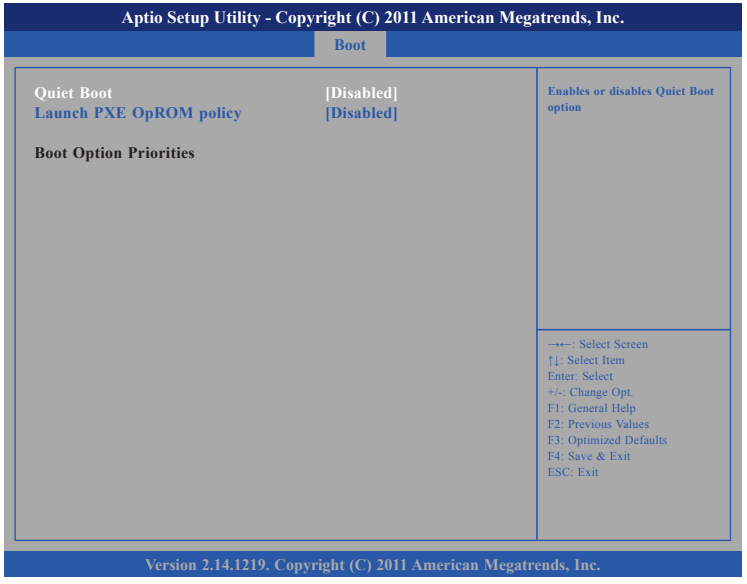
Configure PEG0 B0:D1:F0 Gen1-Gen3. IVB maximum Gen3, SNB maximum Gen2. The options are Auto, Gen1, Gen2 and Gen3.

Enable PEG

Enables or disables the PEG slot.

Boot

This section is used to configure the boot features.



Quiet Boot

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

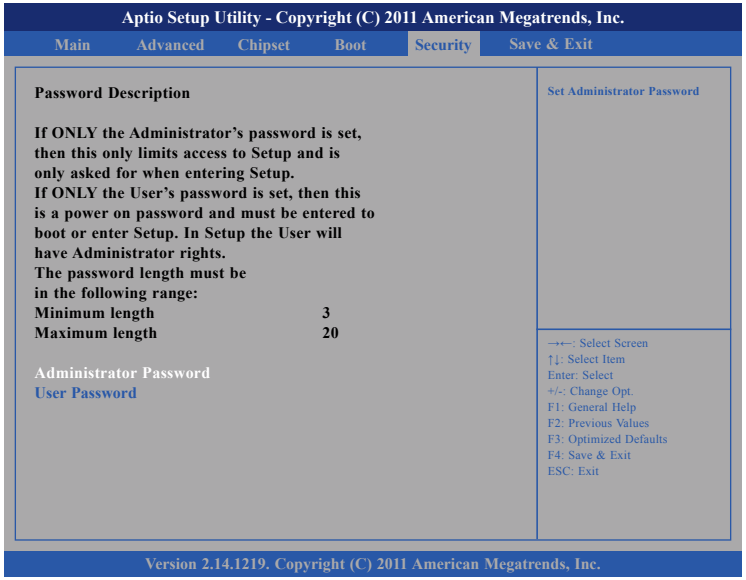
Launch PXE OpROM Policy

Controls the execution of UEFI and legacy PXE OpROM.

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.

Security



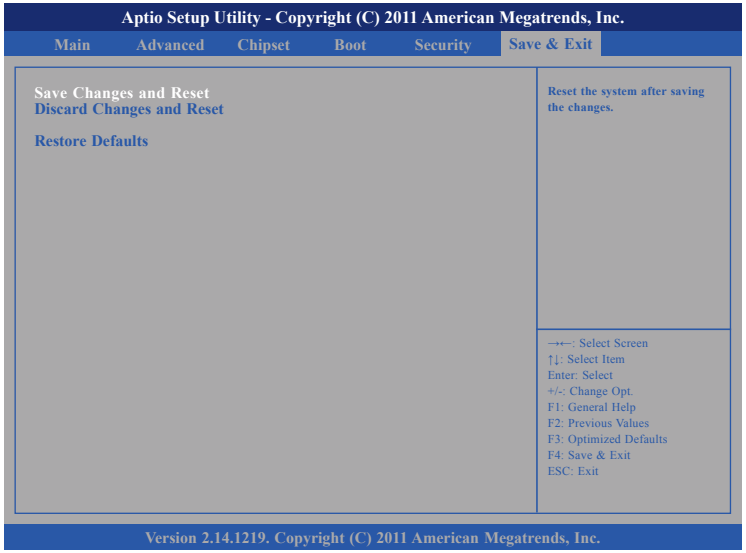
Administrator Password

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.