



NEXCOM International Co., Ltd.

Intelligent Platform & Services Business Unit
Embedded Computing (Mini-ITX Motherboard)

NEX 614A

User Manual

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PREFACE

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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

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Regulatory Compliance Statements

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

Declaration of Conformity

FCC

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

CE

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

RoHS Compliance



NEXCOM RoHS Environmental Policy and Status Update

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

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

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

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

How to recognize NEXCOM RoHS Products?

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

All new product models launched after January 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 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

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Package Contents

Before continuing, verify that the NEX 614A package that you received is complete. Your package should have all the items listed in the following table.

Item	Name	Qty
1	NEX 614A motherboard	1
2	I/O panel shield	1

Optional Accessories

Item	Part Number	Name	Description
1	7400060028X00	12V DC Power Adapter	FSP: FSP060-DIBAN2 60W 12V/5A Level VI for McAfee
2	603COM0092X00	COM Port Cable	COM Port Cable for NEX 614A Great Ideal: YXH17121402 DB9 (M) to Housing 10P PIT:2.0 L=200mm
3	60233USB71X00	USB Cable	USB Cable Best USB A Type CON to Housing 2X5P PH:2.54mm L:180mm
4	60233ATA48X00	SATA Cable Best	SATA CON 7P 180D to 180D Connector L:250mm 28AWG
5	60233PW168X00	SATA Power Cable	SATA Power Cable Best Housing 4P to Housing 5P L:250mm

Ordering Information

The following below provides ordering information for NEX 614A.

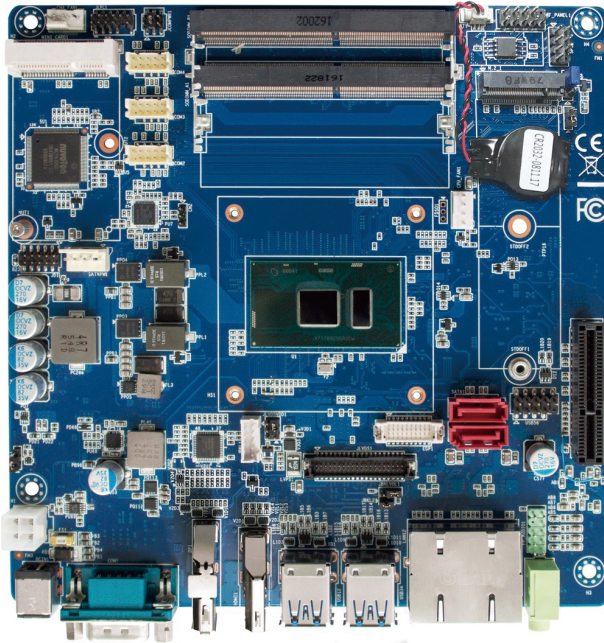
NEX 614A - 3955U (P/N: 10G00061403X0)

Optional Accessories

- **12V, 60W power adapter w/o power cord**
(P/N: 7400060028X00)
- **COM port cable**
(P/N: 603COM0092X00)
- **USB cable**
(P/N: 60233USB71X00)
- **SATA cable**
(P/N: 60233ATA48X00)
- **SATA power cable**
(P/N: 60233PW168X00)

CHAPTER 1: PRODUCT INTRODUCTION

Overview



Key Features

- 6th Generation Intel® Core™ i7/i5/i3 Processor, 15~25W TDPs, BGA 1356
- Support two DDR4 SO-DIMM sockets
- Support multiple displays from DisplayPort 1.2/HDMI 1.4/LVDS
- 2 x SATA III, 2 x GbE LAN, 4 x COM, 4 x USB 3.0, 2 x USB 2.0, 8-bit DIO, HD Audio, 1 x PCIe 2.0 [X1], 1 x M.2, 1 x Mini PCIe
- DC Input +12V
- Low profile system
- Optional: Wi-Fi module/M.2 storage

Hardware Specifications

CPU Support

- 6th Generation Intel® Core™ i7/i5/i3 Processors [support Intel® Core™ i7-6600U/ i5-6300U/ i3-6100U/Celeron 3955U (default)], processor TDP: 15W~25W

Display

- 1 x DisplayPort connector (DisplayPort 1.2 resolution up to 4096 x 2304 @ 60Hz)
- 1 x HDMI connector (HDMI 1.4 resolution up to 4096 x 2160 @ 60Hz)
- 1 x LVDS Connector (resolution up to 1920 x 1080 @ 60Hz), LVDS (Co-layer eDP, default LVDS)

System

- 2 x DDR4 2133 SO-DIMM sockets support up to 32GB, non-ECC
- 2 x SATAIII 6Gb/s connector
- 1 x SATA power connector
- 2 x Realtek GbE LAN controller
- 2 x dual deck USB 3.0
- 1 x USB 2.0 2x5 2.54mm header
- 4 x Serial ports:
 - 1 x RS232/485/422 by COM 1 (DB9)
 - 3 x RS232 by COM2~4 (+5V/RI/+12V Select by COM 2)
- 1 x 8-bit DIO header (by BIOS Setting)
- WDT 1~255 steps by software program
- Support Realtek HD AUDIO:
 - 1 x HD Audio jack (Line-out)
 - 1 x Front Panel connector
- 1 x DC jack (5.5/2.5mm), 1 x ATX 4-pin Power connector

Storage Device

- 2 x SATA III 6.0Gb/s. (SATA2 3955U not supported)
- 1 x M.2 Key-M, 2242/2280 (Default), only supports SATA

Expansion

- 1 x Mini PCI Express slot (Half/Full_Default) size, supports PCIe/USB interface
- 1 x PCIe x4 slot

Power Requirements

- 12V DC input:
 - DC lockable jack or ATX 4-pin power connector
- Power Mode AT / ATX (jumper selection)

Rear I/O

- 1 x DC power jack
- 1 x Serial port
- 1 x DP connector
- 1 x HDMI connector
- 2 x USB 3.0 (double deck)
- 2 x GbE controller
- 1 x Line-out

Mechanical & Environment

- Operating Temperature: 0°C ~ 40°C
- Storage Temperature: -20°C ~ 80°C
- Relative humidity: Operating 10%~90%, non-condensing

Dimension

- Display Head: Mini-ITX, 6.7" x 6.7" (170mm x 170mm)

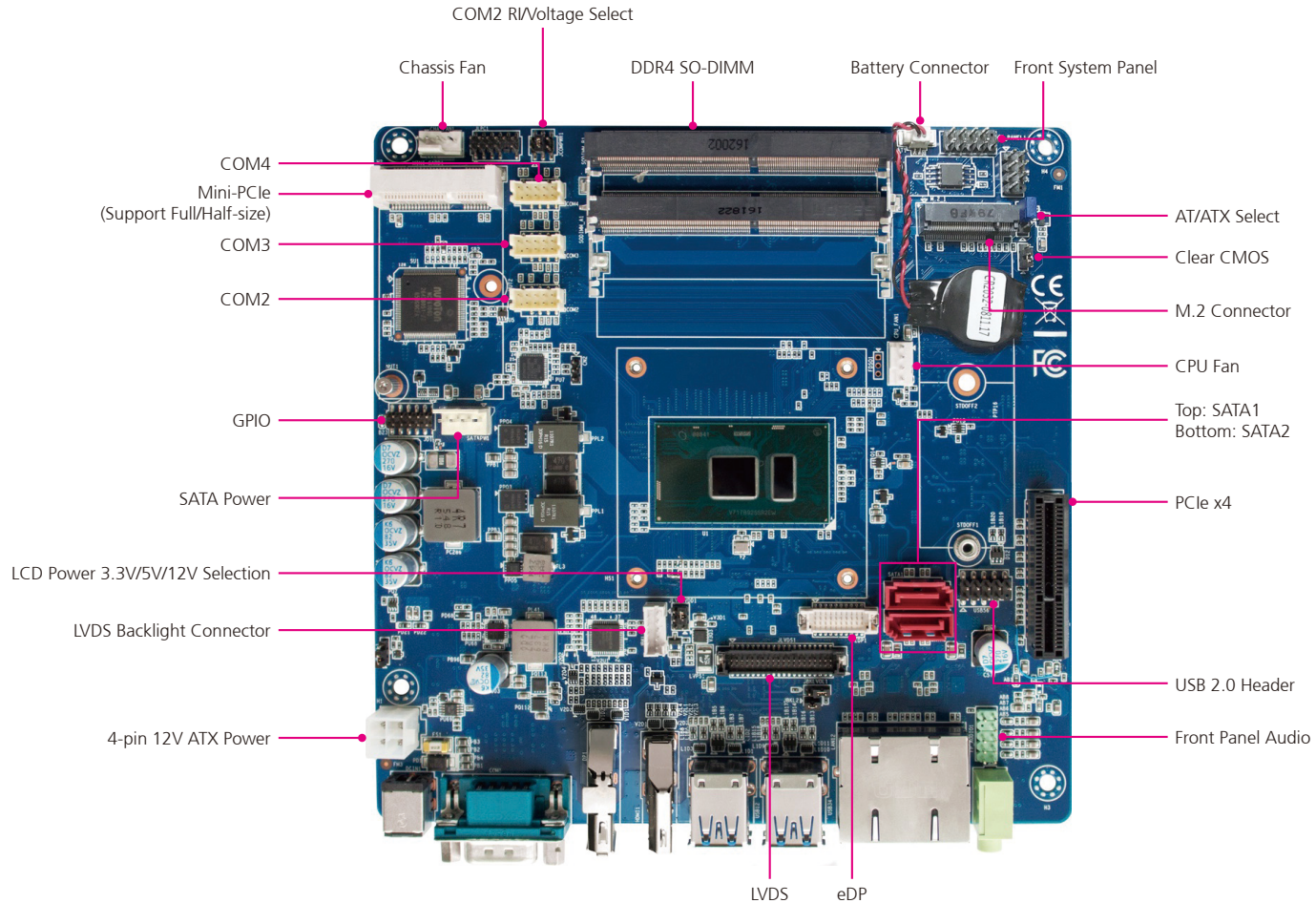
Operating System

- Windows® 10 64-bit
- Windows® 8.1 64-bit
- Windows® 7 32/64-bit
- Linux Fedora

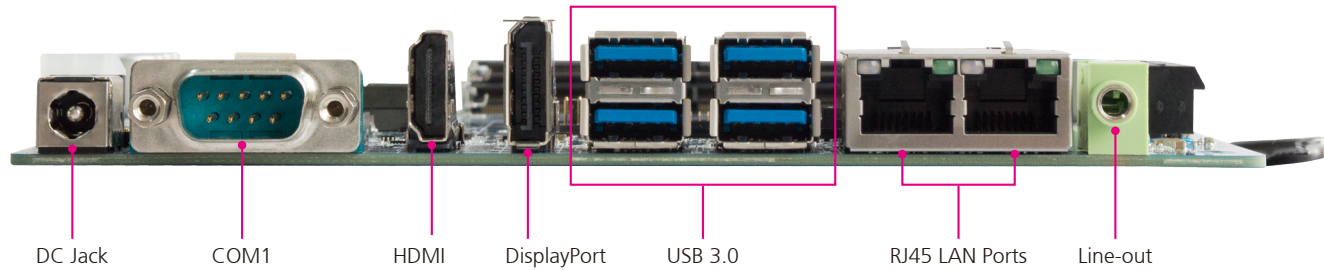
Certifications

- EMC & Safety
- CE/FCC Class A

Knowing Your NEX 614A



Edge I/O View



CHAPTER 2: JUMPERS AND CONNECTORS

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

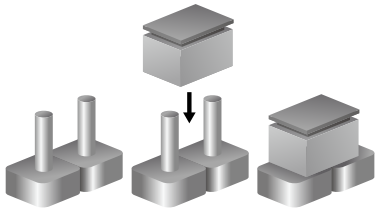
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

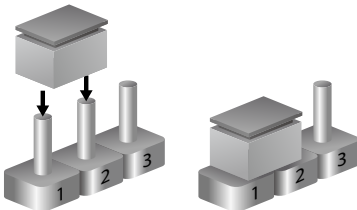
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

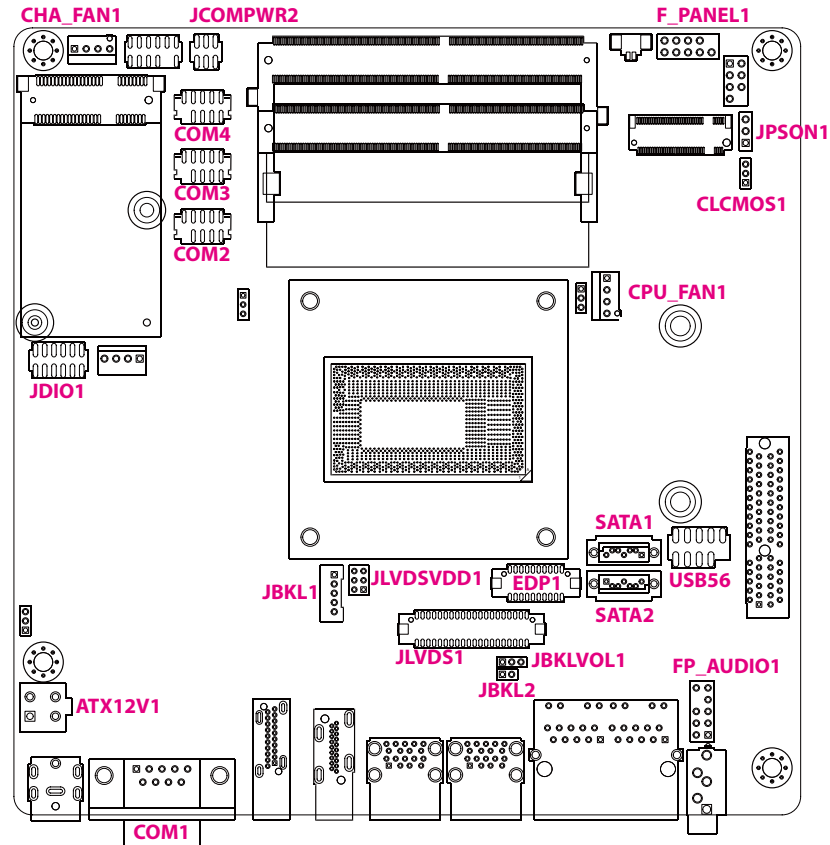


Three-Pin Jumpers: Pins 1 and 2 are Short



Locations of the Jumpers and Connectors

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



Jumpers

Clear CMOS

Connector type: 1x3 3-pin header

Connector location: CLCMOS1



**1-2 Short
(Default)**



2-3 Short

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

AT/ATX Power Mode Selection

Connector type: 1x3 3-pin header

Connector location: JPSON1



1-2 Short



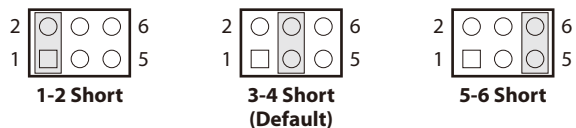
**2-3 Short
(Default)**

Pin	Status	Definition
1-2	Short	AT mode
2-3	Short	ATX mode

COM2 Ring/+5V/+12V Selection

Connector type: 2x3 6-pin header

Connector location: JCOMPWR2

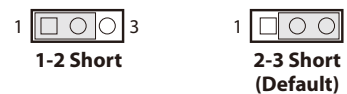


Pin	Status	Definition
1-2	Short	+12V
3-4	Short	Ring
5-6	Short	+5V

LVDS Backlight Control Voltage Selection

Connector type: 1x3 3-pin header

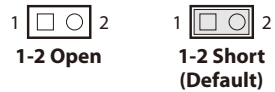
Connector location: JBKLVOL1



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

LVDS Brightness Control Mode Selection

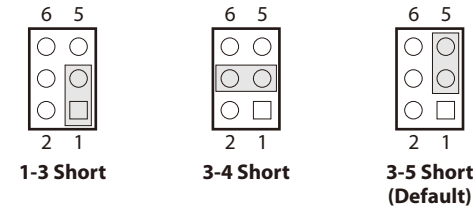
Connector type: 1x2 2-pin header
Connector location: JBKL2



Pin	Status	Settings
1-2	Open	PWM
1-2	Short	Linear

LCD Power Selection

Connector type: 2x3 6-pin header
Connector location: JLVDSVDD1



Pin	Status	Definition
1-3	Short	+5V
3-4	Short	+12V
3-5	Short	+3.3V

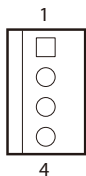
Connector Pin Definitions

Internal Connectors

CPU Fan Connector

Connector type: 1x4 4-pin header

Connector location: CPU_FAN1

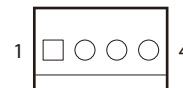


Pin	Definition	Pin	Definition
1	GND	2	+V12
3	FAN_SPEED2	4	FAN_PWM1

Chassis Fan Connector

Connector type: 1x4 4-pin header

Connector location: CHA_FAN1

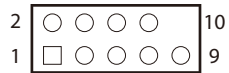


Pin	Definition	Pin	Definition
1	GND	2	+V12
3	FAN_SPEED2	4	FAN_PWM2

System Panel Connector

Connector type: 2x5 10-pin header

Connector location: F_PANEL1

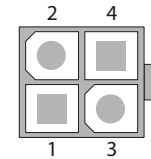


Pin	Definition	Pin	Definition
1	HDD_LED+	2	+5VSB
3	HDD_LED#	4	PWR_LED#
5	GND	6	PANSWIN#
7	RST	8	GND
9	N/A		

ATX +12V Power Connector

Connector type: 2x2 4-pin header

Connector location: ATX12V1

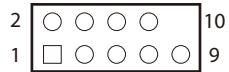


Pin	Definition	Pin	Definition
1	GND	2	GND
3	+12V	4	+12V

Serial Port Connectors (COM2 to COM4)

Connector type: 2x5 10-pin header

Connector location: COM2, COM3 and COM4



COM2

Pin	Definition	Pin	Definition
1	COM2_DCD#	2	COM2_RXD
3	COM2_TXD	4	COM2_DTR#
5	GND	6	COM2_DSR#
7	COM2_RTS#	8	COM2_CTS#
9	COM2_RI#		

COM4

Pin	Definition	Pin	Definition
1	COM4_DCD#	2	COM4_RXD
3	COM4_TXD	4	COM4_DTR#
5	GND	6	COM4_DSR#
7	COM4_RTS#	8	COM4_CTS#
9	COM4_RI#		

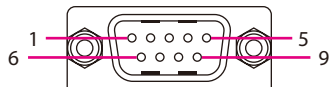
COM3

Pin	Definition	Pin	Definition
1	COM3_DCD#	2	COM3_RXD
3	COM3_TXD	4	COM3_DTR#
5	GND	6	COM3_DSR#
7	COM3_RTS#	8	COM3_CTS#
9	COM3_RI#		

Serial Port (COM1)

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

Connector location: COM1

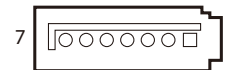


Pin	RS232	RS485/422 Full Duplex	RS485 Half Duplex
1	COM1_DCD#	TX-	Data-
2	COM1_RXD	TX+	Data+
3	COM1_TXD	RX+	
4	COM1_DTR#	RX-	
5	GND	GND	GND
6	COM1_DSR#		
7	COM1_RTS#		
8	COM1_CTS#		
9	COM1_RI#		

SATA Connector 1

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

Connector location: SATA1

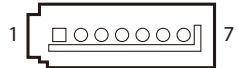


Pin	Definition	Pin	Definition
1	GND	2	RSATA_TXP1
3	RSATA_TXN1	4	GND
5	RSATA_RXN1	6	RSATA_RXP1
7	GND		

SATA Connector 2

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

Connector location: SATA2

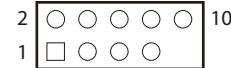


Pin	Definition	Pin	Definition
1	GND	2	RSATA_TXP2
3	RSATA_TXN2	4	GND
5	RSATA_RXN2	6	RSATA_RXP2
7	GND		

USB Connector

Connector type: 2x5 10-pin header

Connector location: USB56

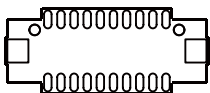


Pin	Definition	Pin	Definition
1	+5V_USB56	2	+5V_USB56
3	USB_CM_N5	4	USB_CM_N6
5	USB_CM_P5	6	USB_CM_P6
7	GND	8	GND
		10	GND

eDP Connector (Optional)

Connector type: 2x10 20-pin header

Connector location: EDP1

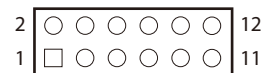


Pin	Definition	Pin	Definition
1	GND	2	GND
3	eDP_A0-	4	eDP_D0-
5	eDP_A0+	6	eDP_D0+
7	GND	8	NC
9	eDP_B0-	10	GND
11	eDP_B0+	12	AUX-
13	GND	14	AUX+
15	eDP_C0-	16	eDP_HPDP
17	eDP_C0+	18	GND
19	VDD_LVDS	20	VDD_LVDS

8-bit GPIO Header

Connector type: 2x5 10-pin header

Connector location: JDIO1

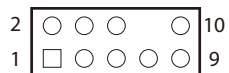


Pin	Definition	Pin	Definition
1	SIO_GPIO0	2	SIO_GPIO4
3	SIO_GPIO1	4	SIO_GPIO5
5	SIO_GPIO2	6	SIO_GPIO6
7	SIO_GPIO3	8	SIO_GPIO7
9	SMB_CLK_RESUME	10	SMB_DATA_RESUME
11	GND	12	+5Vsb

Front Panel Audio Connector

Connector type: 2x5 10-pin header

Connector location: FP_AUDIO1



Pin	Definition	Pin	Definition
1	MIC2L	2	GND
3	MIC2R	4	+3.3
5	LINE2R	6	MIC2-JD
7	SENSEB	8	NC
9	LINE2L	10	LINE2-JD

LVDS Backlight Connector

Connector type: 1x5 5-pin header

Connector location: JBKL1

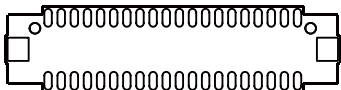


Pin	Definition	Pin	Definition
1	+12V_BL	2	GND
3	BL_EN	4	BRIGHT1
5	+5V_BL		

LVDS Connector

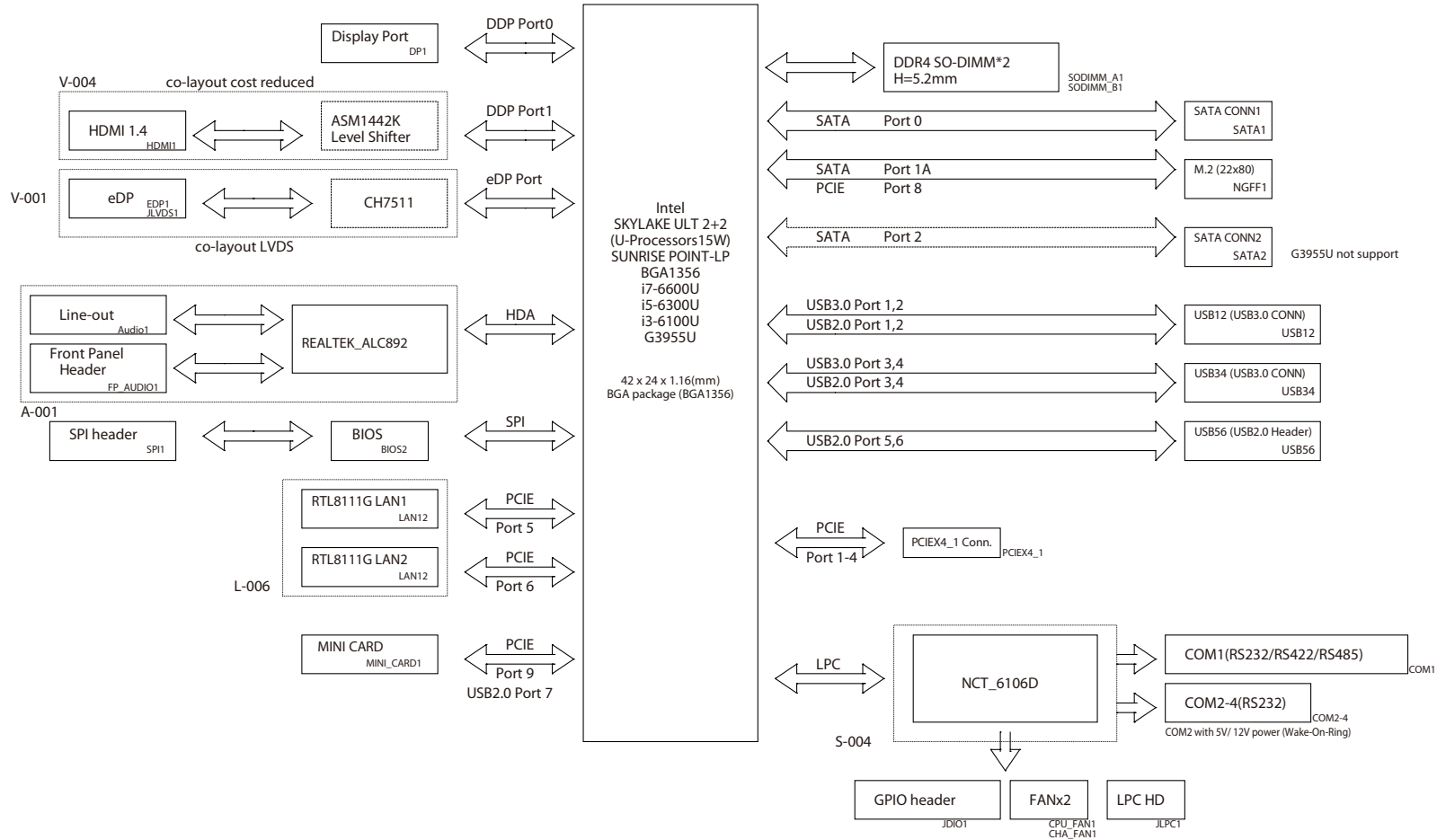
Connector type: 2x20 40-pin header

Connector location: JLVDS1



Pin	Definition	Pin	Definition
1	VDD_LVDS	2	VDD_LVDS
3	GND	4	GND
5	VDD_LVDS	6	VDD_LVDS
7	LVDS_A0-	8	LVDS_B0-
9	LVDS_A0+	10	LVDS_B0+
11	GND	12	GND
13	LVDS_A1-	14	LVDS_B1-
15	LVDS_A1+	16	LVDS_B1+
17	GND	18	GND
19	LVDS_A2-	20	LVDS_B2-
21	LVDS_A2+	22	LVDS_B2+
23	GND	24	GND
25	LVDS_A_CLK-	26	LVDS_B_CLK-
27	LVDS_A_CLK+	28	LVDS_B_CLK+
29	GND	30	GND
31	DDC_CLK	32	DDC_DATA
33	GND	34	GND
35	LVDS_A3-	36	LVDS_B3-
37	LVDS_A3+	38	LVDS_B3+
39	NC	40	NC

Block Diagram



CHAPTER 3: BIOS SETUP

This chapter describes how to use the BIOS setup program for NEX 614A. 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 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.

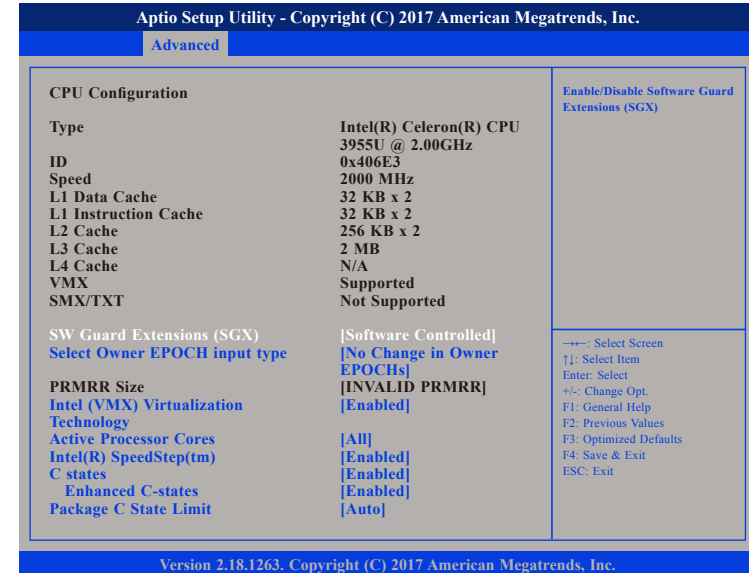


Setting incorrect field values may cause the system to malfunction.



CPU Configuration

This section is used to configure the CPU settings.



SW Guard Extensions (SGX)

Enables or disables Software Guard Extensions (SGX).

Select Owner EPOCH input type

There are three Owner EPOCH modes (each EPOCH is 64-bit):

- No Change in Owner EPOCHs
- Change to New Random Owner EPOCHs
- Manual User Defined Owner EPOCHs

After generating new epoch via 'Change to New Random Owner EPOCHs', the selection reverts back to 'No Change in Owner EPOCHs', this is to ensure EPOCH stays the same.

Intel® (VMX) Virtualization Technology

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

Active Processor Cores

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

Intel® SpeedStep™

Enables or disables Intel SpeedStep.

C states

Enables or disables CPU to go to C states when it is not 100% utilized.

Enhanced C-states

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

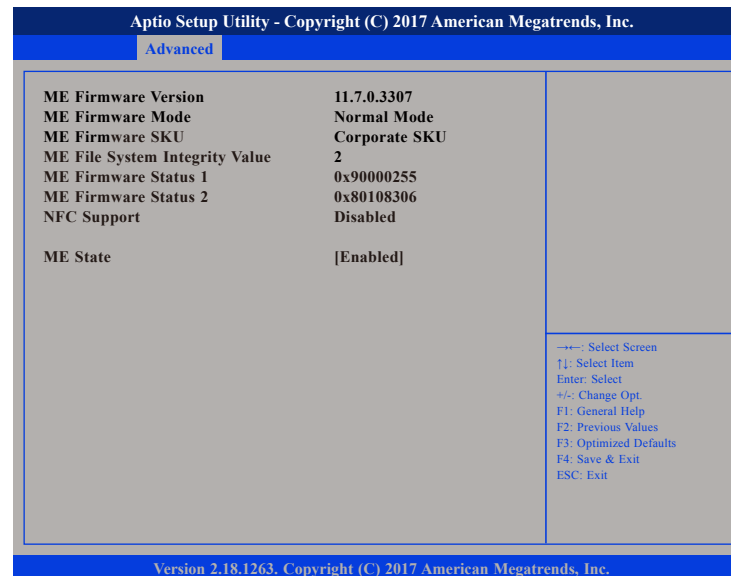
Package C State Limit

Configures the maximum package C state limit setting.

Cpu Default	Leaves to factory default value.
Auto	Initializes to deepest available package C state limit.

PCH-FW Configuration

This section displays the firmware information.



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Advanced

ME Firmware Version	11.7.0.3307
ME Firmware Mode	Normal Mode
ME Firmware SKU	Corporate SKU
ME File System Integrity Value	2
ME Firmware Status 1	0x90000255
ME Firmware Status 2	0x80108306
NFC Support	Disabled
ME State	[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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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 operating systems.

ACPI Sleep State

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

S3 Video Repost

Enables or disables S3 video repost.

PCIE# Wake from S5

Enables or disables PCIe to wake the system from S5.

Wake on Ring

Enables or disables wake on ring function under ACPI S3, S4 and S5.

NCT6106D Super IO Configuration

This section is used to configure serial ports 1 to 4 and the digital I/O port.



Super IO Chip

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

WatchDog Count Mode

Configures the watchdog timing in seconds or minutes.

Deep S5 Support

Enables or disables deep S5 support.

Serial Port 1 Configuration



Serial Port

Enables or disables the serial port.

Device Settings

Displays the IO address and IRQ of serial port 1.

Change Settings

Selects an optimal setting for the Super IO device.

COM Mode Select

Configures the serial port mode to RS232, RS485 Half Duplex or RS485/RS422 Full Duplex.

Serial Port 2 Configuration

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Advanced	
Serial Port 2 Configuration	
Serial Port	[Enabled]
Device Settings	IO=2F8h; IRQ=3;
Change Settings	[Auto]
Enable or Disable Serial Port (COM)	
←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.	

Serial Port

Enables or disables the serial port.

Device Settings

Displays the IO address and IRQ of serial port 2.

Change Settings

Selects an optimal setting for the Super IO device.

Serial Port 3 Configuration

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Advanced	
Serial Port 3 Configuration	
Serial Port	[Enabled]
Device Settings	IO=3E8h; IRQ=5;
Change Settings	[Auto]
Enable or Disable Serial Port (COM)	
←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.	

Serial Port

Enables or disables the serial port.

Device Settings

Displays the IO address and IRQ of serial port 3.

Change Settings

Selects an optimal setting for the Super IO device.

Serial Port 4 Configuration



Serial Port

Enables or disables the serial port.

Device Settings

Displays the IO address and IRQ of serial port 4.

Change Settings

Selects an optimal setting for the Super IO device.

Digital I/O Configuration

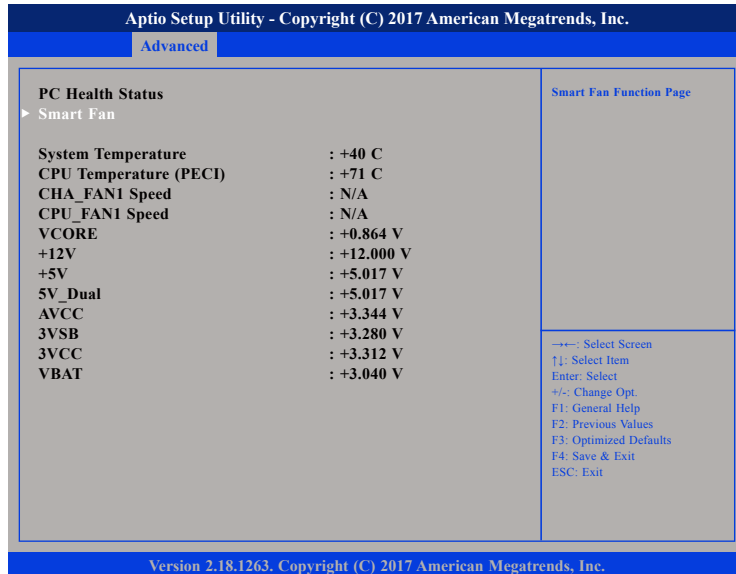


Digital I/O Pin 1 to Pin 8

Configures digital I/O pin 1 to pin 8 as input, output high or output low.

Hardware Monitor

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



The screenshot shows the Aptio Setup Utility interface with the following content:

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.

Advanced

PC Health Status

▶ **Smart Fan**

System Temperature	: +40 C
CPU Temperature (PECI)	: +71 C
CHA_FAN1 Speed	: N/A
CPU_FAN1 Speed	: N/A
VCORE	: +0.864 V
+12V	: +12.000 V
+5V	: +5.017 V
5V_Dual	: +5.017 V
AVCC	: +3.344 V
3VSB	: +3.280 V
3VCC	: +3.312 V
VBAT	: +3.040 V

Smart Fan Function Page

←→: 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_FAN1 Speed

Detects and displays the current CPU fan speed.

VCORE to VBAT

Detects and displays the output voltages.

System Temperature

Detects and displays the current system temperature.

CPU Temperature (PECI)

Detects and displays the current CPU temperature.

CHA_FAN1 Speed

Detects and displays the current chassis fan speed.

Smart Fan



Smart Fan Function

Enables or disables smart fan function.

Smart Fan Mode Configuration



CHA Smart Fan Mode (For Chassis Fan)

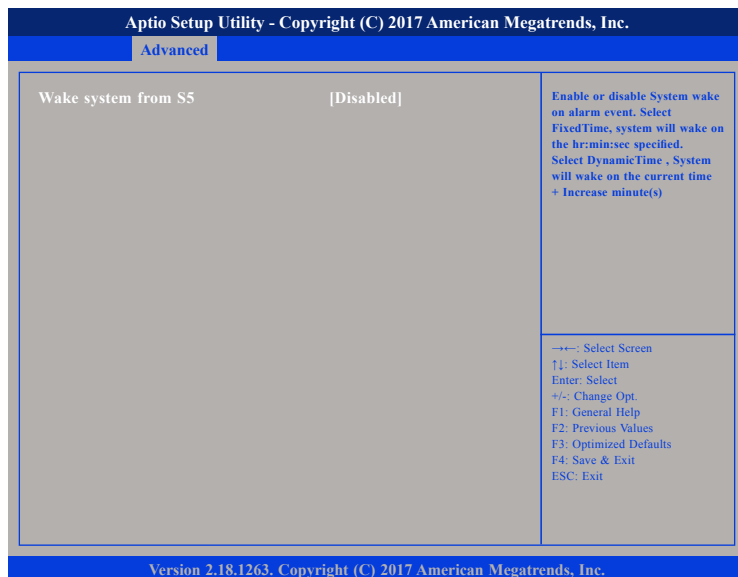
Configures the fan mode of the chassis fan. The options are Manual Mode and Thermal Cruise Mode (automatic fan mode).

CPU Smart Fan Mode (For CPU Fan)

Configures the fan mode of the CPU fan. The options are Manual Mode and Thermal Cruise Mode (automatic fan mode).

S5 RTC Wake Settings

This section is used to configure S5 RTC wake settings.



Wake system from S5

Enables or disables system wake up from S5.

Fixed Time: System will wake on the hr:min:sec specified.

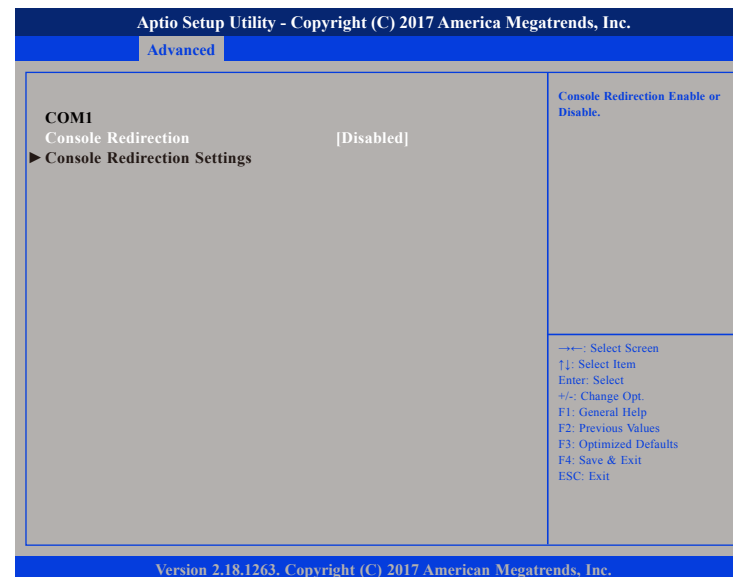
Dynamic Time: System will wake on the current time + increase minute(s).



Note: USB does not support S3, S4 and S5 wake.

Serial Port Console Redirection

This section is used to configure serial port console redirection settings.

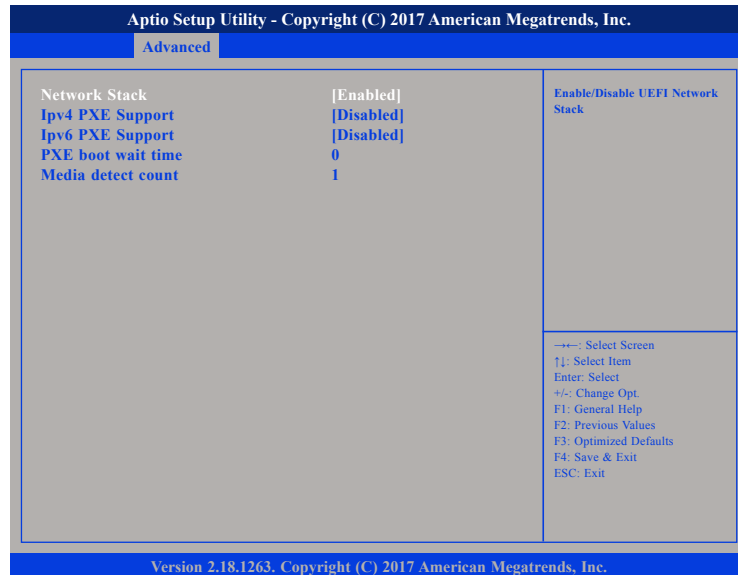


Console Redirection

Enables or disables console redirection.

Network Stack Configuration

This section is used to configure the network stack settings.



PXE boot wait time

Configures the wait time to press the ESC key to abort the PXE boot.

Media detect count

Configures the number of times the media will be checked.

Network Stack

Enables or disables UEFI network stack.

Ipv4 PXE Support

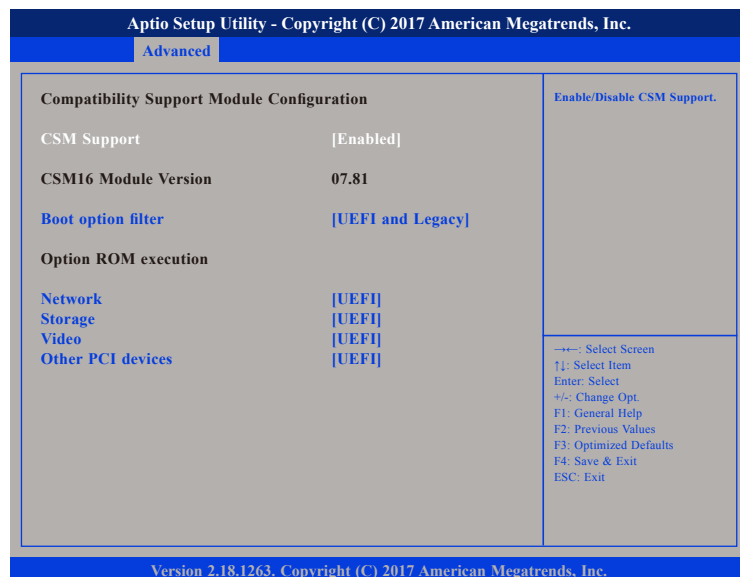
Enables or disables IPv4 PXE boot support. If disabled, IPv4 PXE boot option will not be created.

Ipv6 PXE Support

Enables or disables IPv6 PXE boot support. If disabled, IPv6 PXE boot option will not be created.

CSM Configuration

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



CSM Support

Enables or disables Compatibility Support Module (CSM).

Boot Option Filter

This option filters which devices system can boot to.

Network

Enables or disables the boot option for legacy network devices.

Storage

Enables or disables the boot option for legacy storage devices.

Video

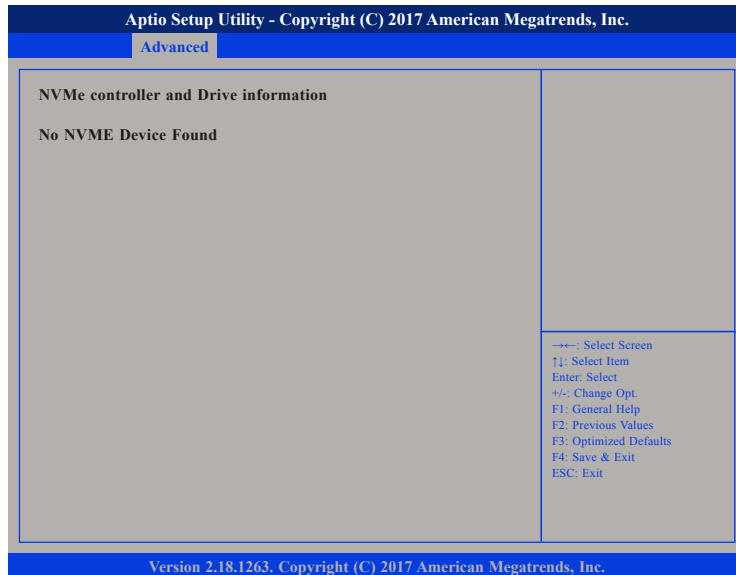
Enables or disables the boot option for legacy video devices.

Other PCI Devices

Configures the OpROM execution policy for devices other than network, storage or video devices.

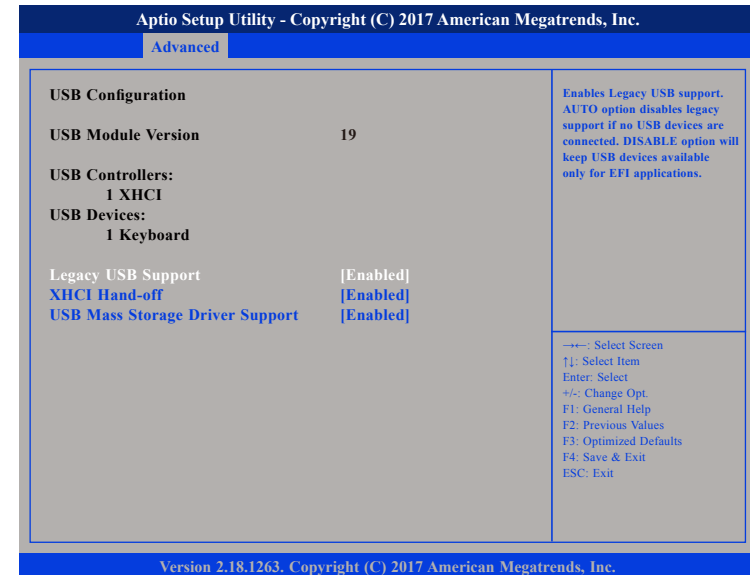
NVMe Configuration

This section is used to display information on the NVMe devices installed.



USB Configuration

This section is used to configure USB parameters.



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.

Chipset

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



System Agent (SA) Configuration

Enters the System Agent (SA) Configuration submenu.

PCH-IO Configuration

Enters the PCH-IO Configuration submenu.

System Agent (SA) Configuration

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



VT-d

Enables or disables VT-d function on MCH.

Memory Configuration

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Chipset

Memory Configuration		Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller
Memory RC Version	2.0.0.6	
Memory Frequency	2133 Mhz	
Memory Timings (tCL-tRCD-tRP- tRAS)	15-15-15-35	
DIMM_A1		Populated & Enabled
Size	16384 MB (DDR4)	
Number of Ranks	2	
Manufacturer	Transcend	
DIMM_B1		Populated & Enabled
Size	16384 MB (DDR4)	
Number of Ranks	2	
Manufacturer	Transcend	
Max TOLUD	[Dynamic]	

→←: 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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Max TOLUD

Configures the maximum value of TOLUD. Dynamic assignment will adjust TOLUD automatically based on the largest MMIO length of installed graphics controller.

Graphics Configuration

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Chipset

Graphics Configuration		Select which of IGFX/PCI E Graphics device should be Primary Display.
Primary Display	[Auto]	
Internal Graphics	[Auto]	
DVMT Pre-Allocated	[32MB]	
DVMT Total Gfx Mem	[256MB]	
▶ LCD Control		

→←: 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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Primary Display

Selects which IGFX/PCI E graphics device should be primary display.

Internal Graphics

Keep IGFX enabled based on the setup options.

DVMT Pre-Allocated

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

DVMT Total Gfx Mem

Configures the DVMT5.0 Total Graphic Memory size used by the internal graphics device.

LCD Control



LVDS Control

Enables or disables LVDS.

LVDS Panel Type

Configures the LVDS panel resolution.

LVDS Brightness Control

Adjusts the brightness of the LVDS.

LVDS Back Light PWM Frequency

Configures the LVDS backlight PWM frequency.

PCH-IO Configuration



LAN1 Controller

Enables or disables onboard LAN1.

LAN2 Controller

Enables or disables onboard LAN2.

Restore on AC Power Loss

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

PCI Express Configuration



PCI Express Root Port 1

Settings for PCI Express root port 1.

PCI Express Root Port 9 (Mini Card)

Settings for PCI Express root port 9.

PCI Express Root Port 1



PCI Express Root Port 1

Enables or disables PCI Express root port 1.

ASPM

Configures the ASPM level.

Force L0s	Force all links to L0s state.
AUTO	BIOS auto configuration.
DISABLE	Disables ASPM

PCIe Speed

Configures the speed of the PCI Express port.

Detect Non-Compliance Device

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

PCI Express Root Port 9 (Mini Card)



PCI Express Root Port 9

Enables or disables PCI Express root port 9.

ASPM

Configures the ASPM level.

Force L0s	Force all links to L0s state.
AUTO	BIOS auto configuration.
DISABLE	Disables ASPM

PCIe Speed

Configures the speed of the PCI Express port.

Detect Non-Compliance Device

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

SATA And RST Configuration



SATA Controller(s)

Enables or disables the SATA controller.

SATA Mode Selection

Configures the SATA mode. The options are AHCI and Intel RST Premium.

Port 0, M.2 Port and Port 2

Enables or disables SATA port 0, M.2 port or SATA port 2.

USB Configuration



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 disables xDCI support (USB OTG Device).

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>Password Description</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</p> <p>Maximum length 20</p> <p>Administrator Password</p> <p>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 & 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) 2017 American Megatrends, Inc.					
Main	Advanced	Chipset	Security	Boot	Save & Exit
<p>Boot Configuration</p> <p>Setup Prompt Timeout 1</p> <p>Bootup NumLock State [On]</p> <p>Quiet Boot [Enabled]</p> <p>Driver Option Priorities</p> <p>Boot mode select [UEFI]</p> <p>FIXED BOOT ORDER Priorities</p> <p>Boot Option #1 [Hard Disk]</p> <p>Boot Option #2 [CD/DVD]</p> <p>Boot Option #3 [USB Hard Disk]</p> <p>Boot Option #4 [USB CD/DVD]</p> <p>Boot Option #5 [USB Key]</p> <p>Boot Option #6 [USB Floppy]</p> <p>Boot Option #7 [USB Lan]</p> <p>Boot Option #8 [Network]</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 & 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 Mode Select

Configures the boot mode option.

Boot Option #1 to Boot Option #8

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

Save & Exit



Save Changes and Exit

To save the changes and exit the Setup utility, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes. You can also press <F4> to save and exit Setup.

Discard Changes and Exit

To exit the Setup utility without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting. You can also press <ESC> to exit without saving the changes.

Save Changes and Reset

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

Restore Defaults

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

Launch EFI Shell from filesystem device

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