NEXCOM International Co., Ltd.

IoT Automation Solutions Business Group

COM Express Type 6
ICES 620-HCAD1-USB

User Manual

NEXCOM International Co., Ltd.
Published October 2022

www.nexcom.com

Contents

PREFACE

Copyright

Disclaimer

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

Acknowledgements

ICES 620-HCAD1-USB 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 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.

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.

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 the equipment from any AC outlet before cleaning or installing a component inside the chassis. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. To prevent electrostatic build-up, leave the board in its anti-static bag until you are ready to install it.

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

6. Keep the board away from humidity.

7. Put the board on a stable surface. Dropping it or letting it fall may cause damage.

8. Wear anti-static wrist strap.

9. Do all preparation work on a static-free surface.

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

11. Hold the board only by its edges. Be careful not to touch any of the components, contacts or connections.

12. All cautions and warnings on the board should be noted.

13. Use the correct mounting screws and do not over tighten the screws.

14. Keep the original packaging and the anti-static bag; in case the board has to be returned for repair or replacement.

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.

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, Zhongzheng Rd.,
Zhonghe District, New Taipei City, 23586,
Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
www.nexcom.com

Asia

Taiwan

NexAIoT Headquarters

Industry 4.0 and Cloud Services

13F, No.922, Zhongzheng Rd.,
Zhonghe District, New Taipei City,
23586, Taiwan, R.O.C.
Tel: +886-2-8226-7796
Fax: +886-2-8226-7926
Email: jacobhuang@nexaiot.com
www.nexaiot.com

NexAIoT Co., Ltd.

Taichung Office

16F, No.250, Sec.2, Chongde Rd.,
Beitun District,
Taichung City, 406, Taiwan, R.O.C.
Tel: +886-4-2249-1179
Fax: +886-4-2249-1172
Email: jacobhuang@nexaiot.com
www.nexaiot.com

NexCOBOT Taiwan Co., Ltd.

13F, No.916, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7926
Email: jennyshern@nexcobot.com
www.nexcobot.com

GreenBase Technology Corp.

13F, No.922, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7900
Email: vivianlin@nexcom.com.tw
www.nexcom.com.tw

DivioTec Inc.

19F-1A, No.97, Sec.4, ChongXin Rd.,
Sanchong District,
New Taipei City, 24161, Taiwan, R.O.C.
Tel: +886-2-8976-3077
Email: sales@diviotec.com
www.diviotec.com

AIoT Cloud Corp.

13F, No.922, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
Email: alantsai@aiotcloud.net
www.aiotcloud.dev

EMBUX TECHNOLOGY CO., LTD.

13F, No.916, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
Email: info@embux.com
www.embux.com

TMR TECHNOLOGIES CO., LTD.

13F, No.916, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
Email: services@tmrtek.com
www.tmrtek.com

China
NEXSEC Incorporated

201, Floor 2, Unit 2, Building 15, Yard 3,
Gaolizhang Road, Haidian District,
Beijing, 100094, China
Tel: +86-10-5704-2680
Fax: +86-10-5704-2681
Email: marketing@nexsec.cn
www.nexsec.cn

NEXCOM Shanghai

Room 406-407, Building C, No 154, Lane 953,
Jianchuan Road, Minhang District,
Shanghai, 201108, China
Tel: +86-21-5278-5868
Fax: +86-21-3251-6358
Email: sales@nexcom.cn
www.nexcom.cn

NEXCOM Surveillance Technology Corp.

Floor 8, Building B3, Xiufeng Industrial Zone,
GanKeng Community, Buji Street,
LongGang District,
ShenZhen, 518112, China
Tel: +86-755-8364-7768
Fax: +86-755-8364-7738
Email: steveyang@nexcom.com.tw
www.nexcom.cn

NEXGOL Chongqing

1st Building No.999,
Star Boulevard, Yongchuan Dist,
Chongqing City, 402160, China
Tel: +86-23-4960-9080
Fax: +86-23-4966-5855
Email: sales@nexgol.com.cn
www.nexcom.cn

Beijing NexGemo Technology Co.,Ltd.

Room 205, No.1, Fazhan Rd.,
Beijing International Information Industry Base,
Changping District,
Beijing, 102206, China
Tel: +86-10-8072-2025
Fax: +86-10-8072-2022
Email: sales@nexgemo.cn
www.nexgemo.com

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
www.nexcom-jp.com

America
USA
NEXCOM USA

46665 Fremont Blvd.,
Fremont CA 94538, USA
Tel: +1-510-656-2248
Fax: +1-510-656-2158
Email: sales@nexcom.com
www.nexcomusa.com

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.com

Package Contents

Before continuing, verify that the ICES 620-HCAD1-USB package that you received is complete. Your package should have all the items listed in the following tables of thermal pads and screws. The fan kit and heat spreader package is optional.

Item	Name	Qty
1	ICES 620-HCAD1-USB Motherboard	1
2	Heat Spreader	1

Ordering Information

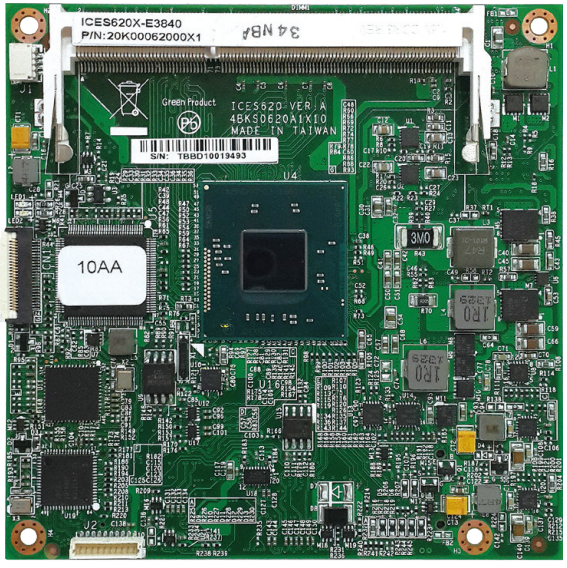
The following information below provides ordering information for ICES 620-HCAD1-USB.

ICES 620-HCAD1-USB (P/N: 10K00062012X2)

COM Express Type 6, compact module, embedded Intel Atom® J1900, support 2 channel DDR3L non-ECC/SO-DIMMs 1066/1333MHz up to 8GB, support 4 x PCIe x1/4 x USB 3.0/7 x USB 2.0/2 x SATA 2.0 and GbE/1 x VGA/2 x DP compatible with HDMI and DVI support 3 display

Chapter 1: Product Introduction

Overview - ICES 620-HCAD1-USB



Key Features

- Onboard Intel Atom® J1900 product family (codename Braswell)
- 2 channel DDR3L non-ECC/SO-DIMMs 1066/1333MHz up to 8GB
- Support three independent displays with DisplayPort, HDMI, and VGA outputs
- 4 x PCIe x1, 4 x USB 3.0, 7 x USB 2.0, 2 x SATA 2.0 and GbE

Hardware Specifications

CPU Support

- Intel Atom® J1900 Quad core processor up to 2.00 GHz

Main Memory

- Dual DDR3L/SO DIMMs, non-ECC support 1066/1333MHz memory up to 8GB

BIOS

- AMI System BIOS
- Plug and play support
- Advanced power management and advanced configuration & power interface support

Display

- Intel® HD graphics with DX9 support
- Two DPs interfaces down to the carried board
- Standard VGA interface

COM Express Connector

- AB:
  - VGA / HDA / 2x SATA / GbE / 2x PCIex1 (without Gbe) / 7x USB2.0 / LPC bus / SDIO (without GPIO) / GPIO / SMBus (I2C) / SPI BIOS
- CD:
  - 4x USB3.0 / 2x DP (HDMI)

Power Requirements

- +12V, +5VSB, +3.3V RTC power
- Support both AT and ATX power supply mode
- One 3 pins 90 degree edge-connector for DC +12V fan

Dimensions

- 95mm (W) x 95mm (L)

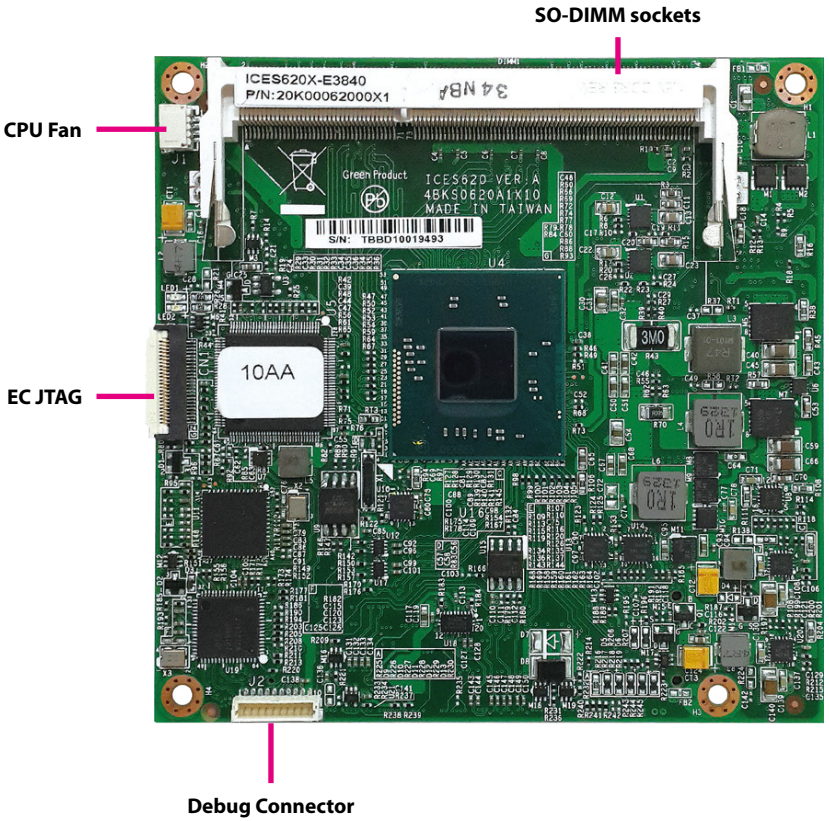
Environment

- Board level operating temperatures: 0°C to 60°C.
- Storage temperatures: -20°C to 80°C
- Relative humidity:
  10% to 90% (operating, non-condensing)
  5% to 95% (non-operating, non-condensing)

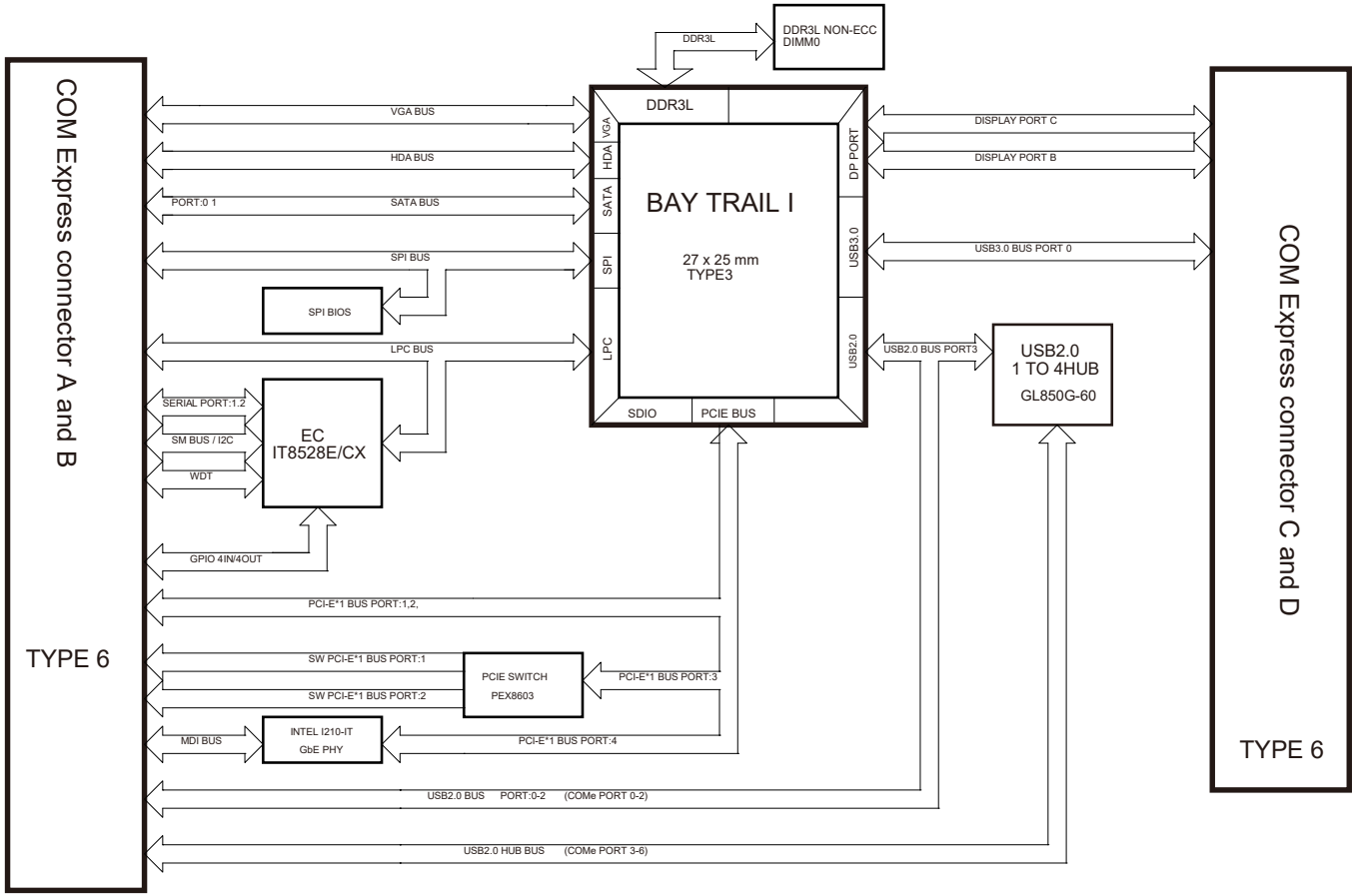
Certifications

- Meet CE/FCC Class B

Knowing Your ICES 620-HCAD1-USB



Block Diagram



Chapter 2: Connector Pinout Assignments

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.

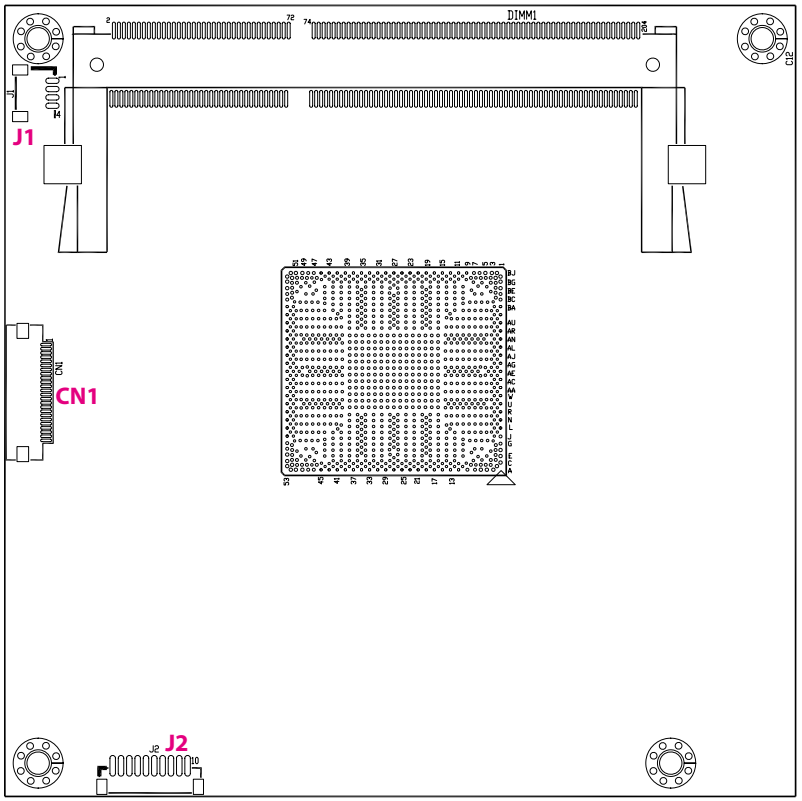
Follow the guidelines below to avoid damage to your computer or yourself:

- 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.

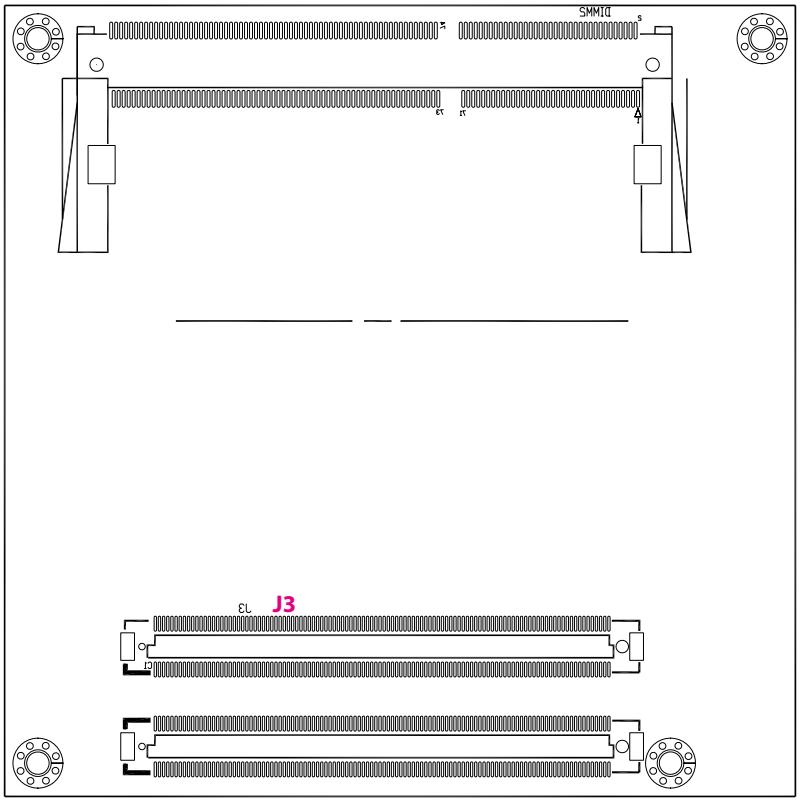
Locations of the Connectors

The figures below show the locations of the connectors for ICES 620-HCAD1-USB.

Top View



Bottom View

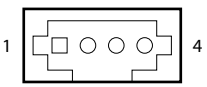


Connector Pin Definitions

Internal Connectors

CPU Fan

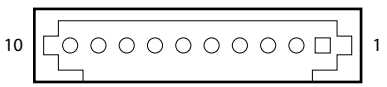
Connector type: 1x4 4-pin header
Connector location: J1



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

Debug Connector

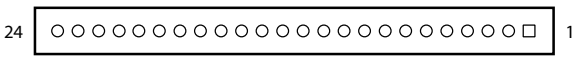
Connector type: 1x10 10-pin header
Connector location: J2



Pin	Definition	Pin	Definition
1	GND	2	PLTRST#
3	LPC_33MCLK	4	LPC_FRAM#
5	LPC_AD3	6	LPC_AD2
7	LPC_AD1	8	LPC_AD0
9	VCC3	10	VCC3

EC JTAG

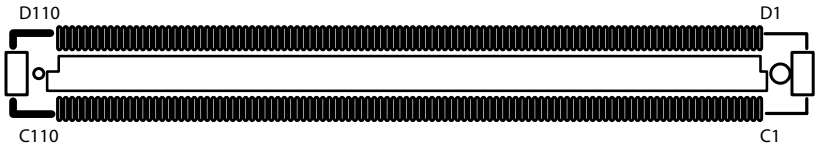
Connector type: 1x24 24-pin header
Connector location: CN1



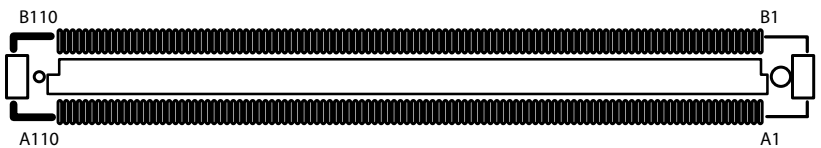
Pin	Definition	Pin	Definition
1	EC_KSO0	2	EC_KSO1
3	EC_KSO2	4	EC_KSO3
5	EC_KSO4	6	EC_KSO5
7	EC_KSO6	8	EC_KSO7
9	EC_KSO8	10	EC_KSO9
11	EC_KSO10	12	GND
13	GND	14	GND
15	GND	16	GND
17	EC_KSI0	18	EC_KSI1
19	EC_KSI2	20	EC_KSI3
21	EC_KSI4	22	EC_KSI5
23	GND	24	GND

High Speed Board-to-Board Connector: Row A and B, Row C and D

Connector location: J3



COM Express C&D Connector



COM Express A&B Connector

Pin	Definition	Pin	Definition	Pin	Definition	Pin	Definition
A1	GND(FIXED)	B1	GND(FIXED)	C1	GND(FIXED)	D1	GND(FIXED)
A2	GBE0_MDI3-	B2	GBE0_ACT#	C2	GND	D2	GND
A3	GBE0_MDI3+	B3	LPC_FRAME#	C3	USB_SSRX0-	D3	USB_SSTX0-
A4	GBE0_LINK100#	B4	LPC_AD0	C4	USB_SSRX0+	D4	USB_SSTX0+
A5	GBE0_LINK1000#	B5	LPC_AD1	C5	GND	D5	GND
A6	GBE0_MDI2-	B6	LPC_AD2	C6	USB_SSRX1-	D6	USB_SSTX1-
A7	GBE0_MDI2+	B7	LPC_AD3	C7	USB_SSRX1-	D7	USB_SSTX1+
A8	GBE0_LINK#	B8	LPC_DRQ0#	C8	GND	D8	GND
A9	GBE0_MDI1-	B9	LPC_DRQ1#	C9	USB_SSRX2-	D9	USB_SSTX2-
A10	GBE0_MDI1+	B10	LPC_CLK	C10	USB_SSRX2-	D10	USB_SSTX2+
A11	GND(FIXED)	B11	GND(FIXED)	C11	GND(FIXED)	D11	GND(FIXED)
A12	GBE0_MDI0-	B12	PWRBTN#	C12	USB_SSRX3-	D12	USB_SSTX3-
A13	GBE0_MDI0+	B13	SMB_CK	C13	USB_SSRX3-	D13	USB_SSTX3+

Pin	Definition	Pin	Definition	Pin	Definition	Pin	Definition
A14	NC	B14	SMB_DAT	C14	GND	D14	GND
A15	SUS_S3#	B15	SMB_ALERT#	C15	NC	D15	DDI1_CTRL_CLK_AUX+
A16	SATA0_TX+	B16	SATA1_TX+	C16	NC	D16	DDI1_CTRL_DATA_AUX-
A17	SATA0_TX-	B17	SATA1_TX-	C17	RSVD	D17	RSVD
A18	SUS_S4#	B18	SUS_STAT#	C18	RSVD	D18	RSVD
A19	SATA0_RX+	B19	SATA1_RX+	C19	NC	D19	NC
A20	SATA0_RX-	B20	SATA1_RX-	C20	NC	D20	NC
A21	GND(FIXED)	B21	GND(FIXED)	C21	GND(FIXED)	D21	GND(FIXED)
A22	NC	B22	NC	C22	NC	D22	NC
A23	NC -	B23	NC	C23	NC	D23	NC
A24	SUS_S4#	B24	PWR_OK	C24	DDI1_HPD	D24	RSVD
A25	NC	B25	NC	C25	NC	D25	RSVD
A26	NC	B26	NC	C26	NC	D26	DDI1_PAIR0+
A27	BATLOW#	B27	WDT	C27	RSVD	D27	DDI1_PAIR0-
A28	(S)ATA_ACT#	B28	NC	C28	RSVD	D28	RSVD
A29	AC/HDA_SYNC	B29	AC/HDA_SDIN1	C29	NC	D29	DDI1_PAIR1+
A30	AC/HDA_RST#	B30	AC/HDA_SDIN0	C30	NC	D30	DDI1_PAIR1-
A31	GND(FIXED)	B31	GND(FIXED)	C31	GND(FIXED)	D31	GND(FIXED)
A32	AC/HDA_BITCLK	B32	SPKR	C32	DDI2_CTRL_CLK_AUX+	D32	DDI1_PAIR2+
A33	AC/HDA_SDOUT	B33	I2C_CK	C33	DDI2_CTRL_DATA_AUX-	D33	DDI1_PAIR2-
A34	BIOS_DIS0#	B34	I2C_DAT	C34	DDI2_DDC_AUX_SEL	D34	DDI1_DDC_AUX_SEL
A35	THRMTRIP#	B35	THRM#	C35	RSVD	D35	RSVD
A36	USB6-	B36	USB7-	C36	NC	D36	DDI1_PAIR3+
A37	USB6+	B37	USB7+	C37	NC	D37	DDI1_PAIR3-
A38	USB_6_7_OC#	B38	USB_4_5_OC#	C38	NC	D38	RSVD
A39	USB4-	B39	USB5-	C39	NC	D39	DDI2_PAIR0+
A40	USB4+	B40	USB5+	C40	NC	D40	DDI2_PAIR0-
A41	GND(FIXED)	B41	GND(FIXED)	C41	GND(FIXED)	D41	GND(FIXED)

Pin	Definition	Pin	Definition	Pin	Definition	Pin	Definition
A42	USB2-	B42	USB3-	C42	NC	D42	DDI2_PAIR1+
A43	USB2+	B43	USB3+	C43	NC	D43	DDI2_PAIR1-
A44	USB_2_3_OC#	B44	USB_0_1_OC#	C44	NC	D44	DDI2_HPD
A45	USB0-	B45	USB1-	C45	RSVD	D45	RSVD
A46	USB0+	B46	USB1+	C46	NC	D46	DDI2_PAIR2+
A47	VCC_RTC	B47	EXCD1_PERST#	C47	NC	D47	DDI2_PAIR2-
A48	EXCD0_PERST#	B48	NC	C48	RSVD	D48	RSVD
A49	NC	B49	SYS_RESET#	C49	NC	D49	DDI2_PAIR3+
A50	LPC_SERIRQ	B50	CB_RESET#	C50	NC	D50	DDI2_PAIR3-
A51	GND(FIXED)	B51	GND(FIXED)	C51	GND(FIXED)	D51	GND(FIXED)
A52	NC	B52	NC	C52	NC	D52	NC
A53	NC	B53	NC	C53	NC	D53	NC
A54	GPI0	B54	GPO1	C54	TYPE0#	D54	NC
A55	NC	B55	PCIE_RX4+	C55	NC	D55	NC
A56	NC	B56	PCIE_RX4-	C56	NC	D56	NC
A57	GND	B57	GPO2	C57	TYPE1#	D57	TYPE2#
A58	PCIE_TX4+	B58	PCIE_RX3+	C58	NC	D58	NC
A59	PCIE_TX4-	B59	PCIE_RX3-	C59	NC	D59	NC
A60	GND(FIXED)	B60	GND(FIXED)	C60	GND(FIXED)	D60	GND(FIXED)
A61	PCIE_TX3+	B61	PCIE_RX2+	C61	NC	D61	NC
A62	PCIE_TX3-	B62	PCIE_RX2-	C62	NC	D62	NC
A63	GPI1	B63	GPO3	C63	RSVD	D63	RSVD
A64	PCIE_TX2+	B64	PCIE_RX1+	C64	RSVD	D64	RSVD
A65	PCIE_TX2-	B65	PCIE_RX1-	C65	NC	D65	NC
A66	GND	B66	WAKE0#	C66	NC	D66	NC
A67	GPI2	B67	WAKE1#	C67	RSVD	D67	GND
A68	PCIE_TX1+	B68	PCIE_RX0+	C68	NC	D68	NC
A69	PCIE_TX1-	B69	PCIE_RX0-	C69	NC	D69	NC

Pin	Definition	Pin	Definition	Pin	Definition	Pin	Definition
A70	GND(FIXED)	B70	GND(FIXED)	C70	GND(FIXED)	D70	GND(FIXED)
A71	NC	B71	NC	C71	NC	D71	NC
A72	NC	B72	NC	C72	NC	D72	NC -
A73	NC	B73	NC	C73	GND	D73	GND
A74	NC	B74	NC	C74	NC	D74	NC
A75	NC	B75	NC	C75	NC	D75	NC
A76	NC	B76	NC	C76	GND	D76	GND
A77	NC	B77	NC	C77	RSVD	D77	RSVD
A78	NC	B78	NC	C78	NC	D78	NC
A79	NC	B79	NC	C79	NC	D79	NC
A80	GND(FIXED)	B80	GND(FIXED)	C80	GND(FIXED)	D80	GND(FIXED)
A81	NC	B81	NC	C81	NC	D81	NC
A82	NC	B82	NC	C82	NC	D82	NC
A83	NC	B83	NC	C83	RSVD	D83	RSVD
A84	NC	B84	VCC_5V_SBY	C84	GND	D84	GND
A85	GPI3	B85	VCC_5V_SBY	C85	NC	D85	NC
A86	NC	B86	VCC_5V_SBY	C86	NC	D86	NC
A87	NC	B87	VCC_5V_SBY	C87	GND	D87	GND
A88	PCIE_CLK_REF+	B88	BIOS_DIS1#	C88	NC	D88	NC
A89	PCIE_CLK_REF-	B89	VGA_RED	C89	NC	D89	NC
A90	GND(FIXED)	B90	GND(FIXED)	C90	GND(FIXED)	D90	GND(FIXED)
A91	SPI_POWER	B91	VGA_GRN	C91	NC	D91	NC
A92	SPI_MISO	B92	VGA_BLUE	C92	NC	D92	NC
A93	GPO0	B93	VGA_HSYNC	C93	GND	D93	GND
A94	SPI_CLK	B94	VGA_VSYNC	C94	NC	D94	NC
A95	SPI_MOSI	B95	VGA_I2C_CK	C95	NC	D95	NC
A96	TPM_PP	B96	VGA_I2C_DAT	C96	GND	D96	GND
A97	TYPE10#	B97	SPI_CS#	C97	RSVD	D97	RSVD

Pin	Definition	Pin	Definition	Pin	Definition	Pin	Definition
A98	SER0_TX	B98	RSVD	C98	NC	D98	NC
A99	SER0_RX	B99	RSVD	C99	NC	D99	NC
A100	GND(FIXED)	B100	GND(FIXED)	C100	GND(FIXED)	D100	GND(FIXED)
A101	SER1_TX	B101	FAN_PWMOUT	C101	NC	D101	NC
A102	SER1_RX	B102	FAN_TACHIN	C102	NC	D102	NC
A103	NC	B103	NC	C103	GND	D103	GND
A104	VCC_12V	B104	VCC_12V	C104	VCC_12V	D104	VCC_12V
A105	VCC_12V	B105	VCC_12V	C105	VCC_12V	D105	VCC_12V
A106	VCC_12V	B106	VCC_12V	C106	VCC_12V	D106	VCC_12V
A107	VCC_12V	B107	VCC_12V	C107	VCC_12V	D107	VCC_12V
A108	VCC_12V	B108	VCC_12V	C108	VCC_12V	D108	VCC_12V
A109	VCC_12V	B109	VCC_12V	C109	VCC_12V	D109	VCC_12V
A110	GND(FIXED)	B110	GND(FIXED)	C110	GND(FIXED)	D110	GND(FIXED)

Chapter 3: BIOS Setup

This chapter describes how to use the BIOS setup program for the ICES 620-HCAD1-USB. 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 website 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:

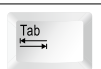
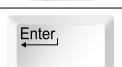
- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

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-menus 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 Language

Selects the language of the BIOS system.

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.

BOM Config and Onboard LAN PXE
Configurations for BOM and LAN PXE ROM.

ACPI Settings

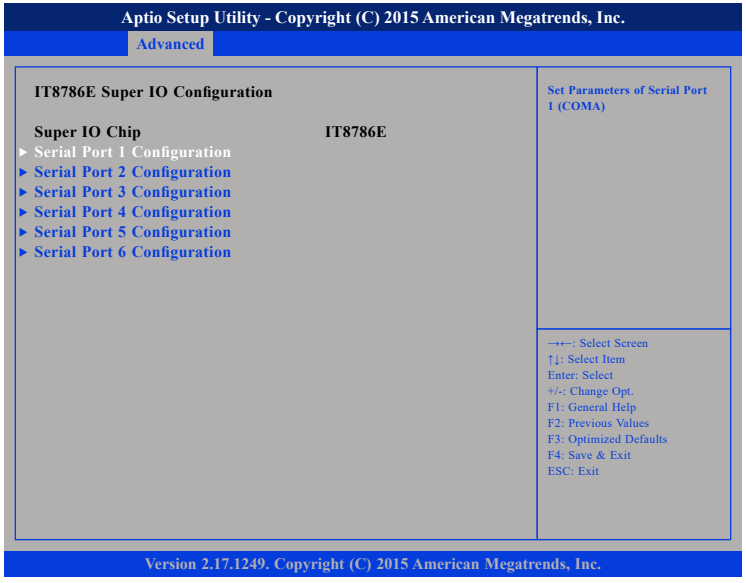
This section is used to configure ACPI Settings.

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.

IT8786E Super IO Configuration

This section is used to configure serial ports 1 to 6 of the super IO.

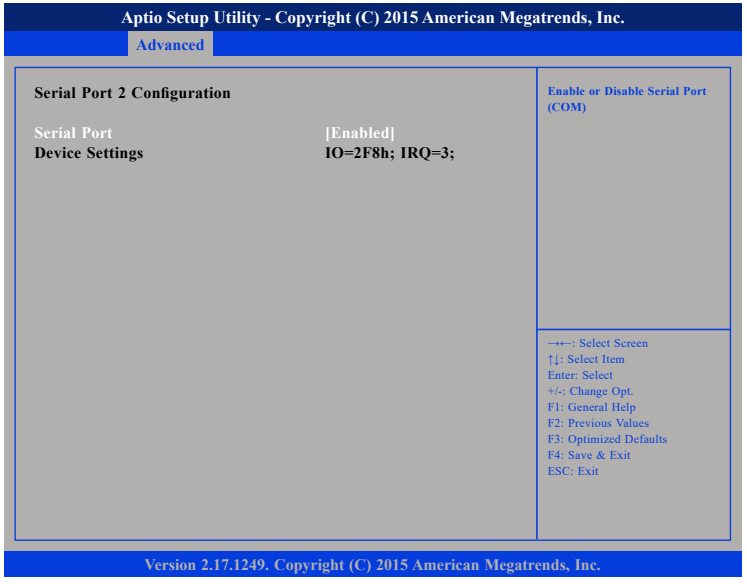


Super IO Chip

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

Serial Port 2 Configuration

This section is used to configure serial port 2.

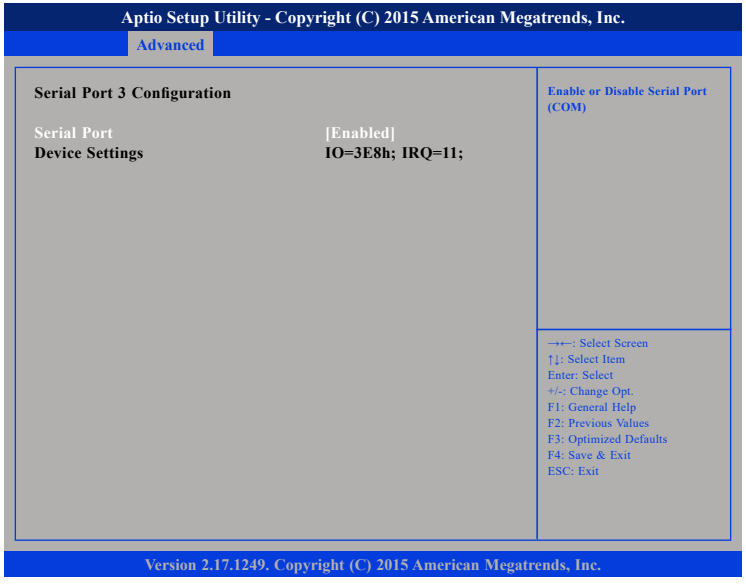


Serial Port

Enables or disables the serial port.

Serial Port 3 Configuration

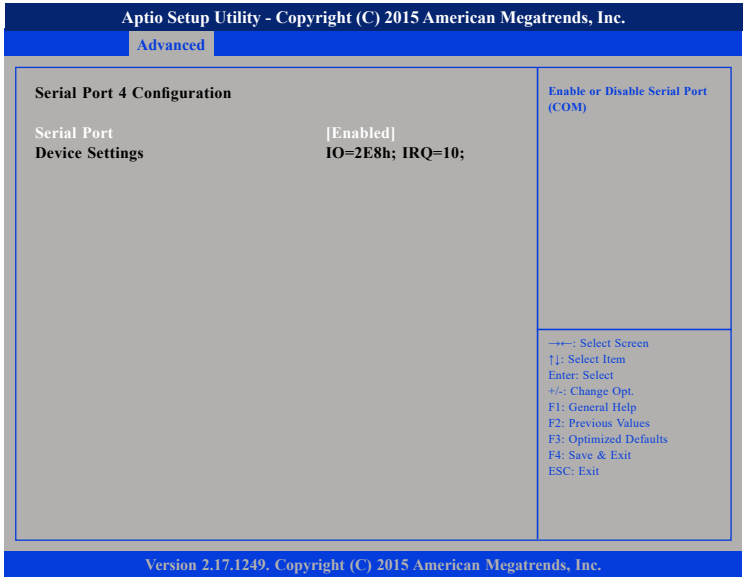
This section is used to configure serial port 3.



Serial Port
Enables or disables the serial port.

Serial Port 4 Configuration

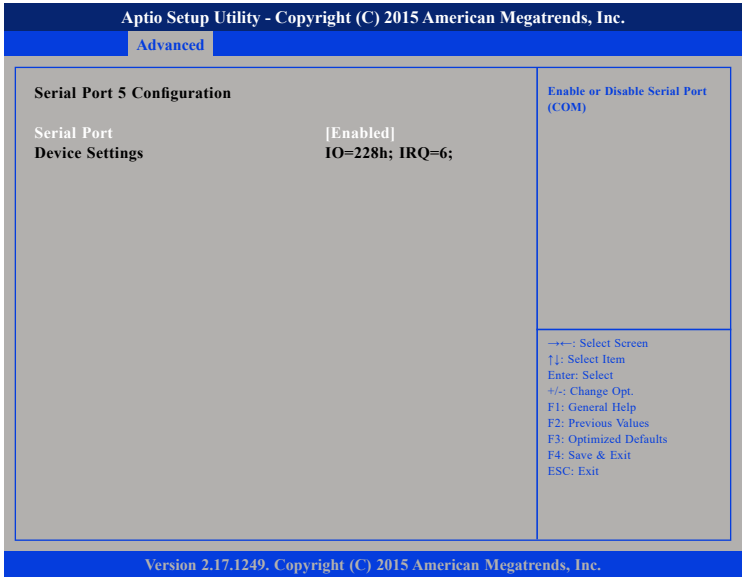
This section is used to configure serial port 4.



Serial Port
Enables or disables the serial port.

Serial Port 5 Configuration

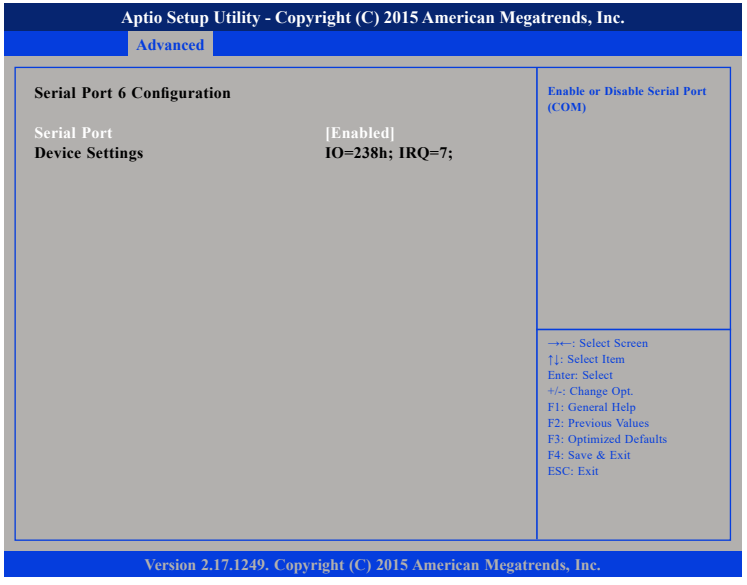
This section is used to configure serial port 5.



Serial Port
Enables or disables the serial port.

Serial Port 6 Configuration

This section is used to configure serial port 6.



Serial Port
Enables or disables the serial port.

IT8528SEC Super IO Configuration

This section is used to configure serial ports 1 and 2 of the second super IO.

Super IO Chip

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

Serial Port 1 Configuration

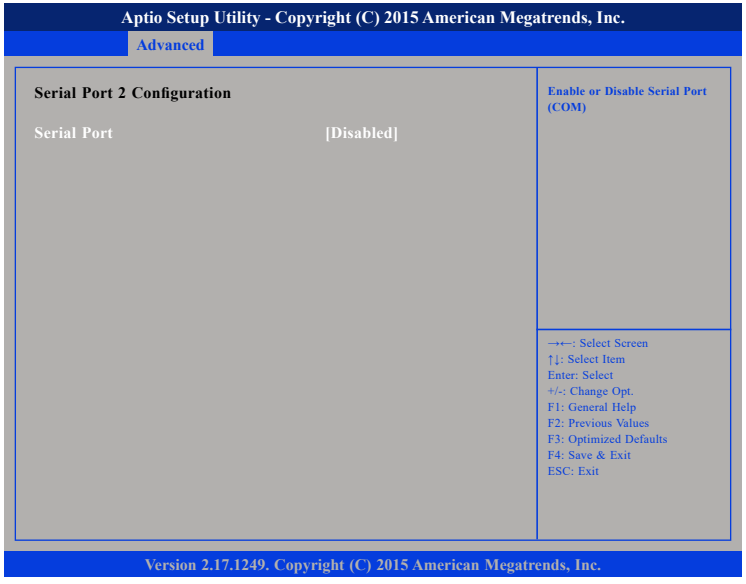
This section is used to configure serial port 1.

Serial Port

Enables or disables the serial port.

Serial Port 2 Configuration

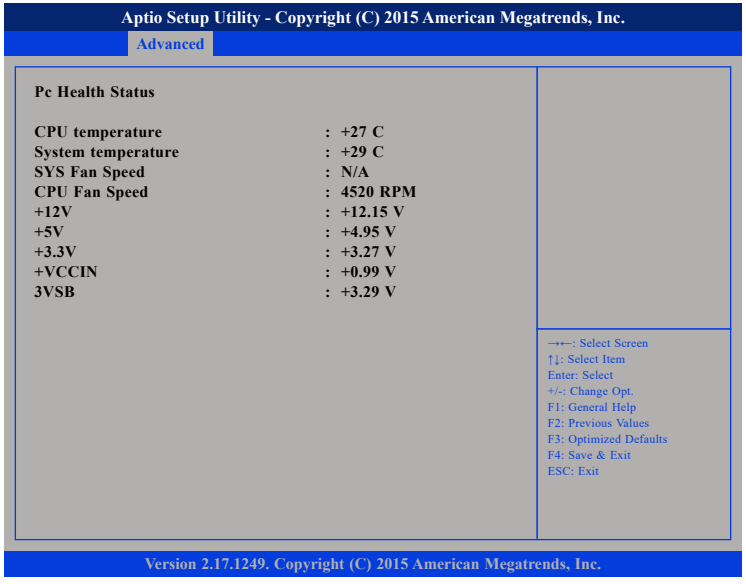
This section is used to configure serial port 2.



Serial Port
Enables or disables the serial port.

Hardware 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.

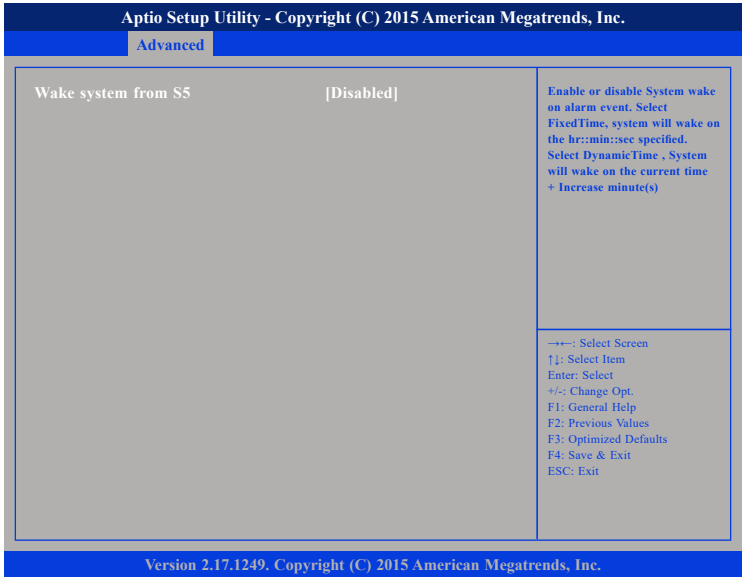
SYS FAN Speed
Detects and displays the system fan speed.

CPU FAN Speed
Detects and displays the CPU fan speed.

+12V to 3VSB
Detects and displays the output voltages.

S5 RTC Wake Settings

This section is used to configure S5 RTC Wake Settings.



Wake system from S5

Enables or disables system wake on alarm event. When FixedTime is selected, the system will wake on the hr::min::sec specified. When DynamicTime is selected, the system will wake on the current time + Increase minute(s).

CPU Configuration

This section is used to configure the CPU.

Limit CPUID Maximum

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

Bi-directional PROCHOT

Enables or disables bi-directional PROCHOT thermal throttling of the processor.

Intel® Virtualization Technology

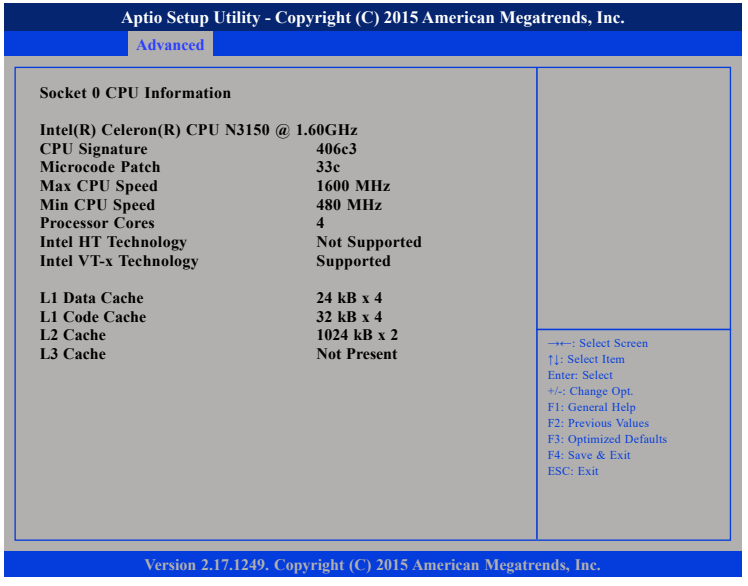
When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Power Technology

Enables or disables the power management features.

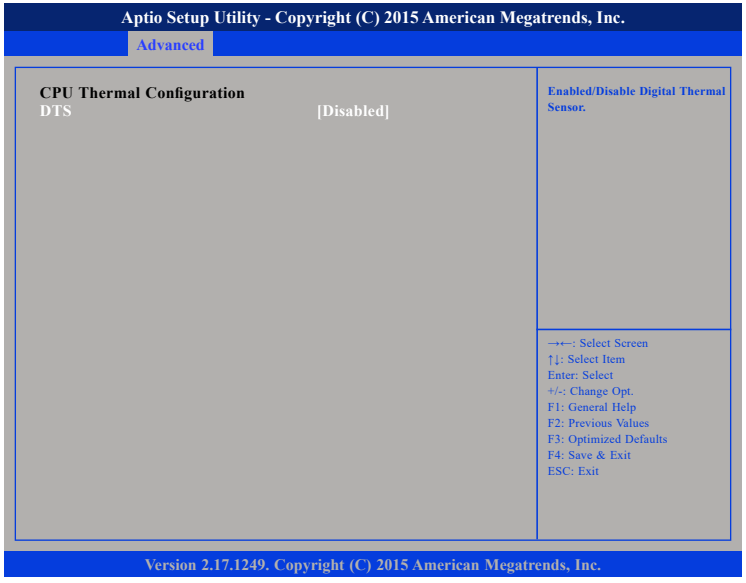
Socket 0 CPU Information

Display information on the CPU installed on socket 0.



CPU Thermal Configuration

This section is used to configure the thermal sensor of the CPU.



DTS

Enables or disables digital thermal sensor.

PPM Configuration

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

EIST

Enables or disables Intel® SpeedStep.

CPU C State Report

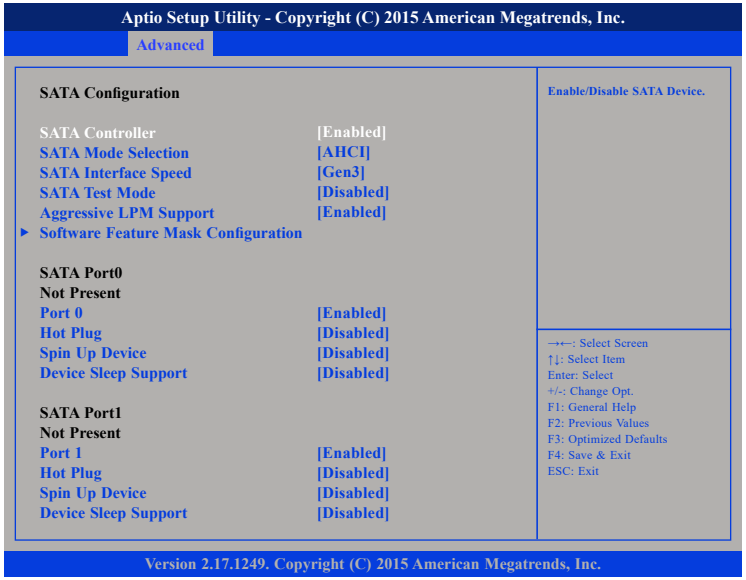
Enables or disables CPU C-State report to OS.

S0ix

Enables or disables CPU S0ix state.

SATA Configuration

This section is used to configure the SATA drives.



SATA Controller
Enables or disables the SATA controller.

SATA Mode Selection
Configures the SATA mode.

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

SATA Interface Speed
Configures the SATA controller as Gen1, Gen2 or Gen3.

SATA Test Mode
Enables or disables SATA test mode.

Aggressive LPM Support
Enables or disables aggressive LPM support.

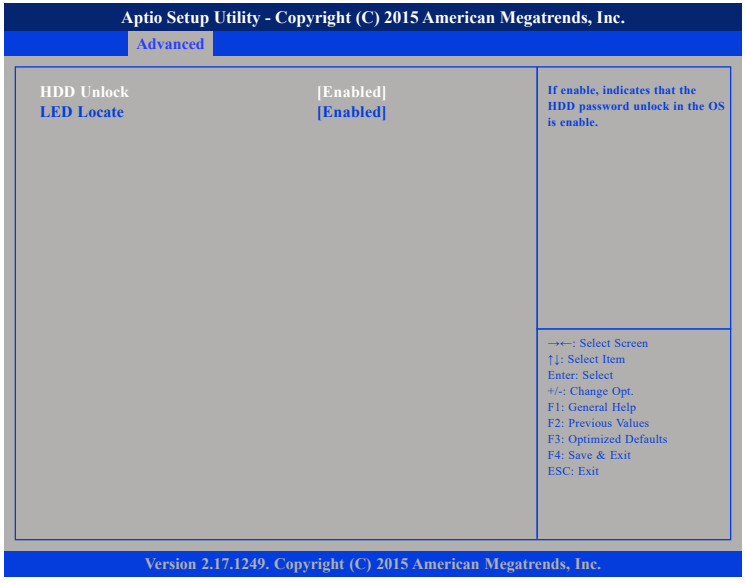
Port 0 and Port 1
Enables or disables SATA port 0 and port 1.

Hot Plug
Enables or disables hot plugging feature on SATA port 0 and port 1.

Spin Up Device
Enables or disables staggered spin up on devices connected to SATA port 0 and port 1.

Device Sleep Support
Enables or disables SATA device sleep support.

Software Feature Mask Configuration

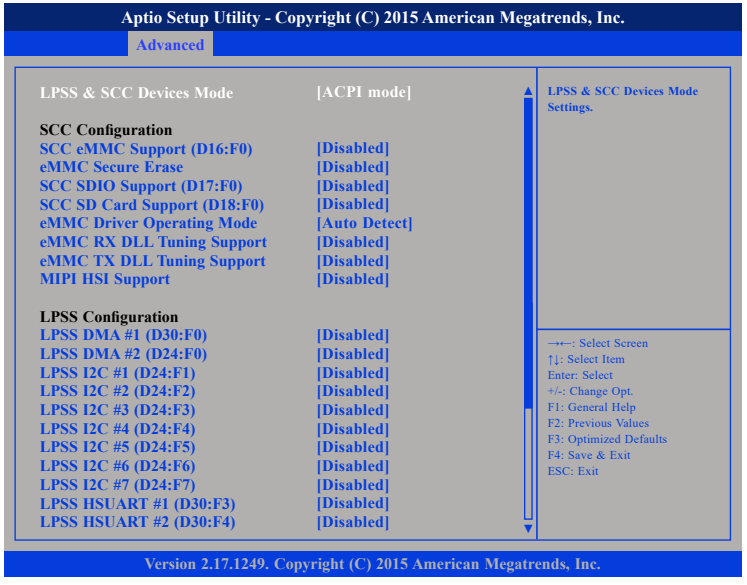


HDD Unlock
Enables or disables HDD password unlock in the OS.

LED Locate
Enables or disables detection of LED/SGPIO hardware and ping-to-locate feature.

LPSS & SCC Configuration

This section is used to configure LPSS and SCC settings.

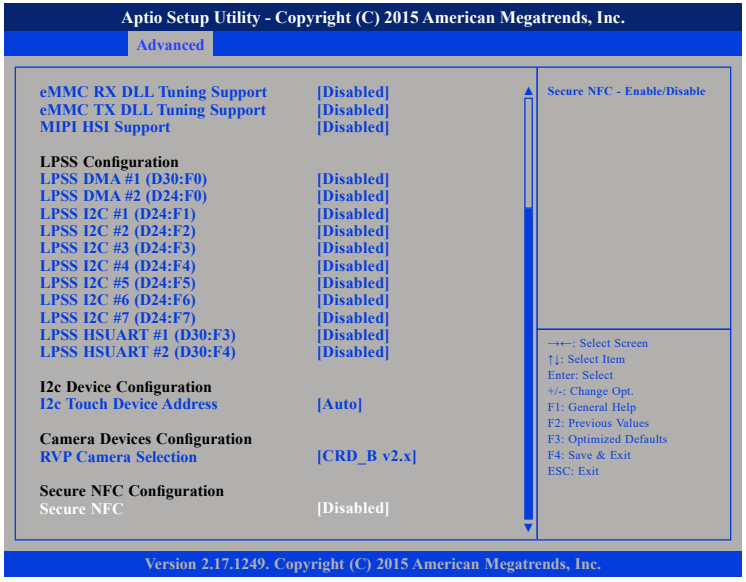


LPSS & SCC Devices Mode
Selects the LPSS and SCC device mode as ACPI mode or PCI mode.

SCC eMMC Support
Enables or disables SCC eMMC support.

eMMC Secure Erase
Enables or disables eMMC secure erase.

SCC SDIO Support
Enables or disables SCC SDIO support.



SCC SD Card Support
Enables or disables SCC SD card support.

eMMC Driver Operating Mode
Configures the eMMC driver operating mode.

eMMC RX DLL Tuning Support
Enables or disables eMMC RX DLL tuning support.

eMMC TX DLL Tuning Support
Enables or disables eMMC TX DLL tuning support.

MIPI HSI Support
Enables or disables MIPI HSI support.

LPSS DMA #1 and LPSS DMA #2
Enables or disables LPSS DMA #1 and #2 support.

LPSS I2C #1 to LPSS I2C #7
Enables or disables LPSS I2C #1 to #7 support.

LPSS HSUART #1 and LPSS HSUART #2
Enables or disables LPSS HSUART #1 and #2 support.

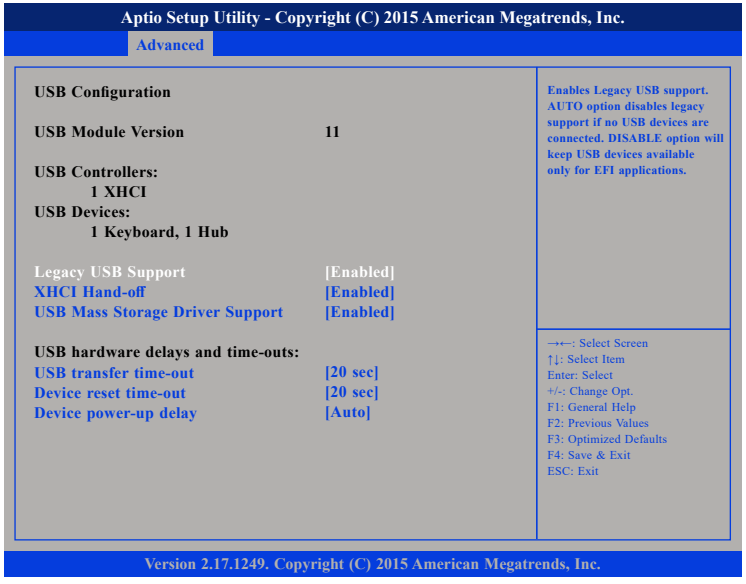
I2C Touch Device Address
Configures the I2C touch device address space.

RVP Camera Selection
Configurations for the RVP Camera device.

Secure NFC
Enables or disables secure NFC support.

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

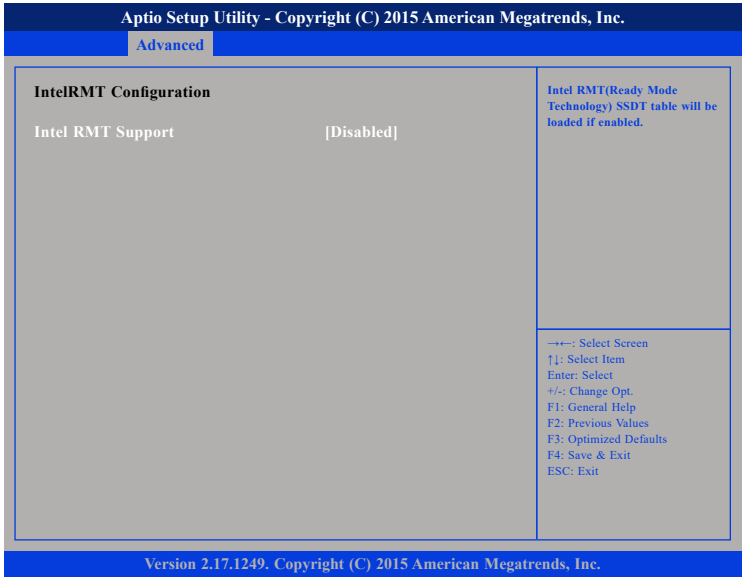
Selects the USB mass storage device's start unit command timeout.

Device Power-up Delay

Maximum time the value will take before it properly reports it self 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.

Intel® RMT Configuration

This section is used to Intel® Ready Mode Technology settings.



Legacy USB Support

Enables or disables loading of the Intel RMT SSDT table.

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.

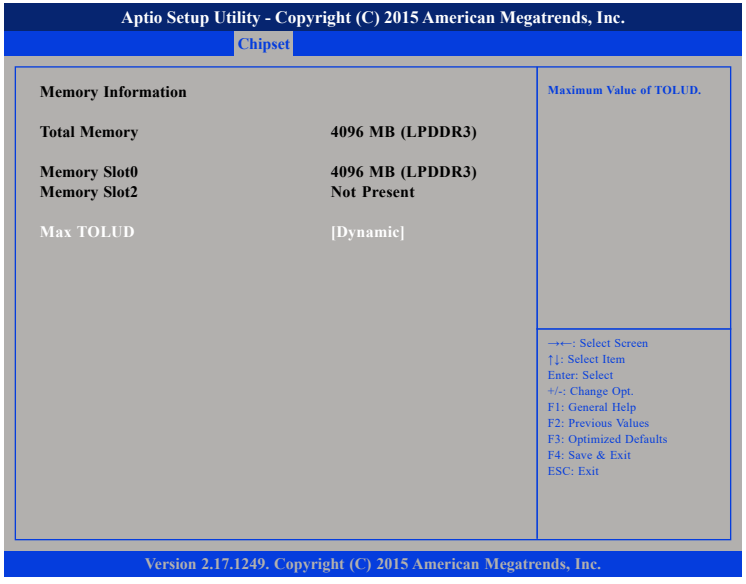
North Bridge

This field is used to configure North Bridge Parameters.

South Bridge

This field is used to configure South Bridge Parameters.

North Bridge



Max TOLUD
Configures the maximum value of TOLUD.

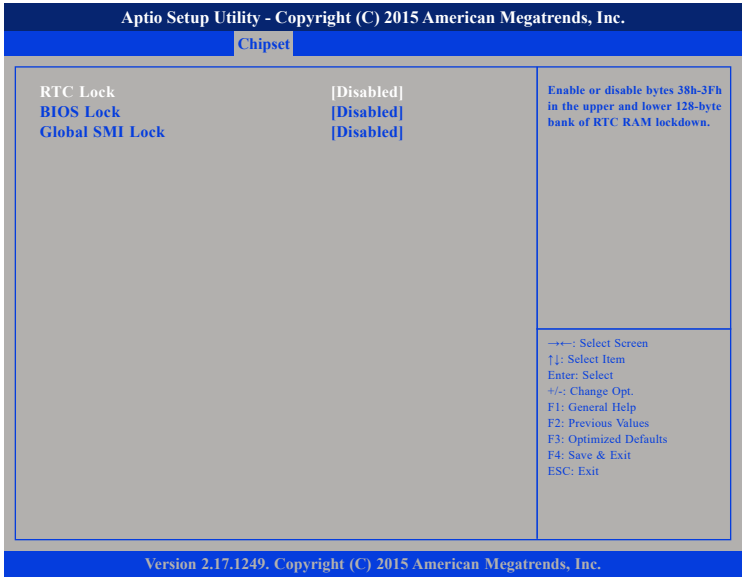
South Bridge

High Precision Timer
Enables or disables high precision event timer.

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

Serial IRQ Mode
Configures the serial IRQ mode.

Security Configuration

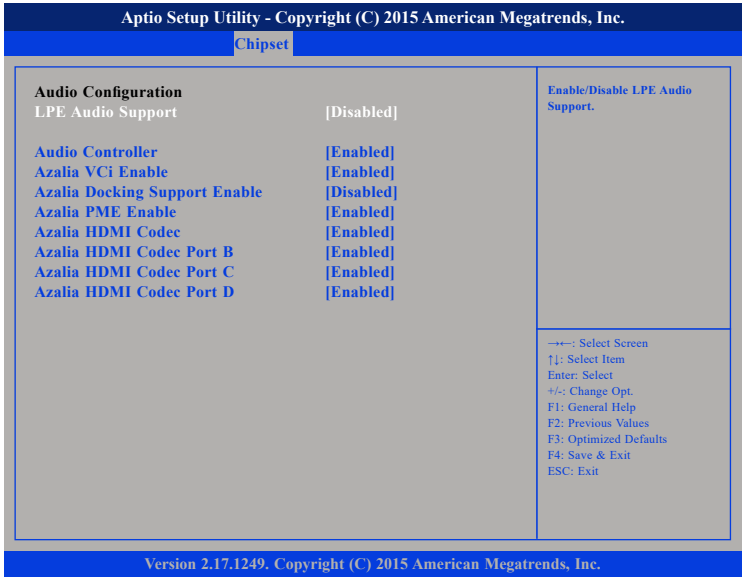


RTC Lock
Enables or disables bytes 38h-3Fh in the upper and lower 128-byte bank of RTC RAM lockdown.

BIOS Lock
Enables or disables BIOS lock enable (BLE) bit.

Global SMI Lock
Enables or disables Global SMI lock.

Azalia Configuration



LPE Audio Support
Enables or disables LPE audio support.

Azalia Controller
Control detection of the Azalia device.

Disabled	Azalia will be unconditionally disabled.
Enabled	Azalia will be unconditionally enabled.

Azalia VCi Enable
Enables or disables virtual channel of Azalia.

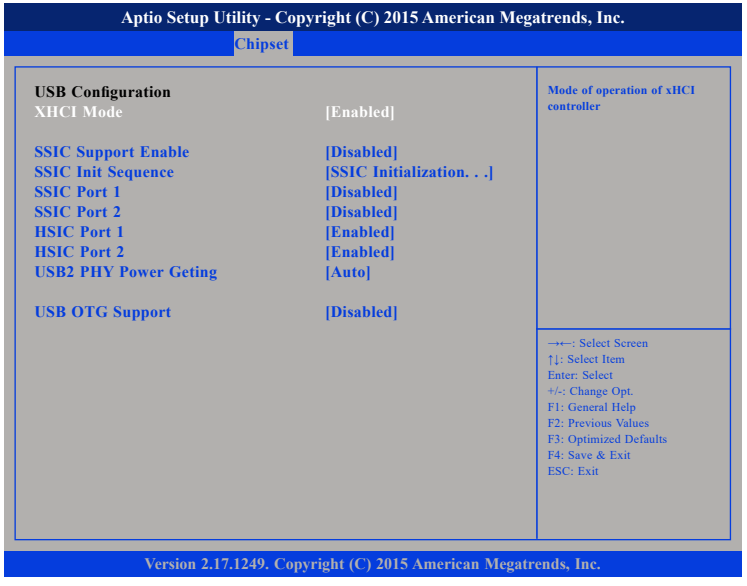
Azalia Docking Support Enable
Enables or disables Azalia docking support.

Azalia PME Enable
Enables or disables the power management feature of Azalia.

Azalia HDMI Codec
Enables or disables internal HDMI codec for Azalia.

Azalia HDMI Codec Port B to Azalia HDMI Codec Port D
Enables or disables Azalia HDMI codec port B to port D.

USB Configuration



XHCI Mode
Configures the operation mode of the XHCI controller.

SSIC Support Enable
Enables or disables SSIC support.

SSIC Init Sequence
Configurations for the SSIC initialization sequence.

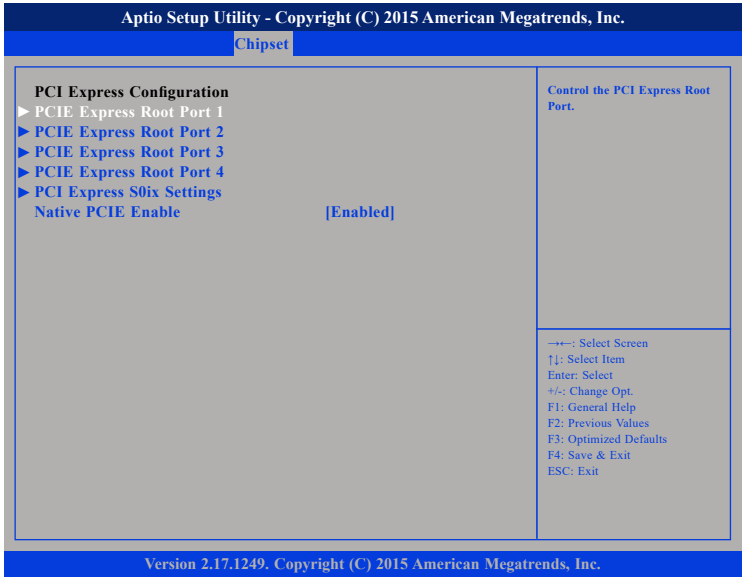
SSIC Port 1 and SSIC Port 2
Enables or disables SSIC port 1 and port 2.

HSIC Port 1 and HSIC Port 2
Enables or disables HSIC port 1 and port 2.

USB2 PHY Power Geting
Configurations for USB2 PHY power.

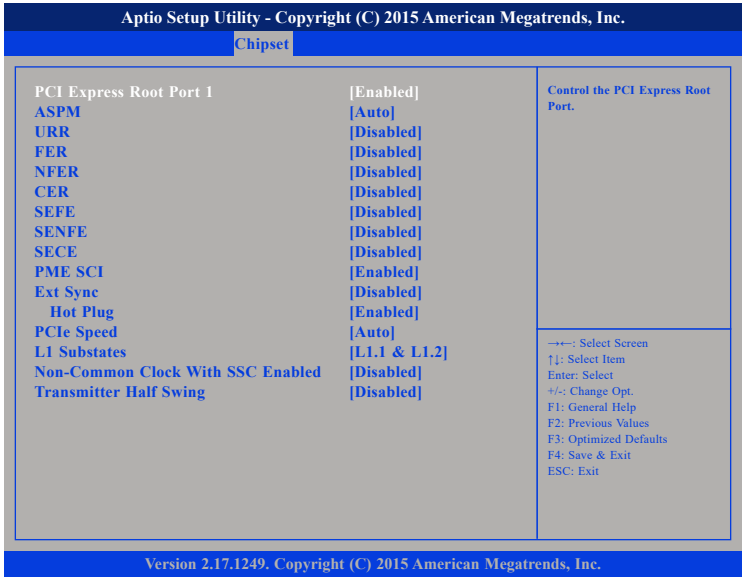
USB OTG Support
Enables or disables USB OTG Support.

PCI Express Configuration



Native PCIE Enable
Enables or disables native PCIe support.

PCI Express Root Port 1 to 4



PCI Express Root Port
Enables or disables the PCIe port.

ASPM Support
Selects the ASPM level.

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

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

Hot Plug
Enables or disables PCIe hot-plug support.

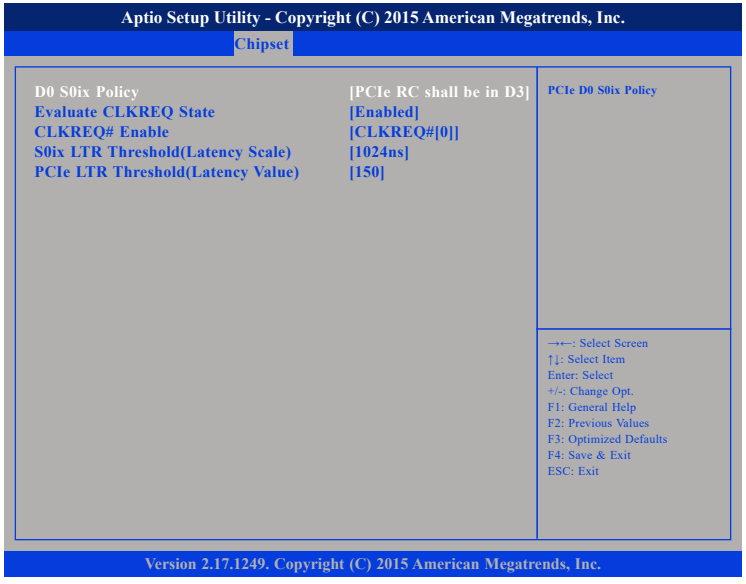
PCIe Speed
Configures the speed of the PCIe port.

L1 Substates
Configures the L1 Substates settings.

Non-Common Clock with SSC Enabled
Enables or disables non-common clock mode with SSC support.

Transmitter Half Swing
Enables or disables transmitter half swing mode.

PCI Express S0ix Settings



D0 S0ix Policy
Configures the D0 S0ix policy.

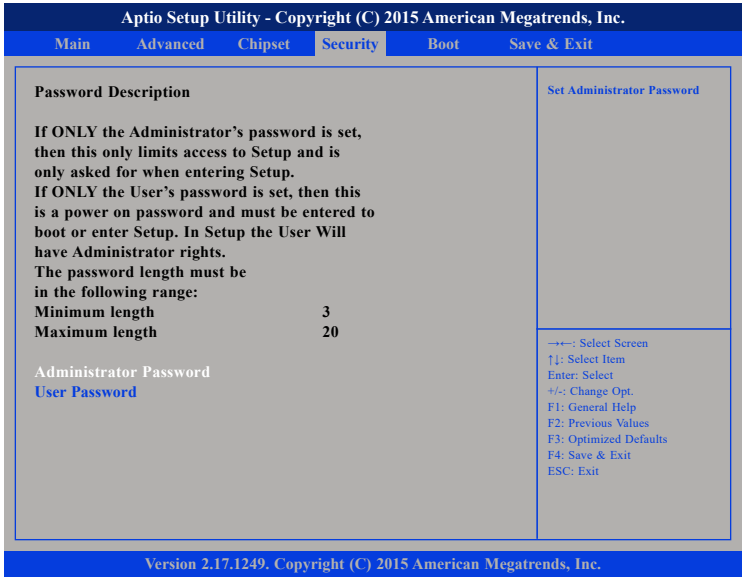
Evaluate CLKREQ State
Enables or disables evaluation of CLKREQ# state.

CLKREQ# Enable
Enables or disables CLKREQ# support.

S0ix LTR Threshold (Latency Scale)
Sets the S0ix LTR threshold scale.

PCIe LTR Threshold (Latency Value)
Sets the PCIe LTR threshold value.

Security



Administrator Password

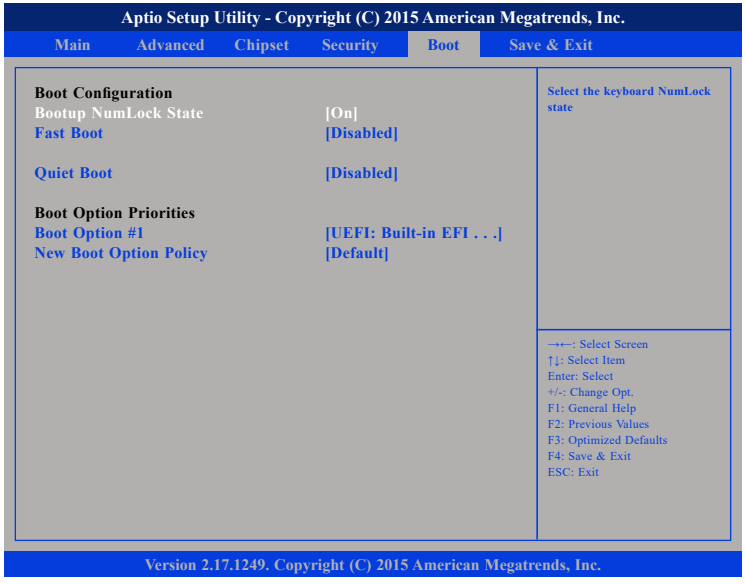
Select this to reconfigure the administrator's password.

User Password

Select this to reconfigure the user's password.

Boot

This section is used to configure the boot features.



Bootup NumLock State

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

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.

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.

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.