



**NEXCOM International Co., Ltd.**

**IoT Automation Solutions Business Group**

**Embedded Computing (Industrial Motherboard)**

**NEX 614**

User Manual

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# PREFACE

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## Acknowledgements

NEX 614 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

## Regulatory Compliance Statements

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

## Declaration of Conformity

### FCC

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

### CE

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

## RoHS Compliance



### **NEXCOM RoHS Environmental Policy and Status Update**

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

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

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force 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 2013 will be RoHS compliant. They will use the usual NEXCOM naming convention.

## Warranty and RMA

### NEXCOM Warranty Period

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

### NEXCOM Return Merchandise Authorization (RMA)

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

### Repair Service Charges for Out-of-Warranty Products

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

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

### Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.
2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.
3. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash storage card.

## Conventions Used in this Manual



### Warning:

Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.



### Caution:

Information to avoid damaging components or losing data.



### Note:

Provides additional information to complete a task easily.

## Global Service Contact Information

### Headquarters

#### **NEXCOM International Co., Ltd.**

9F, No. 920, Chung-Cheng Rd.,  
ZhongHe District, New Taipei City, 23586,  
Taiwan, R.O.C.

Tel: +886-2-8226-7786

Fax: +886-2-8226-7782

[www.nexcom.com](http://www.nexcom.com)

### America

#### **USA**

#### **NEXCOM USA**

2883 Bayview Drive,  
Fremont CA 94538, USA

Tel: +1-510-656-2248

Fax: +1-510-656-2158

Email: [sales@nexcom.com](mailto:sales@nexcom.com)

[www.nexcom.com](http://www.nexcom.com)

### Asia

#### **Taiwan**

#### **NEXCOM Intelligent Systems**

#### **Taipei Office**

13F, No.920, Chung-Cheng Rd.,  
ZhongHe District,  
New Taipei City, 23586, Taiwan, R.O.C.

Tel: +886-2-8226-7796

Fax: +886-2-8226-7792

Email: [sales@nexcom.com.tw](mailto:sales@nexcom.com.tw)

[www.nexcom.com.tw](http://www.nexcom.com.tw)

### **NEXCOM Intelligent Systems**

#### **Taichung Office**

16F, No.250, Sec. 2, Chongde Rd.,  
Beitun Dist.,

Taichung City 406, R.O.C.

Tel: +886-4-2249-1179

Fax: +886-4-2249-1172

Email: [sales@nexcom.com.tw](mailto:sales@nexcom.com.tw)

[www.nexcom.com.tw](http://www.nexcom.com.tw)

### **Japan**

#### **NEXCOM Japan**

9F, Tamachi Hara Bldg.,  
4-11-5, Shiba Minato-ku,  
Tokyo, 108-0014, Japan

Tel: +81-3-5419-7830

Fax: +81-3-5419-7832

Email: [sales@nexcom-jp.com](mailto:sales@nexcom-jp.com)

[www.nexcom-jp.com](http://www.nexcom-jp.com)

### **China**

#### **NEXCOM China**

1F & 2F, Block A, No. 16 Yonyou Software Park,  
No. 68 Beiqing Road, Haidian District,  
Beijing, 100094, China

Tel: +86-10-5704-2680

Fax: +86-10-5704-2681

Email: [sales@nexcom.cn](mailto:sales@nexcom.cn)

[www.nexcom.cn](http://www.nexcom.cn)

## **NEXCOM Shanghai**

Room 603/604, Huiyinmingzun Plaza Bldg., 1,  
No.609, Yunlin East Rd.,  
Shanghai, 200333, China  
Tel: +86-21-5278-5868  
Fax: +86-21-3251-6358  
Email: sales@nexcom.cn  
www.nexcom.cn

## **NEXCOM Surveillance Technology Corp.**

Room202, Building B,  
the GuangMing Industrial Zone Zhonghua Rd.,  
Minzhi Street, Longhua District,  
Shenzhen 518131, China  
Tel: +86-755-8364-7768  
Fax: +86-755-8364-7738  
Email: steveyang@nexcom.com.tw  
www.nexcom.cn

## **NEXCOM United System Service**

Hui Yin Ming Zun Building Room 1108,  
Building No. 11, 599 Yunling Road, Putuo District,  
Shanghai, 200062, China  
Tel: +86-21-6125-8282  
Fax: +86-21-6125-8281  
Email: frankyang@nexcom.cn  
www.nexcom.cn

## **Europe**

### **United Kingdom NEXCOM EUROPE**

10 Vincent Avenue,  
Crownhill Business Centre,  
Milton Keynes, Buckinghamshire  
MK8 0AB, United Kingdom  
Tel: +44-1908-267121  
Fax: +44-1908-262042  
Email: sales.uk@nexcom.eu  
www.nexcom.eu

## **Italy**

### **NEXCOM ITALIA S.r.l**

Via Lanino 42,  
21047 Saronno (VA), Italia  
Tel: +39 02 9628 0333  
Fax: +39 02 9625 570  
Email: nexcomitalia@nexcom.eu  
www.nexcomitalia.it

## Package Contents

Before continuing, verify that the NEX 614 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	60233ATA48X00	SATA Cable	SATA 7P 180D to 180D Connector L:250mm 28AWG	1
2	60233PW149X00	SATA Power Cable EDI:354204040201-RS	AMP 4-pin PIT: 2.54mm to SATA 15P L:200mm	1
3	5050600084X00	I/O Shield for NEX 614 VER:A Northern Queen	158.75 x 44.45 x 4.40mm SUS t=0.2mm	1
4	60177A0570X00	NEX 614 Quick Reference Guide VER:A		1
5	602DCD1318X00	NEX 614 CD Driver VER:1.0		1

### Optional Accessories

Item	Part Number	Name	Description
1	60233SIO62X00	COM Port Cable CP:NEX-110819-01	UL2651#28x9C-DB9+TU1001-10 L:200mm
2	603USB0061X00	USB Cable CP:NEX-160607-02C	USB A Type Male to Dupont 2x4P PIT:2.54mm L=400mm
3	60233ATA48X00	SATA Cable Best	SATA 7P 180D to 180D Connector L:250mm 28AWG
4	60233PW149X00	SATA Power Cable EDI:354204040201-RS	AMP 4-pin PIT:2.54mm to SATA 15P L:200mm
5	5050200093X00	Intel LGA115X 1U CPU Cooler for NEX 614 COOLJAG:JAC7L07A-B	84 x 84 x 26.4mm AL6063 Fan 5500RPM 12V 4PIN 2543 L:200MM
6	10E000TPM00X0	EBK-TPM-1.2	TPM SLB9660TT1.2 FW4.40
7	10E000TPM01X0	EBK-TPM-2.0	TPM SLB9665TT2.0 FW 5.51
8	7400180003X00	Power Adapter FSP:FSP180-AAAN2	180W 24V/7.5A

## Ordering Information

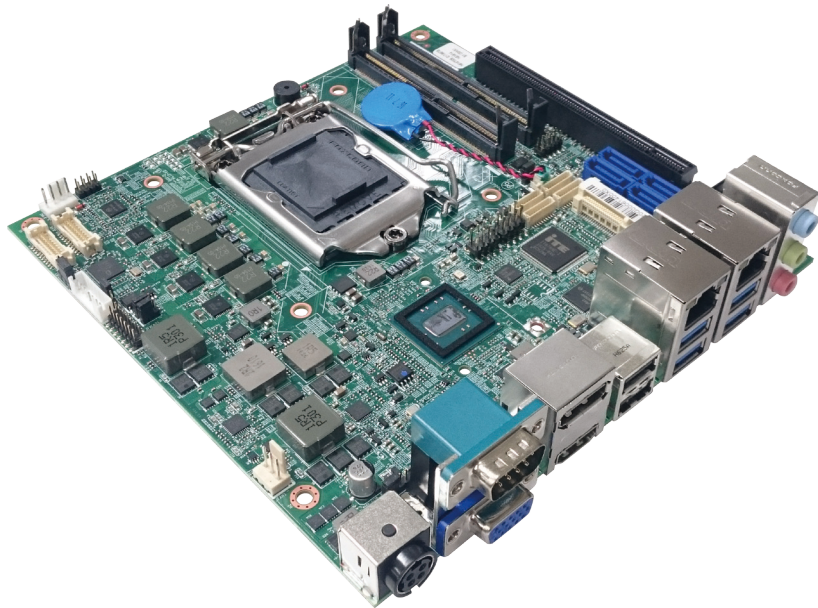
The following information below provides ordering information for NEX 614.

### **NEX 614 (P/N: 10G00061400X0)**

Mini-ITX, Intel® 6th Gen Skylake Core™ processor family, with DP/HDMI/  
VGA/LVDS interface/2 x Gigabit LAN/PCIe x16/mPCIe/8 x USB/4 x COMs/  
TPM (option)/3 x SATA/12V~24V DC input

# CHAPTER 1: PRODUCT INTRODUCTION

## Overview



## Key Features

- Support socket LGA1151 for 6th generation Intel® Core™ i7/i5/i3 and Intel® Celeron® processors (codename Skylake) or next generation Intel Core™/Celeron® processors
- Intel® Q170/H110 chipset
- 2 x 260-pin SO-DIMM DDR4 up to 32GB
- Triple display: HDMI/DP/VGA/LVDS
- 2x GbE with Intel® I219LM and i211-AT
- 1x Full size mini-PCIe
- 4x SATA 3.0
- 4x COM, 7 x USB, 4-in/4-out GPIO, HD audio
- 1x PCIe x16
- DC +12V~24V input  $\pm 5\%$

## Hardware Specifications

### CPU Support

- Socket LGA1151, Intel® 6th and next generation Core™ i7/i5/i3 processor and Intel® Celeron® processors, 14nm process

### Main Memory

- Dual DDR4/SO-DIMMs, up to 32GB

### Chipset

- Intel® H110 PCH
- Intel® Q170 PCH as optional

### BIOS

- AMI system BIOS
- Plug and play support

### On-board LAN

- 2x RJ45 connectors with Intel® I219LM and i211-AT GbE controller
- Support PXE boot from LAN, wake on LAN function

### Display

- 1x HDMI 1.4 connector (resolution up to 4K/2K@30Hz)
- 1x DP 1.2 connector (resolution up to 4096x2304)
- 1x VGA (resolution up to 1920x1200)
- 1x LVDS (support dual port 24-bit)

### Expansion Slot

- 1x mini-PCI express slot support mSATA, Wi-Fi module and 3G module built with card holder

### I/O Interface

- COM1/3/4: RS232, 9-pin wafer with cable JST connector
- COM2: RS232/422/485, 1x DB9 male connector on edge I/O
- USB 2.0/3.0: 7 ports
  - USB 3.0 x 4 ports edge connector
  - USB 2.0 x 3 ports by 2.54mm pin connector
- 4-in/4-out GPIO
- 2x 7-pin header with PWR button/reset button/PWR LED/HDD LED
- 1x 4-pin fan connector support PWM fan
- 1x 3-pin system fan

### Storage

- 3x 7-pin SATA 6Gb/s connector; one supports SATA-DOM
- 4th SATA connector reserved for Q170 as optional to support RAID 0/1/5
- 2x 4-pin connector for SATA power

### Audio

- Realtek ALC886 HD codec

### Power Requirements

- AT/ATX mode (by jumper setting default-AT)
- 4-pin power connector (right angle) for DC power input
- +12V~24V DC input (with ±5%)

### Optional Function

- TPM module (EBK-TPM)



## Dimensions

- 170mm (L) x 170mm (W) (6.7" x 6.7")

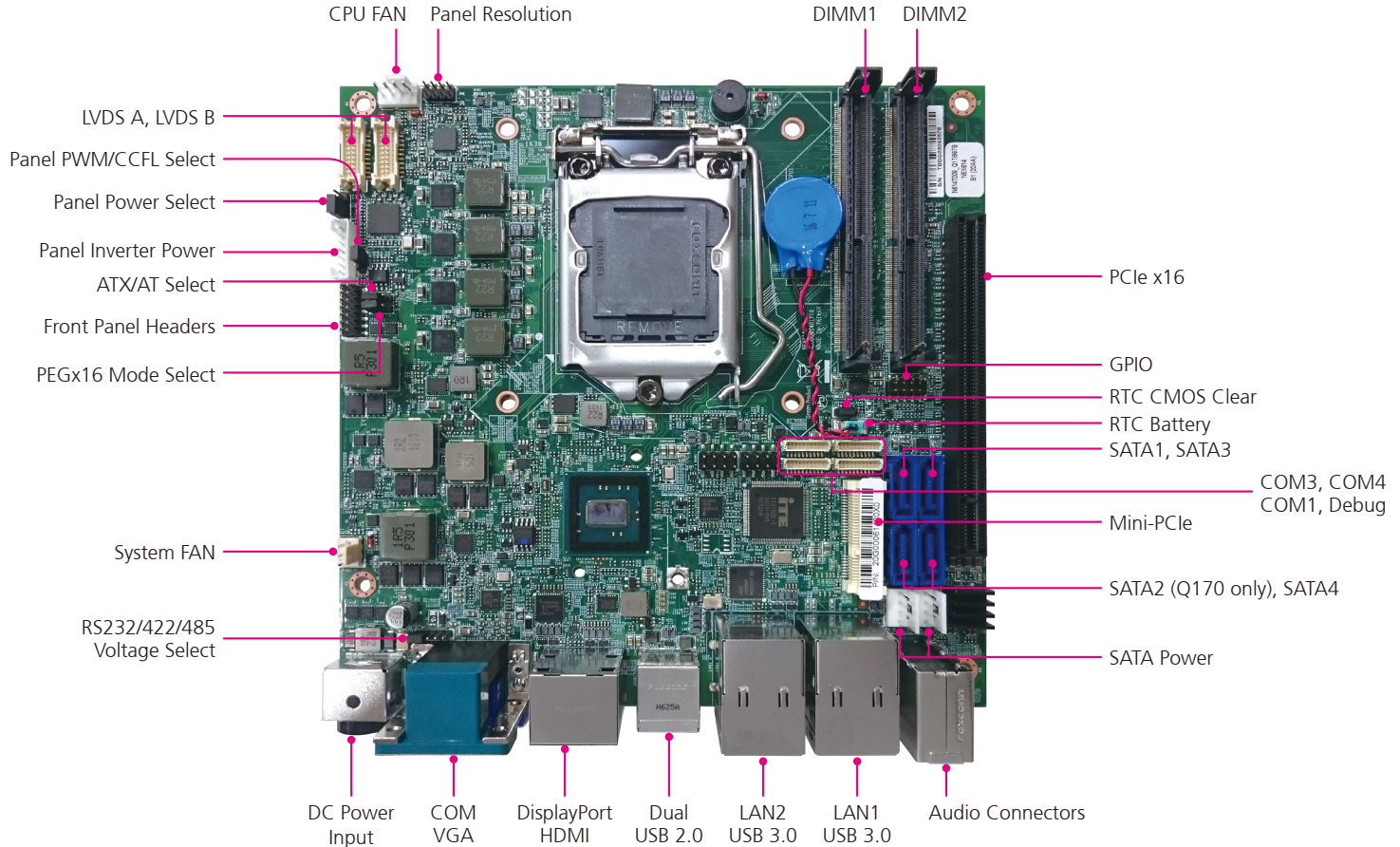
## Environment

- Board level operating temperatures: 0°C to 60°C
- Relative humidity:
  - 10% to 90% (operating, non-condensing)
  - 5% to 95% (non-operating, non-condensing)

## Certifications

- Meet CE
- FCC Class A

# Knowing Your NEX 614



## CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the NEX 614 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:

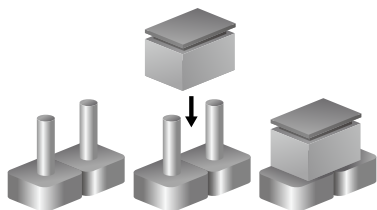
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

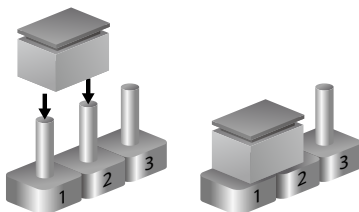
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

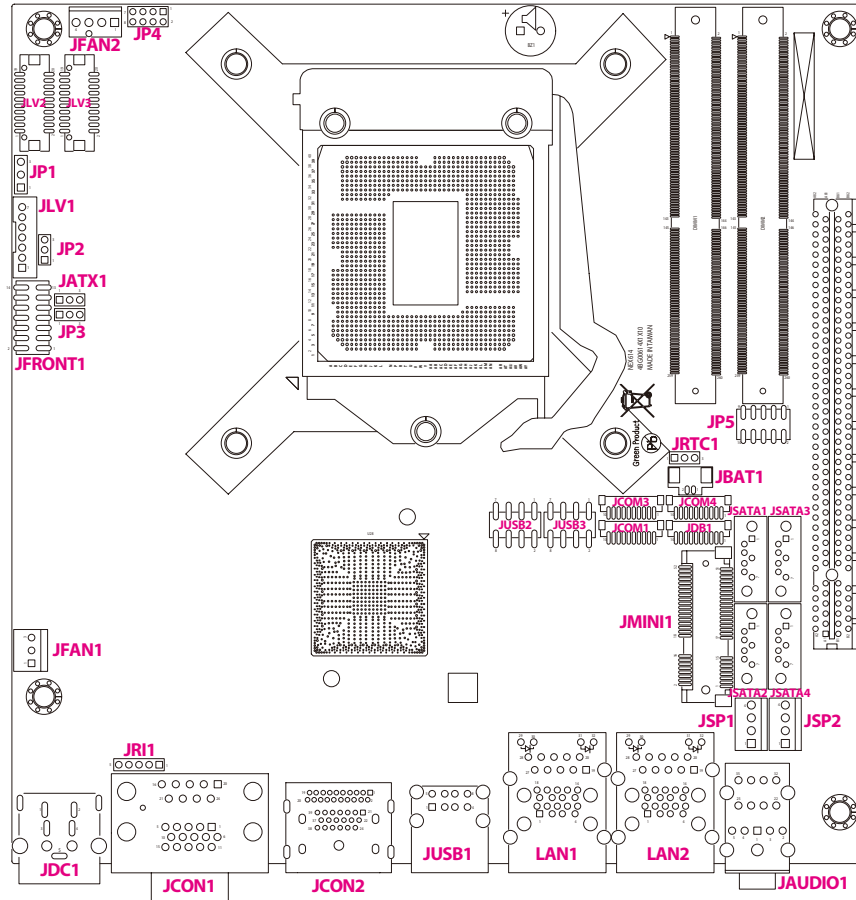


Three-Pin Jumpers: Pins 1 and 2 are Short



# Locations of the Jumpers and Connectors

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



## Jumpers

### AT/ATX Mode Select

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

Connector location: JATX1



Pin	Status	Settings
1-2	Short	ATX Mode (option)
2-3	Short	AT Mode

2-3 On: default

### RTC CMOS Clear Select

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

Connector location: JRTC1



Pin	Status	Settings
1-2	Short	Normal
2-3	Short	Clear CMOS

1-2 On: default

## PEGx16 Mode Select

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

Connector location: JP3



Pin	Status	Settings
1-2	Short	PEG = 1 X 16 LANE
2-3	Short	PEG = 2 X 8 LANE

1-2 On: default

## RS232/422/485 Voltage Select

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

Connector location: JRI1



Pin	Status	Settings
1-2	Short	+5V
2-3	Short	+12V
4-5	Short	RING

Pin	Definition
1	VCC5
2	COM_RI#2_con
3	VCC5
4	COM_RI#2_con
5	COM_RI#2

## Panel PWM/CCFL Mode Select

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

Connector location: JP2



Pin	Status	Settings
1-2	Short	CCFL
2-3	Short	PWM

## Panel Power Select

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

Connector location: JP1



Pin	Status	Settings
1-2	Short	+3V3
2-3	Short	+5V



## Connector Pin Definitions

### External Connectors

#### Power Input Connector

Connector location: JDC1

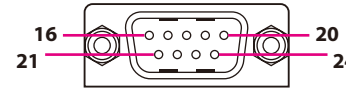


Pin	Definition	Pin	Definition
1	VCC	2	VCC
3	GND	4	GND
5	CGND		

#### COM Port

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

Connector location: JCON1A

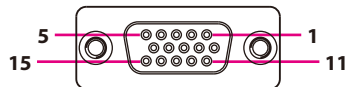


Pin	Definition	Pin	Definition
16	COM_DCD#2	17	COM_RXD#2
18	COM_TXD2	19	COM_DTR#2
20	GND	21	COM_DSR#2
22	COM_RTS#2	23	COM_CTS#2
24	COM_RI#2_con		

## VGA Port

Connector type: DB-15 port, 15-pin D-Sub

Connector location: JCON1B

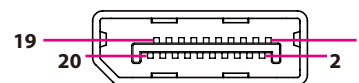


Pin	Definition	Pin	Definition
1	RED_VGA	2	GREEN_VGA
3	BLUE_VGA	4	NC
5	GND	6	VGA_GND
7	VGA_GND	8	VGA_GND
9	VGA_+5V	10	GND
11	NC	12	VGA_SDA_C
13	HSYNC_VGA	14	VSYNC_VGA
15	VGA_CLK_C		

## DisplayPort

Connector type: DisplayPort

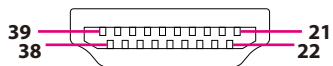
Connector location: JCON2A



Pin	Definition	Pin	Definition
1	DPB_LANE_P0_C	2	GND
3	DPB_LANE_N0_C	4	DPB_LANE_P1_C
5	GND	6	DPB_LANE_N1_C
7	DPB_LANE_P2_C	8	GND
9	DPB_LANE_N2_C	10	DPB_LANE_P3_C
11	GND	12	DPB_LANE_N3_C
13	DPB_CONFIG1_C	14	DPB_CONFIG2_C
15	DPB_AUX_P_C	16	GND
17	DPB_AUX_N_C	18	DPB_HPDC
19	GND	20	DP_PWR

## HDMI Port

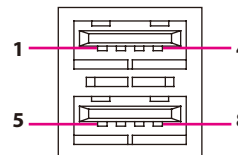
Connector type: HDMI port  
 Connector location: JCON2B



Pin	Definition	Pin	Definition
21	HDMI_D2+_C	22	GND
23	HDMI_D2-_C	24	HDMI_D1+_C
25	GND	26	HDMI_D1-_C
27	HDMI_D0+_C	28	GND
29	HDMI_D0-_C	30	HDMI_CK+_C
31	GND	32	HDMI_CK-_C
33	NC	34	NC
35	HDMI_SCL_C	36	HDMI_SDA_C
37	GND	38	HDMI_PWR
39	HDMI_HPD		

## USB 2.0 Connectors

Connector type: USB 2.0 port, Type A  
 Connector location: JUSB1



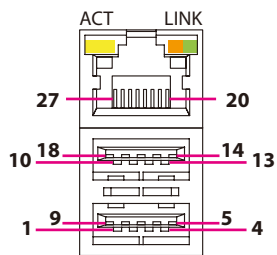
Pin	Definition	Pin	Definition
1	USBVCC(5V)	2	USB2_DN5
3	USB2_DP5	4	GND
5	USBVCC(5V)	6	USB2_DN6
7	USB2_DP6	8	GND

## LAN1 and Dual USB3.0 Ports

Connector type: RJ45 port with LEDs

Dual USB 3.0 ports, Type A

Connector location: LAN2A (USB) and LAN2B (LAN1)



Act	Status
Flashing Yellow	Data activity
Off	No activity

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

### USB

Pin	Definition	Pin	Definition
1	P5V_USB_P01	2	USB2N1_C
3	USB2P1_C	4	GND
5	USB3RN1_C	6	USB3RP1_C
7	GND	8	USB3TN1_C
9	USB3TP1_C	10	P5V_USB_P01
11	USB2_2N_C	12	USB2_2P_C
13	GND	14	USB3_RX2_N_C
15	USB3_RX2_P_C	16	GND
17	USB3TN2_C	18	USB3TP2_C

### LAN

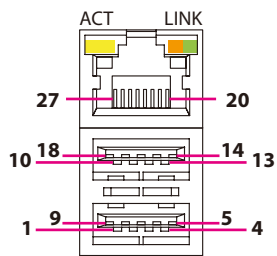
Pin	Definition	Pin	Definition
19	LAN1_VCT	20	LAN1_MDI0P
21	LAN1_MDI0N	22	LAN1_MDI1P
23	LAN1_MDI1N	24	LAN1_MDI2P
25	LAN1_MDI2N	26	LAN1_MDI3P
27	LAN1_MDI3N	28	GND
29	LAN1_ACT_P	30	LAN1_LED_ACT#
31	LAN1_LINK100#	32	LAN1_1000_P

## LAN2 and Dual USB3.0 Ports

Connector type: RJ45 port with LEDs

Dual USB 3.0 ports, Type A

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



Act	Status
Flashing Yellow	Data activity
Off	No activity

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

### USB

Pin	Definition	Pin	Definition
1	P5V_USB_P23	2	USB2N4_C
3	USB2P4_C	4	GND
5	USB3RN4_C	6	USB3RP4_C
7	GND	8	USB3TN4_C
9	USB3TP4_C	10	P5V_USB_P23
11	USB2_3N_C	12	USB2_3P_C
13	GND	14	USB3_RX3_N_C
15	USB3_RX3_N_C	16	GND
17	USB3TN3_C	18	USB3TP3_C

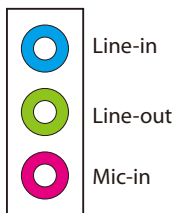
### LAN

Pin	Definition	Pin	Definition
19	LAN2_VCT	20	LAN2_MDI0P
21	LAN2_MDI0N	22	LAN2_MDI1P
23	LAN2_MDI1N	24	LAN2_MDI2P
25	LAN2_MDI2N	26	LAN2_MDI3P
27	LAN2_MDI3N	28	GND
29	LAN2_ACT_P	30	LAN2_LED_ACT#
31	LAN2_LINK100#	32	LAN2_1000_P

## Audio Connectors

Connector type: 3.5mm audio jack

Connector location: JAUDIO1



Pin	Definition	Pin	Definition
1	GND	2	MIC_OUT-L
3	GND	4	MIC_JD
5	MIC_OUT-R		
22	LINE_OUT_LC	23	GND
24	LINEOUT_JD	25	LINE_OUT_RC
32	LINE1-L1	33	GND
34	LININ_JD	35	LINE1-R1

## Internal Connectors

### RTC Battery Connector

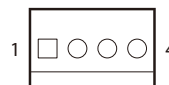
Connector type: 1x2 2-pin header, 1.25mm pitch  
Connector location: JBAT1



Pin	Definition
1	GND
2	VBAT

### CPU FAN Connector

Connector type: 1x4 4-pin Wafer  
Connector location: JFAN2



Pin	Definition
1	GND
2	FAN1_12V_C
3	FAN_TAC1_C
4	FAN_CTL1_C

## System FAN Connector

Connector type: 1x3 3-pin Wafer

Connector location: JFAN1



Pin	Definition
1	GND
2	FAN2_12V_C
3	FAN_TAC2_C

## Debug Port

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

Connector location: JDB1



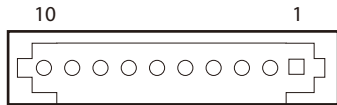
Pin	Definition	Pin	Definition
1	GND	2	RST_LAN_SIO_MINI_N
3	CLK_PCI_P80	4	LPC_FRAME#
5	LPC_AD3	6	LPC_AD2
7	LPC_AD1	8	LPC_AD0
9	INT_SERIRQ	10	VCC(3.3V)



## COM Port Box Headers

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

Connector location: JCOM1 (Port3), JCOM2 (Port1) and JCOM3 (Port4)

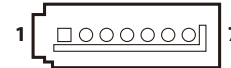


Pin	Definition	Pin	Definition
1	COM_DCD#	2	COM_RXD
3	COM_TXD	4	COM_DTR#
5	GND	6	COM_DSR#
7	COM_RTS#	8	COM_CTS#
9	COM_RI#	10	GND

## SATA Connectors

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)

Connector location: JSATA1, JSATA3, JSATA4 and JSATA2 (Q170 only)

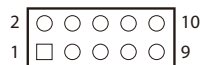


Pin	Definition	Pin	Definition
1	GND	2	SATA6G_TX_DP
3	SATA6G_TX_DN	4	GND
5	SATA6G_RX_DN	6	SATA6G_RX_DP
7	GND		

## SIO GPIO Connector

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

Connector location: JP5

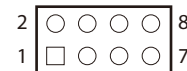


Pin	Definition	Pin	Definition
1	VCC(5V)	2	GND
3	SIO_ GPIO80	4	SIO_ GPIO84
5	SIO_ GPIO81	6	SIO_ GPIO85
7	SIO_ GPIO82	8	SIO_ GPIO86
9	SIO_ GPIO83	10	SIO_ GPIO87

## USB1 Internal Header (USB 2.0)

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

Connector location: JUSB2

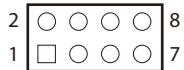


Pin	Definition	Pin	Definition
1	P5V_USB_P78	2	GND
3	USB2N7_C	4	USB2P8_C
5	USB2P7_C	6	USB2N8_C
7	GND	8	P5V_USB_P78

## USB2 Internal Header (USB 2.0)

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

Connector location: JUSB3

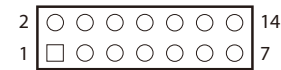


Pin	Definition	Pin	Definition
1	P5V_USB_P9_10	2	GND
3	USB2N9_C	4	USB2P11_C
5	USB2P9_C	6	USB2N11_C
7	GND	8	P5V_USB_P9_10

## Front Panel Connectors

Connector type: 2x7 14-pin header, 2.0mm pitch

Connector location: JFRONT1

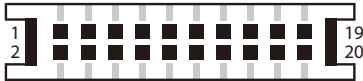


Pin	Definition	Pin	Definition
1	POWER LED	2	VCC(PWR LED)
3	HDD LED	4	VCC(PWR LED)
5	SMB_CLK	6	VCC3
7	SMB_DAT	8	GND
9	SLP_S3_N	10	PS_ON
11	PM_RESET#_J	12	GND
13	PWRBTN#_C	14	GND

## LVDS1 Connector A

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

Connector location: JLV2

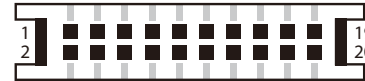


Pin	Definition	Pin	Definition
1	LVDS_DDC_CLK	2	LVDS_DDC_DATA
3	+VCC_LCD	4	LVDSA_LDC0P
5	LVDSA_LDC3P	6	LVDSA_LDC0N
7	LVDSA_LDC3N	8	+VCC_LCD
9	GND	10	LVDSA_LDC1P
11	LVDSA_LL1CP	12	LVDSA_LDC1N
13	LVDSA_LL1CP	14	GND
15	GND	16	+V_INV
17	LVDSA_LDC2P	18	+V_INV
19	LVDSA_LDC2N	20	GND

## LVDS1 Connector B

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

Connector location: JLV3

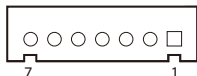


Pin	Definition	Pin	Definition
1	LVDS_DDC_CLK	2	LVDS_DDC_DATA
3	+VCC_LCD	4	LVDSB_LDC4P
5	LVDSB_LDC7P	6	LVDSB_LDC4N
7	LVDSB_LDC7N	8	+VCC_LCD
9	GND	10	LVDSB_LDC5P
11	LVDSB_LL2CP	12	LVDSB_LDC5N
13	LVDSB_LL2CN	14	GND
15	GND	16	+V_INV
17	LVDSB_LDC6P	18	+V_INV
19	LVDSB_LDC6N	20	GND

## Panel Inverter Power Connector

Connector type: 1x7 JST, 7-pin header, 2.0mm pitch

Connector location: JLV1

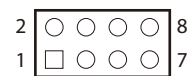


Pin	Definition	Pin	Definition
1	VCC5	2	+V_INV
3	+V_INV	4	PL_BKLTCTRL
5	GND	6	GND
7	M_BKLTEN_R		

## Panel Resolution Pin Header

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

Connector location: JP4

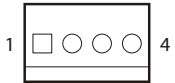


Pin	Definition	Pin	Definition
1	CH7511_GPIO3	2	GND
3	CH7511_GPIO2	4	GND
5	CH7511_GPIO1	6	GND
7	CH7511_GPIO0	8	GND

## SATA Power Connectors

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

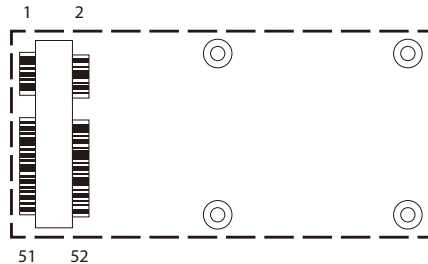
Connector location: JSP1 and JSP2



Pin	Definition
1	VCC12
2	GND
3	GND
4	VCC5

## Mini-PCIe/mSATA Connector

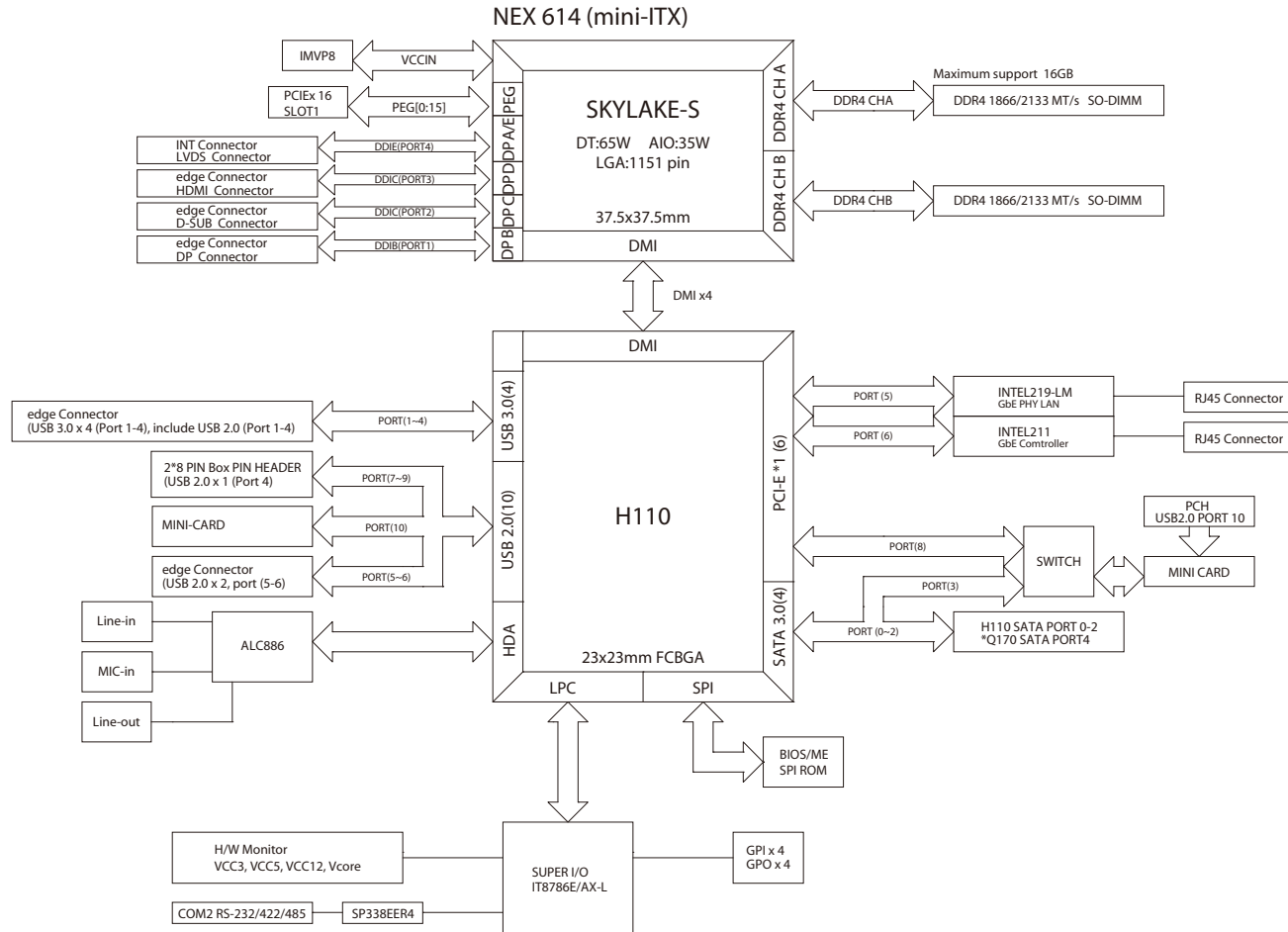
Connector location: JMINI1



Pin	Definition	Pin	Definition
1	WAKE#	2	3.3Vaux
3	NC	4	GND
5	NC	6	1.5V
7	CLKREQ#	8	
9	GND	10	
11	REFCLK-	12	
13	REFCLK+	14	
15	GND	16	
17	NC	18	GND
19	NC	20	W_DISABLE#
21	GND	22	PERST#
23	PERn0/SATA_RX_N	24	+3.3Vaux
25	PERp0/SATA_RX_P	26	GND

Pin	Definition	Pin	Definition
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETn0/SATA_TX_N	32	SMB_DATA
33	PETp0/SATA_TX_P	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3Vaux	40	GND
41	+3.3Vaux	42	NC
43	GND	44	NC
45	Reserved	46	NC
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Presence Detection	52	+3.3Vaux

# Block Diagram





# CHAPTER 3: BIOS SETUP

This chapter describes how to use the BIOS setup program for NEX 614. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM Web site at [www.nexcom.com.tw](http://www.nexcom.com.tw).

## About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the setup options, and second, to make settings appropriate for the way you use the computer.

## When to Configure the BIOS

This program should be executed under the following conditions:

- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

## Default Configuration


Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

## Entering Setup












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

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

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

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

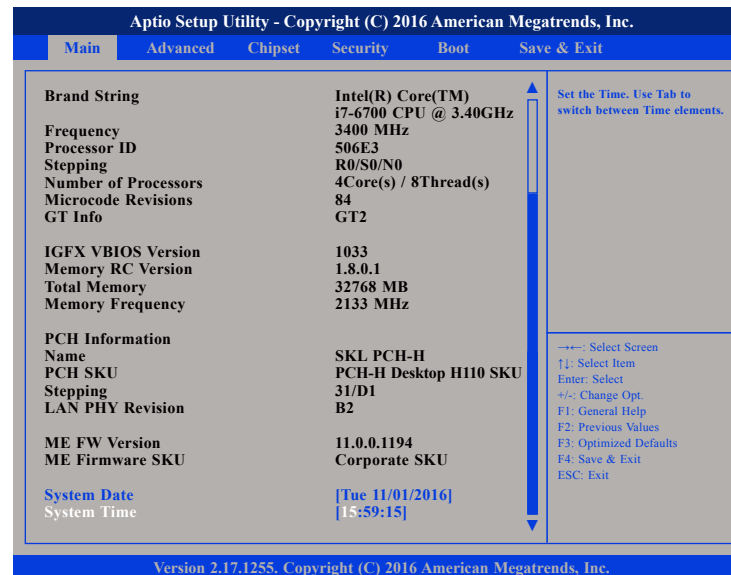
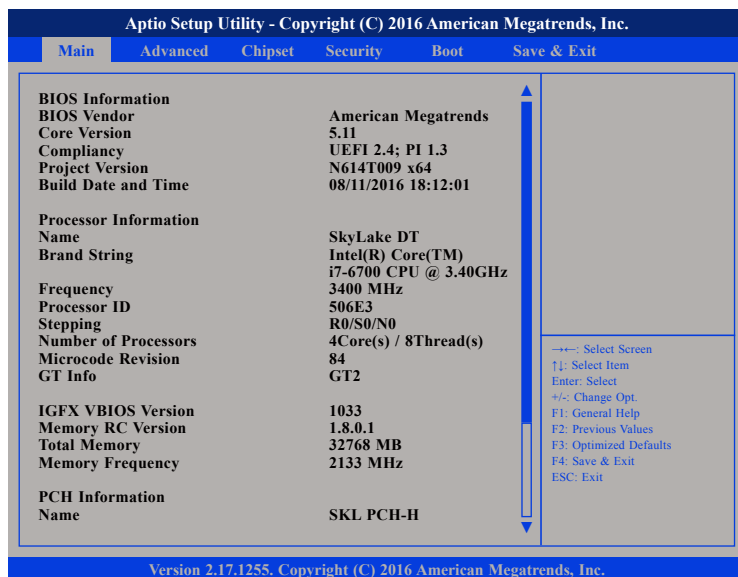
When “▶” appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press  .

## 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  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.

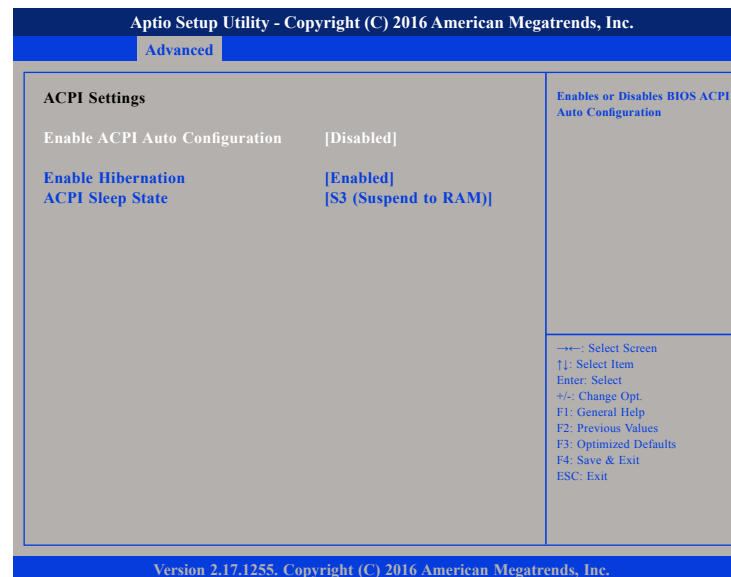


Setting incorrect field values may cause the system to malfunction.



## ACPI Settings

This section is used to configure ACPI settings.



### Enable ACPI Auto Configuration

Enables or disables BIOS ACPI auto configuration.

### Enable Hibernation

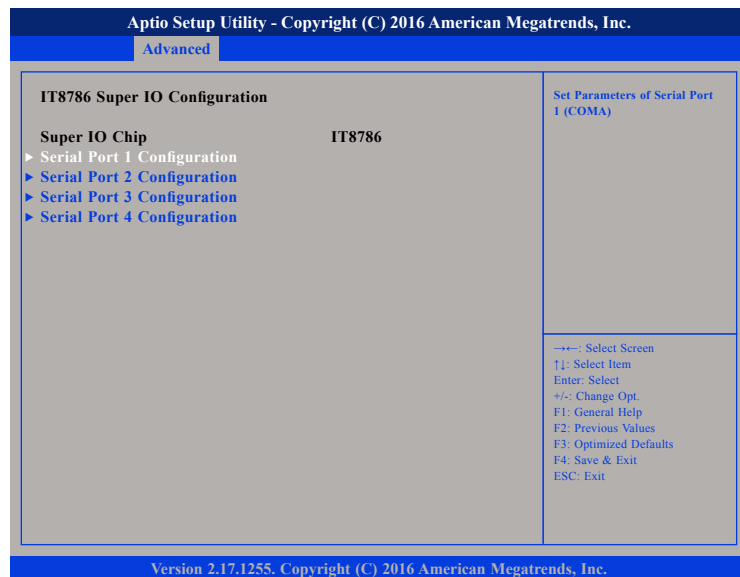
Enables or disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

### ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the suspend button is pressed.

## IT8786 Super IO Configuration

This section is used to configure serial ports 1 to 4 of the super IO.

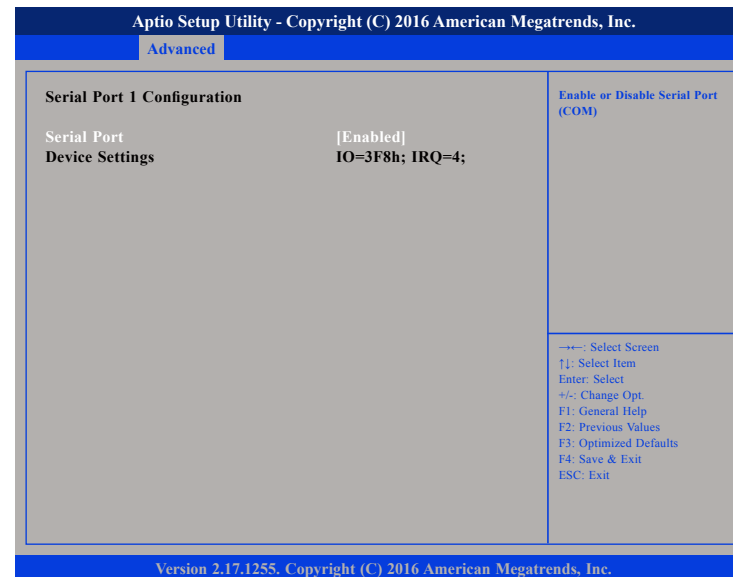


### Super IO Chip

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

## Serial Port 1 Configuration

This section is used to configure serial port 1.

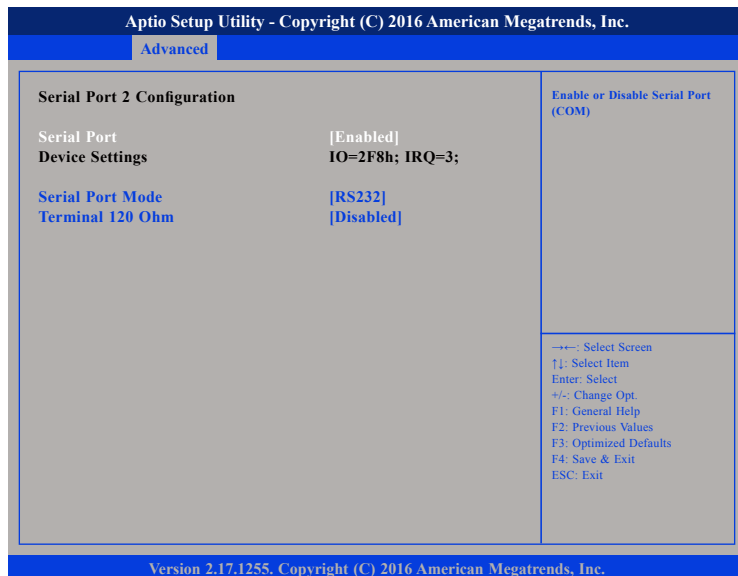


### Serial Port

Enables or disables the serial port.

## Serial Port 2 Configuration

This section is used to configure serial port 2.



### Serial Port

Enables or disables the serial port.

### Serial Port Mode

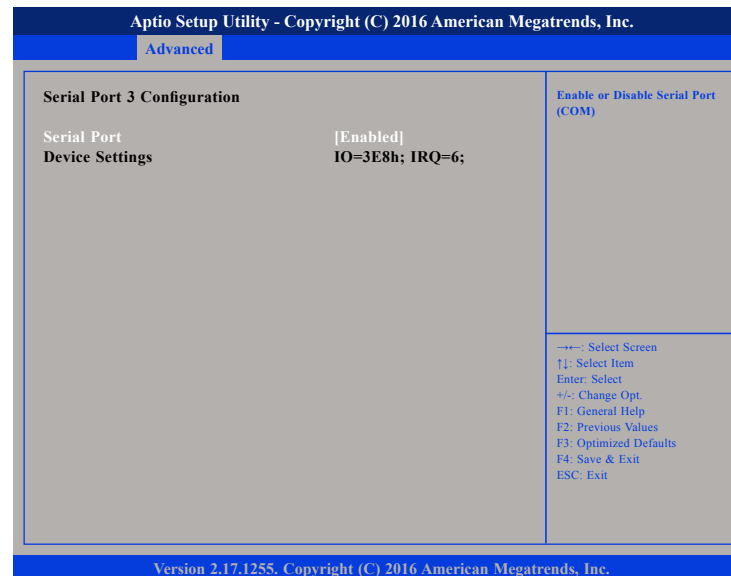
Configures the serial port mode to RS232, RS422, RS485 or RS485 Auto.

### Terminal 120 Ohm

Enables or disables serial port terminal resistance.

## Serial Port 3 Configuration

This section is used to configure serial port 3.



### Serial Port

Enables or disables the serial port.

## Serial Port 4 Configuration

This section is used to configure serial port 4.



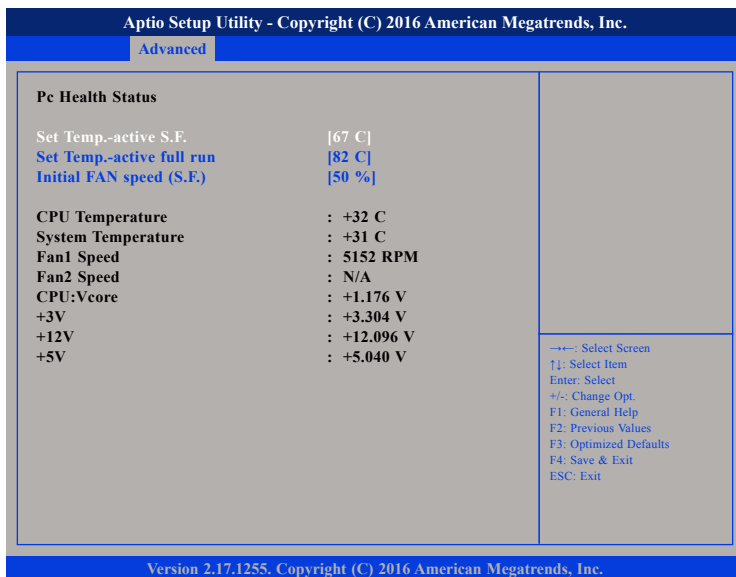
### Serial Port

Enables or disables the serial port.



## Hardware Monitor

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



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

Set Temp.-active S.F.	[67 C]
Set Temp.-active full run	[82 C]
Initial FAN speed (S.F.)	[50 %]
CPU Temperature	: +32 C
System Temperature	: +31 C
Fan1 Speed	: 5152 RPM
Fan2 Speed	: N/A
CPU:Vcore	: +1.176 V
+3V	: +3.304 V
+12V	: +12.096 V
+5V	: +5.040 V

Navigation instructions are listed on the right side of the screen:

- ←→: Select Screen
- ↑↓: Select Item
- Enter: Select
- +/-: Change Opt.
- F1: General Help
- F2: Previous Values
- F3: Optimized Defaults
- F4: Save & Exit
- ESC: Exit

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### CPU Temperature

Detects and displays the current CPU temperature.

### System Temperature

Detects and displays the current system temperature.

### Fan1 Speed

Detects and displays system fan1 speed

### Fan2 Speed

Detects and displays system fan2 speed.

### CPU:Vcore to +5V

Detects and displays the output voltages.

### Set Temp.-active S.F.

Configures the temperature threshold to activate smart fan.

### Set Temp.-active Full Run

Configures the temperature threshold to activate the fan in full speed.

### Initial FAN Speed (S.F.)

Configures the starting fan speed of smart fan.

## CPU Configuration

This section is used to configure the CPU settings.

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Advanced

CPU Configuration	
Intel(R) Core(TM) i7-6700 CPU @ 3.40GHz	
CPU Signature	506E3
Microcode Patch	84
Max CPU Speed	3400 MHz
Min CPU Speed	800 MHz
CPU Speed	3400 MHz
Processor Cores	4
Hyper Threading Technology	Supported
Intel VT-x Technology	Supported
Intel SMX Technology	Supported
64-bit	Supported
EIST Technology	Supported
CPU C3 state	Supported
CPU C6 state	Supported
CPU C7 state	Supported
CPU C8 state	Supported
CPU C9 state	Not Supported
CPU C10 state	Not Supported
L1 Data Cache	32 kB x 4
L1 Code Cache	32 kB x 4
L2 Cache	256 kB x 4
L3 Cache	8 MB

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.

←←←: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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### Hyper-Threading

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

### Active Processor Cores

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

### Overclocking Lock

Enables or disables processor overclocking.

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Advanced

L4 Cache	Not Present	Enable Package C state undemotion
Hyper-threading	[Enabled]	
Active Processor Cores	[All]	
Overclocking lock	[Disabled]	
Intel Virtualization Technology	[Enabled]	
Hardware Prefetcher	[Enabled]	
Adjacent Cache Line Prefetch	[Enabled]	
CPU AES	[Enabled]	
Boot performance mode	[Max Non-Turbo Performance]	
Intel(R) Speed Shift Technology	[Enabled]	
Intel(R) SpeedStep(tm)	[Enabled]	
Turbo Mode	[Disabled]	
Power Limit 1 Override	[Disabled]	
Power Limit 2 Override	[Enabled]	
Power Limit 2	0	
Platform PL1 Enable	[Disabled]	
Platform PL2 Enable	[Disabled]	
CPU C states	[Enabled]	
Enhanced C-states	[Enabled]	
C-State Auto Demotion	[C1 and C3]	
C-State Un-demotion	[C1 and C3]	
Package C state demotion	[Enabled]	
Package C state undemotion	[Enabled]	

←←←: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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### Intel® Virtualization Technology

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

### Hardware Prefetcher

Turns on or off the MLC streamer prefetcher.

### Adjacent Cache Line Prefetch

Enables or disables the adjacent cache line prefetch.

### CPU AES

Enables or disables CPU advanced encryption standard instructions.



### Boot Performance Mode

Configures the performance state that the BIOS will set before OS handoff.

### Intel® Speed Shift Technology

Enables or disables Intel Speed Shift Technology support. Enabling it will expose the CPPC v2 interface to allow hardware controlled P-states.

### Intel® SpeedStep™

Enables or disables Intel SpeedStep.

### Turbo Mode

Enables or disables turbo mode.

### Power Limit 1 Override

Enables or disables power limit 1 override. If this option is disabled, the BIOS will program the default values for power limit 1 and power limit 1 time window.

### Power Limit 2 Override

Enables or disables power limit 2 override. If this option is disabled, the BIOS will program the default values for power limit 2.

### Platform PL1 Enable

Enables or disables platform power limit 1 programming. If this option is enabled, it activates the PL1 value to be used by the processor to limit the average power of given time window.

### Platform PL2 Enable

Enables or disables platform power limit 2 programming. If this option is disabled, the BIOS will program the default values for platform power limit 2.

### CPU C-States

Enables or disables CPU C-States support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

### Enhanced C-States

Enables or disables C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State

### C-State Auto Demotion

Configures C-State Auto Demotion setting.

### C-State Un-Demotion

Configures C-State Un-Demotion setting.

### Package C State Demotion

Enables or disables package C state demotion.

### Package C State Un-Demotion

Enables or disables package C state un-demotion.

### CState Pre-Wake

Configures bit 30 of POWER\_CTL MSR (0x1FC) to 1 to disable the C-state Pre-Wake.

### Package C State Limit

Configures the package C-state limit setting.

### CFG Lock

Configures the MSR 0xE2[15], CFG lock bit.

### Intel TXT(LT) Support

Enables or disables Intel TXT(LT) support.

### Debug Interface

Enables or disables CPU debug feature.

### Debug Interface Lock

Enable or disables lock function of CPU debug feature.

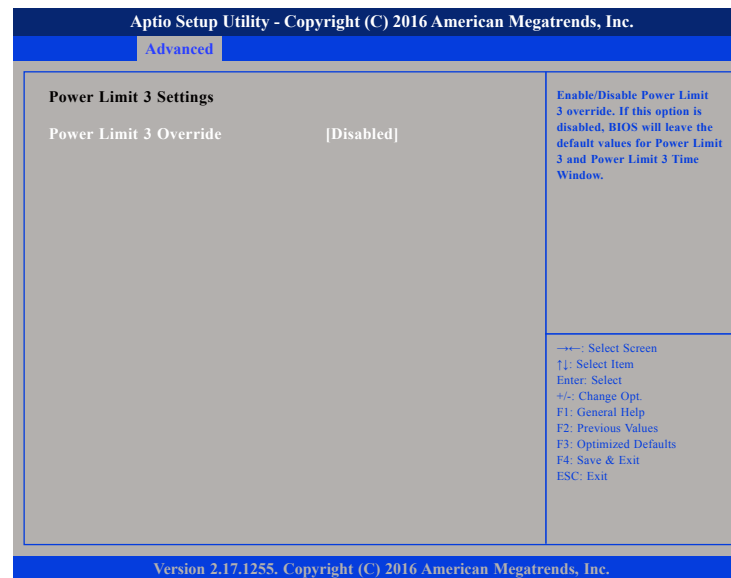
### SW Guard Extensions (SGX)

Enables or disables software guard extensions (SGX).

### Select Owner EPOCH Input Type

Configures the owner Epoch input type.

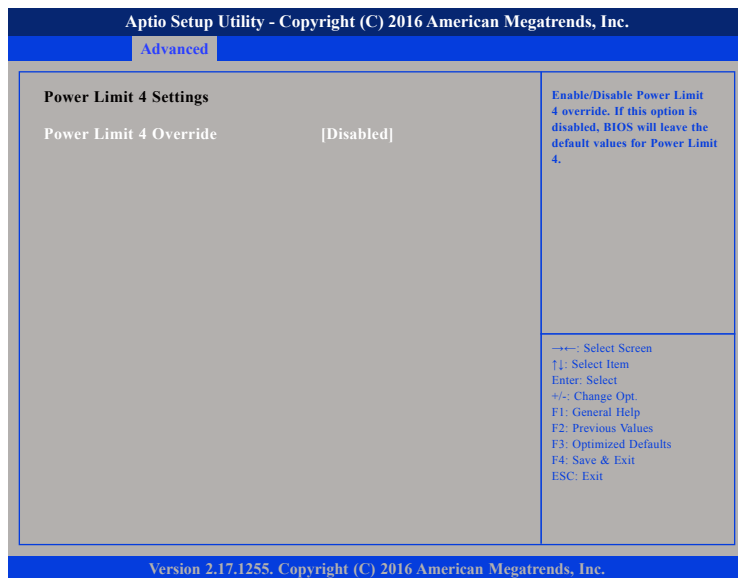
## Power Limit 3 Settings



### Power Limit 3 Override

Enables or disables power limit 3 override. If this option is disabled, the BIOS will leave the default values for power limit 3 and power limit 3 time window.

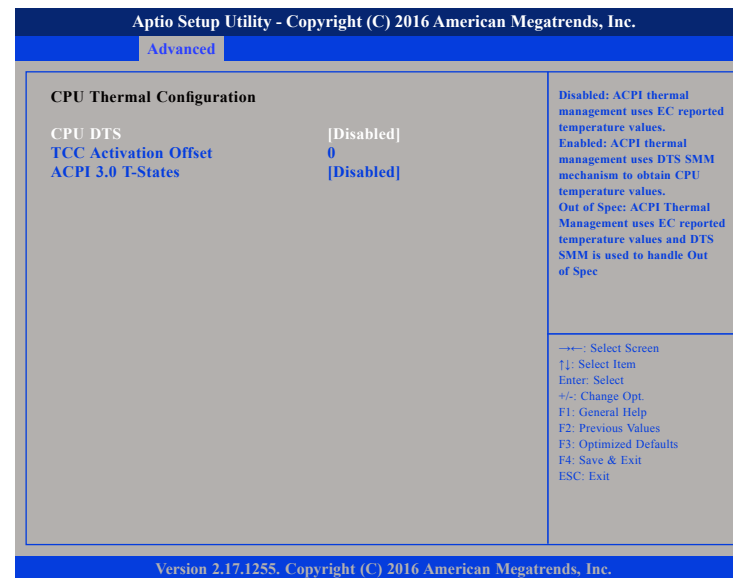
## Power Limit 4 Settings



### Power Limit 4 Override

Enables or disables power limit 4 override. If this option is disabled, the BIOS will leave the default values for power limit 4.

## CPU Thermal Configuration



### CPU DTS

Disabled: ACPI thermal management uses EC reported temperature values.

Enabled: ACPI thermal management uses DTS SMM mechanism to obtain CPU temperature values.

Out of Spec: ACPI Thermal Management uses EC reported temperature values and DTS SMM is used to handle Out of Spec.

### ACPI 3.0 T-States

Enables or disables ACPI 3.0 T-States.

## Secure Erase

This section is used to configure the secure erase settings.



### Secure Erase Mode

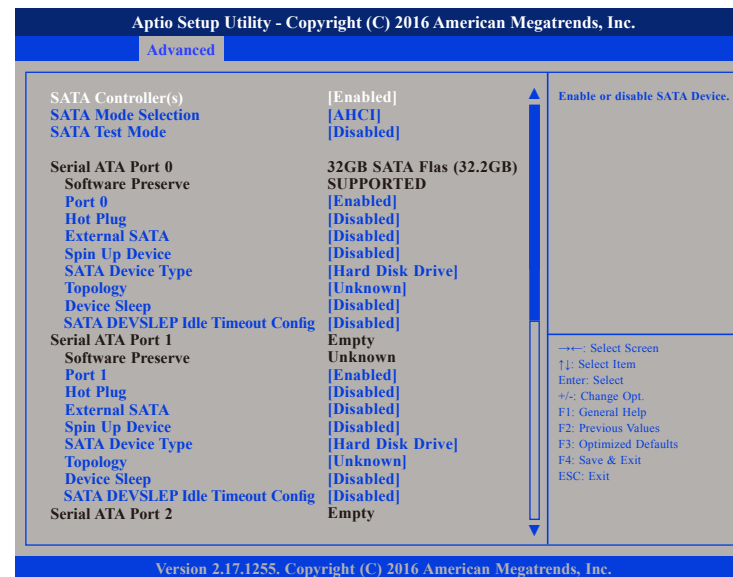
Configures the behavior of the secure erase function.

### Force Secure Erase

Enables or disables force secure erase function.

## SATA Configuration

This section is used to configure the SATA drives.



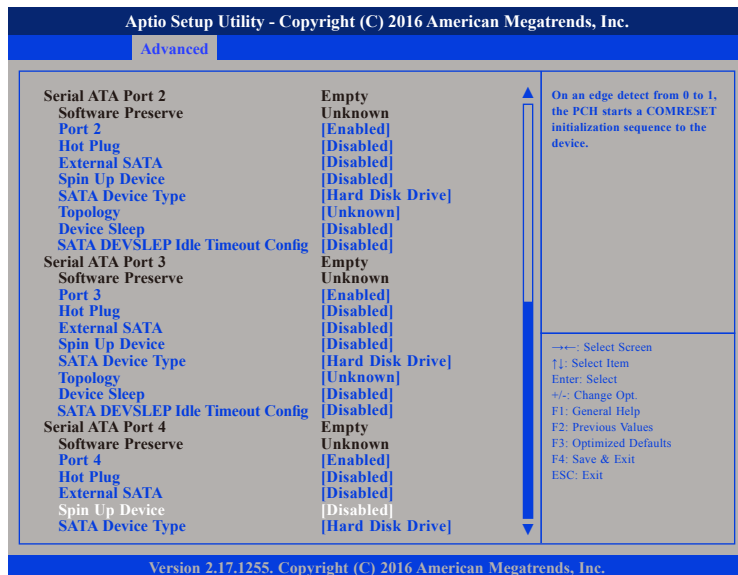
### SATA Controller(s)

Enables or disables the SATA controller.

### SATA Mode Selection

Configures the SATA mode.

**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.



### Spin Up Device

Enables or disables staggered spin up on devices connected to SATA port 0 to port 4.

### SATA Device Type

Identifies what type of SATA device is connected.

### Topology

Identifies what type of SATA connection is used.

### Device Sleep

Enables or disables SATA device sleep support.

### SATA DEVSLEP Idle Timeout Config

Enables or disables SATA DEVSLEP Idle Timeout Config.

### SATA Test Mode

Enables or disables SATA test mode.

### Port 0 to Port 4

Enables or disables SATA port 0 to port 4.

### Hot Plug

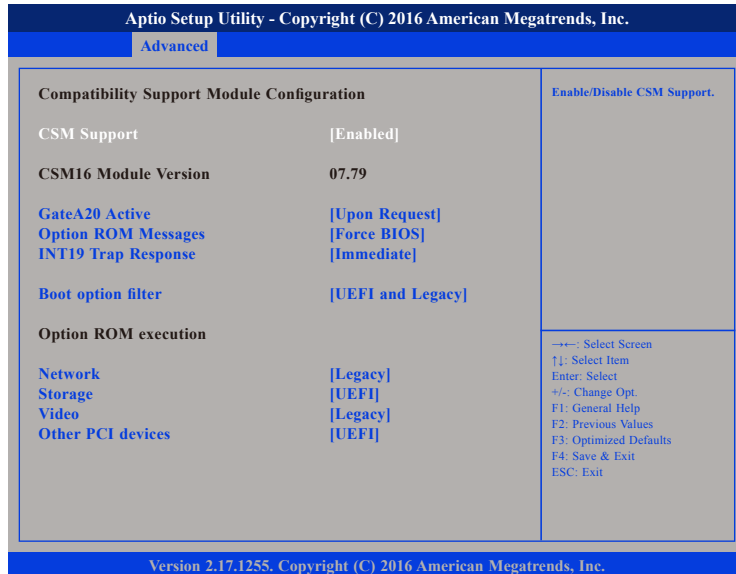
Enables or disables hot plugging feature on SATA port 0 to port 4.

### External SATA

Enables or disables the external SATA option on SATA port 0 to port 4.

## CSM Configuration

This section is used to configure the compatibility support module features.



### CSM Support

This field is used to enable or disable CSM support, if Auto option is selected, based on OS, CSM will be enabled or disabled automatically.

### GateA20 Active

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

### Option ROM Messages

Configures the display mode for Option ROM.

### INT19 Trap Response

Allows Option ROMs to trap Interrupt 19 when enabled.

Immediate Execute the trap right away.  
 Postponed Execute the trap during legacy boot.

### Boot Option Filter

Configures which devices the system will boot from.

### Network

Controls the execution of UEFI and Legacy PXE OpROM.

### Storage

Controls the execution of UEFI and Legacy Storage OpROM.

### Video

Controls the execution of UEFI and Legacy Video OpROM.

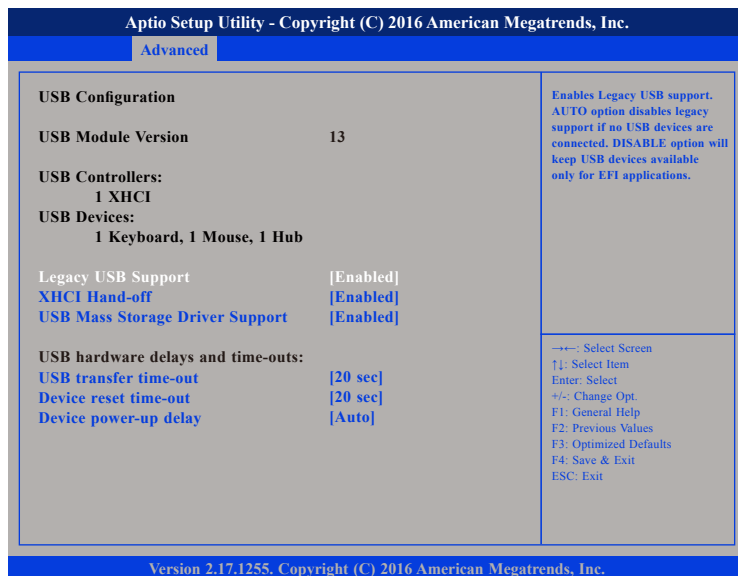
### Other PCI Devices

Configures the OpROM execution policy for devices other than Network, Storage or Video.



## 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.

### XHCI Hand-off

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

### USB Mass Storage Driver Support

Enables or disables USB mass storage driver support.

### USB Transfer Time-out

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

### Device Reset Time-out

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

### Device Power-up Delay

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

## Chipset

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



### LVDS Panel Type

Configures the LVDS panel resolution.

## System Agent (SA) Configuration



### VT-d

Enables or disables VT-d function on MCH.

### Graphics Configuration

Configures the graphics chip settings.

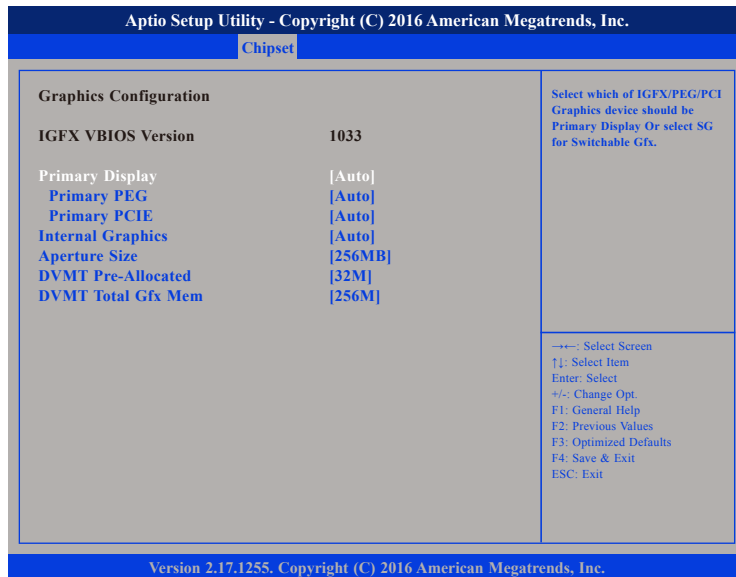
### PEG Port Configuration

Configures the PEG Port settings.

### Memory Configuration

Configures the memory settings.

## Graphics Configuration



### Primary Display

Selects which of IGFX/PEG/PCI graphics device should be primary display or select SG for switchable GFX.

### Primary PEG

Selects which PEG device should be the primary PEG.

### Primary PCIE

Selects which PCIE device should be the primary PCIE.

### Internal Graphics

Keep IGD enabled based on the setup options.

### Aperture Size

Selects the Aperture size.

### DVMT Pre-Allocated

Selects DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.

### DVMT Total Gfx Mem

Selects DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device.

## PEG Port Configuration

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Chipset

PEG Port Configuration

PEG 0:1:0	Not Present
Enable Root Port	[Auto]
Max Link Speed	[Auto]
PEG0 Slot Power Limit Value	75
PEG0 Slot Power Limit Scale	[1.0x]
PEG0 Physical Slot Number	1

Detect Non-Compliance Device [Disabled]  
 Program PCIe ASPM after OpROM [Disabled]  
 Program Static Phase1 Eq [Enabled]

- ▶ Gen3 Root Port Preset value for each Lane
- ▶ Gen3 Endpoint Preset value for each Lane
- ▶ Gen3 Endpoint Hint value for each Lane
- ▶ Gen3 RxCTLE Control

Gen3 Adaptive Software Equalization

Always Attempt SW EQ	[Disabled]
Number of Presets to test	[Auto]
Allow PERST# GPIO Usage	[Enabled]
SW EQ Enable VOC	[Auto]
Jitter Dwell Time	3000
Jitter Error Target	2
VOC Dwell Time	10000

Enable or Disable the Root Port

--- Select Screen  
 ↑↓: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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### Enable Root Port

Enables or disables the root port.

### Max Link Speed

Configures the maximum link speed of the PEG device.

### PEG0 Slot Power Limit Scale

Configures the scale used for the slot power limit value.

### Detect Non-Compliance Device

Enables or disables detection of non-compliance device in the PEG.

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Chipset

Max Link Speed	[Auto]
PEG0 Slot Power Limit Value	75
PEG0 Slot Power Limit Scale	[1.0x]
PEG0 Physical Slot Number	1

Detect Non-Compliance Device [Disabled]  
 Program PCIe ASPM after OpROM [Disabled]  
 Program Static Phase1 Eq [Enabled]

- ▶ Gen3 Root Port Preset value for each Lane
- ▶ Gen3 Endpoint Preset value for each Lane
- ▶ Gen3 Endpoint Hint value for each Lane
- ▶ Gen3 RxCTLE Control

Gen3 Adaptive Software Equalization

Always Attempt SW EQ	[Disabled]
Number of Presets to test	[Auto]
Allow PERST# GPIO Usage	[Enabled]
SW EQ Enable VOC	[Auto]
Jitter Dwell Time	3000
Jitter Error Target	2
VOC Dwell Time	10000
VOC Error Target	2

Generate BDAT PEG Margin Data [Disabled]  
 PCIe Rx CEM Test Mode [Disabled]  
 PCIe Spread Spectrum Clocking [Enabled]

--- Select Screen  
 ↑↓: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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### Program PCIe ASPM After OpROM

Enabled PCIe ASPM is programmed after OpROM.  
 Disabled PCIe ASPM is programmed before OpROM.

### Program Static Phase1 Eq

Enables or disables program static phase1.

### Always Attempt SW EQ

Enables or disables Always Attempt SW EQ, even if it has been done once.

### Number of Presets to Test

Configures the number of presets to test.

### Allow PERST# GPIO Usage

Enables or disables GPIO-based resets to PEG endpoint(s) during margin search.

### SW EQ Enable VOC

Configures the SW EQ Enable VOC mode.

### Generate BDAT PEG Margin Data

Enables or disables the generation of BDAT PEG margin tables.

### PCIe Rx CEM Test Mode

Enables or disables PCIe Rx CEM Test mode.

### PCIe Spread Spectrum Clocking

Enables or disables PCIe Spread Spectrum Clocking for compliance testing.

### Gen3 Root Port Preset Value for Each Lane

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Chipset

Gen3 Root Port Preset value for each Lane

Lane 0	7
Lane 1	7
Lane 2	7
Lane 3	7
Lane 4	7
Lane 5	7
Lane 6	7
Lane 7	7
Lane 8	7
Lane 9	7
Lane 10	7
Lane 11	7
Lane 12	7
Lane 13	7
Lane 14	7
Lane 15	7

←: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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Displays the root port preset value for lane 0 to lane 15.

### Gen3 Endpoint Preset Value for Each Lane

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Chipset

Gen3 Endpoint Preset value for each Lane	
Lane 0	7
Lane 1	7
Lane 2	7
Lane 3	7
Lane 4	7
Lane 5	7
Lane 6	7
Lane 7	7
Lane 8	7
Lane 9	7
Lane 10	7
Lane 11	7
Lane 12	7
Lane 13	7
Lane 14	7
Lane 15	7

→←: Select Screen  
 ↑↓: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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Displays the endpoint preset value for lane 0 to lane 15.

### Gen3 Endpoint Hint Value for Each Lane

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Chipset

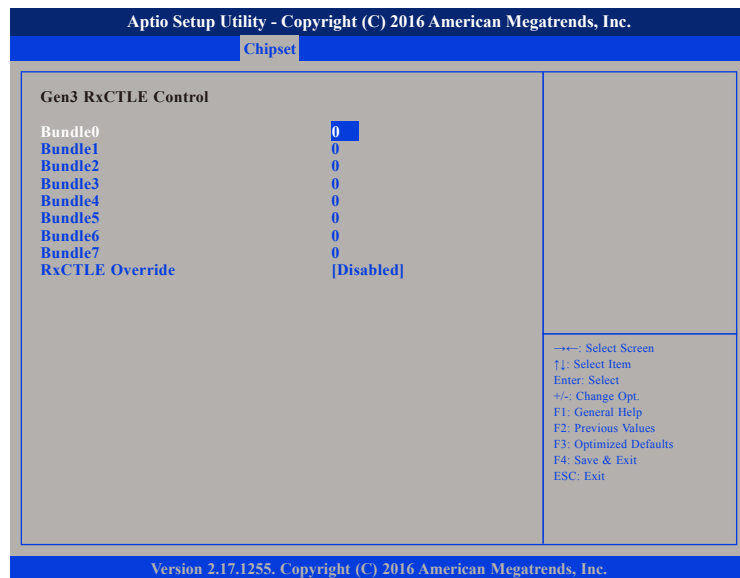
Gen3 Endpoint Hint value for each Lane	
Lane 0	2
Lane 1	2
Lane 2	2
Lane 3	2
Lane 4	2
Lane 5	2
Lane 6	2
Lane 7	2
Lane 8	2
Lane 9	2
Lane 10	2
Lane 11	2
Lane 12	2
Lane 13	2
Lane 14	2
Lane 15	2

→←: Select Screen  
 ↑↓: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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Displays the endpoint hint value for lane 0 to lane 15.

## Gen3 RxCTLE Control



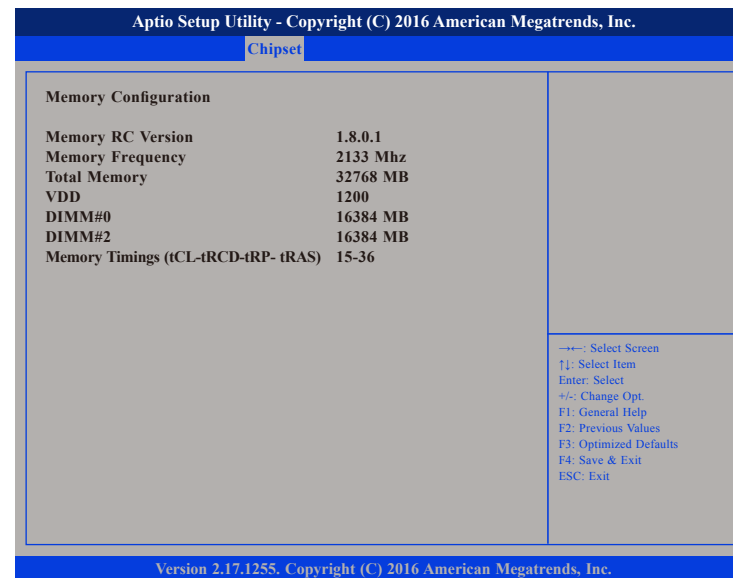
### Bundle0 to Bundle7

Displays the RxCTLE values for Bundle0 to Bundle7.

### RxCTLE Override

Enables or disables RxCTLE override.

## Memory Configuration



Detects and displays the information on the memory installed.

## PCH-IO Configuration



### PCH LAN Controller

Enables or disables onboard NIC.

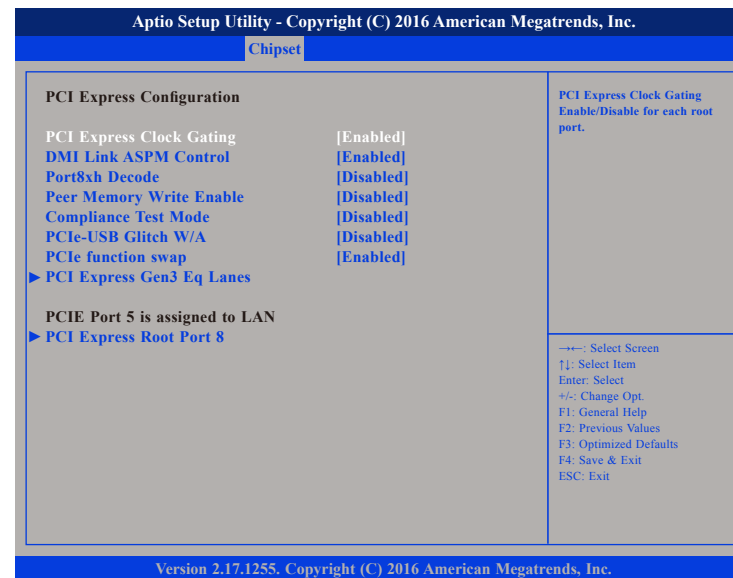
### Wake on LAN

Enables or disables integrated LAN to wake the system.

### Restore on AC Power Loss

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

## PCI Express Configuration



### PCI Express Clock Gating

Enables or disables PCI Express clock gating for each root port.

### DMI Link ASPM Control

Enables or disables Active State Power Management of the DMI link

### Port8xh Decode

Enables or disables PCI Express Port8xh Decode.

### Peer Memory Write Enable

Enables or disables Peer Memory Write.



### Compliance Test Mode

Enables or disables compliance test mode.

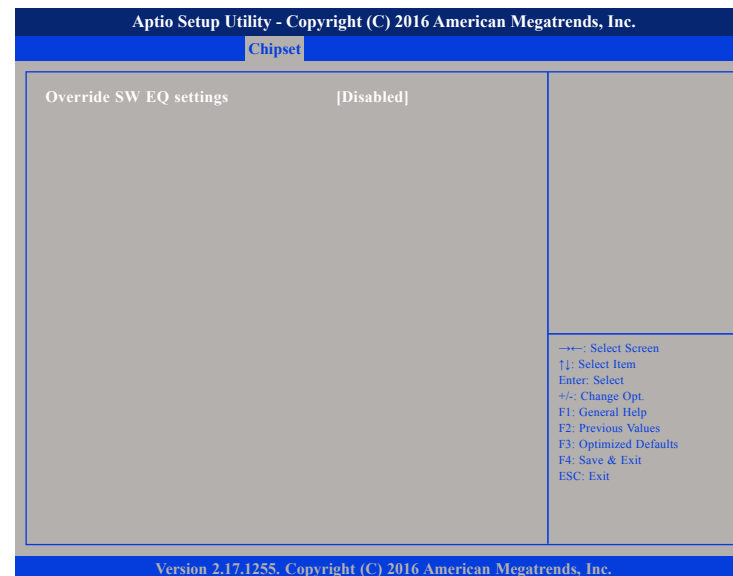
### PCIe-USB Glitch W/A

Enables or disables PCIe-USB glitch workaround.

### PCIe Function Swap

Enables or disables the PCIO root port function swap. If any function other than 0th is enabled, 0th will become visible.

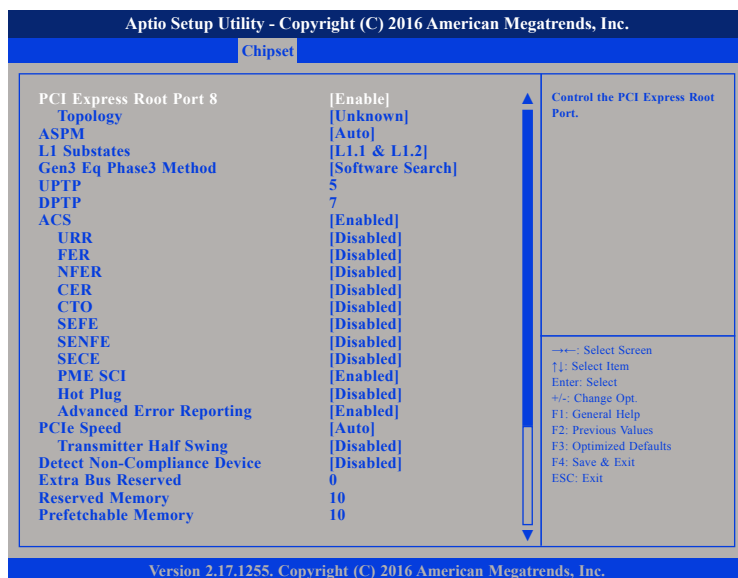
### PCI Express Gen3 Eq Lanes



### Override SW EQ Settings

Enables or disables Override SW EQ settings.

## PCI Express Root Port 8



### PCI Express Root Port 8

Enables or disables PCI Express root port 8. Selecting Auto will disable unused root port automatically for the most optimum power savings.

### Topology

Identifies what type of SATA connection is used.

### ASPM

Configures the ASPM level.

### L1 Substates

Configures the L1 Substates settings.

### Gen3 Eq Phase3 Method

Configures the Gen3 Equalization Phase3 Method type.

### ACS

Enables or disables Access Control Services Extended capability.

### URR

Enables or disables PCI Express Unsupported Request Reporting.

### FER

Enables or disables PCI Express Device Fatal Error Reporting.

### NFER

Enables or disables PCI Express Device Non-Fatal Error Reporting.

### CER

Enables or disables PCI Express Device Correctable Error Reporting.

### CTO

Configures the PCI Express Completion Timer T0.

### SEFE

Enables or disables PCI Express System Error on Fatal Error.

### SENFE

Enables or disables Root PCI Express System Error on Non-Fatal Error.

### SECE

Enables or disables Root PCI Express System Error on Correctable Error.

### PME SCI

Enables or disables PCI Express PME SCI.

### Hot Plug

Enables or disables PCIe hot-plug support.

## PCI Express Root Port 8 Cont.



### Advanced Error Reporting

Enables or disables Advanced Error Reporting.

### PCIe Speed

Configures the speed of the PCI Express port.

### Transmitter Half Swing

Enables or disables Transmitter Half Swing mode.

### Detect Non-Compliance Device

Enables or disables detection of non-compliance PCI Express device. If enabled, POST will take more time.

### PCIe LTR

Enables or disables PCIe latency reporting.

### PCIe LTR Lock

Enables or disables PCIe LTR Configuration Lock.

### PCIe CLKREQ Mapping Override

Enables or disables PCIe CLKREQ Mapping Override support.

### Snoop Latency Override

Snoop latency override for PCH PCIe.

Disabled

Disable override.

Manual

Manually enter override values.

Auto (default)

Maintain default BIOS flow.

### Non Snoop Latency Override

Non-Snoop latency override for PCH PCIe.

Disabled

Disable override.

Manual

Manually enter override values.

Auto (default)

Maintain default BIOS flow.

## USB Configuration



### USB Precondition

Enables or disables precondition work on USB host controller and root ports for faster enumeration.

### XHCI Disable Compliance Mode

Enables or disables XHCI link compliance mode. Setting FALSE will not disable link compliance mode, while setting TRUE will disable link compliance mode.

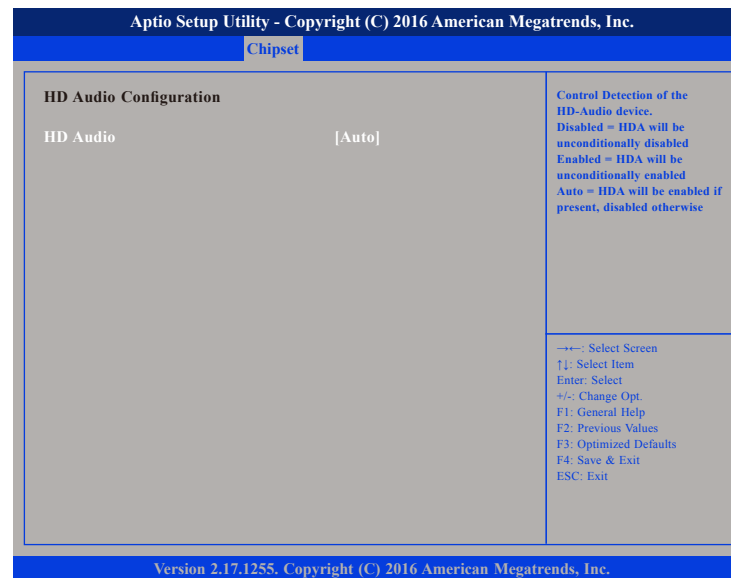
### xDCI Support

Disables or enables xDCI support.

### USB Port Disable Override

Enables or disables the USB port from reporting a device connection to the controller.

## HD Audio Configuration



### HD Audio

Control detection of the HD-Audio device.

Disabled

HDA will be unconditionally disabled.

Enabled

HDA will be unconditionally enabled.

Auto

HDA will be enabled if present, disabled otherwise.

## Security

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Main	Advanced	Chipset	Security	Boot	Save & Exit
<p><b>Password Description</b></p> <p>If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User Will have Administrator rights. The password length must be in the following range:</p> <p>Minimum length                    3 Maximum length                    20</p> <p>Administrator Password User Password</p>		<p>Set Administrator Password</p>			
		<p>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</p>			
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### Administrator Password

Select this to reconfigure the administrator's password.

### User Password

Select this to reconfigure the user's password.

## Boot

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.					
Main	Advanced	Chipset	Security	Boot	Save & Exit
<p><b>Boot Configuration</b></p> <p>Setup Prompt Timeout                    1 Bootup NumLock State                    [On] Quiet Boot                    [Disabled]</p> <p><b>Boot Option Priorities</b></p> <p>Boot Option #1                    [P0: 32GB SATA Flash Drive ] Boot Option #2                    [IBA GE Slot 0100 v1535]</p> <p>Fast Boot                    [Disabled]</p> <p>New Boot Option Policy                    [Default]</p> <p><b>Network Device BBS Priorities</b> <b>Hard Drive BBS Priorities</b></p>		<p>Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.</p>			
		<p>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</p>			
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### Setup Prompt Timeout

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

### Bootup NumLock State

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

### Quiet Boot

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

### Boot Option Priorities

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

### Fast Boot

When enabled, the BIOS will shorten or skip some check items during POST. This will decrease the time needed to boot the system.

### New Boot Option Policy

Controls the placement of newly detected UEFI boot options.

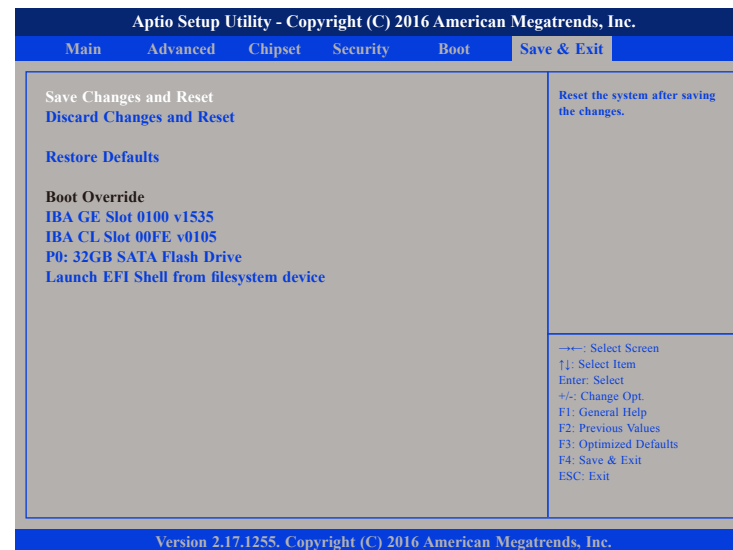
### Network Device BBS Priorities

Sets the boot order sequence for PXE network devices.

### Hard Drive BBS Priorities

Sets the boot order sequence for hard drive devices.

## 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>.

### **Launch EFI Shell from Filesystem Device**

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

# APPENDIX A: POWER CONSUMPTION

Chipset	Voltage	12V	5V	3.3V	5V	3.3V	1V	1V	1.05V
	Net Name	VCC12	VCC5	VCC3	5VSB (Standby)	3VSB (Standby)	V1P0A (Standby)	VCCST	VCCSA
	Input Source								
	Chipset Item					PCH	PCH	CPU	CPU
Skylake-S (65W) Quad Core								0.20A	11.10A
PCH-H (H110 co-lay Q170)				7mA		1.01A	7.85A		
DDR4 SO-DIMM x2									
HDMI/DP Combo Connector*2			1.00A	1.00A					
PCIe x16 Slot	6.00A			3.00A					
Mini-PCIe Card						1.10A			
Intel LAN - I219						0.50A			
Intel LAN - I211						0.18A			
USB 3.0 x4					3.60A				
USB 2.0 x2					1.00A				
USB 2.0 x4 (Pin Header)					2.00A				
ALC886			0.50A		0.50A				
CPU + System FAN	2.00A								
COM Port (RS232*3 RS232 422 485*1)	0.50A	0.50A							
SIO (ITE8786)			1.00A	0.50A	0.50A				
SP338									
CH7511B				0.05A					
<b>Total Current</b>		8.50A	3.00A	4.55A	7.60A	2.79A	7.85A	0.20A	11.10A
<b>Total Watt</b>		102.00W	15.00W	15.03W	38.00W	9.21W	7.85W	0.20W	11.66W